H3C HEALTH SCIENCES INNOVATION SOUVENIR

taj mahal palace hotel

Mumbai, January 15-17, 2015

Hosted by:

The Ohio State University and

The All India Institute of Medical Sciences

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ACKNOWLEDGEMENTS:
Conference logo and Front cover design: Prerna Suri, BA, BS, MA student
Souvenir book editors: Shomita S. Mathew-Steiner, Ph.D. and James Spieldenner, BS

"Impactful healthcare solutions may best come from borderless partnership of strengths across the globe powered by the unified spirit to serve humanity as one whole"

See page 6

H3C

HEALTH SCIENCES INNOVATION CONFERENCE

CONFERENCE ORGANIZERS

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Amit K.	Dinda MD, PhD	Professor, Dept. of Pathology	All India Institute of Medical Sciences
Subrata	Chattopadhyay, PhD	Head, Bio-Organic Division	Bhabha Atomic Research Centre
Partha	Mukherjee, MSc, PhD	Project Director	Liver Foundation, West Bengal, India

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I am delighted to welcome you to the first ever OSU – India Health Sciences Innovation Conference and Trade Show. This conference is a remarkable opportunity to foster collaborative spirit between international leaders in medicine and science.

The Ohio State University is proud to host this event alongside the All India Institute of Medical Sciences (AIIMS), India's top public health care and research institution. Ohio State and AIIMS share an unwavering commitment to quality health care and research dissemination. By bringing together bright minds from around the world, the conference allows us to explore strategic industry and academic relationships, as well as career development.

Ohio State's Global Gateway in Mumbai is a key display of our dedication to supporting and working with our Indian colleagues. The office serves as a portal and resource for companies seeking to partner with the university. I am pleased that our Office of International Affairs chose Mumbai as a location to expand Ohio State's outreach and engagement, as the city is clearly a significant source of knowledge and commerce.

Just as we strive to conduct groundbreaking medical research, we must build a strong pipeline for global communication, funding and recruitment. This is essential as we seek to move forward in understanding the health sciences, and ultimately, save lives. I thank all of you for your attendance and participation in this wonderful event, and hope to see our joint efforts flourish in new and exciting ways.

Sincerely,

Michael V. Drake, MD
President

THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

Chandan K. Sen, PhD, FACN, FACSM
Professor and Vice Chairman (Research)
Department of Surgery
Professor of Nursing
Director
Center for Regenerative Medicine & Cell-Based Therapies
Executive Director
OSU Comprehensive Wound Center
Associate Dean (Innovation)
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Chandan.Sen@osumc.edu

Message from Conference Chair

Founded in 1870, the Ohio State University commonly referred to as Ohio State or OSU, is one of the largest public research universities in the United States. Ohio State's 1,764 acres (7.14 km2) of main campus is approximately 2.5 miles (4.0 km) north of Columbus's downtown. The University has an extraordinary research infrastructure and a massive research program with an annual research expense close to a billion dollars. Among public schools, it ranks second in the United States on industry sponsored research.

The Ohio State University is committed to becoming a preeminent global university – one that prepares its students and faculty to participate actively in knowledge-based collaborations around the world. As one of America's best public universities, we strive to build a foundation that will integrate international dimensions with every facet of the institution, to pursue international partnerships and to collaborate on the solution of local and global issues based on Ohio State's expertise.
To solidify Ohio State's commitment to enhancing its global interactions, the university has offices – Global Gateways – in key parts of the world. The India Gateway office of Ohio State in Mumbai has been the spine of all preparatory activities for the **H3C**. I thank the Office of International Affairs and the Wexner Medical Center for their most enthusiastic support of the **H3C** conference.

This **H3C** Health Sciences Innovation conference is co-hosted by The Ohio State University and the All India Institute of Medical Sciences. It is aimed at fostering Ohio State-India:

(i) Industry partnerships,
(ii) Academic partnerships, and
(iii) Career development opportunities

Industry partnership: (a) inviting Indian industries towards R&D partnership – from basic sciences to clinical trials; Ohio State and the State of Ohio offers its vast infrastructure to benefit Indian industries; (b) several US-based industries, many of which are currently Ohio State sponsors, are coming to India with the intent to explore business opportunities and new partnerships in India.
Academic partnership: In the area of research, education and patient care to share unique expertise in a way that value is brought to all partnering entities.
Career development: To meet Indian students and researchers (undergraduate to post-doctoral) who would like to come to Ohio State or to industries based in Ohio for education and training. To provide Ohio State students and alumni opportunities to train and gain experience in India.

During this past year, I have had the opportunity to meet over 100 key leaders in India and the United States for the purposes of hosting **H3C**. The overwhelming support is reflected in the program and participating institutions. The practice of low cost health care in India is a resourceful classroom to learn from as the United States prepares to deliver affordable health care to its population.

I welcome each of you and thank you for your participation at the **H3C**. This event will seed many new partnerships that will shape the future of health care.

Chandan K Sen, PhD

"Impactful healthcare solutions may best come from borderless partnership of strengths across the globe powered by the unified spirit to serve humanity as one whole" – Chandan K. Sen (2014)

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All India Institute of Medical Sciences
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प्रो० महेश चन्द्र मिश्र
निदेशक

Prof. M. C. Misra
MS, FRCS, Hon. FRCS (Glasg.) FCLS, FAMS, FACS
DIRECTOR

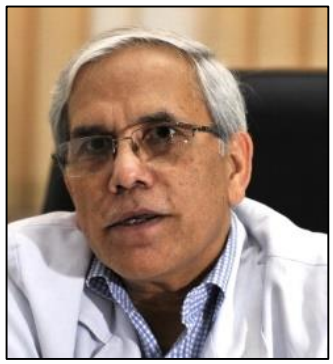
संख्या/No.....

दिनांक/Date 18th December, 2014

MESSAGE

I am happy to learn that All India Institute of Medical Sciences (AIIMS) in conjunction with The Ohio State University are jointly hosting the Health Science Innovation Conference in the Taj Mahal Palace Hotel in Mumbai, India, January 15 - 17, 2015. All India Institute of Medical Sciences is the premier medical institution of India, which has significant contribution in advancement for medical practice improving patient care, education and research. Over past one decade it has been rated as the top medical institution in India. Founded in 1870 the Ohio State University, commonly referred to as Ohio State or OSU, is one of the largest public research university in the United States. Among public schools, it ranks second in the United States on industry-sponsored research. The partnership between AIIMS and OSU in this conference will help the faculty, students, scientists and other health service professionals of both these institutions to communicate and exchange knowledge and views resulting in development of awareness and collaboration for advanced biomedical research and its application in health care.

I wish this conference to be of great success and pave the pathway for long term collaboration between these two leading academic institutions.



(Prof. M.C. Misra)

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On behalf of the Ohio State University College of Medicine, I would like to extend my personal welcome to all of the participants in the OSU Health Sciences Innovation Conference and Trade Show. Dr. Chandan Sen, the Associate Dean for Translational Research in our College of Medicine, has done an outstanding job in organizing and chairing this conference.

Founded in 1914, our College has just celebrated its 100th year of training physicians to serve the citizens of our state, our country and the world. As an integral part of a major academic institution, the College of Medicine has embarked on a journey of innovation and discovery which has brought us to a position of leadership in the health sciences today.

The mission of our College of Medicine is **to improve people's lives through innovation in research, education and patient care.** Our vision is **to work as a team shaping the future of medicine by creating, disseminating and applying new knowledge and by personalizing health care to meet the needs of each individual.**

As evidence of our constant striving for excellence, in December 2014, the Ohio State University Wexner Medical Center opened the new James Cancer Hospital and Solove Research Institute, which is the third largest cancer hospital in the United States, and the world's most advanced Cancer Hospital. Innovation in the Health Sciences has always been a driving force in our College of Medicine.

We hope that you enjoy the conference, and come to visit us in Ohio sometime soon!

Sincerely yours,

E. Christopher Ellison, MD
Interim Dean College of Medicine
Robert M. Zollinger Endowed Chair and College of Medicine Distinguished Professor, Department Surgery
CEO of the Faculty Group Practice and
Senior Associate Vice President of Health Sciences

Brihanmumbai Municipal Corporation (Municipal Corporation of Greater Mumbai)
बृहन्मुंबई महानगरपालिका

December 18, 2014

Re: **H3C Health Sciences Innovation Conference**, Mumbai, January 15-17, 2015
co-hosted by: The Ohio State University (USA) &
All India Institute of Medical Sciences

Dear H3C delegates and visiting members of The Ohio State University,

On behalf of the City of Mumbai (previously known as Bombay) I welcome you to this great city. I commend your vision to address health care, career and commerce under one roof. Indeed there is little future in health care without a talent pipeline and a proper business plan to sustain expanding efforts.

I have had the opportunity to meet Professor Chandan K. Sen, chairman of this meeting, in my office and understand the goals. I am excited that you selected Mumbai as your location. Mumbai is the capital city of the Indian state of Maharashtra. It is the most populous city in India, most populous metropolitan area in India, and the eighth most populous city in the world, with an estimated city population of 18.4 million and metropolitan area population of 20.7 million as of 2011. Mumbai is the financial, commercial and entertainment capital of India. It is also one of the world's top ten centres of commerce in terms of global financial flow, generating 6.16% of India's GDP and accounting for 25% of industrial output, 70% of maritime trade in India (Mumbai Port Trust & JNPT), and 70% of capital transactions to India's economy.

Welcome to Mumbai. Mumbai welcomes new Indo-US partnerships in health care and looks forward to The Ohio State University as a champion of that cause.

I look forward to joining you at the Gala dinner on January the 16th 2015.

Snehal Ambekar
Mayor
City of Mumbai

CONFERENCE PROGRAM

FOR SESSION CHAIRS (also useful for speakers)

- When possible, please meet your speakers in advance of the session and ask if any special needs are required related to their presentation (such as Mac adapters etc.)
- Ask the speakers to show up at the session atleast **15 min** in advance
- Emphasize the need to finish on time because of concurrent sessions
- Please show up at assigned auditorium atleast 15 min before the session. Make sure you **collect plaques for speakers** from session organizers
- Contact the audio-visual staff for your auditorium and make sure that all lectures are pre-loaded
- If any assigned speaker is missing 15 min in advance, contact conference organizers for potential replacement speaker
- If replacement cannot be found, re-allocate available time to existing speakers
- It is a critical responsibility of session chair to ensure every speaker stops on time. If any exceed 2 min of assigned time, the presentation must be interrupted and terminated
- Please ensure active conversation during discussion phase
- Following discussion each speaker should be recognized by a plaque presented by the session chair to the speaker
- **Under NO circumstances may the session exceed the time for which it was programmed to conclude**

PROGRAM OVERVIEW (as of December 23rd, 2014)*

WEDNESDAY

TIME	Event	LOCATION
6:00 pm - 6:30 pm	**Taj Palace Hotel Heritage Tour** *Limited Seats!* *20 people per group max.* *For information more information please contact*	*Shomita S. Mathew-Steiner* *For reservations please RSVP* *Hiral Shah* *Visitors from outside India high priority*
6:00 pm -8:00 pm *All invitees are required to arrive no later than 6:15 pm	**Small Group Dinner For OSU Faculty** *Chief Guest: Prof. Luc Montagnier* Please bring invitation letter to restaurant.	**Rendezvous, Taj Mahal Palace**
Private City Transportation	Registered chauffeured Toyota Innova cars (seats 4) available for rent (3 hour slots). Limited availability. First come first served based on availability. If interested, please contact *Shomita S. Mathew-Steiner* *ASAP.*	

***(For updates visit: india2015.osu.edu)**

PROGRAM OVERVIEW (as of December 23rd, 2014)*

THURSDAY, JAN 15, 2015

TIME	TOPICS	SPEAKER	LOCATION
7:00 am - 8:00 am	***Breakfast***	Free for all registered Taj Hotel Residents (also, free in-room premium WiFi). Tea, coffee, and refreshments will be served on conference location throughout the day at no cost to all registered participants.	Taj restaurants in the Palace and Tower depending on where your hotel room is located.
7:00 am - 1:00 pm	**Registration Open**		
8:30 am - 1:00 pm	**Inaugural Session**	**MC's: Shomita S. Mathew-Steiner and Abhishek Majumdar**	
8:45 am - 9:00 am	**Introductory remarks**	**Chandan K. Sen, PhD**	
9:00 am - 9:15 am	**Welcome Remarks**	**Michael V. Drake, MD**	
9:15 am - 9:35 am	**Chief Guest**	**Hon'ble Jagat Prakash Nadda**	
9:35 am - 9:50 am	**Welcome Remarks**	**Mahesh C. Misra, MBBS, MS, FRCS (Glasg.) FACS, FAMS, FCLS, Hon. FRCS**	
9:50 am - 10:00 am	**Vote of Thanks**		
10:00 am - 10:15 am	**Break**		
10:15 am - 10:30 am	**Welcome Remarks (continued)**	**Michael V. Drake, MD**	
10:30 am - 11:30 am	**Welcome Remarks**	**Hon'ble Thomas L. Vajda** **William I. Brustein, PhD**	
11:00 am - 12:00 pm	**Keynote Lecture:** **HIV/AIDS and the New Epidemics-How to be Prepared**	**Luc Montagnier, MD** **(2008 Nobel laureate)**	
12:00 pm - 12:30pm	**Plenary Lecture:** **Academic Health Care in India: Opportunities to Partner**	**Mahesh C. Misra, MBBS, MS, FRCS (Glasg.) FACS, FAMS, FCLS, Hon. FRCS**	
12:30 pm -1:00 pm	**Plenary Lecture:** **Translation Research: A Global Perspective**	**Christopher Breuer, MD**	
1:00 pm- 3:00pm	**Lunch & Exhibits**		
3:00pm- 3:20 pm	**Liver Regeneration in Health and Diseases**	**Shiv Kumar Sarin, MD, DM**	
3:20 pm - 3:40 pm	**Cancer Care in India**	**Rajendra Badwe, MS**	
3:40 pm - 4:00 pm	**Health Systems and Policy at the Crossroads: An Argumentative Indian Viewpoint**	**Abhijit Chowdhury, MD, DM**	
4:00 pm - 4:20 pm	**Enhancing Child Health Using a Learning Health System**	**William E. Somyer, MD, FASN**	
4:20 pm - 4:40 pm	**Vision of a Futuristic Hospital in Mumbai**	**Gustad Davar, MS, MD**	
4:40 pm - 5:00 pm	**Select USA**	**Camille Richardson**	
5:00 pm - 5:20 pm	**Identifying Issues for Indian Drug Manufacturers in the U.S.**	**Ralph Breitfeller, BA, JD**	
5:20 pm - 5:50 pm	**Health Care Philosophies and Principles: East meets West**	**Partha Nandi, MD, FACP**	
6:00 pm - 6:30 pm	**Taj Palace Heritage Tour (Needs prior reservation)**		
6:00pm- 9:00pm	**VIP Dinner Honoring Sponsors and Commercial Leaders (By invite only)**		
	Mumbai by Night Care Tour. FREE (Needs prior reservation)		

***(For updates visit: india2015.osu.edu)**

PROGRAM OVERVIEW (as of December 23rd, 2014)*

FRIDAY, JAN 16, 2015

TIME	TOPIC	EVENT		LOCATION
7:00 am - 8:00 am	Breakfast	Free for all registered Taj Hotel Residents (also, free in-room premium WiFi). Tea, coffee, and refreshments will be served on conference location throughout the day at no cost to all registered participants.		Taj restaurants in the Palace and Tower depending on where your hotel room is located.
TIME	TRACK 2A	TRACK 2B	TRACK 2C	TRACK 2D
8:00 am – 9:20 am	**Regenerative Medicine**	**Nutrition**	**Blocked**	**Blocked**
9:20 am – 9:30 am	Break	Break	Break	Break
9:30 am – 10:50 am	**Regenerative Medicine**	**Redox Biology**	**Neuroscience**	**Natural Food Supplement**
10:50 am – 11:00 am	Break	Break	Break	Break
11:00 pm – 12:20 pm	**Regenerative Medicine - Bioreactor**	**Therapeutics**	**Advanced Wound Management**	**Convergence of Innovation and Population Health: Indian Child**
12:40 pm - 2:00 pm	Lunch			
2:00 pm – 3:20 pm	**Wound Care Dressings**	**Natural Food Supplements**	**Community Cancer Care**	**Health Care: Business and Legal US & India**
3:20 pm – 3:30 pm	Break	Break	Break	Break
3:30 pm – 4:50 pm	**Wound care**	**Mass Spectrometry Approaches in Biomedical Research**	**Innovations in Drug Discovery, Development, and Therapeutics**	**Poster Session Set Up**
5:00pm- 7:00pm	**Cocktails (Conference faculty and paid registrants) and Poster Presentation (Room 2D) and Exhibit Hall (Ballroom)**			
7:00pm-11:00pm	**Gala Dinner (Crystal Room)** *All paid registrants, speakers, merit award poster presenters and chairs invited.*			
7:00 pm - 8:00 pm	**Performance by Fusion Percussion Maestro - Bickram Ghosh and Band**			
8:15 pm - 8:30 pm	**Recognitions by President Michael V. Drake and Professor Chandan Sen**			
8:30 pm - 9:30 pm	**Dance Performance: Indian Dance Troupes**			

***(For updates visit: india2015.osu.edu)**

PROGRAM OVERVIEW (as of December 23rd, 2014)*

FRIDAY: POSTER SESSION AND GALA DINNER

POSTER SESSION SESSION CHAIRS: Narasimham Parinandi, Savita Khanna, Mahmood Khan & Sashwati Roy	
5:00 pm- 7:00 pm	**Poster Presentation (Gateway Room) and Exhibit Hall (Ballroom)** ***All posters MUST be set up by 4:50 pm following which the assigned spots will not be available.*** ***Out of 200 submitted, top 10 abstracts from India and US each were selected on a merit basis. Of these 20, 10 have been chosen to give poster talks. 5 from US and 5 from India. These poster presenters are invited to present for 3 minutes using no more than 3 PowerPoint slides. All presenters must report to the Gateway Room (Room D) at 5:00 pm sharp.*** *Posters to be dismounted at 9:00 am, Saturday*
7:00 pm-11:00 pm	**Gala Dinner (Crystal Room)** **Chief Guest: Mrs. Snehal Ambekar, Mayor of Mumbai** *All paid registrants, speakers, merit award poster presenters and chairs invited.* *Dress Code - Business Formal* *Doors will be closed by 7:30 pm*
7:00 pm - 8:00 pm	**Performance by:** **Fusion Percussion Maestro and Band** **Bickram Ghosh (Oscar award nominee 2015)** 
8:15 pm - 8:30 pm	**Recognitions by President Michael V. Drake and Professor Chandan Sen**
8:30 pm - 9:30 pm	**Dance Performance:** **Indian Dance Troupes**
Private City Transportation	Registered chauffeured Toyota Innova cars (seats 4) available for rent (3 hour slots). Limited availability. First come first served based on availability. If interested, please contact Shomita S. Mathew-Steiner ASAP.

***(For updates visit: india2015.osu.edu)**

PROGRAM OVERVIEW (as of December 23rd, 2014)*

TRACK 2A- FRIDAY

TIME	TOPICS	EVENT	LOCATION
7:00 am - 8:00 am	**Breakfast**	Free for all registered Taj Hotel Residents.	Taj restaurants in the Palace or Tower

TRACK 2A1
REGENERATIVE MEDICINE
SPONSOR: OSU CRMCBT
SESSION CHAIRS: AMIT DINDA & SUNDEEP KESWANI

TIME	TOPICS	SPEAKER
8:00 am - 8:20 am	**Cardiovascular Tissue Engineering Applications for use in Congenital Heart Surgery**	**Christopher Breuer, MD,** Nationwide Children's Hospital, The Ohio State University
8:20 am - 8:40 am	**Improving the Production of Tissue Engineered Intestine**	**Gail E. Besner, MD,** Nationwide Children's Hospital, The Ohio State University
8:40 am - 9:00 am	**More Than A Decade Of Ongoing Conflict: Application of Traditional Reconstructive Techniques with Regenerative Medicine Therapies In Traumatic Extremity Reconstruction- Introduction Of The Hybrid Reconstructive Elevator**	**Ian L. Valerio, MD, MS, MBA,** The Ohio State University
9:00 am - 9:20 am	**Discussion**	

TRACK 2A2
REGENERATIVE MEDICINE
SPONSOR: OSU CRMCBT
SESSION CHAIRS: MANEESH SINGHAL & GAIL BESNER

9:30 am - 9:50 am	**Scarless Wound Healing, Are we there yet?**	**Sundeep G Keswani, MD,** The University of Cincinnati. Ohio
9:50 am - 10:10 am	**Bioengineering of Nanofiber Cardiac Patch for Myocardial Repair**	**Mahmood Khan, MPharm, PhD,** The Ohio State University
10:10 am - 10:30 am	**Stem Cells and Autism**	**Rene Anand, PhD,** The Ohio State University
10:30 am - 10:50 am	**Discussion**	

TRACK 2A3
REGENERATIVE MEDICINE- BIOREACTOR
SPONSOR: INSTRON
SESSION CHAIRS: CHRISTOPHER BREUER & MAHMOOD KHAN

11:00 am - 11:15 am	**Perfusion Bioreactors for Solid Cured and Hydrogel Scaffolds**	**David Dean, PhD,** The Ohio State University
11:15 am - 11:30 am	**Tissue Engineering Research using Bioreactors & Confocal Microscopy**	**Namrata Gundiah, MSc, PhD ,** Indian Institute of Science Bangalore, India
11:30 am - 11:45 am	**Expanded Technologies in Bioreactor Systems**	**James Ritchey, MBA, BS,** Instron, Massachusetts, USA
11:45 am - 12:00 pm	**Indian Manufacturing of Bioreactor Systems & Solution**	**Ramasubbu Sunder, PhD,** Instron
12:00 pm - 12:20 pm	**Discussion**	
12:20 pm - 12:40 pm	**GROUP PHOTO (MEET IN EXHIBIT HALL)**	
12:40 pm - 2:00 pm	**LUNCH**	

***(For updates visit: india2015.osu.edu)**

PROGRAM OVERVIEW (as of December 23rd, 2014)*

TRACK 2A4 VOMARIS INNOVATIONS... PRODUCT PROCELLERA SPONSOR: VOMARIS SESSION CHAIRS: IAN VALERIO & SUJOY GHOSH		
TIME	TOPICS	SPEAKER
2:00 pm – 2:15 pm	**Comprehensive Approach to Delivery of Wound Care Services Designed to Optimize Outcomes**	**Gayle Gordillo, MD, FACS**, The Ohio State University
2:15 pm - 2:30 pm	**Bioelectric Wound Dressing: Procellera Technology- A Cost Effective Technology Solution for Emerging Markets**	**Mike Nagel, BA, MBA,** Vomaris Inc., Arizona, USA
2:30 pm - 2:45 pm	**Silver-Zinc Redox-Coupled Electroceutical Wound Dressing Disrupts Bacterial Biofilm**	**Shomita S. Mathew-Steiner, PhD** , The Ohio State University Medical Center
2:45 pm - 3:00 pm	**Bioelectric Wound Dressing Disrupts Mixed Species Bacterial Biofilm**	**Kasturi Ganesh Barki, MD,** The Ohio State University Medical Center
3:00 pm - 3:20 pm	**Discussion**	
TRACK 2A5 WOUND CARE SPONSOR: SOUTHWEST TECHNOLOGIES SESSION CHAIRS: GAYLE GORDILLO & MANEESH SINGHAL		
3:30 pm – 3:50 pm	**A Modified Collagen Gel Dressing Resolves Inflammation and Promotes Angiogenesis in Chronic Wounds**	**Sashwati Roy, PhD** , The Ohio State University
3:50 pm - 4:10 pm	**A Modified Collagen Gel Improves Acute Phase Inflammation and Resolution Response in Wound Healing: Role of Macrophage Polarization**	**Amitava Das, Mpharm,** The Ohio State University
4:10 pm - 4:30 pm	**Wound Care: Clinical Case Observations**	**Karen Rose, RN, BSN ,**Comprehensive Wound Center University Hospital East
4:30 pm - 4:50 pm	**Discussion Panel (2A4 + 2A5)**	**Gayle Gordillo, MD, FACS Maneesh Singhal, MS, MCh, FACS**

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PROGRAM OVERVIEW (as of December 23rd, 2014)*

TRACK 2B- FRIDAY

TIME	TOPICS	EVENT	LOCATION
7:00 am - 8:00 am	**Breakfast**	Free for all registered Taj Hotel Residents	Taj restaurants in the Palace or Tower

TRACK 2B1
NUTRITION
SESSION CHAIRS: SUBRATA CHATTOPADHYAY & PARTHASARATHI MUKHERJEE

TIME	TOPICS	SPEAKER
8:00 am - 8:15 am	**Maternal Dietary Lutein and Fish Oil Interact to Alter Atherosclerotic Lesions of Progenies in a Japanese Quail Model of Atherosclerosis**	**Ramesh Selvaraj, PhD,** The Ohio State University
8:15 am - 8:30 am	**Nutrition: Past, Present and Future**	**Mulchand S. Patel, PhD,** State University of New York at Buffalo New York, USA
8:30 am - 8:45 am	**Lipids in Health and Disease**	**Narasimham Parinandi, PhD,** The Ohio State University
8:45 am - 9:00 am	**Can We Prevent Obesity and Diabetes and Associated Health Risks?**	**Sushil Jain, PhD,** Louisiana State University Health Sciences Center
9:00 am - 9:20 am	**Discussion**	

TRACK 2B2
REDOX BIOLOGY
SPONSOR: SFRR-INDIA
SESSION CHAIRS: MULCHAND PATEL & JUNJI YODOI

9:30 am - 9: 45 am	**Malabaricones Via Redox Dysregulation are Effective Anti-Cancer Therapeutics**	**Mitali Chatterjee, MD, PhD,** Institute of Post-Graduate Medicine Education & Research (IPGME&R)
9:45 am - 10:00 am	**Age-Dependent Iron Dysregulation and Accumulation of Amyloid Beta Peptide in Rat Brain: Prevention by Long-Term Oral Administration of N-Acetylcysteine, α-Lipoic Acid and α-Tocopherol**	**Sasanka Chakrabarti, MD,PhD** Institute of Post-Graduate Medicine Education & Research (IPGME&R)
10:00 am - 10:15 am	**Ruffling Redox Balance: Novel Approaches for Development of Radiation Countermeasures**	**S.Santosh Kumar, PhD,** Bhabha Atomic Research Centre, Mumbai, India
10:15 am - 10:30 am	**A Bis-Resorcinol Congener of Resveratrol as an Anti-Ulcer Compound**	**Subrata Chattopadhyay, PhD, Bh**abha Atomic Research Centre, Mumbai, India
10:30 am - 10:50 am	**Discussion**	

TRACK 2B3
THERAPEUTICS
SESSION CHAIRS: PRATIT SAMDANI & KETAN K. MEHTA

TIME	TOPICS	SPEAKER
11:00 am - 11:15 am	**Thioredoxin based Therapeutics**	**Junji Yodi, MD,** Kuoto University, Japan
11:15 am - 11:30 am	**Subcutaneous defibrillators**	**Raul Weiss, MD,** The Ohio State University Medical Center
11:30 am - 11:45 pm	**Non-Invasive Hemodynamic Monitoring to improve outcomes in NYHA class III Heart Failure**	**Ragavendra Baliga, MBBS, MD,** The Ohio State University
11:45 am -12:00 pm	**Enhancement of Antibody Therapy with TLR8 Agonists**	**Jonathan Butchar, MD, PhD,** The Ohio State University
12:00 pm - 12:20 pm	**Discussion**	
12:20 pm - 12:40 pm	**GROUP PHOTO (MEET IN EXHIBIT HALL)**	
12:40 pm - 2:00 pm	**LUNCH (BALLROOM)**	

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TRACK 2B4 NATURAL FOOD SUPPLEMENTS SPONSOR: NATREON SESSION CHAIRS: UTPAL BHANJA & PREETI PANCHOLI		
TIME	TOPICS	SPEAKER
2:00 pm – 2:20 pm	**Promoting Ayurveda in the West - Challenges**	**Sanni Raju, PhD, RPh, N**atreon, Inc., Kolkata,India
2:20 pm - 2:40 pm	**Quality Control of Herbal Dietary Supplements**	**Veeraragavan A Muruganandam, PhD,** Natreon, Inc., Kolkata,India
2:40 pm - 3:00 pm	**Concerning Carbon and Nitrogen-Centered Adducts of C60– Fullerene Occurring in Native Shilajit, an Ayurvedic Rasayan (Super Vitalizer)**	**Shibnath Ghosal, PhD, FRSC,** Natreon, Inc., Kolkata,India
3:00 pm - 3:20 pm	**Discussion**	

TRACK 2B5 MASS SPECTROMETRY APPROACHES IN BIOMEDICAL RESEARCH SPONSOR: WATERS CORPORATION SESSION CHAIRS: ELIEZER A RACHMILEWITZ & MITALI CHATTERJEE		
3:30 pm - 3:50 pm	**Characterization of Protein and Nucleoprotein Complexes by Native Mass Spectrometry**	**Vicki Wysocki, PhD,** The Ohio State University
3:50 pm - 4:10 pm	**Mass Spectrometry based Approaches for the Identification of Human Haemoglobin Variants**	**James H. Scrivens, PhD, CC, FRSC,** University of Warwick, Coventry, United Kingdom
4:10 pm - 4:30 pm	**A Label-Free TransOmics Investigation of Drug Mitigated Obesity Within A Mouse Model**	**Mark A. McDowall, PhD, MIoD,** Waters Corporation Wilmslow, Cheshire, United Kingdom
4:30 pm - 4:50 pm	**Discussion**	

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TRACK 2C- FRIDAY

TIME	TOPICS	EVENT	LOCATION
7:00 am - 8:00 am	**Breakfast**	Free for all registered Taj Hotel Residents	Taj restaurants in the Palace or Tower
TRACK 2C2 NEUROSCIENCE SPONSOR: TATA INSTITUTE OF FUNDAMENTAL RESEARCH SESSION CHAIRS: ANDREW SLIVKA & SHAILAJA KALE			
TIME	TOPICS	SPEAKER	
9:30 am - 9:45 am	**Axonal Transport of Soluble and Membrane Associated Proteins by Kinesin-2**	**Krishanu Ray, PhD,** Tata Institute of Fundamental Research (TIFR), Mumbai, India	
9:45 am - 10:00 am	**Regulation of Synaptic Vesicle Transport**	**Sandhya Koushika, PhD,** Tata Institute of Fundamental Research (TIFR), Mumbai, India	
10:00 am - 10:15 am	**Targeting Hubs of Cancer: PAKs as Novel targets Against Gliomas**	**Vinay K. Puduvalli, MD,** The Ohio State University	
10:15 am - 10:30 am	**Surgical Management of Spine Tumors**	**Ehud Mendel, MD, FACS,** The James Cancer Hospital, The Ohio State University	
10:30 am - 10:50 am	**Discussion**		
TRACK 2C3 ADVANCED WOUND MANAGEMENT SPONSORS: SMITH AND NEPHEW SESSION CHAIRS: ABHIMANYU BASU & SASHWATI ROY			
11:00 am – 11:20 am	**India Demographics & DFU Statistics**	**Amit Mohan, PhD,** Smith & Nephew Inc., Texas,USA	
11:20 am - 11:40 am	**Diabetic Foot Ulcer Disease and its Complications**	**Arun Bal, MS, PhD,** S L Raheja Hospital, Mumbai	
11:40 am -12:00 pm	**Diabetic Foot Ulcer Disease and its Complications**	**Sanjay Vaidya, PhD, MBBS, MS, MCh,** S L Raheja Hospital, Mumbai	
12:00 pm- 12:20 pm	**Discussion**		
12:20 pm - 12:40 pm	**GROUP PHOTO (MEET IN EXHIBIT HALL)**		
12:40 pm - 2:00 pm	**LUNCH (BALLROOM)**		
TRACK 2C4 COMMUNITY CANCER CARE-CHALLENGES AND OPPORTUNITIES SPONSOR: ATHENS CANCER CENTER, ONCOLOGY HEMATOLOGY CONSULTANTS OF SE OHIO SESSION CHAIRS: DIPTENDRA SARKAR & AASHISH BHATT			
2:00 pm - 2:15 pm	**Improving Community Access to Radiation Therapy by Indian/ American Partnerships**	**Aaron O. Williams, PharmD, MD, MBA,** Athens Cancer Center	
2:15 pm - 2:30 pm	**Bridging the Gap- Cancer Care in India**	**Utpal K. Bhanja, MD, DAMS,** Oncology Hematology Consultants of SE Ohio	
2:30 pm - 2:45 pm	**Reforming Medical Business Ethics: A Transcultural Personalist Proposal**	**Ashley K. Fernandes, MD, PhD**, The Ohio State University Medical Center	
2:45 pm - 3:00 pm	**Community Cancer Care in India and KCHRC**	**Rajesh Kantharia, MD**, The Kailash Cancer Hospital and Research Center	
3:00 pm - 3:20 pm	**Discussion**		
TRACK 2C5 INNOVATIONS IN DRUG DISCOVERY, DEVELOPMENT, AND THERAPEUTICS SPONSOR: OSU DEPARTMENT OF PHARMACY SESSION CHAIRS: AMIT DINDA & CAMILLA RODRIGUES			
3:30 pm – 3:50 pm	**Ensuring Effective and Safe Medications for Children**	**Milap Nahata, PharmD, MS,** The Ohio State University	
3:50 pm - 4:10 pm	**Arylimidamide-Azole Combinations against Leishmaniasis**	**Karl A. Werbovetz, PhD,** The Ohio State University	
4:10 pm - 4:30 pm	**Dietary Omega-3 Fatty Acids Increase Susceptibility to Ventricular Arrhythmias After Myocardial Infarction**	**Cynthia Carnes, PharmD, PhD** Professor, The Ohio State University	
4:30 pm - 4:50 pm	**Discussion**		

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TRACK 2D- FRIDAY

TIME	TOPICS	EVENT	LOCATION
7:00 am - 8:00 am	**Breakfast**	Free for all registered Taj Hotel Residents	Taj restaurants in the Palace or Tower
TRACK 2D2 NATURAL FOOD SUPPLEMENTS SPONSOR: OSATO RESEARCH INSTITUTE-JAPAN SESSION CHAIRS: LUC MONTAGNIER & YUKI HAYASHI			
TIME	TOPICS	SPEAKER	
9:30 am - 9:50 am	**Fermented Papaya Preparation (FPP) on Irradiation Effect**	**Eitan Fibach, PhD,** Hadassah - Hebrew University Medical Center Ein-Kerem, Jerusalem, Israel	
9:50 am - 10:10 am	**The Therapeutic Potential of Antioxidants (FPP) in the Treatment of Thalassemia Major and Intermedia**	**Eliezer A Rachmilewitz, MD,** Edith Wolfson Medical Center, Holon, Israel	
10:10 am - 10:30 am	**FPP in Stimulation of Respiratory Burst Function of Innate Immune Cells in Type 2 Diabetes Patients**	**Sashwati Roy, PhD,** Laser Capture Molecular Core, The Ohio State University	
10:30 am - 10:50 am	**Discussion**		
TRACK 2D3 CONVERGENCE OF INNOVATION AND POPULATION HEALTH: IMPLICATIONS FOR THE INDIAN CHILD SPONSOR: NATIONWIDE CHILDREN'S HOSPITAL SESSION CHAIRS: MAHESH C. MISRA & KRISHANU RAY			
11:00 am – 11:20 am	**Etiology of Congenital Heart Defects: The Importance of Genomics**	**Vidu Garg, MD,** The Ohio State University, Nationwide Children's Hospital, Ohio, USA	
11:20 am - 11:40 pm	**Balancing Physiologic and Pragmatic Approaches with Neonatal Feeding: How can we Create Opportunities?**	**Sudarshan R. Jadcherla, MD, FRCP (Irel), DCH, AGAF** Nationwide Children's Hospital, Ohio, USA	
11:40 am - 12:00 pm	**Vagal Neuropathy in Infants of Diabetic Mothers: Role of Gestational Immaturity at Birth**	**Manish Malkar, MD, MPH,** Nationwide Children's Hospital & The Ohio State University Columbus, Ohio	
12:00 pm - 12:20 pm	**Discussion**		
12:20 pm - 12:40 pm	**GROUP PHOTO (MEET IN EXHIBIT HALL)**		
12:40 pm - 2:00 pm	**LUNCH (BALLROOM)**		
TRACK 2D4 HEALTHCARE: BUSINESS AND LEGAL US & INDIA SPONSOR: KEGLER BROWN & RITTER SESSION CHAIRS: MAHENDRA WADIWALA & SUJIT KAR PURAKAYASTHA			
2:00 pm – 2:20 pm	**Overview of the US Regulatory Process for Indian Pharma Companies**	**Ralph Breitfeller, BA, JD,** Kegler Brown Hill + Ritter, LPA., Ohio,USA	
2:20 pm - 2:40 pm	**Globalization of Education & Related Collaborations**	**Vinita Mehra, LLB, BLS,** Kegler Brown Hill + Ritter, LPA., Ohio,USA	
2:40 pm - 3:00 pm	**Contract R&D: A Faster Way to Innovation and Commercial Growth**	**Shalendra Porwal,** Battelle India, Pune	
3:00 pm - 3:20 pm	**Discussion**		

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SATURDAY , JAN 17, 2015

TIME	TOPIC	EVENT		LOCATION
7:00 am – 8:00 am	Breakfast	Free for all registered Taj Hotel Residents (also, free in-room premium WiFi). Tea, coffee, and refreshments will be served on conference location throughout the day at no cost to all registered participants.		Taj restaurants in the Palace and Tower depending on where your hotel room is located.
TIME	TRACK 3A	TRACK 3B	TRACK 3C	TRACK 3D
8:00 am - 9:20 am	**Vitamin E Supplements**	**Cancer**	**Blocked**	**Blocked**
9:20 am – 9:30 am	Break	Break	Break	Break
9:30 am – 10:50 am	**Tocotrienol Vitamin E**	**Recent Advancements in Radition Oncology**	**Brain Regeneration and Stimulation**	**Research Methodology Workshop**
10:50 am – 11:00 am	Break	Break	Break	Break
11:00 am – 2:20 pm	**Tocotrienol Vitamin E**	**Stem Cell Therapy in India**	**Neurogenetics in Neuromuscular Disorders**	**Research Methodology Workshop**
12:20 pm - 1:40 pm	Lunch			
1:40 pm – 3:00 pm	**Tocotrienol Vitamin E**	**Frontiers in Medical Imaging**	**Next Generation Molecular Diagnostics: Innovations and Impact**	**Research Methodology Workshop**
3:00 pm – 3:10 pm	Break	Break	Break	Break
3:10 pm – 4:30 pm	**Tocotrienol Vitamin E**	**Best Practices for Promoting Clear Health Communication and Cultural Competencies**	**Therapeutics**	**Research to Realization - Relevance in the Indian context**

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PROGRAM OVERVIEW (as of December 23rd, 2014)*

TRACK 3A- SATURDAY

TIME	TOPICS	EVENT	LOCATION
7:00 am - 8:00 am	**Breakfast**	Free for all registered Taj Hotel Residents	Taj restaurants in the Palace or Tower

TRACK 3A1 VITAMIN E SUPPLEMENTS SPONSOR: DSM SESSION CHAIRS: SUSHIL JAIN & SANDHYA KOUSHIKA		
TIME	TOPICS	SPEAKER
8:00 am - 8:20 am	**Affordable Innovations to Increase Nutrient Content of Foods**	**Klaus Kraemer, PhD,** Sight and Life, DSM Nutritional Products, Heerlen, Netherlands
8:20 am - 8:40 am	**Emerging Benefits of Vitamins – Opportunities for Public Health**	**Manfred Eggersdorfer, PhD,** DSM Nutritional Products, Kaiseraugst, Switzerland
8:40 am - 9:00 am	**Maternal Micronutrient Status during Pregnancy and its Influence on risk of Non-Communicable Diseases (NCD's) in the Offspring**	**Chittaranjan S Yajnik, MD,** King Edward Memorial Hospital & Research Centre, Pune, India
9:00 am - 9:20 am	**Discussion**	**Klaus Kraemer, Manfred Eggersdorfer, Mulchand Patel,, Pramod Khosla, Cameron Rink**

TRACK 3A2 TOCOTRIENOL VITAMIN E SESSION CHAIRS: CAMERON RINK & SAVITA KHANNA		
9:30 am - 9:45 am	**Introduction of Palm Tocotrienol Against Stroke**	**Chandan K. Sen, PhD,** The Ohio State University
9:45 am - 10:00 am	**Stroke and Treatment Options**	**Andrew Slivka, MD, FAHA,** The Ohio State University
10:00 am - 10:15 am	**Neural Regeneration after Stroke in Response to Palm Tocotrienol**	**Savita Khanna, PhD,** The Ohio State University
10:15 am - 10:30 am	**Palm Tocotrienol Promotes Perfusion of the Stroke Affected Brain**	**Cameron Rink, PhD,** The Ohio State University
10:30 am - 10:50 am	**Discussion**	**Yogheswaran Gopalan (3A3), Ketan K. Mehta (3A4)**

TRACK 3A3 TOCOTRIENOL VITAMIN E SESSION CHAIRS: PRAMOD KHOSLA& SANCHITA P. GHOSH		
TIME	TOPICS	SPEAKER
11:00 am - 11:15 am	**Targeting Met Mediated Epithelial Mesenchymal Transition in the Treatment of Breast Cancer**	**Paul W. Sylvester, PhD,** University of Louisiana at Monroe., Louisiana, USA
11:15 am - 11:30 am	**Controlled and Targeted Deliveries of Tocotrienol and Statin Promote Healing of Osteoporotic Fracture**	**Ahmad Nazrun Shuid, PhD,** Universiti Kebangsaan Malaysia, George Town, Malaysia
11:30 am - 11:45 am	**Effect of Tocotrienols in Non Small Cell Lung Cancer**	**Smiti Gupta, PhD ,** Wayne State University, Ohio, USA
11:45 am - 12:00 pm	**Clinical Evidence on the Neuroprotective effects of Palm Vitamin E Tocotrienols**	**Yogheswaran Gopalan, PhD,** University of Technology, Mara, Malaysia
12:00 pm - 12:20 pm	**Discussion**	
12:20 pm - 1:40 pm	**LUNCH (BALLROOM)**	

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TRACK 3A4 TOCOTRIENOL VITAMIN E SESSION CHAIRS: PAUL W. SYLVESTER & SANCHITA P. GHOSH		
TIME	TOPICS	SPEAKER
1:40 pm -1:55 pm	**Role of Tocotrienols in Indian type II Diabetes**	**Shailaja Kale, MBBS,MD, King Edward Memorial Hospital Pune**
1:55 pm - 2:10 pm	**Tocotrienols in Cardiovascular Health**	**Ketan K. Mehta, MD,FCPS,FICP,FISE** Asian Heart Institute, S.Raheja (Fortis) Hospital & All Institute of Diabetes, Dr. Balabhai Nanavati Hospital, Seven Hills Hospital
2:10 pm - 2:25 pm		**Pratit Samdani, MD (Int Med), FCPS(MED), DND(IHCA), MBBS,** G.T. Hospital & Sir J.J. Group of Hospitals, Mumbai
2:25 pm - 2:40 pm	**Gamma-Tocotrienol as a Promising Radiation Countermeasure for Acute Radiation Syndrome**	**Vijay K. Singh, PhD,** F. Edward Hébert School of Medicine, Maryland, USA, AFRRI, USUHS
2:40 pm - 3:00 pm	**Discussion**	**Shailaja Kale** **Ketan K. Mehta** **Pratit Samdani**
TRACK 3A5 TOCOTRIENOL VITAMIN E SESSION CHAIRS: VIJAY K. SINGH & AHMAD NAZRUN SHUID		
3:10 pm - 3:30 pm	**Vitamin E Supplementation in Hemodilaysis Patients - the Potential for Tocotrienols**	**Pramod Khosla, PhD,** Wayne State University Ohio, USA
3:30 pm - 3:50 pm	**Tocotrienols as Novel Radiation Countermeasure**	**Sanchita P. Ghosh, PhD,** **Armed Forces Radiobiology Research Institute (AFRRI), Maryland, USA**
3:50 pm - 4:10 pm	**Tocotrienols in Eye Health**	**Nafeeza Mohd Ismail, MD (Mal), PhD (UKM), PMP ,** Universiti Teknologi MARA Shah Alam, Malaysia
4:10 pm - 4:30 pm	**Discussion**	
ADJOURNED		

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TRACK 3B- SATURDAY

TIME	TOPICS	EVENT	LOCATION
7:00 am - 8:00 am	**Breakfast**	Free for all registered Taj Hotel Residents	Taj restaurants in the Palace and Tower
TRACK 3B1 CANCER SPONSOR: TATA MEMORIAL CANCER SESSION CHAIRS: AASHISH BHATT & LORRAINE S. WALLACE			
TIME	TOPICS	SPEAKER	
8:00 am - 8:20 am	**The Hepatocyte Growth Factor Receptor as a Potential Therapeutic Target in Dedifferentiated Liposarcoma**	**Raphael E. Pollock, MD, PhD,** The Ohio State University	
8:20 am - 8:40 am	**Low Cost Innovations In Oncology**	**Rajendra Badwe, MD,** Tata Memorial Cancer Hospital Kolkata, India	
8:40 am - 9:00 am	**Head and Neck Cancer in India**	**Anil K D'Cruz MS, DNB, FRCS (Hon),** Tata Memorial Cancer Hospital Kolkata, India	
9:00 am - 9:20 am	**Discussion**		
TRACK 3B2 RECENT ADVANCEMENTS IN RADIATION ONCOLOGY SPONSOR: OSU DEPARTMENT of RADIATION and ONCOLOGY SESSION CHAIRS: RAJENDRA BADWE & AARON O. WILLIAMS			
9:30 am - 9:45 am	**Ion Therapy Re-invented: The Next Horizon in Radiation Oncology**	**Aashish Bhatt, MD,** The Ohio State University	
9:45 am - 10:00 am	**A New Treatment Paradigm in Oncology: Synergistic Effects of Combining Radiation Therapy and Immunotherapy**	**Raju Raval, MD, Dphil,** The Ohio State University	
10:00 am - 10:15 am	**Harnessing the Potential of Radiation Therapy by Incorporating Next Generation Sequencing for a Better Treatment Outcome**	**Kamalakannan Palanichamy, PhD,** The Ohio State University	
10:15 am - 10:30 am	**Advances in Treatment and Information Technology Radiation Oncology**	**Nilendu Gupta, PhD,** The Ohio State University	
10:30 am - 10:50 am	**Discussion**		
TRACK 3B3 STEM CELL THERAPY IN INDIA SPONSOR: STEM RX BIOSCIENCE SOLUTIONS PVT LTD. SESSION CHAIRS: CHRISTOPHER BREUER & GAYLE GORDILLO			
11:00 am - 11:20 am	**Revamping of Practical Regenerative Medicine**	**Pradeep Mahajan, MD,** StemRx Bioscience Solutions Pvt.Ltd., Navi Mumbai, India	
11:20 am - 11:40 am	**Innovations in Cellular Medicine**	**Neetin Desai, PhD,** StemRx Bioscience Solutions Pvt.Ltd., Navi Mumbai, India	
11:40 am - 12:00 pm	**New Frontiers in Biosciences (Role of ITM Group)**	**Bibhu Ranjan Das, PhD,** Institute Of Technology & Management University Raipur, India	
12:00 pm - 12:20 pm	**Discussion**		
12:20 pm - 1:40 pm	**LUNCH (BALLROOM)**		

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TRACK 3B4 FRONTIERS IN MEDICAL IMAGING SPONSOR: SIEMENS SESSION CHAIRS: ANIL D'CRUZ & RAPHAEL E. POLLOCK		
TIME	TOPICS	SPEAKER
1:40 pm - 1:55 pm	**Advances and Innovations in MR Applications**	**Arunark Kolipaka, PhD,** The Ohio State University
1:55 pm - 2:10 pm	**Advances in CT Imaging: Current and Future Trends**	**Rainer Raupach, PhD,** Siemens Healthcare Forchheim, Germany
2:10 pm - 2:25 pm	**Innovations in Ultrasound: Clinical Applications**	**Andy Milkowski, MS,** Siemens Healthcare Forchheim, Germany
2:25 pm - 2:40 pm	**Smart Materials in Healthcare - From Surgical Tools to Diagnostics to Cell Manipulation**	**Vishnu Baba Sundaresan, PhD,** The Ohio State University
2:40 pm - 3:00 pm	**Discussion**	
TRACK 3B5 BEST PRACTICES FOR PROMOTING CLEAR HEALTH COMMUNICATION AND CULTURAL COMPETENCIES SPONSOR: OSU DEPARTMENT OF FAMILY MEDICINE SESSION CHAIRS: MAHENDRA WADIWALLA & RAGAVENDRA BALIGA		
3:10 pm - 3:40 pm	**Development and Evaluation of Low-Literacy, Patient-Centered Prescription Medication Instruction Labeling**	**Lorraine S. Wallace, PhD,** The Ohio State University
3:40 pm - 4:10 pm	**Legacies of Inequity: Using Historical Awareness to Enhance Cultural Competencies in Biomedical Research**	**Janine Overcash, PhD, GNP-BC,** The Ohio State University
4:10 pm - 4:30 pm	**Discussion**	
ADJOURNED		

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TRACK 3C- SATURDAY

TIME	TOPICS	EVENT	LOCATION
7:00 am - 8:00 am	**Breakfast**	Free for all registered Taj Hotel Residents	Taj restaurants in the Palace and Tower

TRACK 3C2
BRAIN REGENERATION AND STIMULATION
SPONSOR: OSU DEPARTMENT OF NEUROLOGY
SESSION CHAIRS: SANDHYA KOUSHIKA & ANDREW SLIVKA

TIME	TOPICS	SPEAKER
9:30 am - 9:45 am	**Regenerating the Brain**	**Sergio D. Bergese, MD,** The Ohio State University
9:45 am - 10:00 am	**Electroceuticals for Neurological Diseases and Pain**	**Milind Deogaonkar, MD,** The Ohio State University
10:00 am - 10:15 am	**Basics of Deep Brain Stimulation and Preoperative Evaluation**	**Parmod Kumar Bithal, MD,** All India Institute of Medical Sciences, Kolkata, India
10:15 am - 10:30 am	**Anesthesia Management for Deep Brain Stimulation**	**Mihir Prakash Pandia, MD,** All India Institute of Medical Sciences, Kolkata, India
10:30 am - 10:50 am	**Discussion**	

TRACK 3C3
NEUROGENETICS IN NEUROMUSCULAR DISORDERS
SPONSORS: GENEDX & FULGENT DIAGNOSTICS
SESSION CHAIRS: MILIND DEOGAONKAR & SERGIO BERGESE

11:00 am - 11:20 am	**Molecular Diagnosis- Why is it Necessary**	**John Thomas Kissel, MD,** The Ohio State University
11:20 am - 11:40 am	**Identification of Novel Genes/ Mutations**	**Stanley Iyadurai, MSc, PhD, MD,** The Ohio State University
11:40 am - 12:00 pm	**Ethics and Counseling in Neurogenetics**	**Jennifer Roggenbuck, MS, LGC,** The Ohio State University
12:00 pm - 12:20 pm	**Discussion**	
12:40 pm - 1:40 pm	**LUNCH (BALLROOM)**	

TRACK 3C4
NEXT GENERATION MOLECULAR DIAGNOSTICS: INNOVATIONS AND IMPACT
SPONSOR: CEPHEID-USA AND INDIA
SESSION CHAIRS: CYNTHIA CARNES & MILAP NAHATA

1:40 pm - 2:00 pm	**Molecular Detection of Drug Resistance and Carbapenemase Resistant Enterobacteriaceae**	**Preeti Pancholi, PhD D(ABMM),** The Ohio State University
2:00 pm - 2:20 pm	**Impact of Rapid Detection of Tuberculosis and Rifampin Resistance in India and Around the World**	**Camilla Rodrigues, MD,** P.D Hinduja Hospital and Medical Research Institute Mumbai, India
2:20 pm - 2:40 pm	**Molecular Solutions to Three Womens' Health Problems: Chlamydia, Gonorrhea, and Human Papillomavirus (HPV)**	**Ellen Jo Baron, PhD, D(ABMM),** Cepheid, California, USA
2:40 pm - 3:00 pm	**Discussion**	

TRACK 3C5
THERAPEUTICS
SPONSOR: INCOZEN
SESSION CHAIRS: CYNTHIA CARNES & ELLEN JO BARON

3:10 pm - 3:30 pm	**Therapeutic Role of Isoform Specific PI3K Inhibitors in Lymphomas – A Clinical Perspective**	**Prajak Barde, MBBS, MD,** Rhizen Pharmaceuticals SA., La Chaux-de-Fonds, Switzerland
3:30 pm - 3:50 pm	**From 'Molecules' to 'Drugs' in an Indian R & D Biotech – The Incozen-Rhizen Journey**	**Srikant Viswanadha, PhD,** Incozen Therapeutics Pvt. Ltd, Hyderabad, India
3:50 pm - 4:10 pm	**Host directed therapies for targeting pathogenic eukaryotes**	**Abhay R Satoskar, MD, PhD,** The Ohio State University
4:10 pm - 4:30 pm	**Discussion**	

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TRACK 3D- SATURDAY

TIME	TOPICS	EVENT	LOCATION
7:00 am - 8:00 am	**Breakfast**	Free for all registered Taj Hotel Residents	Taj restaurants in the Palace and Tower

TRACK 3D2-4
RESEARCH METHODOLGY WORKSHOP
SPONSOR: OSU COLLEGE OF NURSING
SESSION CHAIRS: USHA MENON & JENNIFER KUE
Full Day workshop from 9:30 AM – 3:00 PM

TIME	TOPICS	SPEAKER
9:30 am - 9:45 am	**Designing and Implementing Your Research Study OSU College of Nursing**	**Usha Menon, PhD, RN, FAAN,** The Ohio State University **Jennifer Kue, PhD,** The Ohio State University **Laura A. Szalacha, EdD,** The Ohio State University
9:45 am - 10:00 am		
10:00 am - 10:15 am		
10:15 am - 10:30 am	**A: Developing a Research Agenda**	**Usha Menon, PhD, RN, FAAN**
10:30 am - 10:50 am	**B: Introduction to Methods Significance and Research Design**	**Jennifer Kue, PhD**
11:00 am - 11:40 am	**C: Introduction to Methods: Sampling and Data Collection**	**Usha Menon, PhD, RN, FAAN**
11:40 am - 12:20 pm	**D: Nuts and Bolts of Analysis**	**Laura A. Szalacha, EdD**
12:20 pm - 1:40 pm	**LUNCH (BALLROOM)**	
1:40 pm - 2:20 pm	**D: Nuts and Bolts of Analysis Continued**	**Laura A. Szalacha, EdD**
2:20 pm- 3:00 pm	**E: Building a Team and Publications**	**Jennifer Kue, PhD**

TRACK 3D5
RESEARCH TO REALIZATION - RELEVANCE IN THE INDIAN CONTEXT
SPONSORS: INTERNATIONAL & ALUMNI RELATIONS, INDIAN INSTITUTE OF TECHNOLOGY MADRAS, CHENNAI AND VISION RESEARCH FOUNDATION, SANKARA NETHRALAYA, CHENNAI
SESSION CHAIRS: AMIT DINDA & ARUNARK KOLIPAKA

3:10 pm - 3:30 pm	**Assistive Device Development for Locomotor Impairments**	**Sujatha Srinivasan, MS, PhD,** IIT Madras, Chennai
3:30 pm - 3:50 pm	**Aptamers and their Applications in Cancer**	**S. Krishnakumar, MBBS, MD,** Vision Research Foundation, Chennai,India
3:50 pm - 4:10 pm	**Towards Point-of-Care Mass Spectrometry: New Advances in Ambient Ionization Methods**	**T. Pradeep, PhD,** Indian Institute of Technology Madras, Chennai, India
4:10 pm - 4:30 pm	**Discussion**	

ADJOURNED

***(For updates visit: india2015.osu.edu)**

A PLAQUE OF RECOGNITION PRESENTED TO ALL SPEAKERS AND TO SELECT DISTINGUISHED PARTICIPANTS

The image below shows plaque design and does not represent an actual plaque

PRE-CONFERENCES


HAWA MAHAL, JAIPUR

JAIPUR: Pre-conference on Indian Health and R&D System

January 7-8, 2015

Location: Jai Mahal Palace

Key goal: To understand funding opportunities in India together with the health care model

KOLKATA: Pre-conference workshop on chronic wound care

January 10, 2015

Location: Peerless Hospital and BK Roy Research Center

Key goal: To develop wound care as a discipline in India. In addition to lectures by top wound care experts from clinical and basic science backgrounds, practical demonstrations on wound care were included


VICTORIA MEMORIAL, KOLKATA


RED FORT, DELHI

DELHI: Pre-conference on Regenerative Medicine and Wound Care

January 12-13, 2015

Location: All-India Institute of Medical Sciences

Key goal: This two day workshop was aimed to cover the related and critical topics of Regenerative Medicine, Nanotechnology and Wound Care

WONDERING WHERE YOU ARE IN MUMBAI?

Here's a map of the city (to the left)

And a zoomed in image below is where you are on the map (that is if you're at the conference!!)

NAVIGATING THIS SOUVENIR: COLOR CODING

This souvenir is laid out so as to make the navigation of the book a little easier. Use the following color guides to find the right section

SPEAKER AFFILIATION: Abstract titles are color coded to indicate the following affiliations

OSU

INDIA

OTHER

These abstracts were selected by a panel of expert reviewers as being the top among the abstracts submitted for poster presentation

Among the top 20 posters selected from India and overseas, abstracts with this symbol were shortlisted for a poster talk (PT)

SECTIONS: The color bars extending along the page edges indicate different parts in the conference

WELCOME, PREPARATION FOR CONFERENCE, PARTNERS, SPEAKER INFO, INDEX OF NAMES PREPARATION FOR THE MEETING

SPEAKERS; THURSDAY, JANUARY 15TH, 2015

SPEAKERS; FRIDAY, JANUARY 16TH, 2015

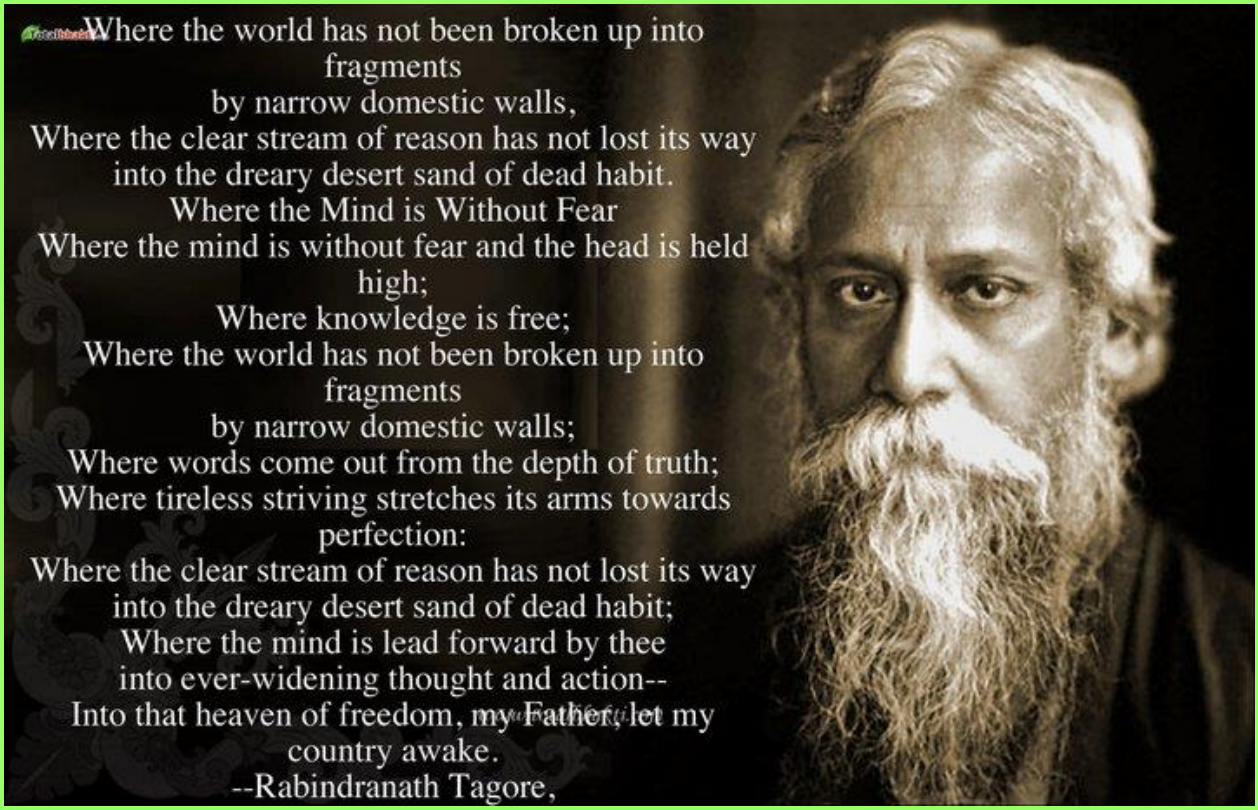
SPEAKERS; SATURDAY, JANUARY 17TH, 2015

TOP 20 POSTERS; FRIDAY, JANUARY 16TH, 2015

POSTERS; FRIDAY, JANUARY 16TH, 2015

IN THE SPEAKER AND POSTER ABSTRACT SECTIONS, ALL BOXES WITH COLORED BACKGROUND ARE TIDBITS OF INFORMATION FOR YOUR iNFOTAINMENT. PLEASE VERIFY FACTS FROM APPROPRIATE SOURCES BEFORE ACTING ON THEM.

ALL BOXES WITH WHITE BACKGROUND REPRESENT ABSTRACTS

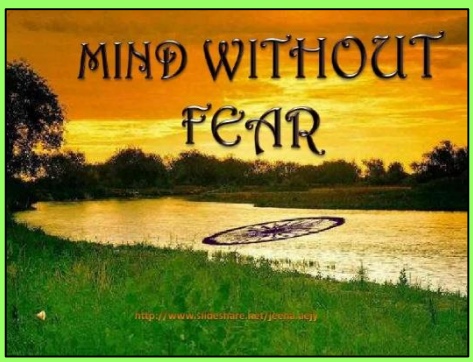


Written by Rabindranath Tagore before India's independence, it represents Tagore's dream of how the new, awakened India should be. The original Bengali language poem was published in 1910

This poem has inspired Indians with its image of a free-thinking, undivided, dynamic nation, and often appears in textbooks. "Chitto Jetha Bhoyshunyo" is also popular among liberals in Bangladesh.

President Barack Obama used the first two lines in his 2010 speech to the joint session of Indian Parliament in New Delhi.
SOURCE: WIKIPEDIA

See this link for a youtube video where OSU President Michael Drake reads this poem https://www.youtube.com/watch?v=q5CjxAWg0Ok



INDIANISMS

Some general rules of good manners and etiquette in India:

1. Indians of all ethnic groups disapprove of public displays of affection between men and women.

2. Never keep your purse or wallet in your back pocket. Certainly not passport!

3. Standing tall with your hands on your hips is perceived as aggressive.

4. Pointing with your finger is considered bad manners and rude.

5. Whistling in public is very etiquette.

6. Never point your feet at another person as feet are considered unclean.

7. Stand when the national anthem (of any country) is playing. Show respect to all flags and all religious symbols.

8. Do not comment on personal appearances or clothes in a negative way; if you cannot say something complimentary, do not say anything at all.

9. Touching - Public physical contact between men and women is far less acceptable in India than in other parts of the world.

10. Don't touch a religious object with your feet or left hand.

Dining Etiquette

Dining etiquette in India is quite different to Western countries. There it is considered proper Indian etiquette to eat with your hands; this is how the majority of the Indian people eat. It is tradition and part of the Indian culture, it is also an accepted part of Indian etiquette.

You may either try to eat in a traditional way or ask for silverware.

Introduction Etiquette.
Indian etiquette considers it important to use a person's title wherever it is possible, titles such as doctor or professor etc. Use courtesy titles such as "Mr", "Mrs", or "Miss" for those without professional titles and wait to be invited to use first names. Try 'Sir/ Ma'am' for strangers and 'Uncle/ Aunty'.

For a stranger, it is better to suffix the name with 'ji', as a mark of respect.

HOW DO I SAY THIS?
KEY ENGLISH – HINDI GREETINGS/WORDS

Greetings:

Hello - Namaste or Namaskar (num-musth-ay or num-us-kaar)

Hi - Suno or Suniye (su-no or su-knee-yay)

Mr. - Shrimaan (shree-maan)

Mrs. - Shrimati (shree-mut-thi)

Miss - Kumaari (koo-maa-ree)

Master - Kumaar (koo-maar)

Bye - Alvida (ul-vee-dha)

Thank you - Dhanyavaad (dhun-ya-vaad)

Good morning - Shubh prabhat, Su prabhat (shoobh-prabhaath or Soo-pra-bhaath)

Good evening - Shubh sandhya (Shoobha –sun-dhi-ya)

Good night - Shubh ratri (shoobha – raa-tree)

Take care - Apna khayal rakhna (up-na ka-yaal ruk-naa)

See you later - Phir milen-gey (fiir mil –eng – gay)

Numbers:

One: ek

Two: do

Three: teen

Four: chaar

Five: paannch

Six: chheh

Seven: saat

Eight: aath

Nine: nao

Ten: dus

Twenty: bees

Thirty: tees

Forty: chaalees

Fifty: pachaas

Sixty: saath

Seventy: sattar

Eighty: assee

Ninety: nabbe

Hundred: sau

Thousand: hazzar

INDIAN NATIONAL ANTHEM

" Jana Gana Mana Adhinayaka Jaya He
Bharat Bhagya Vidhata
Punjab Sindh Gujarat Maratha
Dravida Utkala Banga
Vindhya Himachal Yamuna Ganga
Ucchala Jaladhi Taranga
Tubh Shubha Name Jage
Tubh Shubha Ashisha Mange
Gahe Tubh Jaya Gata
Jan Gan Mangaldayak Jay He
Bharat Bhagya Vidhata
Jaye He ! Jaye He ! Jaye He !
Jaye,Jaye,Jaye,Jaye He "

TRANSLATION

Thou art the rulers of the minds of all people,
dispenser of India's destiny.
Thy name rouses the hearts of
Punjab, Sind, Gujarat, and Maratha,
Of the Dravida and Orissa and Bengal;
It echoes in the hills of
the Vindhyas and Himalayas,
mingles in the music of the Yamuna and Ganga
and is chanted by the waves of the Indian Sea.
They pray for thy blessings and sing thy praise.
The saving of all people waits in thy hand,
Thou dispenser of India's destiny.
Victory, victory, victory to thee.

SPEAKERS:
JANUARY 15TH, 2015

INAUGURAL SESSION

LOCATION: CRYSTAL ROOM

LIVER FAILURE AND PROSPECTS OF HEPATIC REGENERATION

Shiv Kumar Sarin

Director, Institute of Liver and Biliary Sciences, New Delhi, India

Acute chronic liver failure (ACLF) is a serious insult of the liver. ACLF is defined as an acute hepatic insult manifesting as jaundice (serum bilirubin≥5 mg/dL) and coagulopathy (INR≥1.5), complicated within 4 weeks by ascites and/or encephalopathy in a patient with previously diagnosed or undiagnosed chronic liver disease (APASL criteria). According to the western working definitions, ACLF is characterized by one more organ failure, in addition to the liver failure, such as hepatorenal syndrome or encephalopathy and multi-organ failure (MOF). The overall mortality rate for ACLF is around 51-66%. In ACLF, reactivation of hepatitis B virus (HBV), either spontaneous or due to intensive chemotherapy or immunosuppressive therapy and alcohol intake are the common causes of the acute insult. Other acute events include superinfection with HEV or HAV, hepatotoxic drugs and herbal indigenous medicines. Alcoholic hepatitis (AH), sepsis and UGI bleed have been reported to be the most common causes of ACLF in studies from the western countries. In the APASL criteria, overt sepsis and GI bleed are not included. This definition allows screening of a much larger population of patients and an early identification of potentially treatable patients before the onset of overt sepsis.

The rapid worsening of clinical course in ACLF is probably due to ongoing oxidative and immune mediated hepatic injury, hyperferritinemia, development of early sepsis, and acute portal hypertension with its associated complications. The role of a leaky gut (enhanced due to portal hypertension), lipopolysaccharide, TLR4 and Kupffer cell activation, high levels of ROS and oxidative stress (reduced glutathione) have been shown. We have shown increased pro-inflammatory markers like IL1, 6, TNF-a and IFNr in the hepatic parenchyma and reduced dendritic cell and NK cell activity has been recently shown. We have shown that probiotic VS#3 reduces portal pressure and is beneficial in patients with portal hypertension. Iron metabolism is severely deranged in severe AH. We have recently shown that levels of hepcidin; a major regulator of iron homeostasis, is inversely correlated to the serum iron indices [p=0.003] in severe AH and high serum iron and ferritin levels predict organ failure and mortality. Furthermore, we identified a bio-marker, CD163, which is a haemoglobin (Hb) scavenger receptor essential for the clearance of haptoglobin–Hb and a cell surface marker for macrophage lineage cells to be high in patients with AH and liver failure. The intracellular labile iron pool indices are up regulated in (HLA^+,$CD163^+$) subset of M1 macrophage in patients with severe AH with organ failure (18%) than those without organ failure (3.5%) ($p<0.01$).

Sepsis is one of the most important causes of increased morbidity and mortality in patients with severe AH. Reduced dendritic cell activity leads to enhanced CD6 activity and increased rIFN production and liver damage. Neutrophil dysfunction worsens the course and leads to the development of sepsis, hepato-renal syndrome and hepatic encephalopathy. Granulocyte colony stimulating factor (GCSF) therapy has been shown to improve neutrophil function. In a recent study, we have shown that GCSF improved median leucocyte and neutrophil count at wk1 and improved MELD and SOFA score which resulted in improved survival. Moreover, G-CSF therapy led to a significant increase in the CD34 and dendritic cell (DC) population in the liver at 1 month. After GCSF therapy, recruitment of mDCs and pDCs favorably modulated intrahepatic T cell responses in the liver with reduced production IFN-r by the CD4, and CD8 T cells. These new therapeutic approaches, based on new pathophysiological mechanisms are likely to improve the survival of patients with ACLF. G-CSF therapy is promising also in hepatic regeneration as it led to increased mobilization of CD34+ cells to the liver in ACLF patients. New options for the support of failing liver include liver dialysis and bio-artificial liver and these would be discussed.

The **Padma Bhushan** is the third highest civilian award in the Republic of India, after the Bharat Ratna and the Padma Vibhushan, but comes before the Padma Shri. It is announced on the occasion of Republic Day every year. It is conferred by the President of India at a function held at Rashtrapati Bhavan sometime around March/April.

Padma Bhushan Award

Prof. Sarin, with his intense dedication, vision and work, was awarded the **Padma Bhushan (2007)** by the Government of India.

HEALTH SYSTEMS AND POLICY AT THE CROSSROADS: AN ARGUMENTATIVE INDIAN VIEWPOINT

Abhijit Chowdhury

Secretary, Liver Foundation, Kolkata – 700016, India

There has been a significant shift in overall health care financing and Medicare policy in India in recent times. Progressive corporate participation is the starry element of a "new era" Indian health care, largely made possible by an increasing perception in public sector health governors that health is better dealt with by the business world rather than the government. While this morbid disinclination of the government to manage the country's health system as the prime mover and stakeholder holds the key to a simmering corporate dependence for care provisions in the emerging scenario, it is important to note that this might have both good and bad outcomes.

The biggest concern is that after an initial growth spurt that was purely unregulated, the "for profit" corporate health industry is claiming its stake and showing activism in overall health policy discourses in the country, obviously to match its needs. This is occurring despite the fact that lack of transparency and quality of care as well as financial indiscretions including pricing manipulations are some of the plaguing elements of this system that present crevices hard to repair. It is fostering a medical professional culture in this country that is being put into question.

While the health system of this country needs to be mature and advancing, that cannot happen through stressing it's human assets financially due to health care related expenditures, transgressing from the basic principles of human development. The ailing desire of the government to manage and deliver the best possible health care needs to be rapidly reversed. Corporate participation is welcome, but on a tightly regulated platform to make their contribution worthwhile to an emerging India.

Liver Disease in India

India May Become 'World Capital of Liver Diseases'- The New Indian Express
http://www.newindianexpress.com/lifestyle/health/India-May-Become-World-Capital-of-Liver-Diseases/2014/04/19/article2177734.ece

Liver diseases affect one in 5 Indians - The Times of India
http://timesofindia.indiatimes.com/city/mumbai/Liver-diseases-affect-one-in-5-Indians/articleshow/31394640.cms

LIVER FOUNDATION, WESTBENGAL
aspires to take science to society

Liver Foundation, West Bengal, *is a voluntary, non-government organization (NGO) registered under the Societies Act 1961. It was founded on June 30, 2006 by a group of health professionals and social activists. Its primary objective is to take the benefits of the advances of medical sciences to the socio-economically backward sections of India.*
*www.**liverfoundation**.in*

ilbs

*The **Institute of Liver and Biliary Sciences (ILBS)** is a mono-superspeciality hospital for liver and biliary diseases located at New Delhi, India. It was established as an Autonomous Institute to be a dedicated international center of excellence for the diagnosis and management of liver and biliary diseases and to provide advanced training and research in the field of Hepato-biliary Sciences.*
*en.wikipedia.org/wiki/**Institute_of_Liver_and_Biliary_Sciences***

ARE YOU INTERESTED IN A TOUR OF MUMBAI BY NIGHT?!
IT'S FREE!!
*** FOR DETAILS, SEE PAGE 45 ***

HEALTH CARE PHILOSOPHIES AND PRINCIPLES: EAST MEETS WEST

Partha Nandi

CEO and Founder, Ask Dr. Nandi

Dr. Nandi has a diverse background. Born in Calcutta India, he immigrated to the United States as a child. At the age of 16, he completed his high school education in Columbus, Ohio where he was awarded a full academic scholarship to The Ohio State University and University of Notre Dame.

To remain closer to his family, he chose Ohio State. Partha graduated summa cum laude (Top 1% of the class), a member of Phi Beta Kappa honor society, with a Bachelors degree in chemistry and a minor in classical Greek civilization. Partha also served as the Rhodes Scholar representative from Ohio State and was voted the Homecoming King, amongst 55,000 students enrolled at the time.

Dr. Nandi practices gastroenterology in the suburbs of Detroit, Michigan. He is the author of several publications in peer reviewed journals. He is a national speaker, educating physicians on various topics within medicine. He is a patient advocate, emphasizing empathy in patient care and treatment of the entire patient, both body and mind. *Source: Asknandi.com*

- **All India Institute of Medical Sciences Delhi** (**AIIMS Delhi**) is a medical college and medical research public university based in New Delhi, India.
- The Institute was established in 1956 and operates autonomously under the Ministry of Health and Family Welfare.
- AIIMS Delhi was ranked at third place in the first list of the Times Higher Education India Reputation Rankings, published alongside the Times Higher Education World Reputation Rankings in 2013.
- AIIMS has been consistently ranked the top medical college in India to pursue any Medical degree by India Today in annual surveys starting in 1997 and was ranked No. 1 in 2013.
- The hospital has been able to maintain high standards of quality while seeing large numbers of patients (3.5 million in 2006) at very low cost to patients (Ruppee 10 (16¢ US equivalent)

DID YOU KNOW??

Every year AIIMS accepts 72 Indian students based on the results of an all-India entrance examination for its undergraduate M.B.B.S program. The number of students who take the entrance exam every year varies from **80,000 to 100,000**. **The acceptance rate for admission to the undergraduate course (medical school) is thus 72/90000 i.e. 0.08%.** One international student (nominated by Government of India from SAARC nations) completes the class size of 73.

Source: en.wikipedia.org/wiki/**AIIMS**_New_**Delhi**

SAMPLING INDIANS IN OHIO

Captain of industry: Raj Soin leaves indelible imprint on Dayton business and philanthropic communities.
Place of origin: India
Current residence: Beavercreek, OH
Founded: Modern Technologies (MTC) and Soin International.

2003 winner of Ellis Island Medal of Honor.

Monte Ahuja: Businessman enjoys - and shares - fruits of a 'go-go-go' life in Cleveland.
Place of origin: India
Current residence: Cleveland, OH
Founded: Transtar Industries, Mura Holdings LLC
The college of engineering at OSU benefitted from a 3.5 million dollar donation given to support students.

2001 winner of Ellis Island Medal of Honor

Nirmal Sinha: Global Visionary!
Place of origin: India
Current residence: Columbus, OH
Former Civil Rights Commissioner, Ohio, marketing expert, He is a longtime community activist, extensively involved locally and nationally for over 15 years. He was a White House delegate during President Clinton's visit to India.

2003 winner of Ellis Island Medal of Honor

For sustainability scientist, OSU is paradise!
Place of origin: India
Current residence: Columbus, OH
Notable: Dr. Rattan Lal is a world renowned sustainability expert, Professor of soil physics in the School of Environment and Natural Resources, and Director of the Carbon Management and Sequestration Center at The Ohio State University (OSU).
He received the prestigious Dr. M.S. Swaminathan Award in 2009

SPEAKERS: JANUARY 16TH, 2015 (TRACKS 2 A-D)

- Each track assembles in a different auditorium
- Track A – Central stage (Crystal Room)
- Track B & C – Side wings (Crystal Room)
- Track D – Gateway Room

Also note that exhibits will be available for viewing at the Grand Ballroom

Session are synchronized. Participants can move to sessions according to their own preference

CARDIOVASCULAR TISSUE ENGINEERING APPLICATIONS IN CONGENITAL HEART SURGERY

Christopher Breuer and Toshiharu Shinoka

Nationwide Children's Hospital, Columbus, Ohio

Congenital cardiac anomalies represent the most common birth defect affecting nearly 1% of all live births. Despite significant advances in the surgical and medical management of congenital cardiac anomalies, it remains a leading cause of death in the newborn period. Complications arising from the currently available prosthetics in the form of vascular grafts, patches, and replacement heart valves are a leading source of postoperative morbidity and mortality. We developed the first tissue engineered vascular graft specifically designed for use in congenital heart surgery. The tissue engineered vascular graft was created by seeding autologous cells onto a biodegradable tubular scaffold, over time the scaffold degrades as the neo tissue forms ultimately creating a living vascular graft. The tissue engineered vascular graft proved to be the first man made vascular graft with growth capacity making it uniquely suited for use in infants and children. In this presentation we will review the development, translation, and refinement of this technology in addition to the application of tissue engineering methods for creating additional devices specifically designed for use in congenital heart surgery.

IMPROVING THE PRODUCTION OF TISSUE ENGINEERED INTESTINE

Yanchun Liu[1], Terrence Rager[1], John J. Lannutti[2], Jed Johnson[3], Gail Besner[1]

[1]The Research Institute at Nationwide Children's Hospital, [2]Department of Materials Science and Engineering, The Ohio State University, [3]Nanofiber Solutions, LLC, Columbus, OH

Objectives: Treatment of short bowel syndrome with tissue engineered intestine (TEI) requires the development of a proper structural and functional organ. Our objectives were to enhance the production of TEI by infusing scaffolds with the intestinal cyto-protective agent heparin-binding EGF-like growth factor (HB-EGF) and by seeding scaffolds with intestinal stem cell (ISC)-enriched crypts. **Method**s: Polyglycolic acid (PGA) scaffolds were treated with or without: (1) PLLA; (2) HB-EGF (0, 1 or 10 µg); and (3) CO_2 infusion to increase HB-EGF incorporation. HB-EGF release kinetics and bio-potency were determined. A novel filtration system was developed to separate ISC-containing crypts from villi. Rat pups were used as cell donors and the dams served as recipients. Scaffolds were seeded with either ISC-enriched crypts or villi, implanted intra-abdominally, and explants processed for formation of TEI, circumferential mucosal engraftment, and villous length. **Results:** Optimal HB-EGF release and bio-potency was obtained with incorporation of HB-EGF into PGA/PLLA scaffolds and the use of CO_2 infusion. HB-EGF infusion led to TEI with increased villous height, increased crypt numbers, and well-developed smooth muscle. Scaffolds seeded with crypts had 80.9% circumferential mucosal engraftment, whereas those seeded with villi had shorter disorganized villi with only 21.7% mucosal engraftment (p<0.0001, Student t test). The architecture of TEI produced from crypt-seeded scaffolds was very similar to native intestine. **Conclusions**: HB-EGF incorporation into scaffolds, and seeding of scaffolds with ISC-enriched crypts, improves the morphology of TEI.

MORE THAN A DECADE OF ONGOING CONFLICT: APPLICATION OF TRADITIONAL RECONSTRUCTIVE TECHNIQUES WITH REGENERATIVE MEDICINE THERAPIES IN TRAUMATIC EXTREMITY RECONSTRUCTION – INTRODUCTION OF THE HYBRID RECONSTRUCTIVE ELEVATOR

Ian L. Valerio[1, 2] and Mark Fleming[3]

[1]Walter Reed National Military Medical Center, Bethesda, MD, [2]The Ohio State University Department of Plastic Surgery, Columbus, OH; [3]Department of Orthopedics, Walter Reed National Military Medical Center, Bethesda, MD

INTRODUCTION: War-related extremity injuries exhibit extensive zones of injury and high rates of traumatic amputations that can contribute to limited donor tissue/site options. This work will review the application of regenerative medicine therapies in combination with traditional reconstructive elevator techniques in establishing a new paradigm in combat casualty extremity reconstruction. The concept of the hybrid reconstructive elevator will be introduced and our traumatic extremity reconstruction algorithms developed during the modern war conflict will be reported via illustrative cases. **METHODS:** A retrospective review of extremity reconstructions utilizing the hybrid reconstructive elevator from 2003-2012 at Walter Reed National Military Medical Center was completed. Outcomes measured included extremity salvage success/failure rates, regenerative therapies employed, and complications. **RESULTS:** Over 300 hybrid reconstructive elevator cases were performed where regenerative therapies were combined with traditional extremity reconstruction techniques. There were no significant differences in flap/limb salvage success or loss rates, soft tissue infection rates, osteomyelitis rates, or amputation rates between extremities reconstructed via traditional reconstruction measures versus those patients who underwent hybrid reconstructive elevator techniques. Interestingly, hybrid reconstructive elevator cases did trend towards decreased rates of certain soft tissue wound issues. **CONCLUSION(S):** The recent conflicts and improving survival rates have contributed to a high volume of complex extremity reconstructions at our center. While a broad range of extremity salvages have been performed, changes have been implemented in institutional algorithms for adopting regenerative medicine therapies in combination with traditional reconstructive measures in order to improve extremity reconstruction outcomes in trauma care.

•***Aesculus glabra,*** a species of tree, is commonly known as **Ohio buckeye**, **American buckeye**, or **fetid buckeye**.

–Glabra is one of 13-19 species of Aesculus also called horse chestnuts.

–The fruits contain tannic acid, and are poisonous to cattle, and humans, as is the foliage.

¿What does this have to do with The Ohio State University?

*** see page 89 for the answer ***

SCARLESS WOUND HEALING: ARE WE THERE YET?

Swathi Balaji and Sundeep G. Keswani

Division of General, Thoracic and Fetal Surgery, Cincinnati Children's Hospital, Cincinnati, OH 45242

We have known for over 35 years that dermal wounds in a mid-gestation fetus heal without scar, with a regenerative phenotype that is indistinguishable from surrounding skin. Compared to this benchmark, all postnatal wound healing is impaired. The biologic basis of the fetal regenerative phenotype can serve as a roadmap to recapitulating regenerative repair in adult wounds. The critical barrier to recapitulating fetal regenerative tissue repair is an incomplete understanding of its underlying mechanisms.

Compared to adult wounds, fetal wounds are characterized by less inflammation; an extracellular matrix (ECM) composed of high molecular weight hyaluronan (HMW-HA), and a unique fibroblast phenotype. We now have evidence supporting a novel and fundamental role for interleukin-10 (IL-10) in this fetal regenerative response, and its ability to induce fetal type regenerative healing in adult skin. In addition to IL-10's commonly accepted immuno-regulatory mechanism, our preliminary data also indicate a novel mechanism by which IL-10 regulates the extracellular matrix, specifically hyaluronan synthesis.

The concept that an anti-inflammatory cytokine has a biologic role in regulating the ECM is innovative and may yield therapeutic targets for anti-scarring agents. Understanding the mechanisms of dermal scarring may also have implications for other disease processes characterized by excessive fibroplasia. Lastly, we have begun to translate this work from bench to bedside by developing a topical wound hydrogel that delivers IL-10 in a fetal biomimetic matrix that results in scarless wound healing.

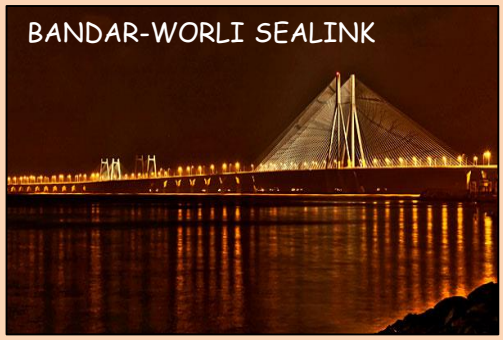
Mumbai by night – tour! FREE!!

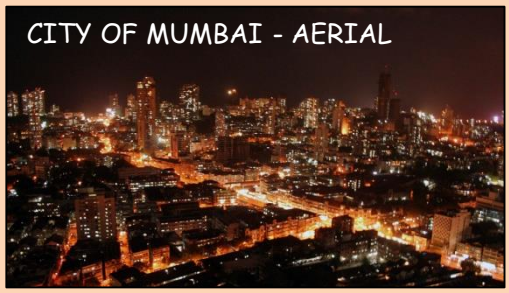
Contact Shomita Mathew (Shomita.Mathew@gmail.com) for more information and to make your reservations.

Preference given to visitors from the US!

Mumbai is a city that stays awake long after the rest of India has gone to bed. No matter what time of night you venture out, you will find many people on streets and roads.

You will catch the breathtaking architecture of **Victoria Terminus station (now called Chhatrapati Shivaji Termimus)** and the **Bandra-Worli Sealink** and other sights and sounds that make Mumbai the unique city that it is!!





BIO-ENGINEERING OF NANOFIBER CARDIAC PATCH FOR MYOCARDIAL REPAIR

Mahmood Khan, Mark Angelos

Department of Emergency Medicine[1], College of Medicine, The Ohio State University Wexner Medical Center, Columbus, OH

Background: A major obstacle to use of stem cells is the low survival and engraftment of transplanted cells in the ischemic heart. We hypothesize that alignment of regenerated cardiomyocytes using a scaffold, which replicates the extracellular matrix will improve cardiomyocyte function and survival. Utilizing human inducible pluripotent stem cell derived cardiomyocytes (hiPSC-CMs) offers a potential means of regenerating viable cardiac tissue.

Methods: Human iPSC-CMs were cultured on 1) a highly aligned polylactide-co-glycolide (PLGA) polymer scaffold (50 micron thick) and 2) on a standard tissue culture plate. The cultured cells were compared for cell alignment (using confocal and SEM imaging), cellular morphology (using TEM), expression of mature cardiac markers (Cx-43, sarcomeric alpha actinin and troponin-T), intracellular calcium signaling (using Fluo-4) and synchronized contractile activity.

Results: Confocal and SEM images demonstrated >90% alignment of hiPSC-CMs on the nanofibers patch in contrast to hiPSC-CMs cultured on standard culture plates. Cardiomyocytes demonstrated symmetrical alignment in the same direction on the aligned nanofiber patch with expression of sarcomeric α-actinin (SAA), N-cadherin (NCDH), cardiac troponin T (cTnT) and connexin 43 (Cx43). Aligned hiPSC-CMs showed a more mature sarcomeric appearance on TEM and also displayed robust calcium cycling and action potential during electrical stimulation. Aligned hiPSC-CMs demonstrated synchronous directional beating when compared with hiPSC-CMs cultured on flat culture plates

Conclusions: Human iPSC-CMs cultured on aligned nanofiber polymer scaffold replicates the normal extracellular matrix in the heart and yielded more mature and functional cardiomyocytes than culturing on traditional flat plates.

STEM CELLS AND AUTISM

Rene Anand

Department of Pharmacology, Department of Neuroscience, College of Medicine, The Ohio State University Medical Center, Columbus, OH

Electric fish generate electric organ discharges for predation, defense, navigation and communication. We have recently published the sequence of the genome of the electric eel, *Electrophorus electricus*, and the transcriptomes of the muscle and electric organs of five other electric fish. Comparative transcriptomics reveals that evolution has sculpted these electric organ cells, the electrocytes, from muscle cell precursors, using a common "molecular toolbox" of transcription factors and signaling pathways. In my talk I will discuss the implications of understanding electrocytes biology at a genomic level and how it provides insight into strategies for treating autism in Cowden syndrome patients with macrocephaly that are being tested in a stem cell model of Cowden syndrome in our laboratory.

US President – Barack Obama
and
Indian Prime Minister – Narendra Modi

India introduces visa-on-arrival for U.S. citizens in 2015 and works toward meeting the requirements to make the United States' Global Entry Program available to Indian citizens.

(http://www.whitehouse.gov/the-press-office/2014/09/30/us-india-joint-statement)

Five best neighborhoods in Mumbai

1. Colaba

For most tourists, a visit to Mumbai includes a stroll down Colaba Causeway. Whether it is to haggle for jewellery and shoes in the street markets, buying embroidered shawls at the craft shops or stopping for a cold beer at Leopold's. Colaba is the tourist hub of Mumbai and a must on any first time visit to the city. The Taj Mahal Palace Hotel is in this district.

2. Kala Ghoda

Just down the road from Colaba is the arts precinct of Kala Ghoda. Here you will find the National Gallery of Modern Art, Jehangir Art Gallery and many smaller boutique galleries tucked inside its laneways. There are also some up and coming designers as well as established brands such as Sabyasachi, alongside trendy cafes like The Pantry and the Kala Ghoda Cafe.

3. Malabar Hill

Probably the most prestigious address in Mumbai, Malabar Hill is famous for its beautiful and unusual Hanging Gardens that overlook the Arabian sea. You can also take a look at Banganga Tank and the Walkeshwar Temple complex where pilgrims flock to bathe away their sins, or just admire this exclusive enclave with some of the most expensive real estate in the city.

4. Bandra

The Western Suburb of Bandra is famous for celebrity spotting and having some of the best selection of restaurants and bars in Mumbai, there is always a party going on in Bandra. Located on the sea front you can also take a walk along Bandra Bandstand as the sunsets and enjoy some freshly roasted corn whilst checking out the stars and statues of Bollywood's who's who.

5. Versova

The up and coming region of Versova is located in the North Western suburb Andheri. Versova hugs the coast and is where Bollywood producers and wannabe actors meet to discuss their new projects. New restaurants, cafes and shops are coming up all the time in this suburb, making it an interesting one to visit.

http://www.forbestravelguide.com/mumbai-india/what-are-the-best-neighborhoods-in-mumbai

BIOREACTOR CULTURING OF BONE TISSUE ENGINEERING SCAFFOLDS

David Dean

Department of Plastic Surgery, Center for Regenerative Medicine and Cell-Based Therapy, The Ohio State University, Columbus, OH USA.

There are three types of bioreactors: (1) "*in vivo*": tissue is cultured in a body cavity and later transplanted to the treatment site, (2) "*in situ*": scaffolds, cells, and growth factors are loaded into the treatment site, (3) "*ex vivo*": scaffolds, cells, and growth factors are pre-cultured outside the body in a vessel prior to implantation. The concept of bioreactors is often associated only with *ex vivo* devices. Our research utilizes *ex vivo* bioreactors to pre-culture bone marrow-derived human Mesenchymal Stem Cells on scaffolds in order to get these cells to coat the scaffold and then to begin secreting bone extracellular matrix. Our current growth factor regimen is Fibroblastic Growth Factor 2 and Platelet Derived Growth Factor for two weeks followed by one week of Bone Morphogenetic 7 protein and minerals. Our goal is to coat a resorbable, 3D printed poly (propylene fumarate) scaffold with 30-50 mm of bone extracellular matrix prior to implantation. We have chosen to use bone marrow derived Mesenchymal Stem Cells because it may be possible to use banked (allogenic) cells as they are not expected to present antigens until late stages of MSC differentiation to bone tissue. We have chosen to preculture these cells in order to avoid implantation of growth factors for which safe *in vivo* (systemic) dose levels are not known. We expect these precultured scaffold to be recognized bone grafts, be remodeled by host bone tissue, and to degrade prior to their becoming a barrier to the remodeling process.

1 US Dollar ≈ 63 Indian Rupees
(as of 12/15/14; google.com)

EXPANDED TECHNOLOGIES IN BIOREACTOR SYSTEMS

James Ritchey

Director, Tissue Engineering Businesses, INSTRON, Norwood, MA, USA

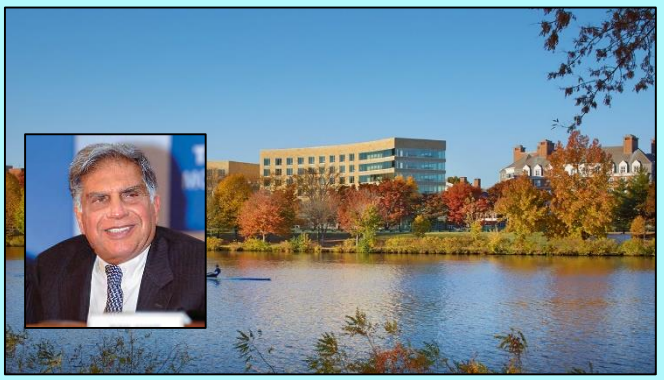
This presentation aims to investigate and explore new technologies being used for bioreactor research in tissue engineering and regenerative medicine. As tissue engineering research continues to expand globally, more standard commercial bioreactor systems have emerged. These systems facilitate the researcher in producing data and results in both a more expedient and reliable manner. These enhancement suggest that future research and, correspondingly, and results could come more quickly for the tissue engineering research community.

INDO-US COLLABORATION IN SOLUTION FOR TISSUE TESTING AND ENGINEERING

Ramasubbu Sunder

Bangalore Integrated System Solutions (P) Ltd, Peenya Industrial Area, Bangalore, India 560058

BiSS and Instron are subsidiaries of ITW, a Fortune-200 holding company. This forms the basis for an extremely fruitful collaboration between teams located on either side of the globe and driven by complementary strengths in tissue engineering and test technology. Instron TGT brings to the market cutting edge solutions related to tissue engineering including bio reactors and test systems to characterize tissue properties. BiSS is the leading Indian developer and manufacturer of precision servo-controlled test systems used in a variety of areas including automotive, nuclear, aerospace, civil and defense applications. The unique feature of BiSS solutions is a unified controller architecture independent of the complexity and variety of mechanical test applications ranging from single to multiple channels of control and data acquisition, servo drives operating in the mW to MW range of power, force ratings from N to MN and velocities from static, right up to several m/s. This presentation describes some of the solutions that have emerged from our collaboration including effort involving the support of other Indian and US partners.

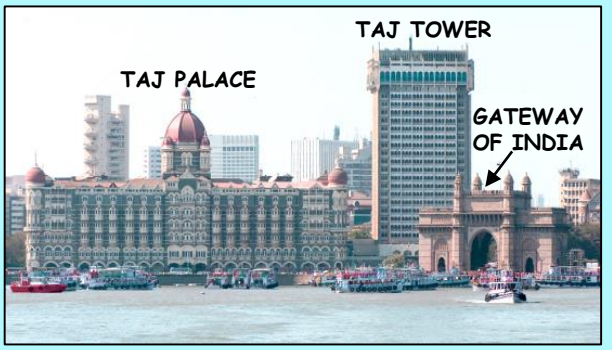


Tata Hall, a facility funded by 50 million dollars donated by Ratan Tata was completed in December 2013. The donation made to the Harvard Business School enhances and expands the School's Executive Education portfolio. The 150,000-square-foot building is part of a complex of state-of-the-art residential, administrative, and classroom facilities dedicated to Executive Education in the northeast corner of the HBS campus. Tata Hall is named in honor of **Ratan N. Tata (**AMP 71, 1975, shown in inset), who served as chairman of the Tata Sons Ltd., one of India's largest business conglomerates, from 1991 until his retirement in 2012.

The Taj Mahal Palace Hotel is located next to the Gateway of India, a structure built to commemorate the landing of their Majesties King George V and Queen Mary in 1911.

- When it opened, the hotel boasted a series of firsts: American fans, German elevators, Turkish baths and English butlers.
- The building was also the first in Bombay to be lit by electricity.
- Eventually it also ended up having the city's first licensed bar, India's first all-day dining restaurant, and the country's first international discotheque, Blow Up.
- The first 24-hour coffee shop in India was opened in this hotel in 1972.
-India's first authentic Sichuan restaurant, the Golden Dragon, was opened in this hotel. It was also the first to hire English butlers.

*** For more information about The Taj Mahal Palace Hotel *** see page 74



A COMPREHENSIVE APPROACH TO DELIVERY OF WOUND CARE SERVICES DESIGNED TO OPTIMIZE OUTCOMES

Gayle M. Gordillo[1,2]

[1]Department of Plastic Surgery, [2]Comprehensive Wound Center, The Ohio State University Medical Center, Columbus, OH

Chronic wounds affect 2% of the global population at any given point in time and the incidence of chronic wounds is expected to increase with the rapidly rising rates of diabetes and obesity. The consequences of chronic wounds are disability, infection, limb loss and even death resulting in a staggering cost to society. Chronic wounds are multifactorial in origin and a comprehensive approach is needed to achieve successful healing. This presentation will discuss how to build the team of health care providers and administrators to deliver effective wound care to achieve a high rate of successful wound closure. Using this model we have achieved a 96% successful healing rate and an amputation rate of <1%.

BIOELECTRIC WOUND DRESSING DISRUPTS MIXED SPECIES BACTERIAL BIOFILM

Kasturi Ganesh, Sashwati Roy, Piya Das Ghatak, Daniel Vanzant, Sriteja Dixith, Shomita Mathew, Jennifer Dickerson, Daniel Wozniak, Chandan K. Sen

Davis Heart & Lung Research Institute, Center for Regenerative Medicine and Cell Based Therapies, Department of Surgery,The Ohio State University Wexner Medical Center, Columbus, OH 43210

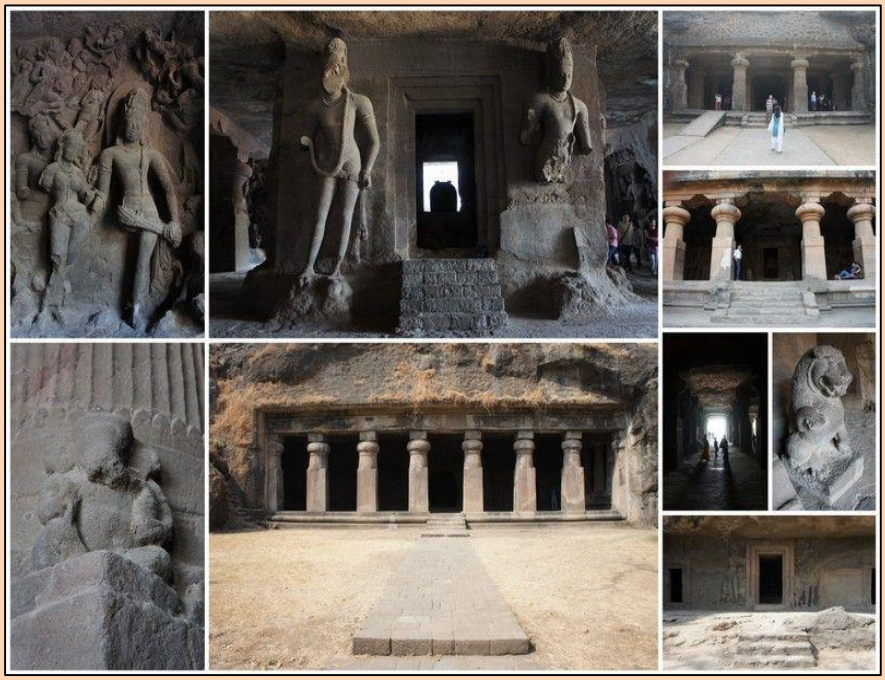
Biofilm infection is a common complication underlying clinically presented chronic wounds. Recent work from our laboratory reported the first pre-clinical model for chronic wound mixed species biofilm infection. In the published work, we demonstrated that biofilm infection limits wound healing by compromising the barrier function of the repaired skin. While many attempts have been made to develop biofilm disrupting drugs, current outcomes result fall short of satisfaction because biofilm bacteria rapidly acquire drug resistance. To address this limitation, we turned towards developing a bioelectric dressing (BED) and tested its anti-biofilm properties in the porcine wound biofilm infection model. Biofilm bacteria produce electrically conductive appendages called bacterial nanowires that may act as a major communication medium for biofilm community. Application of exogenous electrical field may interrupt such communication thus disrupting biofilm. The BED we developed consists of a matrix of silver-zinc coupled biocompatible microcells, which in the presence of conductive wound exudate gets activated to generate electric field (0.3- 0.9V). For this study, domestic Yorkshire pigs (n=9) were subjected to full-thickness burn (2”x2”) using a microprocessor controlled electrically heated burning device developed by our group. A clinically relevant mixed-species infection was established. On the day of infection, the wounds were either treated with placebo dressing or BED twice a week up to 35d. SEM and immuno-histochemical studies demonstrated that BED significantly inhibited ($n=5$, $p<0.05$) biofilm formation on burn wounds. Interestingly, BED significantly ($n=5$, $p<0.05$) improved re-epithelialization as well as restored skin barrier function as evident by measuring the transepidermal water loss (TEWL). In summary, this work presents the first in vivo evidence demonstrating the anti-biofilm properties of BED involving chronic wound infection. BED is FDA approved and chronic wound patient based studies are warranted. *[Supported by NIH grants GM 077185, GM 069589 and DoD W81XWH-11-2-0142 to CKS and in part by NIH grant DK076566 to SR.]*

TOURISM IN THE MUMBAI AREA

Looking to get away for half a day?
Take in some of the city's most well-known sights, visit **Elephanta Island**. The island is famous for its caves, which were discovered by the Portuguese, who also named the island. There are several of them, with both Hindu and Buddhist carvings dating back to about the 5th century, and they are some of the most famous historical sights in Mumbai. Travel to the island in about an hour on a ferry from the city's Gate.

UNESCO heritage site

http://whc.unesco.org/en/list/244



SILVER-ZINC REDOX-COUPLED ELECTROCEUTICAL WOUND DRESSING DISRUPTS BACTERIAL BIOFILM

Shomita S. Mathew, Jaideep Banerjee, Piya Das Ghatak, Sashwati Roy, Savita Khanna, Craig Hemman, Binbin Deng, Amitava Das, Jay L Zweier, Daniel Wozniak, Chandan K Sen.

Comprehensive Wound Center, Davis Heart & Lung Research Institute, The Ohio State University Wexner Medical Center, Columbus, Ohio

Pseudomonas aeruginosa biofilm is commonly associated with chronic wound infection. A FDA approved wireless electroceutical dressing (WED), which in the presence of conductive wound exudate gets activated to generate electric field (0.3-0.9V), was investigated for its anti-biofilm properties. Growth of pathogenic *P. aeruginosa* strain PA01 in LB media was markedly arrested in the presence of the WED. Scanning electron microscopy demonstrated that WED markedly disrupted biofilm integrity in a setting where silver dressing was ineffective. Biofilm thickness and number of live bacterial cells were decreased in the presence of WED. Quorum sensing genes *lasR* and *rhlR* and activity of electric field sensitive enzyme, glycerol-3-phosphate dehydrogenase was also repressed by WED. This work provides first electron paramagnetic resonance spectroscopy evidence demonstrating that WED serves as a spontaneous source of reactive oxygen species. Redox-sensitive multidrug efflux systems mexAB and mexEF were repressed by WED. Taken together, these observations provide first evidence supporting the anti-biofilm properties of WED.

ALL INDIA INSTITUTE OF MEDICAL SCIENCE:

Body is indeed the primary instrument of dharma

Institute day

AIIMS campus

Indian Independence day celebrations

AIIMS HISTORY: When American and British royalty came to visit AIIMS!

Jacqueline Kennedy at AIIMS

Queen Elizabeth and Prince Philip's visit

A MODIFIED COLLAGEN GEL DRESSING RESOLVES INFLAMMATION AND PROMOTES ANGIOGENESIS IN CHRONIC WOUNDS

Sashwati Roy

Departments of Surgery, Davis Heart & Lung Research Institute, Center for Regenerative Medicine and Cell based Therapies and Comprehensive Wound Center, The Ohio State University Wexner Medical Center, Columbus, Ohio

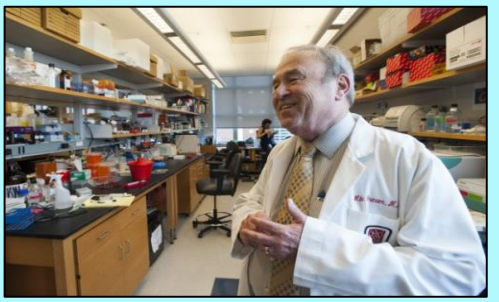
In the United States, chronic wounds affect over 6.5 million patients. An estimated excess of $25 billion is spent annually on treatment of chronic wounds. With the cost of chronic wound care sharply rising, efforts are under way to find simple and inexpensive solutions that may be applied to a broad group of affected people. Collagen is the major constituent of the dermal extracellular matrix (ECM). In addition to providing structural support, collagen dressings support granulation tissue formation by enhancing cellular chemo-attraction, differentiation, and activation. Collagen-based dressings have been of interest in wound care. We recently performed proteomic characterization of a modified collagen gel (MCG) dressing and reported promising effects of the gel in healing full-thickness excisional wounds. We further examined the translational relevance of our aforesaid findings by testing the dressing in a swine model of chronic ischemic wounds recently reported by our laboratory. Full thickness excisional wounds were established in the center of bi-pedicle ischemic skin flaps on the backs of animals. Ischemia was verified by Laser Doppler imaging and MCG was applied to the test group of wounds. Seven days post-wounding, macrophage recruitment to the wound was significantly higher in MCG-treated ischemic wounds. In vitro, MCG up-regulated expression of Mrc-1 (a reparative M2 macrophage marker) and induced the expression of anti-inflammatory cytokine IL-10 and of β-FGF. Furthermore, analyses of wound tissues 7 days post wounding showed up-regulation of TGF-β, VEGF, vWF, and collagen type I expression in MCG-treated ischemic wounds. At 21 days post-wounding, MCG-treated ischemic wounds displayed higher abundance of proliferating endothelial cells that formed mature vascular structures and increased blood flow to the wound. Fibroblast count was markedly higher in MCG-treated ischemic wound-edge tissue. In addition, MCG-treated wound-edge tissues displayed higher abundance of mature collagen with increased collagen type I:III deposition. Taken together, MCG helped mount a more robust inflammatory response which resolved in a timely manner, followed by an enhanced proliferative phase, angiogenic outcome and post-wound tissue remodeling. Findings of the current study warrant clinical testing of MCG in a setting of ischemic chronic wounds. (Supported by National Institutes of Health awards GM077185, GM069589, and DK076566. We thank Southwest Technologies for providing the dressing and unrestricted research development funding to The Ohio State University.)

ENGULFMENT OF APOPTOTIC CELLS BY MACROPHAGES: A ROLE OF MICRORNA-21 IN THE RESOLUTION OF WOUND INFLAMMATION

Amitava Das[1], Kasturi Ganesh[1], Savita Khanna[1], Chandan K. Sen[1] and Sashwati Roy[1]

[1]Comprehensive Wound Center, Department of Surgery, Davis Heart and Lung Research Institute, Center for Regenerative Medicine and Cell Based Therapies, The Ohio State University, Columbus, Ohio 43210

At an injury site, efficient clearance of apoptotic cells by wound macrophages or efferocytosis is a prerequisite for the timely resolution of inflammation. Emerging evidence indicates that microRNA-21 (miR-21) may regulate the inflammatory response. In this work, we sought to elucidate the significance of miR-21 in the regulation of efferocytosis-mediated suppression of innate immune response, a key process implicated in resolving inflammation following injury. An increased expression of inducible miR-21 was noted in postefferocytotic peripheral blood monocyte-derived macrophages. Such induction of miR-21 was associated with silencing of its target genes PTEN and PDCD4. Successful efferocytosis of apoptotic cells by monocyte-derived macrophages resulted in the suppression of LPS-induced NF-κB activation and TNF-α expression. Interestingly, bolstering of miR-21 levels alone, using miR mimic, resulted in significant suppression of LPS-induced TNF-α expression and NF-κB activation. We report that efferocytosis-induced miR-21, by silencing PTEN and GSK3β, tempers the LPS-induced inflammatory response. Macrophage efferocytosis is known to trigger the release of anti-inflammatory cytokine IL-10. This study demonstrates that following successful efferocytosis, miR-21 induction in macrophages silences PDCD4, favoring c-Jun–AP-1 activity, which in turn results in elevated production of anti-inflammatory IL-10. In summary, this work provides direct evidence implicating miRNA in the process of turning on an anti-inflammatory phenotype in the postefferocytotic macrophage. Elevated macrophage miR-21 promotes efferocytosis and silences target genes PTEN and PDCD4, which in turn accounts for a net anti-inflammatory phenotype. Findings of this study highlight the significance of miRs in the resolution of wound inflammation. *[Supported by NIH RO1 DK076566(SR), GM069589, GM007185 and NR013898(CKS)]*



THE BIOMEDICAL RESEARCH TOWER AT OSUMC

The largest research building on The Ohio State University campus, the 403,000 square-foot Biomedical Research Tower (BRT) is a critical hub for Ohio State's internationally recognized research programs in cancer and cancer genetics, cardiovascular and lung disease, and high-field imaging. The facility also expands programs in important emerging fields such as biomedical informatics, neurological disorders, heart failure and heart imaging, pharmacogenetics, and targeted molecular therapies, microbial pathogenesis and biodefense, and tissue engineering.

NUTRITION: PAST, PRESENT AND FUTURE

Mulchand S. Patel

Department of Biochemistry, School of Medicine and Biomedical Sciences, University at Buffalo, State University of New York, Buffalo, NY, USA 14214

Human evolution is, in part, influenced by its dietary practices, even to the present day! Although association of some diseases with diet was noted several hundred years ago, a direct link between a disease (such as scurvy, beriberi) and a specific nutrient was demonstrated only about a century ago. Our current knowledge about nutrition as it relates to calorie requirements, dietary components and essential nutrients and their role in health and disease during different stages of the life cycle has been elucidated in the past century. Malnutrition is still a major problem in many parts of the world, whereas overnutrition predisposing to obesity and the associated metabolic syndrome has emerged as a major global health problem in the past few decades. Hence malnutrition and overnutrition continue to be major public health concerns world-wide. Additional challenges are in the areas of food availability and food safety as well as the roles of the food industry and government public health policy to provide adequate nutrition and healthy food choices for good health for people of all ages. Emerging frontiers in nutritional research such as genome-modified plant and animal products, probiotics, nutraceuticals, functional foods, nutrigenomics will advance our knowledge of nutrition and healthy foods for better health. This Conference and Trade Show on Health Sciences provides a unique platform to discuss the emerging knowledge and challenges in different facets of nutritional and health sciences.

LIPIDOMICS OF HEALTH AND DISEASE

Narasimham L. Parinandi

Department of Internal Medicine, The Ohio State University Wexner Medical Center, Columbus, OH 43210, USA

Lipids are among the three primary classes of biomolecules extremely crucial for the structure and function of the living cells. Most importantly, they are the backbone of the cellular membranes and hence constitute the “Gateway of the Cells”. Thus, the membrane bilayer lipids regulate and maintain the cellular physiological functions from the womb to the tomb in human life. Nevertheless, any alterations in the nature and composition of the cellular membrane lipids lead to or mediate several pathophysiological states. Understanding the biochemical and molecular nature, fate, and metabolic actions of the lipidic species in human body spatiotemporally will provide insights into the mechanisms of onset and progression of a disease state leading to therapeutic strategies. However, the analysis of a wide variety of lipids present in cells and extracellular compartments require simple to sophisticated biological, biochemical, physical, and chemical methods. The currently evolving novel, integrated, and state-of-the-art lipidomic approach for analysis of lipids in biological systems offers tremendous potential to pinpoint and identify the crucial lipidic species that are critical in human disease and health.

MATERNAL DIETARY LUTEIN AND FISH OIL INTERACT TO ALTER ATHEROSCLEROTIC LESIONS OF PROGENIES IN A JAPANESE QUAIL MODEL OF ATHEROSCLEROSIS

Ramesh Selvaraj

Department of Animal Sciences, The Ohio State University, Wooster, OH.

The Barker fetal origin of diseases hypothesis identified the effects of maternal nutrition on fetal health. In avians, the developing chick grows in a nutritionally “isolated” environment and this was used as a tool to study the effects of maternal lutein and fish oil supplementation on the severity of atherosclerosis of progenies in a Japanese quail cholesterol-induced-atherosclerosis model. Maternal quail were fed a basal diet with three amounts of lutein (0, 25 and 50 mg/kg diet) and two amounts of fish oil (3 and 6%) in a 3 X 2 factorial for 25 weeks. Fertile eggs were collected and hatched. All chicks were fed a basal diet that contained 0 mg/kg lutein and 0% fish oil. Atherosclerosis was induced in chicks by feeding cholesterol. At 27 wk of age, chicks hatched from hens supplemented with 50mg lutein+3% fish oil, 0mg lutein+6% fish oil, and 0mg lutein+6% fish oil showed decreased atherosclerotic lesion in the aorta. Increasing maternal dietary fish oil content to 6% increased ($P < 0.01$) the aorta fat content by 3.5 fold ($P=0.02$) and decreased the liver fat by 32% ($P=0.06$) in progenies. Increasing ($P=0.02$) the dietary fish oil content to 6%, increased the total PUFA and decreased the total MUFA content of the aorta. Increasing maternal dietary fish oil content to 6% decreased the amount of TBARS ($P=0.01$) and IL-1 mRNA ($P<0.01$) only in chicks hatched from the 50 mg lutein supplemented groups. Dietary fish oil and lutein interacted to modify the incidences of atherosclerosis through the oxidation pathway.

The Ohio State University Makio Journal – 1948

The Hindustan Student Association was Founded in the Fall of 1946. The purpose of the organization is to unite all Indian students on campus to share in experiences and social life.

Every quarter one party was held, and during Spring Quarter trips were taken to places of interest in Columbus and Central Ohio.

Officers of the association were Gopes Esh, president; Kumud Pandit, vice-president; Chembanda Kalapa, secretary, J.K. Fabir Sab, treasurer; and T.A. Koshy, executive member.

TOP ROW: Dasgupta, Prabhu, P. Mathur, R. Mathur, Bhagat, Chawla, Singh, Bahadur, Gopalan, Chothia, Krishnaswamy. ROW THREE: Chhonkar, Das, Bahadur, Kathi, Hota, Mohiyuddin, Bhatnagar, Mitra, Roy, Rudraiah, Walsh. ROW TWO: Kalapa, Ghose, Mrs. Koshy, Prof. Avey, Mrs. Avey, Mrs. Devadas, Pandit, Esh, Kundu. ROW ONE: Iyer, Jain, Reddy, Nair, Koshy, Fakir Sab, Rau.

CAN WE PREVENT ONSET OF OBESITY AND DIABETES AND ITS COMPLICATIONS?

Sushil K. Jain

Malcolm Feist Chair in Diabetes, Louisiana State University Health Sciences Center Shreveport, Louisiana 71130 USA

Obesity combined with diabetes has become an epidemic and remains a major public health issue worldwide. Insulin resistance and impaired glucose metabolism are hallmarks of type 2 diabetes and have been closely associated with obesity. According to the latest data from International Diabetes Federation (IDF), at least 366 million people are living with diabetes and this number is projected to be 552 million by 2030. At least 50% people with diabetes suffer from one or two major diabetic complications such as diabetic cardiomyopathy, nephropathy, neuropathy, retinopathy and diabetic foot diseases. Diabetes is a metabolic disorder leading to impaired insulin action and glucose metabolism. This lecture will discuss the molecular mechanisms that provide evidence that life style modification and consumption of selective micronutrients, such as, vitamin D, broccoli and curcumin upregulate the insulin dependent and insulin independent signaling pathways in various tissues, and thereby lower insulin resistance and improve the glucose metabolism, which can retard and prevent the onset of obesity and diabetes and associated complications.

MALABARICONES VIA REDOX DYSREGULATION ARE EFFECTIVE ANTI-CANCER THERAPEUTICS

Alak Manna[1], Subrata Chattopadhyay[2] and Mitali Chatterjee[1]

[1]Dept. of Pharmacology, Institute of Postgraduate Medical Education & Research, Kolkata and [2]Bio-Organic Division, Bhabha Atomic Research Centre, Mumbai , India

The 'two-faced' character of reactive oxygen species (ROS) plays an important role in cancer biology by acting as secondary messengers in intracellular signaling cascades, enhancing cancer cell proliferation and survival and sustaining the oncogenic phenotype. Conversely, enhanced generation of ROS can also trigger an oxidative assault leading to a redox imbalance which translates into apoptotic cell death. It has been proposed that low doses of reactive oxygen species especially H_2O_2 are mitogenic and promote cell proliferation, intermediate doses can cause temporary or permanent growth arrest; however, at higher doses beyond a critical threshold, ROS can cause a severe degree of oxidative stress leading to cell death via apoptotic or necrotic mechanisms. Malabaricone-A (MAL-A), a phytoconstituent derived from a diarylnonanoid was purified from the fruit rind of *Myristica malabarica.* MAL-A showed potent cytotoxicity in leukemic cell lines, its IC_{50} ranged from 2.70 ± 0.10 to 18.10 ± 0.95 µg/ml. This was mediated by activation of the MAPK pro-inflammatory signalling pathways which led to an enhanced generation of ROS along with concomitant depletion of non protein thiols and reduction in gluthathione peroxidise activity. The resultant redox imbalance led to mitochondrial membrane depolarization, enhanced externalization of phosphatidyl serine, caspase 3 activation and a halting of cell cycle progression, evident by an increment in the sub-G_0/G_1 population, all features of apoptosis. Furthermore, the ability of MAL-A to demonstrate collateral sensitivity in a multidrug resistant cell line endorsed its ability to be considered worthy of future pharmacological consideration.

AGE-DEPENDENT IRON DYSREGULATION AND ACCUMULATION OF AMYLOID BETA PEPTIDE IN RAT BRAIN: PREVENTION BY LONG-TERM ORAL ADMINISTRATION OF N-ACETYLCYSTEINE, α -LIPOIC ACID AND α-TOCOPHEROL

Sasanka Chakrabarti, Maitrayee Sinha, Priyanjalee Banerjee, Shruti Anand, Aritri Bir, Arghyadip Sahoo

Department of Biochemistry, Institute of Post-graduate Medical Education & Research, Kolkata

The aged brain, suitably manipulated, may be used as a tool to investigate different facets of Alzheimer's disease (AD) pathogenesis or to screen candidate drugs for this disease. In the present study, we have noticed a significant increase in the amyloid precursor protein (APP) level in the brain of aged rats (22 - 24 months) but only with marginal increase in APP mRNA level. Moreover, there is a rise in the activity level of β-secretase, a key enzyme in the amyloidogenic processing of APP, in the aged brain cortex compared to that in young rats (4 - 6 months). Likewise, the activity of neprilysin, a crucial degrading enzyme of amyloid beta 42 (Aβ42), is diminished (48%) in brain cortex of aged rats. All these changes lead to a markedly increased accumulation of Aβ42 in aged rat brain cortex. Concomitant with these changes, a significant increase in the iron content of the aged brain is noticed along with increased levels of ferritin and transferrin receptors. Another set of rats were given long-term oral supplementation of a cocktail (NLT) of N-acetylcysteine, α-lipoic and α-tocopherol daily starting at 18 months of age until they sacrifice between 22 and 24 months and the brain tissue analyzed for age-related alterations in amyloid beta metabolism. The NLT supplementation was shown to attenuate the alterations in amyloid beta metabolism and iron dysregulation in aged rats remarkably. In separate experiments, a significant impairment of spatial learning and memory was observed in aged rats, and the phenomenon was strikingly prevented by the same dietary supplementation of the aged animals with NLT. The results strongly imply that the therapeutic potential of this combination against AD should be tested in suitable models.

Fun fact about the Taj Hotel: The hotel is the only five-star in the city to have a sugar cane machine so you can enjoy Sugarcane juice without risking "Delhi Belly".
Source: www.johnnyjet.com › Asia

RUFFLING REDOX BALANCE: NOVEL APPROACHES FOR DEVELOPMENT OF RADIATION COUNTERMEASURES

Santosh K. Sandur

Radiation Biology & Health Sciences Division, Bhabha Atomic Research Centre, Trombay, Mumbai-400085, India

In view of the ominous threat of possible terrorist attack, nuclear accidents and enhanced use of radiation in diagnosis and treatment modalities, there is a pressing need to develop novel strategies and agents as radiation countermeasures. The role of reactive oxygen species (ROS) as prime mediators of radiation damage is well understood. However, subtle manipulations in the cellular redox balance can be employed as a novel strategy for radioprotection via activating redox sensitive pro-survival transcription factors. In this study we describe the potential of an antioxidant (baicalein) and a pro-oxidant (withaferin A) to modulate cellular redox and protect against radiation induced hematopoietic syndrome. Baicalein (5,6,7-trihydroxyflavone) offered complete protection to mouse splenic lymphocytes against radiation-induced cell death. Baicalein inhibited phosphatase MKP3, enhanced phosphorylation of ERK and its downstream proteins such as Elk and Nrf-2. Importantly, baicalein administration to mice offered significant protection against WBI 7.5Gy induced mortality in mice. Further, administration of all-trans-retinoic acid (inhibitor of Nrf-2), significantly abrogated baicalein-mediated protection against WBI-induced mortality in mice. In contrast, withaferin A (WA) modulated cellular redox by depleting GSH/GSSG and increasing basal ROS levels. It protected against radiation induced cell death and double strand breaks in lymphocytes and bone marrow cells. Inhibitors of Nrf2 and thiol antioxidants abrogated WA mediated radio-protection. WA administration protected mice against WBI 7.5Gy induced mortality and loss of cellularity. Thus, in contrast to the generalized concept of anti-oxidants acting as radioprotectors, redox dependent induction of pro-survival transcription factors can be employed to develop novel agents against radiation injury.

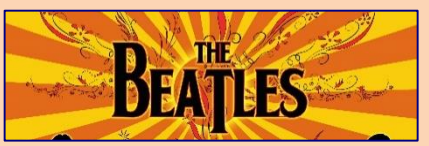
A BIS-RESORCINOL CONGENER OF RESVERATROL AS AN ANTI-ULCER COMPOUND

S. Yadav and S. Chattopadhyay

Bio-Organic Division, Bhabha Atomic Research Centre, Mumbai – 400085, India

The dietary hydroxystilbene, resveratrol (resv) is credited with several beneficial effects such as cardiovascular and neuro-protection and even cancer chemoprevention. Regardless of these, it also shows different contra-indicative properties, especially to the gastrointestinal (GI) tract. To this end, the aim of the study was to formulate a resveratrol congener as a new chemo-preventive agent without GI toxicity and rationalize its mode of action. A new hydroxystilbene (HST-1), developed by our group reversed the adverse effects of IND on several inflammatory (MPO, cytokines), ulcer-healing (cyclooxygenases) as well as signaling parameters in mice. Importantly, HST-1 down-regulated TNF-a and the TNF-a-mediated activation of NF-kB and JNK MAPKs that were found to be the key factors in IND gastropathy. The effect of HST-1 was significantly better than that of resv, misoprostol and omeprazole. The effect of resv on pP38 and p-JNK was much less, while it reduced the pro-survival ERK1/2 activation. HST-1 also showed better growth inhibitions of several human cancer cell lines than resv. Apparently, its ability to control TNF-a induction and subsequent activation of NF-kB and JNK prevented stomach ulceration and enabled faster healing. Moreover, the structural modification also enhanced its anti-cancer property. Thus, HST-1 may be a potent anti-ulcer and anti-cancer agent.

TAJ TRIVIA 1:
Which famous Beatle stayed at the Taj incognito in order to learn a new musical instrument?
Can you guess who his tutor was?



*** For answers: see page 67 ***

The Ohio State University Wexner Medical Center

University Hospital is the flagship patient care facility of The Ohio State University Wexner Medical Center. We are a 900-bed hospital that offers patients the latest in care, research and technology. Our specialties include critical care, organ transplantation, women's health, digestive diseases, minimally invasive surgery, rehabilitation and neurosciences.

Ohio State's University Hospital is consistently recognized as one of America's Best Hospitals by U.S.News & World Report. In addition to our designation as a Level I Trauma Center, we're also home to the most advanced intensive care units in the area, including a Level III neonatal intensive care unit and a comprehensive burn center.

University Hospital is unique in the region for many services, including central Ohio's only adult solid organ transplant program and a groundbreaking Center for Neuromodulation, which pioneers procedures such as deep brain stimulation that can dramatically improve the lives of people with specific neurological and psychiatric symptoms.

(http://wexnermedical.osu.edu/patient-care/locations-and-parking/university-hospital)

THE ENTIRE SUBCUTANEOUS IMPLANTABLE DEFIBRILLATORS – A NEW TOOL FOR SUDDEN CARDIAC DEATH PREVENTION

Raul Weiss

The Ohio State University Medical Center, Columbus, OH

The Subcutaneous Implantable Cardioverter Defibrillator (S-ICD) system was developed in response to the relatively high complication rate of the Transvenous ICD system. It is entirely subcutaneous. It was also developed in response to a large group of patients that outlived their TV leads. The S-ICD system also provides ICD therapy to patients who have difficult or no venous access. Also, for most patients, S-ICD can be implanted without use of fluoroscopy facilitating scheduling in busy hospital settings. Finally, the system mitigates the detrimental effect of radiation that is more accentuated in the young and the repetitive exposure to health care personnel over time. The S-ICD system was approved by the FDA in 2012 and is indicated in patients who meet current published guidelines for SCD prevention and who do not have either bradycardia pacing indication or recurrent pace-terminable monomorphic ventricular tachycardia. The SICD has been shown to be effective in sudden cardiac death prevention. SICD has also been shown to be safe with an acceptable risk of complications.

NON-INVASIVE HEMODYNAMIC MONITORING TO IMPROVE OUTCOMES IN NYHA CLASS III HEART FAILURE

Ragavendra R Baliga

Division of Cardiovascular Medicine, Wexner Medical Center, Davis Heart and Lung Research Institute, Columbus, OH 43210

Non-invasive pulmonary artery pressure monitoring provides data to reduce hospitalizations related heart failure. After the sensor is implanted in the pulmonary artery, data is wirelessly transmitted to the care provider who utilizes it to manage hypervolemia in heart failure patients. This talk will discuss the CHAMPION trial which was spearheaded by investigators from the Ohio State University. The talk will also discuss the utility of this unique sensor in the real-world setting given that the system was recently approved by the FDA.

TOLL-LIKE RECEPTOR 7/8 AGONISTS ENHANCE MONOCYTE RESPONSES TO ANTI-TUMOR ANTIBODIES

Jonathan P. Butchar,[1,2] Saranya Elavazhagan,[1] Prexy Shah,[1] Hemal Patel,[1] Carolyn Cheney,[2] Xiaokui Mo,[3] William E. Carson III,[1,2] John C. Byrd[1,2] and Susheela Tridandapani[1,2]

[1]Department of Internal Medicine, [2]Comprehensive Cancer Center, [3]Center for Biostatistics, The Ohio State University Wexner Medical Center, Columbus, OH

Monocytes and macrophages play critical roles in antibody therapy against cancer, as they not only engage the antibody-coated tumor cell but also activate neighboring immune cells. These responses are mediated by Fc-γ receptors, which bind the antibodies and drive several downstream signaling pathways that lead to phagocytosis, antibody-dependent cellular cytotoxicity and cytokine release. However, antibody therapy is not fully effective and this may be due in large part to the suppressive activities of tumor cells on monocytes/macrophages. Hence, preventing or reversing this tumor-associated immunosuppression should significantly improve the outcome of antibody therapy. One promising way to do this is through the activation of Toll-like receptors (TLR), which trigger pro-inflammatory responses upon the sensing of pathogen components. We screened TLR agonists to compare their effects on monocyte Fc-γ receptor responses and found that agonists for TLR 7 and 8 were the most effective. Treatment of monocytes with the agonists R-848, CL075 or VTX-2337 led to increased expression of Fc-γ receptors, and to greater IgG-mediated cytokine production. In addition, monocyte-mediated antibody-dependent cellular cytotoxicity against tumor cells was also significantly increased. Interestingly, agonist treatment led to the production of Granzyme B and Perforin by monocytes, and blocking Granzyme B nullified the agonist-induced increase in monocyte-mediated antibody-dependent cellular cytotoxicity. We also tested the TLR 7/8 dual-agonist R-848 in a mouse model of antibody therapy and found that it synergized with antibody treatment for attenuating tumor growth. In summary, TLR 7/8 agonists may serve as effective adjuvants for antibody therapy.

TAJ TRIVIA 2

Which American movie star sent a note to the Taj Palace Hotel appreciating the gorgeous sunrise view?

*** See page 94 for answer ***

THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

Key Facts and Figures:

Hospitals - 5
- -University Hospital: *** See page 57 ***
- -University Hospital East *** See page 157 ***
- -James Cancer Hospital: *** See page 59 ***
- -Ross Heart Hospital: *** See page 133 ***
- -Harding Hospital

Beds - 1,246
Patient Admissions - 57,024
Outpatient Visits - 1.6 million
Employees - 19,544
Operating Revenue - $2.1 billion
Community Benefit (FY13) - $179.2 million
Active Research Studies - 1,000+
National Rankings
Ranked by *U.S. News & World Report*
- -Ear, Nose & Throat
- -Cancer
- -Urology
- -Cardiology and Heart Surgery
- -Nephrology

(http://wexnermedical.osu.edu/mediaroom/facts)
(Updated 11/12/14)

Rankings and Awards:

22 years in U.S. News & World Report's "America's Best Hospitals" rankings.

On Best Doctors Inc.'s most recent "Best Doctors in America" list, 79 percent of the central Ohio honorees were Ohio State faculty.

Our College of Medicine ranks 12th in the country among public universities in the magazine's "America's Best Graduate Schools" list.

The Ross Heart Hospital, University Hospital, and The James are all designated ANCC Magnet hospitals, one of the highest honors awarded for nursing excellence.

Recognized as one of the nation's Most Wired hospitals 11 times by Hospitals & Health Networks magazine.

The Midwest's highest ranked hospital for safety and patient care.

The National Cancer Institute (NCI) has named Ohio State's Comprehensive Cancer Center "exceptional" – its highest ranking. Ours is one of only 41 NCI-designated comprehensive cancer centers in the United States.

(http://wexnermedical.osu.edu/about-us/rankings-and-awards)

PROMOTING AYURVEDA IN THE WEST – CHALLENGES AND OPPORTUNITIES

Sanni Raju

Natreon, Inc., New Brunswick, NJ, 08901, USA

Ayurveda is the traditional Indian system of medicine and the word means “science of life.” It dates back to 3500 BC with compendia, Charaka Samhita and Sushruta Samhita, as the fundamental sources of Ayurvedic knowledge. Ayurvedic products are used extensively by Indian people. Ayurveda is a cornucopia of wonderful medicinal products and deserves a prominent place in medicine worldwide. Although, Ayurvedic products have been sold in the west for a few decades, there is still plenty of opportunity to expand the market. However, there are plenty of challenges as well to realize such an opportunity. These challenges and opportunities are discussed in this presentation.

Recent news at OSU

*The Ohio State University Comprehensive Cancer Center (OSUCCC) – “**The James**” opened in December, 2014.*

- *Third largest cancer hospital in the nation*
- *21 stories*
- *1.1 million square feet*
- *306 inpatient beds*
- *14 operating rooms*
- *6 interventional radiology suites*
- *7 linear accelerators for radiation therapy*
- *Dedicated early-phase clinical trials unit*

- *Inpatient floors that specialize in specific cancer subtypes to facilitate care by subspecialist multidisciplinary teams of physicians, nurses and pharmacists,*

- *Translational research labs on each inpatient floor that bring physicians together with researchers to develop and deliver the most effective targeted treatments for patients.*

- *A Fully Integrated Cancer Emergency Department, opening March 2015, that will treat cancer-related medical emergencies. Emergency medicine physicians and nurses will work with oncologists and oncology nurses to care for patients and ease their transition to further care at The James or at home.*


Good Health

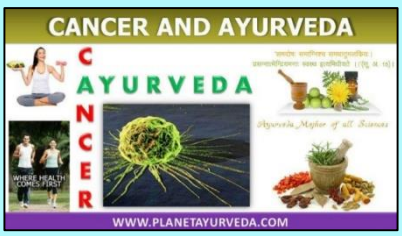
By MANU MOUDGIL

THE GREEN CURE

Carctol is a herbal treatment for cancer formulated by Dr Nandlal Tiwari that has helped many in their battle against the disease and is being prescribed by doctors in the UK too

Carctol has been successful in about 60-70 per cent of those who have tried it and can be taken along with allopathic remedies too

Dr Nandlal Tiwari




pumped into the market than 2000 employees through ... its VRS. The ...

THE ASIAN AGE 22 JULY 2003 11

THE LAST WORD / Cancer institute develops drug to combat leukemia

Ayurveda claims cancer cure

BY OUR CORRESPONDENT

Ahmedabad, July 21: When allopathy battles relentlessly to end the trauma of cancer patients, there comes news from the practitioners of ayurveda that the potency of ayurvedic medicines can well be on its way to treat cancer.

The Alternative Medicine Clinic run by Gujarat Cancer and Research Institute, Civil Hospital at Ahmedabad claims of a breakthrough in curing promyelocity leukemia, a type of blood cancer, by a newly formulated Ayurvedic medicine that is dispensed in capsule form.

Dr Ranjitsinh Solanki, an ayurveda practitioner in Surat and a visiting doctor at the city clinic, tested his formulation — containing a mixture of herbs, minerals and arsenic — on a patient Samubhen Prajapati, 35, a resident of Vadgam in Banaskantha district. The treatment commenced for Samubhen who was in an stage of blood cancer. She is stated to have fully recovered from her ailment, according to, Dr. Shilin Shukla, deputy director of the cancer institute.

The formulation though prepared in April 2003 by Dr Solanki is yet to be named. The dosage for Samubhen had lasted for two months and she had shown complete remission of cancerous cells from her body, Dr Shukla claimed.

“Arsenic in the form of arsenic crioxide is used to prepare injections in the West to treat cancer. The cost of one such injection is Rs 1 lakh. Many other medicines like Aetra, Donnomycin and Idarubicin are available in the market. American drug controllers have sanctioned the usage of these medicines in India, but they are too expensive. Chemotherapy is another option and there is no guarantee that cancer will be cured as one affected cell in the body can replicate and get out of control. In comparison, the cost of an ayurvedic

Turn to Page 11

Cancer cure

Continued from Page 9

formulation is only Rs 12,000-15,000 that works out for a four-month dosage and is affordable,” Dr Shukla said. Dr Shukla along with Dr S.K. Nanda are involved in R&D of ayurvedic medicines to treat cancer. Dr Nanda said, “In recent times therapies like Unani and Ayurveda is developing as useful alternative to allopathy. The clinic is also testing different ayurvedic formulations for other types of cancers.” Calling the recent achievement as a landmark development in the history of Ayurveda, Dr Nanda said it was for the first time that such a feat has been accomplished in Ayurveda.

MASS SPECTROMETRY IN STRUCTURAL BIOLOGY: SURFACE-INDUCED DISSOCIATION/ION MOBILITY OF PROTEIN COMPLEXES

Vicki Wysocki

Department of Chemistry and Biochemistry, The Ohio State University, Columbus, OH

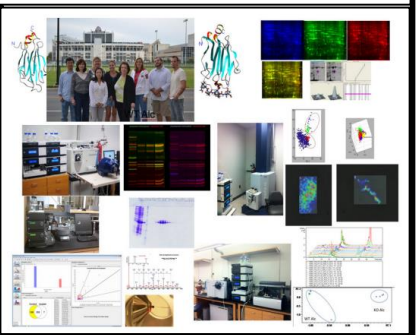
Characterization of the overall topology and inter-subunit contacts of protein complexes, and their assembly/disassembly and unfolding pathways, is critical because protein complexes regulate key biological processes, including processes important in understanding and controlling disease. Conventional structural biology methods such as X-ray crystallography and nuclear magnetic resonance provide high-resolution information on the structures of protein complexes and are the gold standards in the field. However, other emerging biophysical methods that only provide lower resolution data (e.g. stoichiometry and subunit connectivity) on the structures of the protein complexes are also important. Native mass spectrometry is one of these approaches that provide lower resolution, but critical, structural information with high throughput. The power of native MS increases when coupled to ion mobility (IM-MS), a technique that measures rotationally averaged collisional cross sections and thus direct information on conformational changes. This presentation illustrates a new approach, surface-induced dissociation/ion mobility (SID/IM) MS, for characterization of topology, intersubunit connectivity, and other structural features (degree of unfolding) of multi-meric protein complexes.

MASS SPECTROMETRY BASED APPROACHES FOR THE IDENTIFICATION OF HUMAN HAEMOGLOBIN VARIANTS

J. H Scrivens

School of Life Sciences, University of Warwick, CV47AL, UK

Hemoglobinopathies include genetic defects that result in an abnormal structure of one of the globin chains of the hemoglobin molecule. Common hemoglobinopathies include sickle-cell disease and it is estimated that 7% of world's population are carriers. A three-month mirrored clinical trial on 2017 antenatal patient blood samples has been carried out in which the established clinical approach, based on either cation exchange liquid chromatography or capillary electrophoresis was used in conjunction with three different mass spectrometry based methods. These approaches were based on tryptic digestion followed by MS/MS characterisation with or without liquid chromatography separation and top down approaches using electron transfer dissociation (ETD) or electron capture dissociation (ECD) ion activation. The existing clinical approach was used to identify those hemoglobin variants that have been classed as being of clinical significance in the UK. These include HbSS, HbSC, HbS, HbD-Punjab, HbE and HbO-Arab. HbA2, which corresponds to an α2δ2 species, was also measured in the same experiment with elevated levels used to provide an indication of β-thalassemia. Excellent agreement with the established clinical approaches was observed with significant additional information being provided by mass spectrometry including the identification of false positive results in the clinical method, the characterisation of nine additional hemoglobin variants and the quantitation of glycan adducts. The top down approach also has an advantage in not requiring enzymatic digestion or chromatographic separation. The method also has advantages over the existing clinical approach in terms of cost, speed, sensitivity, selectivity, potential for automation and improved diagnostic information.



A LABEL-FREE TRANSOMICS INVESTIGATION OF DRUG MITIGATED OBESITY WITHIN A MOUSE MODEL

Mark McDowall

Waters Corporation, Stamford Avenue, Wilmslow, Cheshire, SK9 4AX, UK

Obesity is associated with metabolic syndrome, causing excessive body fat to be accumulated, adversely affecting health and life expectancy. It has previously been shown that glucosylceramides play a crucial part in such metabolic syndromes. The manipulation of glucosylceramides with drugs, in mouse models, has shown that symptoms can be negated. Lipid and protein extracts of liver tissue from 3 control and 3 obese mice models were analysed. Protein extracts were proteolysed with trypsin and the resulting peptides separated over a 90-minute reversed-phase nanoscale gradient. Lipid extracts were prepared using 500 µL IPA/water (50:50) and separated over a 20-minute reversed-phase gradient. Data were acquired by data independent acquisition. For protein profiling, ion mobility separation was integrated on-line to increase the peak capacity of the analytical system. The acquired data were processed with Progenesis QI software. Randomized proteomic samples (100 ng on-column) were analysed in triplicate to reveal 1200 highly curated proteins across all technical replicates and biological conditions. Over 300 proteins exhibited a significant fold change greater than 2. Randomized lipid extracts (2 µL on-column) were analysed in triplicate. A lipid QC sample, comprised of aliquots of all samples in equal amounts, was injected after every 5 injections. Interrogation of the resulting data revealed over 500 lipid identifications. Unsupervised multi-variate analyses showed clear distinction between obese and control groups in both proteomic and lipidomic experiments.

*The **Tata Institute of Fundamental Research** (TIFR) is a research institution in Mumbai, India, dedicated to basic research in mathematics and the sciences.*

*It works under the umbrella of the Department of Atomic Energy of the Government of India. It is located in Colaba, Mumbai. TIFR is considered one of the outstanding research centres in India. **Founded - 1945***

en.wikipedia.org/wiki/Tata_Institute_of_Fundamental_Research

The name Tata ring a bell? See page 145 for info!

REGULATION OF SYNAPTIC VESICLE TRANSPORT

Sandhya P. Koushika

Department of Biological Sciences, Tata Institute for Fundamental Research, Mumbai, India

Neurons communicate with each other at synapses through the process of synaptic transmission. The synapse can be upto a meter away from the cell body necessitating a robust transport process to bring all components required for synaptic transmission to the synapse. The axon that connects the cell body with synapses provides a highway for cargo movement, enabling neurons to both develop and maintain synaptic connections. Synaptic vesicles are a prominent and essential axonal cargo. The molecular motor, UNC-104, picks up synaptic vesicles in the cell body, moves them along the axon and delivers them at their destination, namely synapses. I will discuss the regulatory mechanisms we have identified involved in (i) synaptic vesicle movement in the neuronal process and finally (ii) motor regulation after vesicle release from the motor.

TARGETING HUBS OF CANCER: PAKs AS NOVEL TARGETS AGAINST GLIOMAS

Vinay Puduvalli

Division of Neuro-Oncology, The Ohio State University, Columbus, OH

Epithelial–mesenchymal transition (EMT) is an embryonic trans-differentiation program that is implicated in organ formation by facilitating the formation of highly motile cells with stem cell capabilities. Mesenchymal transition of cells leads to loss of polarity and facilitate metastatic dissemination of carcinoma cells. Pathways that act as mediators of EMT in cancer are hence targets for therapy. We have identified p21-associated kinases as key regulators of mesenchymal transition in gliomas. PAK3 (from the Class I PAKs) and PAK4 (from Class II PAKs) both mediate key pathways that drive glioma biology. We have characterized a role for PAK3 in Akt activation likely by serving a scaffold function. Similarly, PAK4 mediated several key programs including invasion, migration and angiogenesis both independently and in response to treatment in gliomas and impact tumor growth *in vitro* and *in vivo*. These data provide a strong basis for targeting PAKs as "hubs" of signaling pathways in gliomas and a rationale for developing PAK inhibitors as anticancer agents.

IAA: EMBRACING AND SHARING THE INDIAN HERITAGE

The Indian American Association (IAA) at The Ohio State University was founded in 1992 on the premise of promoting ethnic solidarity through its various programs, events, and community service activities.

As individuals from various denominations of both India and America, each of the members brings unique customs, traditions, and values from their respective backgrounds to form a distinct collage known as the Indian American Association. This organization is a forum to foster the common bond shared as first and second generation Indian-Americans.

(http://iaa.org.ohio-state.edu/)

INNOVATIVE APPROACHES TO TREATMENT OF SPINE MALIGNANCIES

Ehud Mendel

Department of Neurological Surgery, The Ohio State University Medical Center, Columbus, OH

The Ohio State University Spine Research Institute (SRI) has been at the forefront of advanced spine modeling research for over three decades. Traditionally, we have used our models for ergonomics and occupational biomechanics research with great success, helping numerous companies reduce injuries in the workplace by as much as 90%. Recently, our models have become more advanced and are beginning to show promise for clinical research.

Our advanced biomechanical model uses biomedical imaging data (CT/MRI) to create patient-specific vertebrae, intervertebral disc, ligament, and muscle geometry. These structures are combined with patient-specific motion data (using optical motion capture), muscle activity data (using electromyography), and kinetic data (using forceplates and transducers.) All of these data inputs are combined to create a dynamic, patient-specific model that can be used to explore the motion and the forces, stresses and strains on various tissues while performing realistic activities of daily living. These advanced models can be used for a number of different diagnostic and surgical prediction purposes.

There are few diagnostic tools that can reliably pinpoint an individual's source of back pain. In fact, standard of care imaging (MRI, CT) is unable to locate the cause of pain in 85% of cases. These imaging techniques are unsuccessful because they are assessing a patient's spine in the most stable state: when it is not moving and it is unloaded. However, using our biomechanical model results in what is essentially, a dynamic, three-dimensional, functional MRI or CT. Since the weight of all the body segments and the loads coming from the muscles and load bearing structures are included, the model provides a much more insightful look at the status of the patient's spine. And since the patient's own motion provides an input to the model, the patient can assume postures that instigate pain to see the underlying cause of the pain, from the model.

In addition to its use as a diagnostic tool, the biomechanical model has the potential to be used as an instrument to predict and guide surgical interventions. Any number of different surgeries can be performed virtually, in the model, to check the effectiveness of the intervention and to try to detect any unintentional side effects. This allows the clinician to optimize treatment for each individual patient in the model before the actual surgery. Furthermore, the model can be used for training and research into new techniques and even for the development and testing of new devices.

While much of this model is still under development, it will hopefully become a readily accessible and valuable tool for the clinician in the near future; both for patient-specific diagnosis and treatment prediction, and for all kinds of other spine research.

"The Pride of the Buckeyes"

The Ohio State University Marching Band *(often called The Best Damn Band in the Land or TBDBITL)* performs at Ohio State football games and other events during the fall semester.

The 225-piece "Pride of the Buckeyes" is one of the few college all-brass-and-percussion bands in the U.S. and is acknowledged as the largest of its type in the world.

With a history dating back to the late 1800s, many marching band innovations were developed at Ohio State. Among them: floating and animated formations, script writing, and the fast cadence with a high knee lift. The band's Script Ohio (**below, top**) is considered by many to be the most memorable tradition in college band history.

(osumarchingband.com)

@TBDBITL

IMPROVING COMMUNITY ACCESS TO RADIATION THERAPY BY INDIAN/AMERICAN PARTNERSHIPS

Aaron O. Williams

Athens Cancer Center, Athens, OH - 45701

Background/Purpose: India has one of the fastest growing populations in the world. Associated with this an increasing incidence of cancer cases complicated by vast distances to current treatment centers. **Objectives:** The objective of this oral presentation is to define the current barriers to access and provide specific efficient solutions. **Approach:** The data used for this presentation will be compiled from a review of the current literature and input from radiation oncologists in and from India. **Deliverables:** A panel discussion designed to explore all the variables that effect access. These variables include incidence rates, types of cancer by region, infrastructure challenges, technology implementation and maintenance, government and nongovernment partnerships, personnel and community education. **Conclusions/Recommendations:** An ongoing retrospective and prospective review of the ability to gain access to radiation therapy is necessary. This information along with prudent strategic planning, financing and education will bridge the gap between patient and state of the art care. Partnerships between Indian and US firms should continue to be explored to expedite this goal. Our organization is interested in this type of collaborative partnership.

Do this, NOT that in Mumbai!

DON'T - Drink the water from the tap in Mumbai even if you see locals doing it. Stick to bottled mineral water everywhere – even to brush your teeth!

DO - For food, you should be safe eating from large hotels and clean, sit down restaurants. If you want to try some of Mumbai's fabulous street food it is best to stick to hot food that you have seen being cooked in front of you.

DON'T - Food that has been sitting around for long periods of time (as flies and other bugs may have touched them), or cut fruit that may have been rinsed in tap water.

DO - Even though it may be hot and Mumbai is quite modern, it is respectful and wise to wear modest clothing. This will not only protect your skin from the weather, but also limit the amount of stares that you receive, making your visit more comfortable.

BE AWARE - Seeing poverty is unavoidable in Mumbai. There are millions of people who are either homeless or live in slums, and these are everywhere, even in the poshest of suburbs. It can be very confronting, and it is perhaps worth thinking about whether you wish to give money or not before you are faced with the situation. You may be followed for a while, and this can be quite distressing for some people

BRIDGING THE GAP – CANCER CARE IN INDIA

Utpal K. Bhanja

Oncology Hematology Consultants of SE Ohio, Millennium Business Solutions, Columbus, OH

Background: India is home to one sixth of the world's population. One million cancer cases are diagnosed each year in India and 600,000 patients are dying. These numbers are projected to double in the next twenty years. Access to care is adversely affected because of India's significant socio-economic disparity as well as the paucity and geographically skewed distribution of cancer-care resources. Expensive high energy radiotherapy equipment and newer molecularly targeted anti-neoplastic agents are compounding the problem further. Delivering cost effective and standardized care for cancer is one of the greatest public health challenges India is facing. **Objective:** This presentation intends to bring awareness among policy makers, investors, physicians and healthcare personnel in order to call for an orchestrated effort to find the solution. This discussion will open the dialogue to identify the barriers and solutions to deliver accessible quality care. **Method:** The data used for the presentation are compiled from review of current literature, available statistics and input from specialists involved in cancer care. A panel discussion with experts in the field has been designed to explore the variables that effect access. **Conclusion:** Ongoing dialogue along with prudent strategic planning, infrastructure implementation, financing, education, and evidence-based guidelines specific for India, will bridge the gap between the patient and the care. Public-private partnerships and Indo-American collaboration should continue to be explored to expedite the goal. The extent to which cancer will impact the nation will depend on the investments made in the coming decades. **Proposal:** Our organization is interested in exploring potential partnership opportunities, so that expertise from the U.S. will help foster such cancer-care programs.

REFORMING MEDICAL BUSINESS ETHICS: A TRANSCULTURAL PERSONALIST PROPOSAL

Ashley K. Fernandes

The Ohio State University Center for Bioethics and Medical Humanities, and Nationwide Children's Hospital, Columbus, OH

In this provocative presentation, I focus on the broad ethical implications of the relationship between business and corporate interests, and those of traditionally-conceived American medicine. The twenty-first century has seen a sharp increase in the commodification and commercialization of the practice of medicine in the US, leading to record rates of physician burnout, dissatisfaction, and the perception by the public of a loss of objectivity and professionalism. This trend has been framed in the literature as "business against medicine." I argue, however, that while medicine and business do traditionally have "different ends," high-quality, compassionate medical care and free-market innovation are not incompatible. Reforming medical business ethics can be accomplished utilizing a "personalist" approach, a philosophical re-training in which the individual person—rather than profit—becomes the ultimate unit of (metaphysical) value. The values of medicine should influence medical business, not the other way around. Recommitting to and building upon a robust notion of social justice with human dignity at its center, and using contemporary examples of corporate structure such as the "for-benefit" model, I argue that reforming biomedical business is not only possible, it is a moral obligation. Finally, as an Indian-American, I conclude with some personal reflections on what India's embrace of innovation in business, communitarianism, and medical excellence can teach the West, and where we can learn from the promises and pitfalls of both cultures.

COMMUNITY CANCER CARE IN INDIA AND KCHRC

Rajesh A Kantharia, Ashish Kumar, Rakshit Shah, Niraj Bhatt

Kailash Cancer Hospital and Research Centre, Goraj, India

Background: Kailash Cancer Hospital & Research Centre, KCHRC is a comprehensive cancer center for prevention, treatment & research in cancer and is recognized as one of the leading cancer treatment centers in Western India. KCHRC is situated in the rural area of Gujarat and serves the people of the region who are deprived of technology and advanced facilities for the lack of knowledge and economic strength.

Mission: To provide the best quality medical facility to every section of society irrespective of religion, caste and financial status. Treatment is provided solely on humanitarian grounds.

Comprehensive Cancer Care: Every year nearly 15,000 new patients visit the hospital from all over Gujarat and the neighboring states. Surgery remains the vital form of treatment along with radiation therapy and chemotherapy. The strategies for early diagnosis, treatment management, rehabilitation, pain relief and terminal care have been established in a comprehensive and multidisciplinary approach for a total cancer care programme. Nearly 60% of these cancer patients receive primary care at the hospital of which over 70% receive some form of financial help from the hospital. KCHRC provides state-of-the-art cancer care to the rural population.

THE OHIO STATE UNIVERSITY

Center for Electron Microscopy and AnalysiS (CEMAS)

The mission of the Center for Electron Microscopy and AnalysiS (CEMAS) is to disrupt the stratification of disciplines in the characterization of materials. We will bring together multidisciplinary expertise to drive synergy and amplify our characterization capabilities, and thus challenge what is possible in analytical electron microscopy.

CEMAS is one of the largest concentrations of electron and ion beam analytical microscopy instruments in any North American institution. This includes two aberration corrected scanning transmission electron microscopes (S/TEM). One instrument is optimized for high spatial resolution imaging and analysis with the capability to provide sub-angstrom resolution, while the second instrument is designed for investigation of soft materials and biomaterials with the ultimate in chemical analysis capabilities as well as high resolution imaging performance.

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ENSURING SAFE AND EFFECTIVE MEDICATION USE IN PEDIATRIC PATIENTS

Milap C. Nahata

Colleges of Pharmacy and Medicine, The Ohio State University and Nationwide Children's Hospital, Columbus, Ohio, USA

Although the pediatric population (birth to 18 years of age) accounts for only about one-fourth to one-third of the total population in various parts of the world, it is affected by numerous acute and chronic illnesses. The subgroups of this population, including premature and full term neonates, infants, children and adolescents, have unique dosage requirements based on the distinct pharmacokinetics and pharmacodynamics of drugs due to physiologic differences compared with adults. Premature infants often require the lowest and children the highest dose per kilogram of body weight. Much has been learned about the prevention and treatment of certain common illnesses. Little is known, however, about the efficacy of drugs in many conditions, e.g., gastro-esophageal reflux disease in neonates and long-term safety of many drugs during the developmental period. Application of pharmacogenomics and technology offers opportunities for enhanced medication efficacy and safety. The challenges include off-label use of medications, lack of appropriate dosage forms, access to care, and affordability of drugs and vaccines for this population. Leadership is needed to advance pediatric research, education and practice. Stakeholders including healthcare providers and policy makers, government, industry and communities must all commit to ensure optimal health and wellbeing of pediatric patients.

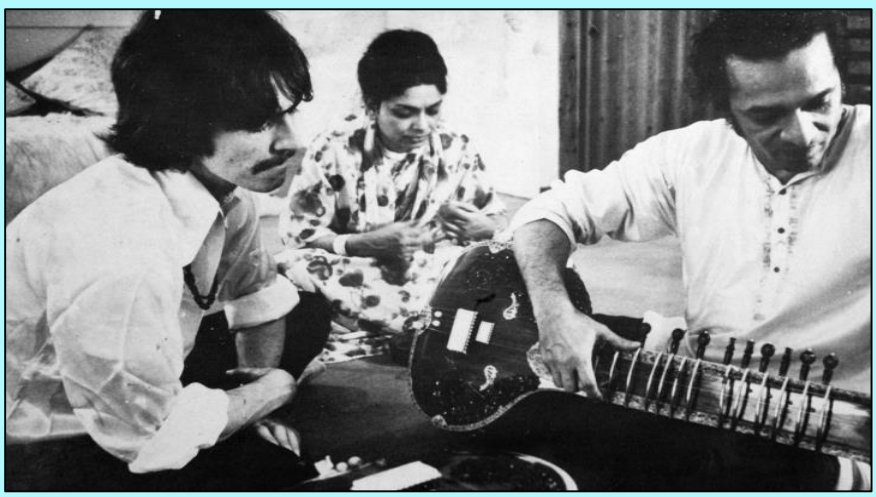
THE ACTIVITY OF THE ARYLIMIDAMIDE DB766 AGAINST *LEISHMANIA DONOVANI* INVOLVES CYP5122A1 AND IS SYNERGISTIC WITH THE AZOLE ANTI-FUNGAL POSACONAZOLE

Karl A. Werbovetz[1], Trupti Pandharkar[1], Xiaohua Zhu[1], Radhika Mathur[2], and Chandrima Shaha[2]

Division of Medicinal Chemistry and Pharmacognosy, College of Pharmacy, The Ohio State University, Columbus, Ohio, USA[1], Cell Death and Differentiation Research Laboratory, National Institute of Immunology, New Delhi, India[2]

Arylimidamides show promising activity against intracellular pathogens. DB766 (2,5-bis[2-(2-*i*-propoxy)-4-(2-pyridylimino)aminophenyl]furan hydrochloride) is the frontrunner arylimidamide against visceral leishmaniasis based on its outstanding potency versus intracellular Leishmania and its oral efficacy in animal models of visceral leishmaniasis. We performed a series of experiments to probe the mechanism of action of DB766. Transmission electron micrographs of *L. donovani* exposed to DB766 revealed vesicles in the cytoplasm and flagellar pocket along with damage to the flagellum. *L. donovani* axenic amastigotes resistant to DB766 were raised through continuous compound pressure; these parasites displayed 12-fold resistance to DB766. The resistant parasites (DB766R) were not cross-resistant to the structurally related pentamidine but were hypersensitive to ketoconazole and posaconazole, two sterol 14α-demethylase (CYP51) inhibitors that have also been used clinically to treat leishmaniasis. CYP51 expression is slightly increased in DB766R parasites compared to wild type organisms, while a dramatic reduction in the expression of CYP5122A1, a cytochrome P450 that plays a role in *Leishmania* ergosterol metabolism, was also observed in DB766R parasites. *L. donovani* promastigotes engineered to possess a single copy of CYP5122A1 were significantly more susceptible to ketoconazole and less susceptible to DB766 than the corresponding diploid wild type organisms, in agreement with susceptibility studies conducted with DB766R parasites. Synergistic activity was also observed between DB766 and posaconazole in *L. donovani* intracellular amastigotes (mean ΣFIC = 0.41). Studies are in progress to explore the potential of arylimidamide-azole combinations as therapies for visceral leishmaniasis and to clarify the role of CYP5122A1 in the anti-leishmanial action of the arylimidamides.

MUSIC HISTORY: A FORMER BEATLE LEARNS THE SITAR AT THE TAJ



*In 1966, **George Harrison** checked into The Taj Mahal Palace Hotel under an assumed name and studied sitar under Pandit Ravi Shankar. and it was to commemorate this legendary occasion that the Ravi Shankar Suite was created. There is even a dedicated library with a collection of concert recordings of Pandit Ravi Shankar and George Harrison. In fact, from the colors of the sitar that are used as the main color theme throughout, to memorabilia and sitars that the genius once played, this suite is an inspiration, much like the man himself.*

DIETARY OMEGA-3 FATTY ACIDS INCREASE SUSCEPTIBILITY TO VENTRICULAR ARRHYTHMIAS AFTER MYOCARDIAL INFARCTION

Cynthia Carnes [1,2], Andriy Belevych[2,3], Hsiang-ting Ho[2,3], Ingrid Bonilla[1,2], Sandor Györke[2,3], George Billman[2,3].

[1]College of Pharmacy, [2]Dorothy M. Davis Heart and Lung Research Institute, [3]Department of Physiology and Cell Biology, College of Medicine, The Ohio State University, Columbus, OH, USA

BACKGROUND: Supplemental omega-3 polyunsaturated fatty acids (n-3 PUFAs) have been suggested to reduce the risk of arrhythmic death after myocardial infarction, although there are conflicting reports. We evaluated the effects of n-3 PUFAs on susceptibility to post-infarction ventricular arrhythmias in a validated animal model. **METHODS:** Subjects with healed infarctions were tested for arrhythmia susceptibility during a standardized test. Subjects with and without induced arrhythmias were randomized to treatment with n-3 PUFAs or sham (corn oil) for three months. After three months, arrhythmia susceptibility testing was repeated. Red blood cell and tissue concentrations of n-3 PUFAs were measured. Cardiac myocytes were isolated and tested for calcium cycling and cellular arrhythmias. **RESULTS:** n-3 PUFA concentrations were increased in the active treatment group ($P<0.01$). n-3 PUFA treatment did not reduce inducibility of arrhythmias ($p=0.56$), but induced new ventricular arrhythmias in a subset of animals without baseline arrhythmias ($p=0.044$). Myocytes from n-3 PUFA treated animals did not show any antiarrhythmic effect, but did show increased cellular arrhythmias. **CONCLUSIONS:** Chronic n-3 PUFA treatment does not reduce arrhythmia risk in the setting of a healed myocardial infarction. This suggests that routine clinical use in patients with previous heart attacks may not be warranted.

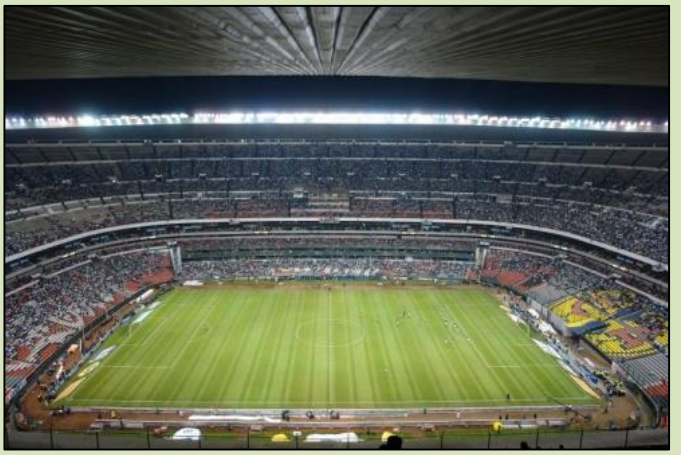
A COMPARISON OF "FOOTBALLS"

American Football

Ohio Stadium is one of the most recognizable landmarks in all of sports. Built in 1922 at a cost of $1.3 million and refurbished in 2001 for slightly more than $194 million, the horseshoe-shaped stadium is a monument to college football. With its present seating capacity of 104,944, Ohio Stadium is the fourth largest on-campus facility in the nation. Since the opening game against Ohio Wesleyan on Oct. 7, 1922, more than 36 million fans have streamed through the stadium's portals.

Indian Football

Salt Lake Stadium or Yuva Bharati Krirangan is the largest stadium in India, and the second-largest stadium in the world by capacity. The record attendance of 131,000 was set in 1997 in a match between East Bengal FC and Mohun Bagan AC. The stadium, situated approximately 10 km to the east of downtown Kolkata covers an area of 76.40 acres (309,200 m^2) and it was inaugurated in January, 1984.



THE EFFECT OF FERMENTED PAPAYA PREPARATION (FPP) UPON RADIOACTIVE EXPOSURE

Eitan Fibach[1] and Eliezer A Rachmilewitz[2]

Departments of Hematology, [1]Hadassah – Hebrew University Medical Center, Jerusalem, and [2]The E. Wolfson Medical Center, Holon, Israel

Background: Ionizing radiation causes cellular damage, which may lead to premature cell death or accumulation of somatic mutations which may lead to malignancy. The damage is mediated in part by free radicals, particularly reactive oxygen species. Since FPP, a product of yeast fermentation of *Carica papaya Linn*., has been shown to act as an anti-oxidant, we studied its potential to prevent radiation-induced damage. **Methods:** FPP (0-100 µg/ml) was added either before or after irradiation (0-18 Gy) of cultured human foreskin fibroblasts and myeloid leukemia (HL-60) cells. After 1-3 days, the cells were assayed for intracellular labile iron, measured by staining with calcein, generation of reactive oxygen species, measured with dichlorofluoresceine diacetate, apoptosis, determined by phosphatidylserine exposure, membrane damage, determined by propidium iodide uptake, and cell survival – by a cell proliferation assay. DNA damage was estimated by measuring 8-oxoguanine, a parameter of DNA oxidation, using a fluorescent specific probe, and by the comet assay which measures DNA stability. These parameters were also assayed in bone marrow cells of mice treated with FPP (by adding it to the drinking water) either before or after irradiation. Somatic mutation accumulation was determined in their peripheral red blood cells, and their survival was monitored. **Results:** FPP significantly reduced the measured radiation-induced cytotoxic parameters. **Conclusions:** FPP might serve as a radio-protector. Its effect on DNA stability and mutagenicity might reduce the long-term effects of radiation, such as primary and secondary malignancy.

THE EFFECT OF FERMENTED PAPAYA PREPARATION (FPP) IN THALASSEMIA

Eitan Fibach[1] and Eliezer A Rachmilewitz[2].

Departments of Hematology, [1]Hadassah – Hebrew University Medical Center, Jerusalem, and [2]The E. Wolfson Medical Center, Holon, Israel

Oxidative stress aggravates symptoms in many diseases, including hemolytic anemias – b-thalassemia, sickle cell anemia, glucose-6-phosphate dehydrogenase, hereditary spherocytosis, congenital dyserythropoietic anaemia and Paroxysmal Nocturnal Hemoglobinuria. Although oxidative stress is not the primary etiology of these diseases, oxidative damage to their erythroid cells play a crucial role in hemolysis due to ineffective erythropoiesis in the marrow and short RBC survival in the circulation. In addition, patients with some of these diseases may experience thrombo-embolic complications and recurrent bacterial infections to which oxidative damaged platelets and leukocytes have a significant contribution. FPP, a yeast fermentation product of *Carica papaya Linn*., has a strong antioxidant effect: We demonstrated this activity spectro-fluorometrically in a cell-free system and by flow cytometry in various blood cells. *In vitro* treatment of blood cells from b-thalassemic patients with FPP elevated their content of the main cellular anti-oxidant, reduced glutathione, and lowered reactive oxygen species, membrane lipid peroxides and external phosphatidylserine, all markers of oxidative stress, in RBC, platelets and polymorphonuclears. These effects result in (a) reduced thalassemic RBC susceptibility to hemolysis and phagocytosis by macrophages; (b) improved ability of polymorphonuclears to generate an oxidative burst – an intra-cellular mechanism of bacteriolysis, and (c) reduced platelet tendency to undergo activation. Oral administration of FPP to b-thalassemic mice (50 mg/mouse/day for 3 months) and to patients (3g x 3 times/day for 3 months) reduced the oxidative stress parameters. These results suggest that FPP, as a potent antioxidant, might alleviate symptoms in thalassemia and other forms of hemolytic anemia.

FPP IN THE STIMULATION OF RESPIRATORY BURST FUNCTION OF INNATE IMMUNE CELLS IN TYPE 2 DIABETES PATIENTS

Sashwati Roy

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The World Health Organization (WHO) report that diabetes affects 346 million people worldwide. The incidence of infection is known to be increased in patients with diabetes mellitus (DM). Leukocytes (neutrophil and monocytes), through their characteristic 'respiratory burst' activity, produce superoxide anion (O2•-) and derivative reactive species which fight infection. Leukocyte NADPH oxidase, found in professional phagocytes, catalyzes the production of O2•- by the one-electron reduction of oxygen, using NADPH as the electron donor. It is widely reported that patients with type II DM (T2DM) suffer from systemic oxidative stress. However, the ability of peripheral blood monocytes of T2DM to mount respiratory burst response in response to appropriate pathogenic stimulus is known to be compromised increasing the risk of infection related complications in diabetics. Fermented papaya preparation (FPP) is a nutritional supplement reported to act as an antioxidant by scavenging reactive oxygen species (ROS) and removing 'bad ROS', while inducing "respiratory burst" production of necessary 'good ROS'. We sought to investigate the safety of oral administration of FPP (9g/d, 6 weeks) to T2D patients with respect to its effect on the hyperglycemia status of these patients. Peripheral blood was collected during a baseline visit, followed by subsequent collections during and after supplementation. Induced "respiratory burst" ROS production was measured at each visit in addition to fasting blood glucose, lipid profile, glycated hemoglobin (HbA1c), and lipid/protein peroxidation. Oral FPP supplementation induced "respiratory burst" in peripheral blood mononuclear cells while not influencing other blood parameters studied. When human monocytic THP-1 cells were supplemented with sugar-based FPP, cellular ATP and NADPH concentrations were increased while matched glucose alone did not produce similar effects, suggesting a glucose-independent component of FPP to be responsible for increasing cellular energetics. THP-1 cells supplemented with FPP also exhibited higher mitochondrial membrane potential (Δψm) and oxygen consumption as compared to cells treated with glucose alone. Taken together, our observations lead to the hypothesis that FPP corrects inducible "respiratory burst" function in type 2 diabetes patients.

ETIOLOGY OF CONGENITAL HEART DEFECTS: THE IMPORTANCE OF GENOMICS

Vidu Garg

Center for Cardiovascular and Pulmonary Research and The Heart Center, Nationwide Children's Hospital, Columbus, OH 43205, Department of Pediatrics and Department of Molecular Genetics, The Ohio State University

Columbus, OH 43205

Cardiovascular malformations are the most common type of birth defect and even with advances in medical and surgical management, still result in significant morbidity and mortality worldwide. Congenital heart defects, which occur as a result of abnormal heart development, are thought to have a multifactorial etiology involving both genetic and environmental contributors but the specific etiology in the majority of cases remains unknown. Development of four-chambered heart is a complex process and the elucidation of the molecular pathways critical for normal cardiac development has led to the identification of numerous genes necessary for this complex morphogenetic process. This work has aided the discovery of an increasing number of single genes being implicated as the cause of congenital heart defects in humans. Recently, genomic approaches, including whole genome and exome sequencing, are increasingly being utilized to analyze the human genome and have demonstrated de novo single nucleotide polymorphisms and chromosomal copy number abnormalities as having a role in the pathogenesis of congenital heart defects. In this session, we will describe these recent genetic discoveries in congenital heart disease along with current cardiovascular genomics research being conducted at the Research Institute at Nationwide Children's Hospital. In addition, we will discuss potential training and collaboration opportunities with the clinical and research cardiovascular programs at Nationwide Children's Hospital.

SIMPLIFYING THE COMPLEXITY OF NEONATAL FEEDING

Sudarshan Jadcherla

The Neonatal and Infant Feeding Disorders Program, Nationwide Childrens Hospital Research Institute & The Ohio State university College of medicine, Columbus, Ohio, USA

Background: Neonatal feeding difficulty is a major global problem, and consequences of dysfunctional feeding patterns spill into infancy and toddler age groups. Growth, development and independent feeding skills are all delayed among high risk infants. Such a group comprises of prematurely born, low birth weight, congenital anomalies, perinatal asphyxia, post-surgical infant, and sepsis categories. **Objectives:** The overarching question is how to balance between physiologic and pragmatic approaches with neonatal feeding, so as to create opportunities. We will discuss our research, experience and evidence related to pathophysiologic basis of feeding challenges, and present pragmatic solutions to advance feeding skills. **Hypothesis:** We hypothesized that the implementation of our pathobiology-based feeding quality improvement (QI) program among premature neonates would accelerate feeding milestones safely and lowers resource utilization. **Methods:** First, we will discuss cutting edge research methods to elucidate maturational changes in GI reflexes and translational approaches to diagnosis. Next, will describe how to develop a feeding program to simplify feeding strategies and compare quality improvement initiatives between baseline and intervention groups. **Results:** Comparing baseline vs. feeding program (N=92) groups respectively, the feeding program improved: the number of premature (< 32 wk gestation) infants receiving trophic feeds (34% vs. 80%, P < 0.002), trophic feeding duration (14.8 ± 10.3 vs. 7.6 ± 8.1, days, P < 0.0001), time to enteral feeds-120 (16.3 ± 15.4 vs. 11.4 ± 10.4, days, P<0.04), time from oral feeding onset to oral feeds-120 (13.2 ± 16.7 vs. 19.5 ± 15.3, days, P < 0.0001), time from oral feeds-120 to adlib feeds at discharge (22.4 ± 27.2 vs. 18.6 ± 21.3, days, P<0.01), weight velocity (24 ± 6 vs. 27 ± 11, g/ day, P < 0.03), and hospital stay (94.8 ± 51.2 vs. 75.9 ± 45.2, days, P=0.004). Mortality, readmissions within 30 days, and comorbidities were similar. **Conclusions:** This novel program focuses on accelerating the development of feeding milestones in a targeted and timely manner by applying the model of inter-disciplinary interactions and timely investigations in ensuring feeding success. This model program enhances educational and skill competencies of all the feeding providers (physicians, nurses, occupational therapists, lactation consultants, nutritionists, and parents). Process optimization and execution of standardized feeding strategy minimizes practice variability, accelerates the attainment of enteral and adlib oral feeding milestones safely, and decreases hospital stay without increasing adverse morbidities. *Value of such programs may improve nutrition, growth and developmental profiles of infants globally.*

CENTER FOR CLINICAL AND TRANSLATIONAL SCIENCE

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WHO:
*The Ohio State University
*The Ohio State University Wexner Medical Center
* Nationwide Children's Hospital

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HOW:
Funded by a multi-year Clinical and Translational Science Award (CTSA) from the National Institutes of Health

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VAGAL NEUROPATHY IN INFANTS OF DIABETIC MOTHERS: ROLE OF GESTATIONAL IMMATURITY AT BIRTH

Manish B. Malkar, Sudarshan Jadcherla

Center for Perinatal Research, Nationwide Children's Hospital, Columbus, OH, United States. The Ohio State University, Columbus, OH, United States

Background & Aims: Infants of diabetic mothers (IDMs) undergo feeding and airway problems and often require ICU hospitalization. The effect of gestational immaturity at birth on feeding and aero-digestive characteristics in IDMs is unclear. Our aims were to evaluate to characterize and differentiate 1. Aero-digestive outcomes at discharge in IDMs vs. controls. 2. Potential adaptive pharyngo-esophageal reflexes in preterm vs. term IDMs.

Methods: Using micro-manometry system, a concurrent respiratory inductance plethysmography and specially designed pharyngo-esophageal catheter assembly, pharyngo-esophageal motility characteristics were analyzed in 10 Controls and 20 dysphagic IDMs [10 were born at term (38 ± 0.3 weeks GA) and 10 were born preterm (30 ± 1.4 weeks GA)]. After allowing for adaptation following catheter placement, abrupt pharyngeal provocation was performed using graded sterile water infusions. Esophageal peristaltic and sphincteric reflexes were evaluated.

Results: The demographic and outcome characteristics (Table 1) and effects of gestational maturity at birth on them (Table 2) are summarized.

Table 1. Demographic and Outcome characteristics in IDMs vs Controls

Characteristics	IDMs (N=20)	Control(N=10)	p value
Gestational age at Birth in weeks	34.2 ± 1.2	32.7 ± 1.7	0.5
PMA at time of evaluation in weeks	41.6 ± 0.6	40.1 ± 0.9	0.15
Birth weight, grams	2978 ± 365	2257 ± 1238	0.19
Supplemental oxygen at Discharge, n(%)	6/20 (30)	1/10 (10)	0.37
Gastrostomy feeding at Discharge, n(%)	9/20 (45)	0/10 (60)	0.03

Table 2. Basal Pharyngo-Esophageal motility characteristics of IDMs vs Controls

Characteristics	IDMs (N=20)	Control (N=10)	P value
Resting UES Pressure, mmHg	16.9(14.9-18.9)	13.34(11.54-15.15)	0.004
UES Relaxation Time, sec	0.73(0.53-0.99)	0.30(0.19-0.43)	<0.0001
UES nadir duration, sec	1.62(0.77-2.98)	1.38(0.74-3.63)	<0.0001
LES Nadir Pressure, mmHg	0.61(-0.81-2.03)	-2.96(-5.26- -0.66)	<0.0001
pk esoph. body peristal.vel.cm/s.	79(1.52-2.05)	0.64(-0.65-1.93)	0.044
Respiratory change, n(%)	16(12.60%)	111(87.40%)	<0.0001

Values stated as Least square means (95% CI) or as stated otherwise.

Table 3. Pharyngo-esophageal characteristics in Preterm vs Term IDMs

Characteristics	Pre-term	Term	P value
Basal Resting UES pressure, mmHg	10.4 ± 0.9	23.2 ± 1.6	0.04
Basal Resting LES pressure, mmHg	12.7 ± 2.4	19.5 ± 2.8	0.07
PUCR duration, sec	2.9 ± 3.5	7.2 ± 1.9	0.04
LES relaxation response frequency, N (%)	44(83)	27(68)	0.08
Nadir LES pressure, mmHg	-7.1 ± 1.1	-1.2 ± 1.4	0.002
LES Duration Nadir, sec	36.9 ± 5.1	20 ± 5.9	0.01

*Values are presented as least square means ± SE

Conclusion: In Infants of Diabetic Mothers,

1.Fetal Exposure to Maternal Hyperglycemia is associated with Vagal Neuropathy

2.IDMs differ in basal pharyngo-esophageal motility characteristics than controls

3.Gestational immaturity at birth modulates aero-digestive maladaptation

4.These are associated with differences in aero-digestive outcomes at discharge.

OVERVIEW OF THE UNITED STATES REGULATORY PROCESS FOR PHARMA COMPANIES

Ralph Breitfelller

Kegler Brown Hill + Ritter, LPA, Columbus, OH

In this presentation, Mr. Breitfeller will examine the key issues of the United States drug approval process. He will discuss new drug approvals (brand name), abbreviated new drug approvals (generic) and compare and contrast the United States drug approval process with India's. He will discuss issues arising between Indian companies and the US Federal Drug Administration. Mr. Breitfeller will look at clinical trials with attention to Phase 1, Phase 2 and Phase 3 trials for use in the Federal Drug Administration's approval process, along with making the most of clinical trials, such as designing trials so that results may be used in multiple jurisdictions. The post approval process will also be discussed with attention to post approval clinical trials, marketing issues, US advertising restrictions and the Physician Payment Sunshine Act.

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GLOBALIZATION OF EDUCATION AND RELATED COLLABORATIONS

Vinita Mehra

Director at Kegler Brown Hill + Ritter, LPA, Columbus, OH

Globalization for colleges and universities is no longer a competitive advantage- it is becoming an expectation among forward-thinking administrations and an incoming workforce with an increased focus on the global marketability of their degrees. Ms. Mehra's presentation will look at various types of collaborations and partnerships between United States' medical centers, educational institutes and hospitals or clinics in India. She will also examine the key legal and business issues to consider regarding the globalization of education.

- Each track assembles in a different auditorium
- Track A – Central stage (Crystal Room)
- Track B & C – Side wings (Crystal Room)
- Track D – Gateway Room

Also note that exhibits will be available for viewing at the Grand Ballroom

Session are synchronized. Participants can move to sessions according to their own preference

SPEAKERS: JANUARY 17TH, 2015 (TRACKS 3 A-D)

AFFORDABLE INNOVATIONS TO IMPROVE NUTRIENT INTAKE IN DEVELOPING COUNTRIES

Klaus Kraemer, Eva Monterrosa and Kalpana Beesabathuni
Sight and Life, Basel, Switzerland

In many developing countries, dietary quality is often poor in terms of both nutrient content and bioavailability. A typical diet is predominantly based on starchy staple foods, such as cereals, roots, and tubers, with very little animal-source foods, fruits, or vegetables. Rice, maize, and wheat provide 60 percent of the world's food energy intake. These traditional food staples are bulky, generally provide insufficient energy or nutrient density, and have low bioavailability of some micronutrients. Thus, dietary quality is an important pre-requisite for adequate nutrition, which depends on the content and density of nutrients and the presence of anti-nutritional factors and contaminants. Pregnant and breastfeeding mothers, infants and young children are particularly vulnerable to poor nutritional quality because of their relatively higher micronutrient requirements. Behavior change to increase dietary diversity, supplementation, bio-fortification, and the fortification of staple foods are typical approaches to increasing micronutrient intakes. This presentation provides an overview of recent cost-effective innovations, such as the use of enzymes (phytase, amylase), home-fortification with micronutrient powders (MNP), and the use of extrusion technology in rice and pulse fortification aimed at improving the nutrient density of food consumed by vulnerable populations in developing countries.

ALL REGISTERED PARTICIPANTS WILL RECEIVE A COMPLIMENTARY DIGITAL COPY OF THE GROUP PHOTO TAKEN ON FRIDAY, JAN 16TH

EMERGING BENEFITS OF VITAMINS : OPPORTUNITIES FOR PUBLIC HEALTH

Manfred Eggersdorfer
University Medical Center, Groningen and Nutrition Science & Advocacy DSM Nutritional Products

One of mankind's most remarkable achievements is increased life expectancy. Unfortunately, for many people this gain in life years is not matched by gain in years of healthy life. We face a continuous increase of non-communicable diseases (NCDs) like osteoporosis, diabetes, cardiovascular diseases and cancer. Though, there is growing evidence that lifestyle factors, including nutrition, have substantial effects on health and well-being. A balanced nutrition providing all nutrients is a powerful way to contribute to health, wellness and performance. Inadequate nutrition is linked to serious, irreversible consequences for health and development. Intake surveys indicate that people do not get all the micronutrients comparing to recommendations. Data shows for instance that globally 88% of the healthy population does not have an optimal vitamin D status. Data on vitamin E intake indicates that major parts of populations do not consume vitamin E according recommendation. An inadequate status of the essential nutrients has consequences on long-term health. NCDs are the most relevant reason for impairments and deaths nowadays. WHO states that the risk for NCDs can be reduced by lifestyle, nutrition being an essential part. Approximately one third of cancers and up to 80% of heart diseases, strokes and diabetes type 2 deaths are preventable. The impact for individuals as well as the society, and health care systems is tremendous. The talk addresses approaches and models available to assess the impact and benefit of nutrition, by providing information about micronutrient intake and consequences for health and health care systems.

TOCOTRIENOL TREATMENT FOR STROKE

Andrew Slivka

Professor of Neurology, Division of Cerebrovascular Diseases & Neurocritical Care, The Ohio State University Medical Center, Columbus, OH

Acute stroke management has focused on two main strategies, reperfusion and neuro-protection. Currently, treatment with intravenous tissue plasminogen activator given within 4.5 hours of symptoms onset in eligible patients is standard care in most countries. Other thrombolytic agents are being investigated and the role of interventional treatments is evolving. Dozens of neuro-protective agents have been evaluated for acute stroke but none has been consistently found to be beneficial in improving outcomes. Multiple studies suggest that good collateral circulation is as important as reperfusion in determining outcomes after stroke but ways to improve collateral circulation have not been an active area of study. Tocotrienol has been shown to decrease infarct size in animal models of focal cerebral ischemia and in a canine model this was associated with improved collateral circulation. Thus tocotrienol may offer a novel, safe way to improve stroke outcomes in patients at risk for stroke whether they receive reperfusion treatment or not.

Secondary prevention of noncardio-embolic stroke includes treating modifiable stroke risk factors such as hypertension, hypercholesterolemia, with statins, and smoking cessation. Antiplatelet medications including aspirin, clopidogrel, combination aspirin-dipyridamole, and ticlopidine have also been shown to be beneficial in decreasing stroke in this population. Tocotrienol has several properties that may make it helpful for secondary stroke prevention. Tocotrienol has 3 hydroxy-3 methylglutaryl coenzyme A reductase inhibitor properties like statins. We have demonstrated an *in vitro* anti-platelet effect with tocotrienol similar to aspirin.

The potential of tocotrienol for both acute management of stroke as well as secondary prevention prompted initiation of a Phase II clinical trial that is ongoing. The design of the trial will be discussed.

Vitamin E: The Basics

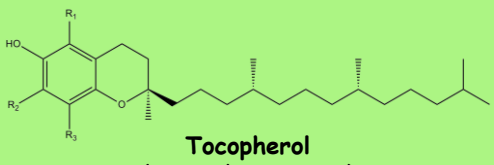
Vitamin E refers to a group lipid-soluble antioxidants that include both tocopherols and tocotrienols. Vitamin E can be found naturally in a variety of plant species.

Wheat Germ Oil

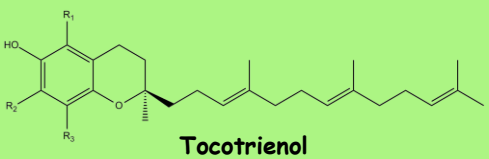
Asparagus

Red Palm

There are 4 members of the tocopherol family (α, β, γ, δ) and 4 members of the tocotrienol family (α, β, γ, δ) that are differentially distributed amongst plant species.



Tocopherol
(general structure)



Tocotrienol
(general structure)

(http://en.wikipedia.org/wiki/Vitamin_E)

The physical properties of each Vitamin E family member are unique and have unique biological functions extending beyond their antioxidant properties.

Find out more at this speaker session!

Regeneration: Not just a myth!

Regeneration is a theme of ancient Greek mythology.

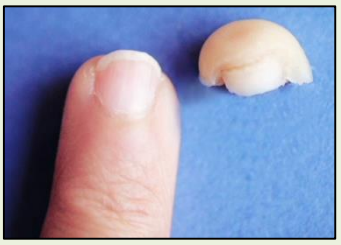
•The Hydra was a many-headed monster that regenerated two heads for each one cut off.

•The god Prometheus stole fire from Mount Olympus for the human species he created. As eternal punishment, Zeus had him chained to a rock where an eagle would peck out his liver during the day, only to have it regenerate each night.

•Experiments in the 20th century showed that the liver actually does have the prodigious regenerative capacity described in the legend of Prometheus.

•Plants such as the carrot can regenerate a whole plant from a single cell.

http://www.regen.iupui.edu/facts.asp



Amputated fingertips of humans can regenerate if the amputation surface is not sutured shut. For more info check out the article in the link!

http://www.cnn.com/2010/HEALTH/09/09/pinky.regeneration.surgery/

NEURAL REGENERATION AFTER STROKE

Savita Khanna, Cameron Rink, Richard Stewart, Zachary C. Briggs, Surya Gnyawali, Jessica Weist, Subhadip Ghatak, Hallie Harris, Sashwati Roy, Chandan K. Sen

Department of Surgery, Dorothy M Davis Heart and Lung Research Institute, The Ohio State University Wexner Medical Center, Columbus, OH 43210, USA

Every year, 15 million people worldwide are affected by stroke, of which 87% of the cases are ischemic stroke, caused by occlusion of a cerebral artery leading to brain infarction, causing death and disability in adulthood. It has been noted that many of these patients will improve in the weeks to months following stroke, implying an innate capability for brain to repair. Stroke induces signaling that leads the stem/progenitor cells in the adult brain to divide and recruit immature neurons to the areas of damage. This process is referred to as post-stroke neurogenesis. Under normal physiological circumstances, neurogenesis is known to occur in two specific locations in the adult brain i) the dentate gyrus (DG) of the hippocampus and ii) the sub-ventricular zone (SVZ). After stroke, these proliferating cells migrate from the DG and SVZ to the peri-infarct necrotic zone, replenishing the massive loss of cells. Vitamin E consists of tocopherols and tocotrienols, of which α-tocotrienol is the most potent neuro-protective form that is also effective in protecting against stroke. The primary objective of the current study was to examine whether α-tocotrienol supplementation can augment post-stroke neurogenesis. C57BL/6 mice (5 weeks, 50 mg/kg body weight) were orally gavaged with placebo or α-tocotrienol for 10 weeks. Transient (60min) focal cerebral ischemia was induced by the intraluminal suture method of middle cerebral artery occlusion (MCAO). To label proliferating cells, bromo-deoxyuridine was injected twice-daily beginning at 24h post-stroke. Immuno-histochemical and functional assays were performed to elucidate the effect of α-tocotrienol on cellular and sensorimotor changes after stroke at 2,7,14 and 28 days following reperfusion. The number of proliferating neural progenitor cells and the distance of neuroblast migration from the SVZ toward the ischemic cortex were significantly higher in α-tocotrienol supplemented mice at 14 & 28 days after stroke compared to a placebo supplemented mice. Immunohistochemical staining and co-localization analysis showed that α-tocotrienol supplemented mice generated higher numbers of new neurons in the peri-infarct zone at 14 & 28 days after stroke as compared to controls. Consequently, α-tocotrienol supplemented mice demonstrated improved functional recovery at 7 & 14 days. α-tocotrienol significantly decreased the number of TUNEL positive cells. Taken together, these results suggest that α-tocotrienol promotes post-stroke sensorimotor recovery likely via enhancing neurogenesis, neural cell migration in the peri-infarct region of the ischemic brain. *[Supported by NIH RO1 NS42617, NS085272 & 12SDG11780023].*

TOCOTRIENOL VITAMIN E PROMOTES ARTERIOGENESIS AND PROTECTS THE BRAIN FROM ISCHEMIC STROKE INJURY

Savita Khanna[1], Mallory Heigel[1], Seth Teplitsky[1], Surya Gnyawali[1], Chandan K Sen[1], Cameron Rink[1]

[1]Surgery, The Ohio State University Wexner Medical Center, Columbus, Ohio

Tocotrienols (TCT), lesser-known vitamin E family members, improve perfusion to brain tissue and attenuate stroke injury. However, mechanisms underlying TCT improvement of collateral perfusion during ischemic stroke remain unclear. Arteriogenesis is defined by the growth of functional collaterals in brain tissue where tissue inhibitor of metalloproteinase-1 (TIMP1) is believed to play a key role in extracellular matrix remodeling. We hypothesize that TCT increases collateral size and number, and induces TIMP1 expression in collaterals of stroke-affected brain.

C57/BL6 mice (male, 5 wks) were orally gavaged daily with 50mg/kg body weight of TCT or volume matched placebo (n=12) for 10 wks prior to middle cerebral artery occlusion (MCAO). During MCAO, cerebral perfusion was monitored using laser speckle flowmetry. While ischemia persisted, mice were perfused with FITC-conjugated lectin to identify patent collaterals in the MCA territory of the stroke-affected hemisphere. Collaterals size (diameter) and number were quantified as CD31+/FITC-lectin+ arterioles in stroke-affected S1 cortex and collected by laser capture microdissection. TIMP1 gene and protein expression in laser-captured collaterals was determined by RT-PCR and Western blot.

Compared to placebo, TCT treatment significantly increased perfusion and collateral number during MCAO. Furthermore, TCT supplementation significantly induced TIMP1 expression in laser-captured collaterals as compared to placebo controls. Taken together, outcomes suggest prophylactic TCT enables arteriogenic remodeling for functional collateral growth and protection against ischemic stroke. As TCT is a safe, natural nutrient, proposal outcomes may quickly translate toward clinical applications for high-risk stroke patients, such as those who suffer a transient ischemic attack (TIA).

THE OHIO STATE UNIVERSITY

Statistics:

Established: 1870
Colleges: 14
Undergraduate majors: 175
Master's degree programs: 133
Doctoral degree programs: 112
Professional Degree Programs: 7
Courses offered (est.): 12,000
Total enrollment: 63,058
Undergraduates: 49,466
First-year classes with fewer than 50 students: 71 percent
ACT composite score range, middle 50 percent: 26–30
Living alumni: 500,000
Degrees Awarded: 669,552 since 1878
Size of Columbus campus: >1,700 acres, 594 buildings
Regional Campuses: Lima, Ohio, USA; Mansfield, Ohio, USA; Marion, Ohio, USA; Newark, Ohio, USA; Agricultural Technical Institute, Wooster, Ohio, USA.
Students Enrolled at regional Campuses: 6,671
Total Research Expenditures: $934 million (2012-2013)

Rankings:

***18th** among national public universities, *U.S. News & World Report's* 2015 "America's Best Colleges"
***1st** among Ohio publics in academics
***10 graduate programs** ranked in the **top 10** by *U.S. News & World Report*
***12th** in the nation for sought after graduates, as ranked by the *Wall Street Journal*

(http://www.osu.edu/osutoday/stuinfo.php)

Aerial View of Campus

Thompson Library

Mirror Lake

The Oval

University Hall

(http://www.osu.edu/highpoints/)

(http://www.osu.edu/visitors/aboutohiostate.php)

TARGETING MET MEDIATED EPITHELIAL-MESENCHYMAL TRANSITION IN THE TREATMENT OF BREAST CANCER

Paul W. Sylvester

School of Pharmacy, University of Louisiana at Monroe, Monroe, LA 71209, USA

Mesenchymal epithelial transition factor receptor or Met is a receptor tyrosine kinase that plays a critical role in promoting cancer cell malignant progression. Met is activated by its ligand, hepatocyte growth factor (HGF). HGF-dependent Met activation plays an important role in stimulating epithelial-mesenchymal transition (EMT) in tumor cells resulting in increased tumor cell proliferation, survival, motility, angiogenesis, invasion and metastasis. The HGF/Met axis has therefore attracted great interest as a target in the development of novel cancer therapies. Several approached have been used to inhibit Met-induced EMT in an effort to suppress tumor cell malignant progression, including the development of agents that act as specific Met tyrosine kinase inhibitor, HGF antagonists that interfere with HGF binding to Met, and antibodies that prevent Met activation and/or dimerization. Tocotrienols, a subgroup within the vitamin E family of compounds, display potent anticancer activity that results, at least in part, from their inhibitory effects on of HGF-dependent Met activation and signaling. The present review will provided a brief summary of the increasing importance of the HGF/Met axis as an attractive target for cancer chemotherapy and the role of tocotrienols in suppressing Met activation, signaling and HGF-induced EMT in breast cancer cells. Evidence provided suggests that γ-tocotrienol therapy may provide significant benefit in the treatment of breast cancers characterized by Met dysregulation.

CONTROLLED AND TARGETED DELIVERIES OF TOCOTRIENOL AND STATIN PROMOTE HEALING OF OSTEOPOROTIC FRACTURE

Ahmad Nazrun Shuid , Nurul 'Izzah Ibrahim

Department of Pharmacology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Cheras, 56000 Kuala Lumpur, Malaysia

Oral tocotrienol has anti-osteoporosis and fracture healing properties. In a recent study, a combination of oral tocotrienol and oral statin resulted in better prevention of osteoporosis. In this study, tocotrienol and statin were combined with their carriers and delivered directly to the fracture site (controlled drug delivery system) of osteoporosis fracture model. Forty-eight Sprague-Dawley female rats were divided into 6 groups. The first group was sham-operated (SO), while the others were ovariectomized. After two months, the right tibiae of all rats were fractured at proximal upper third area and fixed with plates and screws. The SO and ovariectomized-control rats (OVxC) were given two single injections of carriers. The estrogen group (OVx + ERT) was given daily oral gavages of Premarin® (64.5 µg/kg). The Lovastatin treatment group (OVx + Lov) was given a single injection of 750 µg/kg lovastatin particles. The tocotrienol group (OVx + TT) was given a single injection of 60 mg/kg tocotrienol particles. The combination treatment group (OVx + Lov + TT) was given two single injections of 750 µg/kg lovastatin particles and 60 mg/kg tocotrienol particles. After 4 weeks of treatment, the fractured tibiae were dissected out for micro-CT and biomechanical assessments. Only combined treatment group (OVx + Lov + TT) showed significantly better callous structure but all treatment groups showed better callous strength than OVxC group. In conclusion, combined lovastatin and tocotrienol may promote better fracture healing of osteoporotic bone.

ANTI-CANCER EFFECTS OF DELTA TOCOTRIENOL IN NON-SMALL CELL LUNG CANCER CELLS

Lichchavi D. Rajasinghe, Rohini Pindoprulu, Xiangming Ji and Smiti V. Gupta

Department of Nutrition and Food Science, Wayne State University, Detroit, MI, USA

Lung cancer is the leading cause of death among all malignant diseases, with non-small cell lung carcinoma (NSCLC; 80% of all lung cancer cases) reported to have a five-year survival rate of only 16%. Previously, we reported that delta-tocotrienol (δT3) inhibited NF-κB signaling, cell proliferation, invasion and induced apoptosis in NSCLC cells (A549 and H1299). Further we demonstrated that this was at least in part attributable to downregulation of Notch-1, a molecular target of miR-34a, a microRNA upregulated by δT3. In this study we report the effect of δT3 on the matrix metallopeptidase 9 (MMP9) pathway, key to cancer metastasis. δT3 reduced cell migration, invasion and adhesion in a dose and time dependent manner via inhibition of MMP-9 activity. Down regulation of MMP9 was mediated both by the Notch1-NF-κB and the urokinase plasminogen activator (uPA) pathways. Further, δT3 induced expression of miR-451 while inhibiting that of miR-192, a tumor suppressor and promoter respectively, correlated with cell invasion and metastasis. In addition to the molecular markers, we investigated the metabolome of A549 and H1299 cells with and without intervention with δT3. The change in the metabolomics profile due to intervention with δT3 correlated with changes in cell proliferation, Notch 1 expression and MMP9 activity giving further mechanistic insight into the role of δT3 in NSCLC cells. Taken together, our findings warrant further investigation of δT3 as a potential therapeutic approach to arrest NSCLC cell invasion and metastasis.

CLINICAL EVIDENCE OF THE NEURO-PROTECTIVE EFFECTS OF PALM VITAMIN E TOCOTRIENOLS

Yogheswaran Gopalan[1], Ibrahim Lutfi Shuaib[2], Enrico Magosso[2], Jia Woei Wong[3], Kalyana Sundram[4], Kah Hay Yuen[5] *et al*

[1]Faculty of Pharmacy, Universiti Teknologi Mara, Malaysia; [2]Advanced Medical and Dental Institute, Universiti Sains Malaysia, Penang, Malaysia; [3]Hovid Research Sdn Bhd, Ipoh, Malaysia; [4]Malaysian Palm Oil Council, Selangor, Malaysia; [5]School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, Malaysia

Background and Purpose: Previous cell-based and animal studies convincingly showed that mixed-tocotrienols are neuro-protective but the ultimate proof is evidence from human trials. Hence, the present study was conducted to ascertain the neuro-protective activity of mixed-tocotrienols in humans with white matter lesions (WMLs). WMLs are ischaemic changes of the small blood vessels in the brain, leading to varying degrees of neurodegeneration and tissue damage. **Methods:** 121 volunteers above 35 years old with cardiovascular risk factors and magnetic resonance imaging (MRI) confirmed WMLs were randomized to receive 200 mg mixed-tocotrienols or placebo twice a day over 2 years. The WML volumes of both groups of volunteers were measured from MRI images taken at baseline, 1 year and 2 years using a validated software and compared. Fasting blood samples were collected for full blood chemistry investigation. **Results:** According to per protocol (88 volunteers) and intention-to-treat (121 volunteers) analyses, the mean WML volume of the placebo group increased after 2 years, whereas that of the tocotrienol-supplemented group remained essentially unchanged. The mean WML volume change between the two groups was not significantly different ($p = 0.150$) at the end of 1 year but was significant at the end of 2 years for both per protocol and intention-to-treat analyses ($p = 0.019$ and $p = 0.018$). No significant difference was observed in the blood chemistry parameters between the two groups. **Conclusions:** Using WMLs as the study model, mixed-tocotrienols were found to be neuro-protective in attenuating the progression of the lesions. ***Clinical Trial Registration:*** *URL: http://clinicaltrials.gov. Unique Identifier: NCT00753532*

DEVELOPMENT OF GAMMA-TOCOTRIENOL AS A COUNTERMEASURE FOR ACUTE RADIATION SYNDROME

Vijay K. Singh[1,2]

[1]Department of Radiation Biology, F. Edward Hébert School of Medicine, [2]Armed Forces Radiobiology Research Institute, USUHS, Bethesda, MD, USA

Despite significant scientific advances over the past sixty years toward the development of a safe, non-toxic and effective radiation countermeasure for the acute radiation syndrome (ARS), no drug has been approved by the United States Food and Drug Administration. Gamma-tocotrienol (GT3) is one of the eight isomers (tocols) of vitamin E and appears to be one of the more promising radio-protective tocols tested to date. GT3 has been shown to increase survival in rodents, through ameliorating the radiation-induced injuries of the hematopoietic and GI systems. When administered 24 h before irradiation, GT3 significantly protected irradiated CD2F1 mice and induced high levels of granulocyte colony-stimulating factor (G-CSF). Injection of a G-CSF neutralizing antibody to the GT3-treated mice resulted in complete neutralization of G-CSF and abrogation of its radioprotective efficacy. Administration of a G-CSF antibody did not affect levels of other cytokines induced by tocols. The radioprotective efficacy of GT3 was tested against three different radiation doses without supportive care in an NHP model. Results demonstrate that the GT3 treatments significantly decreased the duration and severity of neutropenia and thrombocytopenia in irradiated NHPs. It is important to note that GT3, when administered in one dose, was comparable to multiple G-CSF administrations in combination with supportive care, in terms of improving radiation-induced neutropenia and thrombocytopenia. Our studies indicate that GT3 is a promising radiation countermeasure and may be developed as a radioprotector for humans against the potentially lethal effects of radiation exposure (ARS). (The views expressed do not necessarily represent the Armed Forces Radiobiology Research Institute, the Uniformed Services University of the Health Sciences, or the Department of Defense.)

INDIA: UNITY IN DIVERSITY

India, officially the **Republic of India** (*Bhārat Gaṇarājya*), is a country in South Asia.

- Seventh-largest country by area
- second-most populous country with over 1.2 billion people
- The most populous democracy in the world.
- Bounded by the Indian Ocean on the south, the Arabian Sea on the south-west, and the Bay of Bengal on the south-east, it shares land borders with Pakistan to the west; China, Nepal, and Bhutan to the north-east; and Burma and Bangladesh to the east.

The Constitution of India designates a bilingual approach for official language of the Government of India employing usage of Hindi as well as English.

There are more than 20 officially recognized languages in India, including English, Hindi, Bengali, Telugu, Tamil, Kannada, Malayalam, Gujar ati, Punjabi, Nepali Marathi etc

http://en.wikipedia.org/wiki/India

National anthem: Jana Gana Mana

Indian Flag

Ashoka chakra: Indian emblem

सत्यमेव जयते

Truth Alone Triumphs

VITAMIN E SUPPLEMENTATION IN HEMODIALYSIS PATIENTS – THE POTENTIAL FOR TOCOTRIENOLS

Pramod Khosla

Dept of Nutrition and Food Science, Wayne State University, Detroit, MI, USA

Patients undergoing hemodialysis (HD) are at increased risk for cardiovascular disease, associated with increased oxidative stress, elevated inflammatory biomarkers and dyslipidemia. Accordingly, numerous studies have evaluated outcomes following supplementation with antioxidants. Amongst the Vitamin E family, the antioxidant properties of the tocopherols as well as their ability to inhibit inflammation have provided the rationale for supplementation studies in HD patients. Although, the SPACE (Secondary Prevention with Antioxidants of Cardiovascular Disease in End-Stage Renal Disease) study showed significant reductions in myocardial infarction and other cardiovascular events in HD patients treated with a-tocopherol, it did not report any oxidative stress measures. Till now, in some twenty trials, measures of inflammatory biomarkers, as well as blood lipids have also yielded mixed results. A recent study in which HD patients received a-tocopherol and lipoic acid, found no effects on oxidative stress or inflammation biomarkers. We recently reported results from a pilot study in which HD patients were supplemented with a palm oil-derived vitamin E tocotrienol rich fraction (TRF) for 16 weeks. While, TRF supplementation did not impact any nutritional, inflammatory or oxidative status biomarkers, it improved lipid profiles, with reductions in plasma triacylglycerols and increased plasma high-density lipoprotein cholesterol. A multi-centered study to test the long-term efficacy of TRF in HD patients is just underway.

INDIAN UNION HEALTH MINISTER

Jagat Prakash Nadda is an Indian politician and current Union Health Minister. He is a member of Rajya Sabha (Council of states) from Himachal Pradesh and was national general secretary of Bharatiya Janata Party. He has experience in handling the Environment and Forest Ministry in Himachal Pradesh and was also a part of many delegation to Canada, Costa Rica, Greece, UK and Turkey for exchange of knowledge and process sharing.

en.wikipedia.org/wiki/**Jagat_Prakash Nadda**

zeenews.india.com › Health › Health News

TOCOTRIENOLS AS NOVEL RADIATION COUNTER-MEASURES

Sanchita P. Ghosh[1], Mang Xiao[1], Venkataraman Srinivasan[1], and Martin Hauer-Jensen[2]

[1]Armed Forces Radiobiology Research Institute, USUHS, Bethesda, MD; [2]Division of Radiation Health, Department of Pharmaceutical Sciences, University of Arkansas for Medical Sciences, Little Rock, Arkansas

Currently there is no drug for countering acute injuries resulting from external penetrating ionizing radiation exposures approved by the Food and Drug Administration (FDA) to protect first responders deployed in a radiation field for military operations, which is a likely event. This is a serious capability shortfall. In this regard, we have been studying the radio-protective efficacy of various tocol isomers for the last several years. Recently, we demonstrated that a single subcutaneous injection of gamma- or delta-tocotrienol (GT3 or DT3) to mice 24 h prior to whole body gamma-radiation confers a striking survival benefit. We have shown that GT3 and DT3: 1) protect animals exposed to lethal radiation and 2) protect against radiation-induced hematopoietic and gastrointestinal injury. GT3 also protected animals from vascular damage. Survival was partly dependent on inhibition of the enzyme hydroxyl-methyl-glutaryl coenzyme A reductase and involves biosynthesis of tetrahydrobiopterin. Both tocotrienols induced a high level of granulocyte colony stimulating factor (G-CSF). DT3 was found to protect animals through the ERK/mTOR pathway. Our results demonstrated that GT3 and DT3 are promising radiation countermeasures with strong efficacy in mice administered 24 h prior to radiation exposure. In the near future we are planning to develop one of the tocols as a radiation countermeasure in non-human primates for FDA approval. *(The opinions contained herein are the private views of the authors, and are not necessarily those of the Armed Forces Radiobiology Research Institute, the Uniformed Services of the University of the Health Sciences, or the Department of Defense.)*

TOCOTRIENOL EFFECTS ON CATARACTOGENESIS

Nafeeza Mohd Ismail[1], Nurul Alimah Abdul Nasir[1], Renu Agarwal[1], Sushil Vasudevan[1], Minaketan Tripathy[2], Renad Alyautdin[1]

[1]Faculty of Medicine, [2]Faculty of Pharmacy, Brain and Neuroscience Communities of Research, Universiti Teknologi MARA (UiTM), Shah Alam, Selangor, Malaysia

Cataract, a leading cause of blindness, is one of the common complications of diabetes. Currently, intervention is surgical as there are no medical therapies yet available for prevention or treatment of cataract. The driving force of cataractogenesis is oxidative stress. Various antioxidants including vitamin E analogs have been investigated for anti-cataract properties. The anti-cataract properties of tocotrienols have however not been investigated. We studied the effects of topically applied micro-emulsion formulation of tocotrienol (TTE) using six concentrations ranging from 0.01% to 0.2%. Eight groups of *Sprague-Dawley* rats (n = 9) received distilled water, vehicle, or one of the six TTE concentrations as pretreatment topically twice daily for 3 weeks while on a normal diet. After pretreatment, animals in groups 2-8 received a 25% galactose diet whereas group 1 continued on the normal diet for 4 weeks and were given topical treatment continued as for pretreatment. Weekly slit-lamp examination was conducted to assess cataract progression. after which the animals were euthanized, and the lens oxidative stress levels estimated. Groups treated with 0.03% and 0.02% TTE showed slower progression of cataract ($p<0.05$) with lenticular malondialdehyde and antioxidant enzymes levels comparable to ($p<0.05$). Group treated with 0.2% TTE, however showed faster progression of cataract compared to vehicle-treated group. Topically applied TTE within the concentration range of less than 0.05% and more than 0.01% tends to delay onset and progression of galactose-induced cataract by reducing lenticular oxidative stress whereas a concentration of 0.2% accelerates cataractogenesis.

OSU-INDIA CONFERENCE PARTICIPANTS FACTS

>400 TOTAL REGISTERED PARTICIPANTS	>100 SPEAKERS AT THE CONFERENCE	>100 POSTER PRESENTERS	>35 ACADEMIC INSTITUTIONS REPRESENTED
30 INDUSTRIES REPRESENTED	9 COUNTRIES REPRESENTED	2 US CONSULATE REPS	1 NOBEL PRIZE WINNER

THE HEPATOCYTE GROWTH FACTOR RECEPTOR AS A POTENTIAL THERAPEUTIC TARGET IN DE-DIFFERENTIATED LIPOSARCOMA

Kate Lynn Bill[1], Jeanine Garnett[2], Xiaoyan Ma[2], Roman Belousov[2], Caitlin May[2], Davis Ingram[2], Svetlana Bolshakov2, Alexander Lazar[2], Dina Lev[3], Raphael Pollock[1]

[1]The Ohio State University Comprehensive Cancer Center, [2]University of Texas MD Anderson Cancer Center, [3]Sheba Medical Center, Tel Aviv University, Israel

De-differentiated liposarcoma (DDLPS) is resistant to conventional chemo- and radiotherapies, with frequently morbid surgical resections remaining as the chief therapeutic strategy. Consequently, there is a pressing need for novel anti-DDLPS targeted approaches. Hepatocyte growth factor receptor (Met) expression is elevated in DDLPS; however, the functional role of Met signaling in this disease is not known. We found that the *in vitro* stimulation of DDLPS cells using hepatocyte growth factor (HGF) elevated the degree of PI3K/AKT and MAPK pathway signaling, and that pro-tumorigenic phenotypes such as cell proliferation, migration, and invasion were significantly enhanced. Conversely, Met knock down using sh-RNA-mediated decreased *in vitro* HGF-induced Met signaling as well as migratory and invasive DDLPS activity *in vitro* and also *in vivo* DDLPS cell tumorigenicity. In a comparable manner, when Met tyrosine kinase activity was inhibited using EMD1214063, a Met-specific inhibitor, Met-dependent signaling as well as the oncogenicity of DDLPS cells was reduced *in vitro*, and the survival of nude mice bearing subcutaneous DDLPS xenografts increased significantly. Taken together, these findings support further investigations of HGF-induced Met signaling in DDLPS in that inhibition of this axis may constitute a potential therapeutically useful strategy on behalf of DDLPS patients.

How to Be a Bollywood Extra

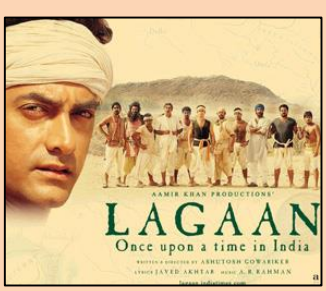
If you'd rather be in a Bollywood movie than simply see the set of one, that's possible too. Foreigners are always in demand to be extras in Bollywood movies. The easiest way to make it happen is to hang around Colaba Causeway in Mumbai, particularly in the area around Leopold's Cafe, and you're sure to be approached to be an extra. Expect long hours, lots of waiting, and pay of around 500 rupees ($12) per day.

http://goindia.about.com/od/bollywood/p/bollywoodfilm.htm

The name "Bollywood" is a portmanteau derived from **B**ombay (the former name for Mumbai) and H**ollywood**, the center of theAmerican film industry. However, unlike Hollywood, Bollywood does not exist as a physical place. It has its own entry in the *Oxford English Dictionary*.

The term is often incorrectly used to refer to the whole of Indian cinema; however, it is only a part of the large Indian film industry, which includes other production centres producing films in multiple languages. Bollywood is one of the largest film producers in India and one of the largest centres of film production in the world. It is more formally referred to as **Hindi cinema**.

*en.wikipedia.org/wiki/**Bollywood***



In 2011, Lagaan was listed in *Time* magazine's list of "The All-Time 25 Best Sports Movies"

HARNESSING THE POTENTIAL OF RADIATION THERAPY BY INCORPORATING NEXT GENERATION SEQUENCING FOR A BETTER TREATMENT OUTCOME

Kamalakannan Palanichamy and Arnab Chakravarti

Department of Radiation Oncology, James Comprehensive Cancer Center and The Ohio State University College of Medicine, Columbus, OH 43210, USA

Currently cancers are treated according to their type and stage. This study is a proof of the principle for incorporating gene status to make wise therapeutic choice. The prolific advances in sequencing technology have decreased the sequencing cost exponentially. This will lead us to incorporate sequencing results to make therapeutic decisions clinically for a curative therapy. Glioblastoma (GBM) is the most aggressive form of brain tumor with poor prognosis. Inspite of various combination treatments and molecularly targeted approaches, the increase in median survival of GBM patients remains dismal. The integrated analyses of multi-dimensional sequencing data of GBM have proved informative to advance the cure. The Cancer Genome Atlas (TCGA) reports the deregulation of RB, p53 and RTK/RAS/PI3K pathways as obligatory events in most, and perhaps all GBMs. While we were trying to understand why several molecularly targeted clinical trials inhibiting the key players that reside within the deregulated pathways did not lead to a better survival outcome, we uncovered the co-dependence of p53 mutational status and Akt kinase inhibition, which was modulated by non-homologous end joining (NHEJ) DNA repair pathway after radiation treatment (RT), leading to synthetic lethality. We specifically inhibited the activation of Akt using a phospho-inositol analog (PIA) and combined with RT in a panel of commercially available and primary GBM cells. The combination treatment exhibited radiosensitization in a sub-set of cells. Transcriptomic and proteomic profiling were undertaken in these GBM cells to determine the factors responsible for radiosensitization. Our results show that PIA specifically inhibits Akt kinase and abolishes pro-survival signaling. PIA induces apoptosis in GBM cells and enhances radiosensitization of GBMs with mutant/null p53. Furthermore, the radiosensitization effect depends on the activation of NHEJ repair pathway as evidenced by the DNA-PK expression level. For the first time, we are reporting that p53 gene status determines radiosensitization as a result of concomitant Akt kinase inhibition. This study supports the fact that, in targeted therapies, treatment failure is primarily due to the compensatory effects of complicated gene- and protein- network, allowing cancer cells to evade death. The findings from this study form a foundation for personalizing GBM therapies based on gene and molecular signature of tumors.

NIH Activities in India

NIH research grants and contracts: Over **80 million dollars** in grant money have been awarded to researchers from various Indian institutions including **AIIMS**

NIH International Center for Excellence in Research (ICER): HHS/NIH established an ICER site at the Tuberculosis Research Center, a component of the Indian Council of Medical Research, Department of Health Research, Indian Ministry of Health and Family Welfare located in Chennai, building on a lengthy history of collaboration with this institution. The aim of the NIAID ICER program is to develop sustained research programs in areas of high infectious-disease burden.

Over the past few decades, NIH has developed a robust relationship with India's medical research community in the biomedical and behavioral health sciences.

NIH collaborations areas of focus:
HIV/AIDS
Maternal and child health
Infectious diseases
Eye disease
Hearing disorders
Mental health
Vaccine development
Blood pressure initiatives

For more info go here:
http://www.fic.nih.gov/WORLDREGIONS/Pages/SouthAsia-India.aspx#activities

NIH Fogarty International Center
Advancing Science for Global Health

REDUCTION IN WOUND COMPLICATIONS WITH LOW VERSUS HIGH DOES PRE-OPERATIVE RADIOTHERAPY FOR SACRO-COCCYGEAL CHORDOMAS

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PURPOSE: An integrated strategy using 19.8 to 50.4 Gy preoperative radiation (pre-op RT), followed by complete resection, and postoperative (post-op) RT to a high cumulative dose of ≥70 Gy has significantly improved local control (LC) in spine chordomas. However, wound complications (WC) are a significant challenge, particularly in patients with sacro-coccygeal chordomas (SCC). The difference in WC rates between a low versus high dose pre-op RT has not been established. **METHODS:** We reviewed 49 consecutive patients treated with pre-op RT for SCC. Patients received either "low dose" (N=20) with median 19.8 Gy (range: 18 – 25.2) or "high dose" (N=29) with median 50.4 Gy (range: 45-50.4) pre-op RT using photons and/or protons. WC was defined as the occurrence of either wound dehiscence and/or wound infections within a 3 month post-operative period. **RESULTS:** Median age was 57 years, median tumor size was 7 cm and 61% were males. The low vs. high dose group experienced wound dehiscence rate of 40% vs. 55% (p=0.4), wound infection rate of 30% vs. 41% (p=0.5), both 15% vs. 38% (p=0.1) and subsequent re-operation rate of 25% vs. 38% (p=0.3), respectively. On multivariable analysis, female gender (47% vs 17%; p=0.02) and gluteal and/or post-sacral involvement (41% vs. 18%; p=0.05) were associated with a higher rate of WC. A trend for higher WC was noted with higher pre-op dose (38% vs 15%; p=0.11, CI - 0.89 to 14). No significant association was found with tumor stage, size, prior surgery or use of a flap. **CONCLUSION**: A lower pre-op dose of ~20 Gy was associated with a trend towards decrease in wound complications when compared to a higher pre-op dose of ~50 Gy with comparable LC. Females and patients with post-sacral and gluteal muscle involvement (larger soft tissue surgical defects) were significantly more likely to have WC's. In selective patients, consideration should be given to lower rather than higher preoperative radiation dose.

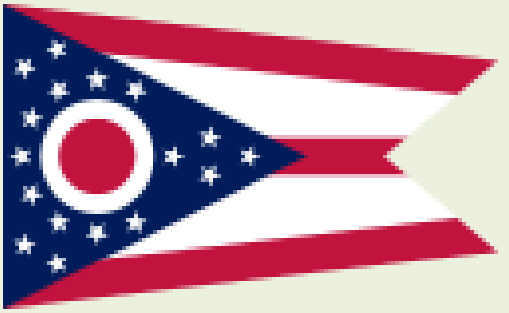
A NEW TREATMENT PARADIGM IN ONCOLOGY: SYNERGISTIC EFFECTS OF COMBINING RADIATION THERAPY AND IMMUNOTHERAPY

Raju Raval

Department of Radiation Oncology, The Ohio State University Wexner Medical Center, James Cancer Hospital and Solove Research Institute, Columbus, OH, USA

Recent advances in understanding the basic mechanisms of the immune system, and how it relates to cancer therapy have been rapidly developing. This knowledge has accelerated the translation of these advancements into medical breakthroughs for many cancer patients. Oncologists and cancer researchers are focused on understanding these mechanisms, and in finding novel approaches to cancer immunotherapy. Combining immunotherapy with other therapies such as radiation therapy, immune-modulators, cytotoxic chemotherapy, or molecularly targeted therapies may hold the key to the true potential of these treatments in the future management of cancer patients. Specifically, clinical success in modulating immune checkpoints for cancer therapy has led to intense clinical interest in this field. Tumor infiltrating lymphocytes can express a variety of immune checkpoint molecules, and recent FDA approval of ipilimumab (anti-CTLA-4) and pembrolizumab (anti-PD-1) for patients with metastatic melanoma was based on trials showing significant clinical activity for these agents. In addition, combining CTLA-4 blockade with PD-1 blockade in metastatic or advanced melanoma patients showed a large proportion of patients with dramatic and rapid responses in their disease burden with a proportion of patients maintaining a durable response. In particular, combining radiation therapy with immunotherapy may lead to synergistic therapeutic responses, as has been seen in recent case reports of potential abscopal effects in patients with metastatic melanoma. Continued delineation of the most effective combinatorial approaches for therapy is important, as optimal combinations will likely be different for various tumor types.

State flag



Did you know these things about the State of OHIO???

OHIO is a state in the Midwestern United States.

- 34th largest (by area)
- 7th most populous
- 10th most densely populated of the 50 United States.
- Capital and largest city is Columbus.

The name "Ohio" originated from Iroquois word *ohi-yo'*, meaning "great river" or "large creek".
Although there are conflicting narratives regarding the origin of the nickname, Ohio is historically known as the "Buckeye State" (relating to the Ohio buckeye tree) and Ohioans are also known as "Buckeyes".
Other nicknames: The Mother of Presidents; Birthplace of Aviation; The Heart of It All

http://en.wikipedia.org/wiki/Ohio#State_symbols

ADVANCES IN TREATMENT AND INFORMATION TECHNOLOGY IN RADIATION ONCOLOGY

Nilendu Gupta

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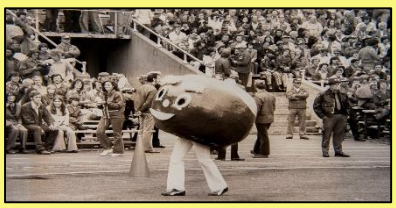
Modern Radiation Oncology involves complex treatment technologies, and needs a robust information technology infrastructure to enable treatment planning the treatment delivery. Especially in the past five years, there has been a quantum increase in enabling technologies integrated into radiotherapy treatment planning and delivery systems. These enabling technologies include real time imaging, motion management and tracking through infrared, optical guidance, radiofrequency beacon tracking, among others. A review of key treatment technologies and enabling targeting technologies that represent the state of the art will be presented. Such advancements, along with advances in radiotherapy treatment delivery devices results in the ability to accomplish superior targeting capabilities, smaller margins for uncertainties, and maximizing the dose to the target, while keeping normal tissue doses well below safety limits.

In the ninety's, the introduction of Record and Verification systems required radiation oncology departments to develop a basic IT infrastructure. Since then, Radiation Oncology departments have become one of the most IT advanced areas within the hospital, with a radiation oncology electronic medical record, integrated with a distributed treatment planning system, and Picture Archival and Communication Systems that form the backbone for data enabled treatment planning and longitudinal follow-up. IT systems and software allow multi-modality imaging, biomarker, and other patient specific data to be used to enable planning of personalized therapies. A review of key IT enablers for Radiation Oncology will be presented.

Paper mache 1965

Fiberglass 1965

Fiberglass 1975



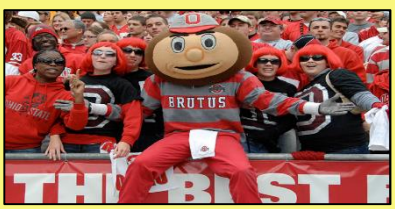
Fiberglass 1976

Ohio State students Ray Bourhis and Sally Huber decided Ohio State needed a **MASCOT** in 1965 and convinced the athletic council to study the matter. At the time, mascots were generally animals brought into the stadium or arena. A buck deer was contemplated but rejected as impossible. Instead, the buckeye was selected, as the buckeye is the official state tree of Ohio. A simple papier-mâché chocolate was constructed by students, worn over the head and torso, with legs sticking out. It made its appearance at the Minnesota vs. Ohio State homecoming football game on October 30, 1965.

Fiberglass 1980

Cloth 1981

Cloth 2000s



Costume 2007
Inducted into Mascot Hall of Fame

TODAY!

BRUTUS BUCKEYE
THROUGH THE AGES

http://www.osu.edu/features/2014/brutus-through-the-years.html#11

REVAMPING OF PRACTICAL REGENERATIVE MEDICINE

Pradeep .V. Mahajan

StemRx Bioscience Solutions Pvt. Ltd., Navi Mumbai, India

Regenerative medicine is a branch of translational research which uses stem cells in tissue engineering and molecular biology which deals with the "process of replacing, engineering or regenerating human cells, tissues or organs at the defective sites to restore or establish normal function". Stem cells are the repairing kits which you carry in your own body. The cellular therapy is known for years in the form of prolotherapy. There are many sources of stem cells like cord blood, cord tissue, bone marrow, adipose tissue which can be used for the therapeutic applications. In autologous cellular treatment patients own body cells are transplanted back after processing them *in vitro*. Regenerative medicine also includes use of biodegradable scaffolds with stem cells and their safe implantation at the defective sites. The applications of Regenerative Medicine are worldwide and it is now important to merge the distinguishing fields of science where the efficacy of the regenerative medicine can be enhanced. The distinguishing fields comprise of game changing technologies like robotic medicine, tele medicine, digital medicine, genomic & molecular medicine and nanomedicine. Robotic medicine is the treatment modality where with the help of robotic arms and machines complicated surgeries can be done with ease. The wireless innovations in healthcare have revolutionized the concept of remote consultations. With the help of Google mirrors, holographic consultations can be done indoors sitting at home. Nanotechnology allows scientists to create, explore, and manipulate materials measured in nanometers which can be used in advanced surgeries. Regenerative medicine can be coupled with all these advancements and this can revamp the entire healthcare sector. With these progresses, the paradigm of healthcare has shifted towards cellular medicine from the old conventional medicine. In the recent past, transplant surgeons have done number of successful transplants with the help of stem cells. Hip replacement has taken over by hip regeneration. Instead of spending millions of dollars on insulin injections, now it is possible to regenerate insulin factories *in vivo* to eliminate diabetes completely. Similarly in several orthopedic conditions, neurodegenerative and neuro developmental conditions stem cells treatments have proven their usefulness. Science is so evolved that concept of developing the body organ which looked like a dream once upon a time is no more fiction now but has turned into the reality with the help of 3D printing technology and scanner technology. Now it is possible to develop the organs like liver, kidney etc. This clearly indicates that regenerative medicine is the future of the medicine and conceptually the day is not far when one can access the organ shops easily in the healthcare market. However this field is under siege politically and financially so it warrants urgent attention to promote this field which is truly revamping the entire healthcare sector.

INNOVATIONS IN CELLULAR MEDICINE

Neetin S. Desai

StemRx Bioscience Solutions Pvt. Ltd., Navi Mumbai, India

One of the most significant developments in cell and developmental biology in recent years has been the incredible interest in the potential of stem cells in regenerative medicine which is reflected from the fact that Nobel prize in medicine in 2012 was awarded to Shinya Yamanaka and John B. Gurdon and. In spite of the ongoing political, ethical and scientific challenges, interest in the potential clinical utility of stem continues to increase and people are getting introduced to these innovations every now and then. Earlier the field of Regenerative Medicine was subjected to only banking of cord blood cells but recently this field introduced many other innovations including 'Adipose Tissue Banking' ,'Menstrual Stem Cells Banking', 'Skin Banking', 'Dental Stem Cells Banking' etc. Initially researchers were limited to applications of stem cells in hematopoietic disorders. But in the recent years the shackles have been broken and the scope broadened for the new areas for applications of stem cells in autoimmune disorders including diabetes type 1, alopecia, rheumatoid arthritis, neuro degenerative and neuro-developmental conditions and many other orthopedic and sport injuries. The world looks forward to make human life as centenarian life where the average quality life expectancy can be more than 100 years. Stem cells can be isolated from various sources like bone marrow, adipose tissue, cord blood, cord tissue, dental pulp, skin etc. As the sources vary in nature, the treatment protocols also vary with respect to their applications. In transplantation or implantation procedures, first desired sources are recognized from the human body, from which the stem cells are harvested, cultured and cryopreserved if required. These processed cells are multiplied to the desired cell count and transplanted back in the body of the same patient with the required growth factors. This is known as autologous cellular therapy. Scientists have noticed that the human body is a pool of miraculous cells which can be therapeutically used for treating a number of dreadful diseases. Recent inventions may include EPC's (endothelial progenitor stem cells), VSEL's (Very small embryo-like cells), DC (Dendritic cells in cancer therapy) and many more. The novel range of these cells and their sources from the human body has given a wide scope to all the scientists and researchers to develop new treatment modalities based on the applications of these cells. This has turned out to be the base of the innovations of new protocols. Some examples include the use of EPC's along with MSC's in lung disorders, use of cord blood stem cells in autoimmune disorders (T-cells educator therapy), use of dendritic cells in cancer etc. These innovations want an urgent attention of medical fraternity who can make proper use of these innovative cells for the transplantations. In the future it is a certainty that cellular therapy will be the best treatment modality for number of dreadful diseases which has no cure till date.

OSU President Drake: "H3C is the Largest Ohio State Event Outside the U.S."

(From L to R) :

Dr. William Brustein (Vice Provost for Global strategies and International affairs),
Dr. Michael Drake (OSU President),
Dr. Chandan K. Sen (H3C organizer and chair)

@Indian Community Gala Dinner on Sept. 20, 2014

NEW FRONTIERS IN BIOSCIENCES – OPPORTUNITIES AND CHALLENGES

Dr. B.R. Das[1], Dr. V.P. Kolla[2], Dr. M.P. Rao[3], Dr. T. Dayakar Rao[4] Dr. P.V. Ramanna[5]

[1]Academic Advisory, [2]Bioscience Program, [3]Legal Affairs, [4]Vice Chancellor, [5]Chancellor, Institute for Technology and Management University, Raipur, India

The general field of biosciences and clinical diagnostics based on molecular level markers, and genetic markers is growing and changing rapidly. The technology and machinery for computerized analysis and rapid testing of biological material for accurate identification of various disease markers has evolved so fast that labs are now equipped for over a 1000 different tests and can do 100,000 tests or more in a day. The slogan is “one lab for India” and pretty soon will be “one Lab for the world”. Currently, there is more knowledge and technology in the fields of Genetic Engineering, manipulation of genetic material to find new ways to arrest disease, Industrial Bio-Tech, Research & Development, Diagnostics etc, than is available in Academia, with the exception of a few world-ranked Research Universities. The demand for industry-oriented professional training in the field of bioscience is growing day by day. Institute of Technology and Management (ITM) is working closely with high-tech research driven organizations like Thyrocare, SRL Diagnostics, StemRx, IPCA Labs, AVTOS and Reliance Life Sciences so that we understand the industry need for trained professionals at Technician, Bachelors and Masters Level. ITM is in the process of developing mutually beneficial relationships with other pharma and biotech companies from Bangalore, Vadodara, Hyderabad and Mumbai, to develop *in-situ* programs for current employees to upgrade their qualifications, and technical knowledge. Similar programs will be offered to incoming students as companies adopt these programs, with internships for students, which will form a trained pool for hiring and expansion.

ADVANCES AND INNOVATIONS IN MAGNETIC RESONANCE IMAGING

Arunark Kolipaka

Department of Radiology, The Ohio State University Wexner Medical Center, Columbus, Ohio

Magnetic Resonance Imaging (MRI) has been one of the important diagnostic tools to determine the soft tissue characteristics such as morphology and function without any radiation exposure. Over the years, the evolution of new techniques in MRI has provided superior diagnostic information when compared to other imaging technologies. New emerging techniques include magnetic resonance elastography- a non-invasive tool to estimate stiffness of soft tissues; MRI tissue parameter estimation (T1, T2, T2* mapping)- to diagnose acute vs chronic myocardial infarction; 4D-flow technique to provide comprehensive flow characteristics in vessels; diffusion tensor imaging to determine the anisotropic fiber architecture in the tissues. These innovations have tremendously enhanced the capabilities of MRI to precisely and robustly diagnose different diseases. Additionally, because of patient’s inability to lay flat for more than 35 min for a comprehensive study and inability to hold the breath for long time, advanced imaging techniques such as compressed sensing has been introduced to MRI which reduces the scan time by 8-10 folds. Therefore, these advancements and innovations have put MRI as a front runner for identifying many disease conditions. The purpose of this abstract is to provide brief insight of all these technologies and demonstrate the clinical applications.

nature INDIA

Nature India is an online publication by Nature Publishing Group (NPG) that highlights research being produced in India in science and medicine. The international website was launched in February 2008.

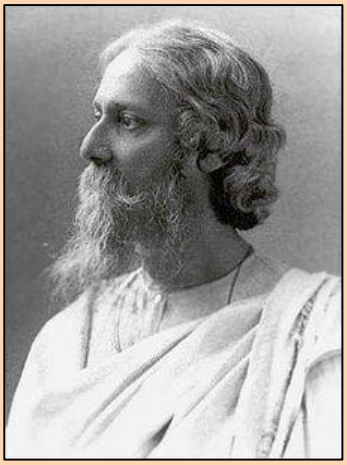
The aim of *Nature India* is to give scientists and professionals insight into the latest research from India. Each week, the editors survey scientific journals (both in English and in Indian languages) to identify the best recently published papers from India. Unlike other Nature Publishing Group journals, *Nature India* posts only research highlights (200-word summaries) that explain the importance of the latest scientific findings in the country.

http://en.wikipedia.org/wiki/Nature_India

NOTABLE QUOTE BY OSU PRESIDENT

In closing his remarks to the campus community during his 2005 visit to the UC-Irvine campus, current OSU president Drake quoted **Indian poet and Nobel laureate Rabindranath Tagore**, *"I slept and dreamt that life was joy. I awoke and saw that life was service. I acted and behold, service was joy.*
http://archive.today.uci.edu/Features/drake_welcome.asp

WHO IS RABINDRANATH TAGORE?



He was the first non-European to win the **Nobel Prize in Literature in 1913**.

He was highly influential in introducing the best of Indian culture to the West and vice versa, and he is generally regarded as the outstanding creative artist of the modern Indian subcontinent
Source: Wikipedia

ADVANCES IN CT IMAGING: CURRENT AND FUTURE TRENDS

Rainer Raupach
Computed Tomography, Siemens Healthcare, Ohio, USA

Over the last decade CT imaging has made tremendous progress in terms of spatial and temporal resolution as well as volume coverage and speed. This enabled new clinical applications due to reduced breath holding time and the possibility to image moving organs without motion artifacts. Even scanning at free breathing and of uncooperative patients without sedation can be considered with advanced CT systems. The increased availability of CT and raising awareness of radiation exposure has driven new technologies to reduce dose. This applies to hardware such as integrated detectors, low kV-scanning, optimized x-ray spectra, and dynamic collimators, but also to new reconstruction algorithms. In particular, iterative reconstruction has experienced growing relevance for decreasing the exposure in a wide range of clinical applications. While CT has been an imaging modality for obtaining morphological information for a long time it started evolving into a wider spectrum of applications. 4D imaging (perfusion) is routinely available today, not least, due to advanced dose reduction techniques. With the introduction of multi-energy CT additional information about the tissue becomes accessible. The present dual energy approaches enable for instance to quantify iodine uptake, classify kidney stones or automated calcium removal. New clinical advances can potentially be expected by the use of quantum counting detectors which allow for a more flexible discrimination of x-ray energy as well as virtually no electronic noise.

INNOVATIONS IN ULTRASOUND: CLINICAL APPLICATIONS

Andy Milkowski
Siemens Medical Solutions, Issaquah, WA, USA

Ultrasound has expanded beyond the ability to depict morphology and hemodynamics to now describe the elastic properties of tissue. Shear wave elasticity has been implemented on conventional transducers and is performed during typical exams. It has been shown to improve the accuracy in assessing fibrosis and suspicious lesions. Usage and acceptance has increased to the point where standard organizations publish elasticity use guidelines while technical organizations advance the field through variation reduction and vendor bias elimination. This talk will review existing uses, current research and future applications.

SMART MATERIALS IN HEALTHCARE – FROM SURGICAL TOOLS TO DIAGNOSTICS TO CELL MANIPULATION

Vishnu Baba Sundaresan

Department of Mechanical and Aerospace Engineering, The Ohio State University, Columbus, OH

Smart materials are a category of materials that exhibit coupling between multiple physical domains and subsequently are used as solid-state actuators, sensors and high-fidelity devices. Smart materials can be broadly classified into two broad categories - electronic and ionic materials, and will enable the next generation of assistive technologies for the healthcare provider. This talk will present the current state-of-the-art in the application of smart materials as cutting tools, sensors and cell manipulation devices. Specifically, the talk will focus two areas of ongoing research in Sundaresan's group – a closed-loop smart surgical device using magneto-electric composites and a lab-on-chip platform for measuring chemo-electrical gradients across cell membranes.

The closed-loop smart surgical device developed in Sundaresan's group is designed from layer-by-layer arrangement of magneto-strictive and piezo-electric wafers laminated and formed into a composite. It is demonstrated that this magneto-electric device can be used to develop high precision cutting tips in conditions similar to minimally invasive surgery. Detailed results from experimental work and technical challenges towards developing this system into an autonomous platform will be presented and discussed.
The second topic that will be presented in this talk will be the application of application of ionic active smart materials. Ongoing work using polypyrrole-based membranes for measuring and active regulation of chemo-electrical gradients across lipid bilayer membranes and cell membranes in-vitro will be presented. The projected application scenario for these material systems will also be presented to motivate the vision towards convincing opportunities in healthcare.

DEVELOPMENT AND EVALUATION OF LOW-LITERACY, PATIENT-CENTERED PRESCRIPTION MEDICATION INSTRUCTION LABELING

Lorraine Wallace

College of Medicine, The Ohio State University Medical Center, Columbus, OH

Nearly half of English-speaking American adults have rudimentary health literacy and/or numeracy skills. As a result, many adults struggle to use and interpret medical-related instructions, prescription medication labeling, and patient education materials (PEMs). Unfortunately, dosing errors are common and are often directly attributed to poorly designed prescription medication instruction labeling and PEMs. While it is not uncommon for the reading demands of prescription medication instruction labeling and PEMs to exceed the actual literacy and numeracy abilities of the typical adult, low-literacy, plain language prescription medication instruction labeling and PEMs have shown to improve patient understanding, foster proper use and adherence. Reading demands and formatting characteristics (e.g., font size, dimensions, illustrations, tables/figures, and directions for use) of standard and low-literacy prescription medication instruction labeling and PEMs will be compared and contrasted. The development and dissemination of evidence based, patient-centered, low-literacy prescription medication instruction labeling and PEMs can improve medical-related outcomes across various populations.

Select movies:
-Thelma and Louise (1991)
-Dead Man Walking (1995) Winner of Best Actress Academy Award
-Stepmom 1998

The answer to Taj trivia 2:
Susan Sarandon
She wrote
"Thank you for a wonderful stay a beautiful sunrise and an excellent staff"

Don't forget to catch a sunrise while you're at the Taj hotel!

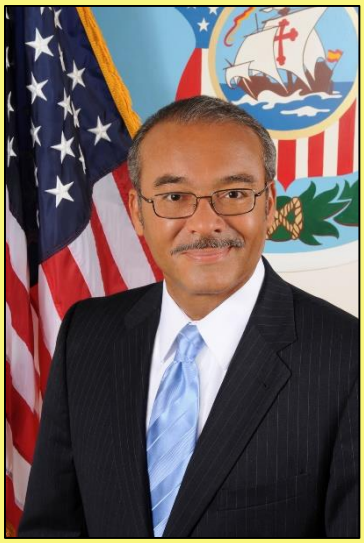
GERIATRIC ONCOLOGY MODELS OF CARE: AN INTERNATIONAL PERSPECTIVE

Janine Overcash

College of Nursing, The Ohio State University, Columbus, OH, USA

The care of the older patient diagnosed with cancer can be very different as compared to the treatment of the younger person. Older patients tend to have comorbid conditions, geriatric syndromes and additional social support needs that must be anticipated and addressed. Clinicians must be sensitive to the special needs of the senior adult. The delivery of geriatric oncology care can be offered in the hospital and in the ambulatory care setting. Geriatric Oncology Ambulatory Care Clinics require a great amount of planning, negotiation and infrastructure development in order to be sustainable. Screening patients in order to identify limitations that may affect oncology treatment decisions are a critical element to geriatric care. Falls risk, emotional and cognition screening, and caregiver issues are all very important elements associated with cancer treatment and are assessed using a comprehensive geriatric assessment. Anticipating problematic cancer treatment-related symptoms can help the patient maintain scheduled cancer treatments and preserve functional status. Incorporating comprehensive geriatric assessment into an oncology clinic visit must be efficient and add to the plan of care. Geriatric oncology is a global need and requires many professionals to provide the necessary care to cancer patients and their families.

THE MAYOR OF COLUMBUS



Michael B. Coleman (born November 18, 1954) is an American politician of the Democratic Party, the 52nd and current mayor of Columbus, Ohio. He is the first African-American mayor of Ohio's capital.
Having served for 16 years, this would make him the longest serving Mayor in Columbus' history.

THE MAYOR OF MUMBAI

The Mayor of Mumbai (Formerly Mayor of Bombay) is the first citizen of the Indian city of Mumbai.

This person is the chief of the Municipal Corporation of Greater Mumbai, but the role is largely ceremonial as the real powers are vested in the Municipal Commissioner. The Mayor also plays a functional role in deliberating over the discussions in the Corporation.

Elected in September 2014, **Snehal Ambekar** is the current Mayor of Mumbai. She is the 7th woman and first Dalit woman to hold the position.

http://en.wikipedia.org/wiki/Snehal_Ambekar

ELECTROCEUTICALS FOR NEUROLOGIC DISEASES AND PAIN

Milind Deogaonkar

Department of Neurosurgery, Center of Neuromodulation, Wexner Medical center, The Ohio State University, Columbus, OH 43210

Electroceuticals are bio-electronic implants that stimulate nervous system to treat disease. The fundamental of this therapy is based on targeted stimulation of a neural node, pathway or nerve in central or peripheral nervous system to modify the output of the end organ. Deep brain stimulation (DBS) has been established as a therapy for Parkinson's disease and other movement disorders. DBS is also being increasingly used for psychiatric disorders and pain. By stimulating a nucleus in the brain, the output of that particular system (motor, sensory or limbic) can be modulated to reduce the symptoms of the disease. Same is true with spinal cord stimulation (SCS) and peripheral nerve stimulation (PNS) in chronic pain patients. Functional electrical stimulation (FES) of peripheral nerves enhances motor activity. The concept of electroceuticals is now exported out of brain disorders to other systemic disorders like diabetes, post-traumatic stress disorders, fibromyalgia, asthma, obstructive sleep apnea, incontinence, erectile dysfunction and acute renal dysfunction. Targeted modulation by temporary or permanent implants to the peripheral and autonomic nerve supply of organs responsible for these disorders can improve the function of the end organ without causing any systemic changes. Electrical impulses are the language of the neural networks in the body. Virtually all organs and functions are regulated through circuits of neurons communicating through such impulses. In future electroceuticals will play a major role in controlling and modifying various neurological and non-neurological diseases.

OHIO STATE INDIAN STUDENT POPULATION:

Total number enrolled: 628

 # in undergrad programs: 136

 # in graduate programs: 484

# of professional students: 8

http://oia.osu.edu/india

ANESTHESIA MANAGEMENT FOR DEEP BRAIN STIMULATION

Mihir Prakash Pandia

All India Institute of Medical Sciences, New Delhi, India

Deep brain stimulation (DBS) is used for the treatment of various movement disorders like Parkinsonism, essential tremors and dystonias, psychiatric illnesses and chronic pains . The procedure involves insertion of microelectrodes into the deep brain structure guided by microelectrode recordings and clinical testing and connection of the microelectrodes to an implanted pacemaker for stimulation. Anesthetic management for this procedure is challenging because of the special requirements of the procedure and the associated complications. The major goals of anesthesia management are to keep the patient comfortable and cooperative with stability of the cardio respiratory function. Non interference of the microelectrode recording and preserving the movement of the patient for clinical testing are important for the success of the procedure. Anesthetic agents can ameliorate tremor (or rigidity), involuntary movement, and interfere with brain mapping and testing of the implanted DBS electrode lead. Respiratory depression caused by the anesthetic agents may lead to serious consequences especially due to difficult access to the airway, because of the bulky metal frame and the head fixed in a flexed position. Arterial hypertension may occur due to anxiety, pain or discomfort and is a major risk factor for intracerebral hemorrhage in DBS implantations and thus maintenance of blood pressure during procedure is important. Monitored anaesthesia care, conscious sedation and general anaesthesia have been used for these procedures. Propofol and remifentanyl are preferred agents because of their short duration of actions. The pharmacologic profile of the α-2 agonist dexmedetomidine is increasingly used for conscious sedation during DBS procedures because it provides sedation, maintains hemodynamic stability (controls hypertension), and doesn't cause significant respiratory depression.

IMPLICATIONS OF MOLECULAR GENETIC TESTING FOR DIAGNOSIS AND TREATMENT OF NEUROMUSCULAR DISORDERS

John T. Kissel, Stanley Iyadurai, MD, Jennifer Roggenbuck

Departments of Neurology, Pediatrics, Neuroscience, and Internal Medicine (Human Genetics), The Ohio State University Wexner Medical Center, Columbus, OH

Appropriate diagnosis is critical and essential for providing accurate prognostic information, identifying associated co-morbidities, providing appropriate family counseling and, most importantly, directing therapy. Often with neuromuscular disorders however, the clinical presentation, examination findings, and routine laboratory studies may not distinguish between acquired and inherited neuromuscular disorders, especially in younger patients. This difficulty has significant implications for treatment in that many acquired neuromuscular disorders are treated with immunomodulating agents, while inherited disorders are currently unresponsive to such treatment. This situation is rapidly changing however, in that so-called small molecule and gene-based clinical trials are currently underway for several types of neuromuscular disorders and especially for motor neuron diseases like amyotrophic lateral sclerosis and spinal muscular atrophy. Rapid, early, and accurate genetic diagnoses even for pre-symptomatic patients have become a crucial necessity for this population. Fortunately, new technologies developed over the past decade now permit accurate, specific and cost effective diagnoses for most genetic neuromuscular disorders. These developments have lead to a fundamental change in the diagnostic approach to these patients as well as more effective and timely supportive management of their conditions. Most importantly these advances have also resulted in new opportunities for specific therapies, including the possibility of identifying patients pre-symptomatically so that treatment can be started before the patients develop difficulties. These presentations will employ a case-based format to present new diagnostic algorithms employed in these patients, review new technologies that permits such testing, and highlight the practical and ethical issues involved in genetic testing.

INDIA GATEWAY NEWS

OHIO STATE UNIVERSITY AWARDED $500, OOO GRANT FOR PASSPORT TO INDIA INITIATIVE

The Ohio State University is the recipient of a **$500,000** grant from the U.S. Department of State to serve as the lead administrator of the national Passport to India initiative, which seeks to increase the number and diversity of American college and university students studying abroad and interning in India by 2020. The program was launched by former Secretary of State **Hillary Clinton** in 2011 to create a hub for U.S.-India higher education partnerships and to develop a stronger bond between the youth of both countries by increasing American student mobility.

In 2011-2012 academic year,

4,593 American students (out of 280,000) chose **INDIA** as their top destination!!

The Ohio State University has been selected to receive NAFSA's Senator Paul Simon Award for Comprehensive Internationalization which recognizes institutions for overall excellence in internationalization efforts as evidenced through best practices in engagement, programming, curriculum/faculty development and outreach.

5 THINGS ABOUT MUMBAI

1) Mumbai is built on what was once a *group of seven islands*.

2) These seven islands were merged into one landmass over a period of*six decades* starting circa 1784 AD

3) Mumbai was previously known as Bombay, a name given by the Portuguese navigator, *Francis Almeida* derived from ***Bom Bahia*** which means the ***Good Bay***.

4) The *Portuguese* handed over Bombay to the *English* in 1661, as a **part of dowry**, when *King Charles II of England* married *Princess Catherine de Braganza of Portugal*.

5) The ***zero mile of Mumbai,*** which marks the centre of the city has 3 different locations as perceived by the Mumbaikars. The **Flora Fountain**at Hutatma Chowk, **the Asiatic Society Library** in the Fort area and **the *GPO*** near the CST terminus, all are believed to be the actual zero mile/s of Mumbai.

http://www.mydestination.com/mumbai/travel-articles/722246/mumbai--15-amazing-facts

IMPLICATIONS OF MOLECULAR GENETIC DIAGNOSIS IN NEUROMUSCULAR DISORDERS

Stanley Iyadurai

Department of Neurology, The Ohio State University Medical Center, Columbus, OH

Appropriate diagnosis is critical and essential for providing appropriate treatment to the patient. However, the symptomatology, presentation and the clinical course may not provide enough clues for the physician to distinguish between acquired and inherited neuromuscular disorders, especially in younger ages. This leads to a significant implication in treatment – most acquired neuromuscular disorders are treated with immune-modulating agents (IA), while the inherited ones are unresponsive to such treatment. The mistaken identity and treating a patient with an inherited disorder with IA only exposes the patient to harm rather than gain. Here we present a case of a 19-year old boy who was treated with IA for 15 years (with a suspected acquired demyelinating polyneuropathy (ADN)), who was found to have an inherited form of neuropathy, Charcot-Marie-Tooth Type 1E. The patient had delayed motor milestones early in life – walked at 2 years of age, and ran clumsily and a young child. He was evaluated by a neurologist at age 4, and based on electro-diagnostic studies, a diagnosis of ADN was made, and was placed on chronic steroid treatment. Upon re-evaluation at age 19, the patient demonstrated an osteopenic boy of short stature, distal-predominant atrophy and weakness, severe multimodal sensory loss and areflexia. He reported no response to prior steroid treatment. Molecular evaluation revealed a mutation in the PMP-22 gene [c.36 C>A (pHis12Gln)], revealing a diagnosis of CMT 1E. Steroid treatment has been stopped and counselling has been provided.

GENETIC DIAGNOSIS OF NEUROLOGIC DISORDERS

Jennifer Roggenbuck[1], Stanley Iyadurai[2], John T. Kissel[2]

[1]Division of Medical Genetics, Department of Internal Medicine, [2]Neuromuscular Division, Department of Neurology, Ohio State University Wexner Medical Center, Columbus, Ohio

The advent of next-generation sequencing has dramatically reduced the cost and increased access to medical genetic testing. This technology has the potential for broad application in the evaluation of neurologic disorders, many of which have a genetic basis with overlapping symptomatology. Establishing a genetic diagnosis enables specific management and treatment, accurate genetic counseling, and targeted testing of at-risk relatives. We will present several cases which illustrate the use of next generation sequencing in the evaluation of patients with poorly understood or difficult to diagnose conditions. Issues related to test interpretation, variably penetrant mutations, pre-symptomatic testing, results disclosure and other clinical challenges will be addressed.

Ever wondered how far Columbus OH is from Mumbai, India?
Distance in miles: 8109.3
Distance in kms: 13050.7
Approximate travel time (not accounting for delays): 16 h and 50 m
http://www.happyzebra.com/distance-calculator/Columbus-to-Mumbai.php

MOLECULAR DETECTION OF DRUG RESISTANCE AND CARBEPENEMASE RESISTANT ENTEROBACTERIACEAE

Preeti Pancholi

Clinical and Molecular Microbiology Laboratory, Department of Pathology
The Ohio State University Medical Center, Columbus, OH

Carbapenems are the antibiotics of last-resort and are usually reserved for severe life-threatening infections caused by multidrug resistant organisms (MDROs). The global spread of carbapenemase-producing *Enterobacteriaceae*, *Pseudomonas aeruginosa*, and *Acinetobacter* species i.e., multidrug-resistant organisms is a critical medical and public health issue. These bacteria are often resistant to all beta-lactam antibiotics and frequently co-resistant to most other antibiotics, leaving very few treatment options. Carbapenemases of global importance include Klebsiella pneumonia carbapenemase, New Delhi metallo-β-lactamase, Verona integron-encoded metallo-β-lactamase, imipenemase metallo-β-lactamase, and oxacillinase-48. As of 2014, Klebsiella pneumonia carbapenemase is the most widespread carbapenemase in the United States. MDRO's like New Delhi metallo-β-lactamase-1, originating in India, are increasingly devastating patients in the developing and developed world. A rapid and accurate method for screening of patients carrying carbapenemase-producing microorganisms, with differentiation among the five major families of resistance genes could facilitate the ability of infection control programs to interrupt the spread of MDROs in hospitals and other health care venues. Screening can be accomplished using either culture-based methods or molecular methods, such as Polymerase Chain Reaction. Traditional enriched culture methods are laborious, taking up to 72 hours for a result. Can molecular tools help us contain and control them? I will discuss the latest advances in detection of carbapenem-resistant Enterobacteriaceae and other Multidrug-resistant gram-negative organisms, and how these new technologies are partnering with conventional infection prevention activities to improve patient outcomes for those at risk to prevent outbreaks and determine the best infection prevention pathways.

INFLUENCE OF THE MOLECULAR DIAGNOSTIC REVOLUTION ON DIAGNOSIS OF SEXUALLY TRANSMITTED INFECTIONS

Ellen Jo Baron

Stanford University, Stanford, CA and Cepheid, Sunnyvale, CA, USA

Beginning in the mid-1990's, molecular methods revolutionized testing for *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. Patients still had to wait several days for the results, but the results were more accurate because a live organism, difficult to recover in culture, was no longer required. The hidden epidemic of sexually transmitted infections was uncovered. Recently introduced molecular assays for *Trichomonas vaginalis* have again exposed a previously unsuspected high prevalence of infection. Now, relatively rapid turnaround times are making near-patient and point-of-care testing a reality, and more patients are receiving their diagnosis and thus appropriate, timely treatment. Using these new assays to generate more rapid yet highly reliable results is having positive patient care effects in varied environments, ranging from the aboriginal population in the outback of Australia to a far different patient population in a busy London downtown sexually transmitted infection clinic. Now we are on the verge of having the benefits of rapid yet reliable molecular tests for detection of human papillomavirus. Studies have led to some recommendations that molecular tests should be the first screening test for human papillomavirus as a risk factor for cervical cancer, reflexing to Papanicolaou smears, in contrast to the previous standard practice that performed the tests in the opposite order. Interpretation and implications of the results of these molecular tests will be discussed.

THERAPEUTIC ROLE OF ISOFORM SPECIFIC PI3K INHIBITORS IN LYMPHOMAS – A CLINICAL PERSPECTIVE

Prajak Barde

Rhizen Pharmaceuticals SA, La Chaux-de-Fonds, Switzerland

Phosphatidylinositol 3-kinases (PI3Ks) represent a family of lipid kinases that plays a key role in signal transduction, cell metabolism, survival and immunity. PI3K and its downstream pathways being involved in many cellular functions related to growth and proliferation, are constitutively activated in many cancers. Three classes of PI3Ks (I-III) with distinct structure, cellular distribution, mechanism of action, and substrate preference are known. There are three Class IA p110 isoforms (α,β and δ) and one related Class IB p110 isoform (γ). Isoforms α and β are believed to be expressed ubiquitously. In contrary, δ and γ are expressed predominantly in hematopoietic cells (δ on B-cells and γ on T-lymphocytes and neutrophils); and overexpressed in a wide range of lymphoproliferative disorders.

The development of PI3K inhibitors is rapidly evolving with newer compounds being evaluated clinically for the treatment of leukemia and lymphomas. Isoform-specific PI3K inhibitors appear promising as they offer greater selective target blockade while minimizing off target effects due to inhibition of other isoforms as in the case of pan-PI3Kinhibitors. Interestingly, dual targeting of PI3K δ/γ appears to be favorable strategy for hard-to treat T-cell lymphomas due to a significant synergy rather than a redundancy between δ and γ isoforms. Currently, various PI3Kδ-specific (e.g. Idelalisib and TGR-1202) and PI3Kδ/γ-specific (e.g. RP6530 and Duvelisib) inhibitors are in clinical development. These compounds have shown clinical activity as a single agent against different lymphoid malignancies. Recently, Idelalisib is approved by US FDA for the treatment of relapse/refractory CLL, SLL and FL.

Tumor responses with PI3K inhibitors differ based on the importance of this oncogenic pathway in tumor progression. Knowledge of somatic molecular alterations may enable more effective therapeutic targeting using isoform specific PI3K inhibitors. It is plausible that the best clinical results could only be achieved by deepening the biological knowledge of how each individual tumor would behave upon alteration of PI3K pathways. Also, it is unlikely that any single agent could produce maximal efficacy thereby paving the way for rational combinations based on overlapping but non-redundant pathways. Besides improving efficacy, combination trials of isoform specific PI3K inhibitors with other approved targeted agents could likely accentuate the approval process by FDA.

FROM 'MOLECULES' TO 'DRUGS' IN AN INDIAN R & D BIOTECH – THE INCOZEN-RHIZEN JOURNEY

Srikant Viswanadha
Drug Discovery, Incozen Therapeutics Pvt. Ltd. Hyderabad, India

The study of human biology in relation to diseases and treatment has been a subject of intense research over the last century. While early therapeutic options involved the use of natural products, 'big' molecules (biologics) such as antibodies and peptides revolutionized treatment of diseases over the last couple of decades. Biologics however, are fraught with several limitations including adverse effects, degradation potential, and route of administration that is often systemic. The disadvantages of biologics is offset by small molecule chemical entities that have a low molecular weight (<900 daltons) and can be administered orally. Small molecules for the treatment of various diseases within oncology, immune-inflammation, and metabolic diseases, have been the subject of Rhizen-sponsored Incozen's research over the past six years. Incozen therapeutics is a cost-effective, lean R & D organization that personifies the definition of a biotech in the current era. With a team of 28 scientists spread across departments that include medicinal chemistry, biology, pharmacokinetics, toxicology, and quality assurance, the Incozen-Rhizen relationship has so far yielded two clinical candidates and a number of late pre-clinical leads across oncology and inflammation. While Incozen is involved in the pre-clinical development of molecules, Rhizen Pharmaceuticals oversees patentability of molecules, clinical trials, and business development. The Incozen-Rhizen's relationship thus represents a paradigm of a successful collaboration that maximized efficiency with optimal resources.

HOST-DIRECTED THERAPIES FOR TARGETING PATHOGENIC EUKARYOTES

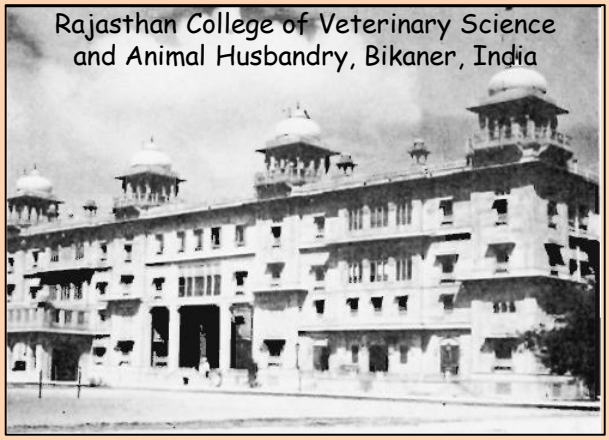
Abhay R. Satoskar
Departments of Microbiology and Pathology, The Ohio State University, Columbus, OH 43210

Infections caused by viruses, bacteria, parasites and fungi are responsible for high morbidity and mortality worldwide. Over the last four decades, discovery of several new antimicrobial drugs has led to significant improvements in the clinical management of infectious diseases. However, due to the rapid emergence of drug resistance, a high prevalence of co-infections and increased incidence of infections caused by emerging pathogens, there is a constant need for novel drugs and therapeutic strategies for treating infectious diseases. This is especially important for obligate intracellular bacteria (e.g.,*Mycobacteria)* and parasites (e.g., *Leishmania*), which reside within host cells and cause chronic disease. Recently, a new paradigm has emerged for treating infections caused by intracellular pathogens, which focuses on identifying and targeting host pathways that are critical for invasion, survival and multiplication of pathogens. This presentation will be an overview of novel host targeted therapies that are under development for the treatment of infections caused by pathogenic eukaryotes such as *Leishmania.*

A STEP BACK IN TIME….1958

RETURNS FROM INDIA . . .
BY RUDY SCHNEIDHORST, Vet. Med III
(College of Vet.Med. OSU, 1958 Archives)
DR . J- D. GROSSMAN has just re turned from a two year assignment in India with the Technical Co-op Mission of the United States and India. The Agricul tural Education Branch of this organization sends teams from five land grant agricultural colleges of this country to assist the young nation of India in its agricultural development. Dr. Grossman was affiliated with the Rajasthan College of Veterinary Science and Animal Husbandry at Bikaner, India.

https://kb.osu.edu/dspace/bitstream/handle/1811/44808/SPECULUM_v12_i01_1958_low.pdf?sequence=3



RESEARCH METHODS: DESIGNING AND IMPLEMENTING YOUR RESEARCH STUDY

Usha Menon[1,2], Jennifer Kue[2], Laura Szalacha[2,3]

[1]The Center for Clinical Translational Sciences, [2]College of Nursing, [3]Center for Research and Transdisciplinary Scholarship, The Ohio State University, Columbus, OH

7:30 - 9:00 AM

A. DEVELOPING A RESEARCH AGENDA (Menon)

B: INTRODUCTION TO METHODS: SIGNIFICANCE AND RESEARCH DESIGN (Kue)

BREAK: 9:00 - 9:15

9:15 - 10:45 AM

C: INTRODUCTION TO METHODS: SAMPLING AND DATA COLLECTION (Menon)

D. NUTS AND BOLTS OF ANALYSIS (Szalacha)

BREAK: 10:45 - 11 AM

11 AM - 12:30 PM

D. NUTS AND BOLTS OF ANALYSIS CONTD. (Szalacha)

E. BUILDING A TEAM AND PUBLICATIONS (Kue)

LUNCH: 12:30 - 2:00 PM

2:00 - 4:00 pm: INDIVIDUAL CONSULTATIONS WITH COURSE FACULTY (OPTIONAL)

20-minute consultations will be offered with course faculty when you can discuss your research ideas and get assistance with methods, etc. Sign-up sheets will be available at the start of the workshop. Consultations are offered on first-come basis; you may sign up for time with the faculty of your choice. All three faculty members can provide consultations on any topics presented in the workshop.

ASSISTIVE DEVICE DEVELOPMENT FOR LOCOMOTOR IMPAIRMENTS

Sujatha Srinivasan

Department of Mechanical Engineering, Indian Institute of Technology Madras, India

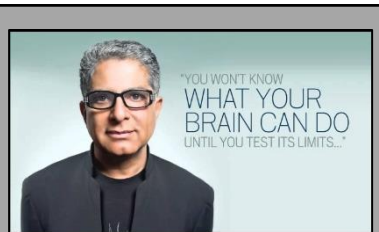
The National Sample Survey Organization in its 2002 Report estimated the number of disabled people in India to be 18.5 million, out of which over 10 million have some kind of locomotor disability. There are many causes for locomotor impairments and hence a multitude of needs for orthoses (supportive devices), prostheses (replacement devices) and mobility devices such as wheelchairs. With cost as a major constraint, technologies available to the vast majority in India are rather primitive and unsuitable. For instance, prostheses for people with above-knee amputations are fitted typically with a single axis knee that is kept locked during walking to maintain stability. This constraint results in an unnatural gait with increased energy consumption and damage to other joints in the long run. Imported technologies are not only expensive but may also be unsuitable in the Indian context. The talk will showcase some of the efforts of the Rehabilitation Research and Device Development (R2D2) group at IIT Madras on developing assistive devices that are affordable and functional in the Indian context. Our evaluation of existing polycentric knees revealed their unsuitability for use on uneven terrain, for example. To address this need, we have developed a polycentric knee for above-knee prostheses whose geometry is optimized to handle uneven terrain. In addition to cost constraints, challenges include need determination, and access to the vast majority of the disabled population. Partnerships with industry that focus on affordable, high quality assistive devices are also essential to change the disability landscape.

APTAMERS AND THEIR APPLICATION IN CANCER

S.Krishnakumar

Ophthalmic Pathology Department & Vision Research Foundation, Sankara Nethralaya, Chennai, India

Purpose: Epithelial cell adhesion molecule (EpCAM), a cancer stem cell marker is over expressed in epithelial cancers and in retinoblastoma. We fabricated an EpCAM targeting aptamer-doxorubicin, siRNA chimera and an aptamer fluorescent conjugate and investigated the efficacy of these conjugates in cell culture and animal models. **Methods:** The binding affinity, formation of physical conjugates and cellular uptake and drug efficacy of the EpCAM Aptamer-doxorubicin conjugate to retinoblastoma cells and non-neoplastic cell lines were evaluated with flow cytometry, spectrofluorimetry and fluorescent microscopy and cell proliferation assay respectively. The anti-tumor efficacy of EpCAM aptamer- siRNA chimera was evaluated by relevant molecular techniques in EpCAM positive cell lines and also using xenograft animal models. The fluorescent conjugate was synthesized by bio-orthogonal chemistry utilizing a strain promoted alkyne-azide cycloaddition (copper free click) reaction and the ligation efficiency was improved by freeze-thaw cycles. **Results:** The targeted uptake of the EpCAM Aptamer-doxorubicin conjugates caused cytotoxicity selectively in the retinoblastoma cells. EpCAM Aptamer siRNA chimera silenced significantly EpCAM in retinoblastoma and breast cancer cell lines ($p<0.005$) and in breast cancer xenograft model. The fluorescent conjugate showed target specific binding and aided in the imaging of EpCAM positive cancer cells. **Conclusion:** Aptamers provide opportunity for delivery of drugs, siRNA and imaging agents. *Supported by: Indo – Australian grants, Department of Atomic Energy and Programme support on Retinoblastoma, Department of Biotechnology*



Did you know he was an AIIMS alumnus?

Deepak Chopra is an Indian-American bestselling author and public speaker. He is a prominent alternative medicine advocate and is a "controversial New-Age guru". Through his books and videos, he has become one of the best-known and wealthiest figures in the holistic-health movement. He gained a fan following after his spot on the Oprah Winfrey show!

TOWARDS POINT-OF-CARE MASS SPECTROMETRY: NEW ADVANCES IN AMBIENT IONIZATION METHODS

T. Pradeep

DST Unit of Nanoscience (DST UNS) and Thematic Unit of Excellence (TUE), Department of Chemistry, Indian Institute of Technology Madras, Chennai – 60036, India

Ambient ionization methods have made giant advancements in mass spectrometry. Recently, two new ways of ion formation, at low and high applied voltages have been introduced. In the first, termed nanotube ionization, molecular ionization is achieved at small voltages (≥1 V) using carbon nanotube (CNT) impregnated paper. In the other, termed electrolytic ionization, ions of noble metals are formed in solutions starting from metal electrodes at high applied voltages of the order of a few keV. In nanotube ionization, organic molecules give simple high quality mass spectra without fragmentation in the positive or negative ion modes. Conventional field ionization is ruled out and field emission of microdroplets is indicated. Microscopic examination of the CNT paper confirms that nanoscale features at the modified paper surface are responsible for the high electric fields. At these voltages, the ions carry extremely low internal energy and weakly bound species are detected efficiently. Unprecedented signal quality is observed in several cases. The nanotube ionization has been extended using other one-dimensional nanostructures. Electrolytic ionization has been used to make nanoparticles and localized transformations in nanostructures. These ionization methods and patterned nanostructures created by such methods have been used for detecting diverse analytes. Adaptation of such methods will enable point-of-care mass spectrometry. Some examples will be illustrated.

IIT-BOMBAY – 2ND IIT to be established	
Motto	*jñānaṁ paramaṁ dhyeyam* (Sanskrit)
Motto in English	Knowledge is the Supreme Goal
Established	1958
Type	Public Institution
Director	Prof. Devang V. Khakhar
Academic staff	565
Undergrads	3400
Postgrads	4600
Location	Powai, Mumbai, Maharashtra, India
Campus	Urban, spread over 550 acres (2.2 km^2) in North Central Mumbai
Website	www.iitb.ac.in

PARTNERS

IIT-MADRAS – 3RD IIT to be established	
Motto	Siddhirbhavati Karmaja
Motto in English	Effort Yields Success
Established	1959
Type	Public institution
Chairman	M.M. Sharma
Director	Prof Bhaskar Ramamurthi
Academic staff	550
Undergrads	2,900
Postgrads	2,500
Location	Chennai, Tamil Nadu, India
Campus	Urban, 618 acres (2.5 km^2) of wooded land
Website	www.iitm.ac.in

Source: IIT Wikipedia

Chandan K. Sen with Devang V. Khakhar (IIT-B Director)

POSTERS
JANUARY 16TH, 2015
5-7 PM

TOP 20

Out of 200 submitted, top 10 abstracts from India and US each were selected on a merit basis.

Of these 20, 10 have been chosen to give poster talks (PT). 5 from US and 5 from India.

These poster presenters will present for 3 minutes using no more than 3 PowerPoint slides.

INDIAN STUDENTS IN THE US - STATISTICS

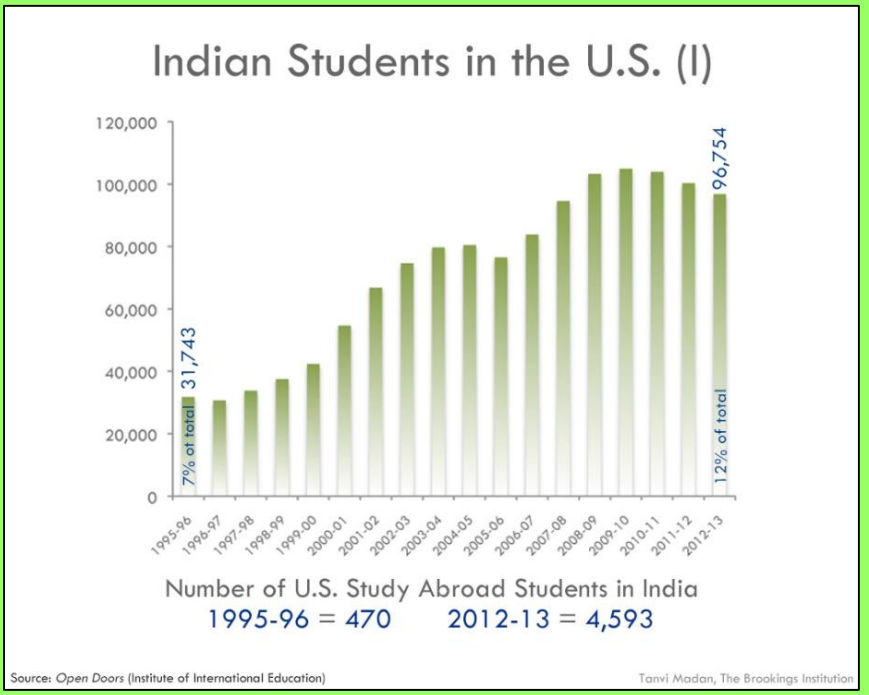
STEPPING ON THE PLANE FOR AMERICAN DEGREES

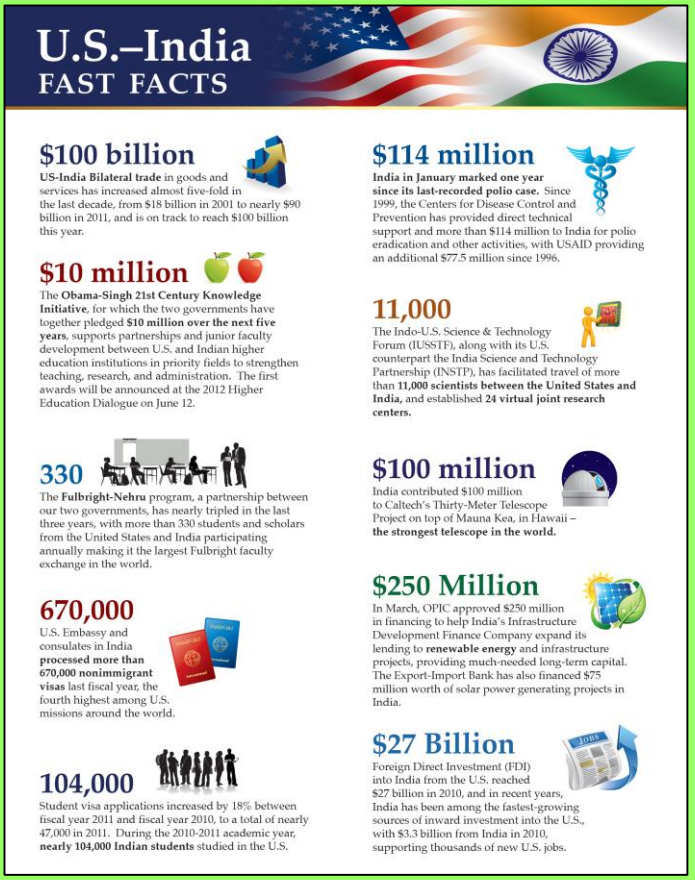
Top 10 Stem Source Cities as Total F-1 Students

Rank	City	No of STEM F-1s	No of F-1s	STEM%
1	Hyderabad	20,840	26,220	79.5
2	Beijing	19,605	49,946	39.3
3	Seoul	11,628	56,503	20.6
4	Shanghai	10,768	29,145	36.9
5	Mumbai	10,638	17,294	61.5
6	Chennai	7,342	9,141	80.3
7	Riyadh	6,817	17,361	39.3
8	Bangalore	6,470	8,835	73.2
9	Jeddah	4,993	10,468	47.1
10	Taipei	4,802	15,985	30.0

Top 10 STEM Source Cities as Percentage of Total F-1 Visa Students

Rank	City	No of STEM F-1s	No of F-1s	STEM%
1	Vijayawada	1,867	2,181	85.6
2	Vishakhapatnam	1,482	1,840	80.5
3	Chennai	7,342	9,141	80.3
4	Hyderabad	20,840	26,220	79.5
5	Secunderabad	2,333	2,969	78.6
6	Pune	4,270	5,551	76.9
7	Tehran	4,668	6,154	75.9
8	Bangalore	6,470	8,835	73.2
9	Kolkata	2,570	3,881	66.2
10	Dhaka	2,179	3,450	63.2





http://mumbai.usconsulate.gov/

The Consulate General seeks to promote U.S.-India relations and progress towards common goals through information outreach, dialogue and exchange in western and central India, including Mumbai and the states of Maharashtra, Gujarat, Madhya Pradesh, Chhattisgarh, and Goa.

The Consulate General of the United States of American in Mumbai was located in the former Wankaner Palace, built in 1938 by the Maharaja of Wankaner, along the Breach Candy seaface. Called Lincoln House, this building houses the officers of the Consul General, the Consulate's principal officer; the Consular Section, which offers services to American citizens in India and to Indians traveling to the United States; an economic and political section, and a management office.

At a separate facility in the Churchgate district of Mumbai, the American Center building housed four additional Consulate offices: the Public Affairs Section, which promotes mutual understanding through its public outreach programs and exchanges; the U.S. and Foreign Commercial Service, which promotes U.S. exports and trade; the Food and Drug Administration, which promotes food and drug safety; and the Foreign Agricultural Service which represents the U.S. Department of Agriculture.

Since November 2011, all sections of the U.S. Consulate General Mumbai are located at a new facility in Bandra Kurla Complex.

SYNTHESIS, CHARACTERIZATION AND FRACTIONAL SEPARATION OF CdTe QUANTUM DOTS

Vivek Borse and Rohit Srivastava

Department of Biosciences and Bioengineering, Indian Institute of Technology Bombay, Mumbai 400076, India

Colloidal semiconductor nanocrystals or quantum dots (QDs) have unique size-dependent properties which have attracted great scientific and technological interest. By modulating the size of the QDs, their optical properties can be changed and can be utilized for various applications. QDs are reported to be used as a fluorescence agent for biological reporting. There are two methods for organo-metallic synthesis of QDs, one is aqueous synthesis and other is organic synthesis. As the biological system requires an aqueous environment, QDs synthesized with organic solvents need time consuming processes to convert them to water soluble forms. Thus the aqueous QDs synthesis method becomes more attractive as it is much cheaper and has also been found suitable for biological applications. We report the aqueous synthesis of CdTe QDs with bright fluorescence. These QDs were synthesized using metal salts and mercaptan acid as stabilizing agent. Characterization was completed by fluorescence, UV absorbance spectroscopic measurement, XRD, FTIR and TEM. Subsequently, we performed the fractional separation of the QDs using ethanol and obtained various colors of QDs. These QDs have different colors because they have different sizes. These different color and size range of QDs can be utilized in bio-sensing applications, which are currently underway.

FETUIN-A IMPLEMENTS OBESITY INDUCED ADIPOSE TISSUE DYSFUNCTION AND INSULIN RESISTANCE

S. Dasgupta[1], D. Pal[2], R. Kundu[2], S. Maitra[2], G. Das[3], S. Mukhopadhyay[4], S. Ray[4], S.S. Majumdar[5] & S. Bhattacharya[2]

[1]Department of Molecular Biology & Biotechnology, Tezpur University, Assam, India. Department of Zoology, Visva-Bharati, Santiniketan, West Bengal, India. [3]Jawaharlal Nehru University, New Delhi, India. [4]IPGME&R-SSKM Hospital, Kolkata, India. [5]National Institute of Immunology, New Delhi, India

Type 2 diabetes mellitus (T2DM) is now being considered as pandemic disease due to its growing pervasiveness in the world population. Insulin resistance is a major defect and an early sign for future development of T2DM. To search the possible cause for the development of insulin resistance, obesity induced hyperlipidemia was identified as the leading cause of insulin resistance and T2DM. There has been growing evidence for last few years that obesity induced adipocyte dysfunction and chronic low-grade inflammation leads to the development of insulin resistance in insulin target cells but the underlying mechanism is still not clear.

Adipose tissue is known to play a pivotal role in controlling the whole-body glucose homeostasis and insulin sensitivity by sequestering fat inside the adipocytes. Adipose tissue dysfunction leads to the formation of hypertrophied adipocytes which increases circulatory FFA level and cause chronic low grade inflammation in adipose tissue. Toll-like receptor 4 (TLR4) plays a key role in initiating inflammatory signalling in the adipose tissue and thereby promoting insulin resistance. Several studies in this direction pointed that mice deficient of TLR4 gene confers protection from obesity induced inflammation and insulin resistance. However, in absence of direct interaction between FFA and TLR4, how FFAs activate TLR4 signaling remains unresolved. Recently, we have showed that fetuin-A, a hepatic secretory glycoprotein, acts as an endogenous ligand of TLR4 binds with FFA and presented to TLR4. This triggers TLR4 signaling which overexpresses an array of proinflammatory cytokines that compromise insulin sensitivity. Fetuin-A also involved in the impairment of adipogenesis. Incubation of fetuin-A in 3T3-L1 preadipocytes significantly reduces PPARγ gene and protein expression, a master regulator of adipogenesis, and thus attenuating differentiation of preadipocyte to adipocyte. Our findings therefore suggest that fetuin-A could be a potentially new target for developing therapeutics against insulin resistance and T2DM.

APPLICATION OF NANOTECHNOLOGY FOR DEVELOPMENT OF SINGLE SHOT BOOSTER FREE VACCINE WITH CAPABILITY OF ANTIGEN CROSS PRESENTATION

Amit Dinda, CK Prashant, Madhusudan Bhat

Department of Pathology, All India Institute of Medical Sciences, New Delhi, India

Development of a vaccine which does not require cold chain for stability, provides prolonged immunity with a single shot and has the ability to enhance cytotoxic T-cell response through antigen cross presentation against intracellular infections is ideal to meet the WHO grand challenge. We synthesized poly-ε-caprolactone nanoparticles (PCL NPs) in two size ranges (60nm and 450nm), loaded with tetanus toxoid (TT) and studied their effect on human blood monocyte derived macrophages (M) *in vitro* along with *in vivo* study of humoral and cell-mediated immune (CMI) response in Swiss albino mice immunized through different routes. The 60nm PCL NPs caused M-1 polarization and 450nm caused M-2 polarization *in vitro*. Following single dose intramuscular immunization in mice 60nm PCL NPs produced robust humoral as well as CMI against TT for more than 2 months. Additionally, tests with small PCL NPs loaded with hepatitis viral (HBV) antigen showed marked enhancement of CMI. We observed endosomal escape of NPs in 6 minutes resulting in cytosolic release of antigen which may enhance its cross presentation. The PCL NPs were seen in the macrophage/dendritic cells in draining lymph nodes beyond 2 months indicating its capability of prolonged antigen presentation. Flow cytometric analysis revealed central and peripheral memory T cell expansion. This study indicates that application of nanotechnology can meet the vaccine grand challenge.

FUNDING OPPORTUNITY

HRFP15-01: Building U.S.-India Ties through Small Grants
Department of State
U.S. Mission to India
http://www.grants.gov/web/grants/view-opportunity.html?oppId=269368

CHARACTERISING A NOVEL REGULATOR OF SYNAPTIC VESICLE TRAFFICKING

Madhushree Kamak[1], Sucheta Kulkarni[2] and Sandhya P.Koushika[1]

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Synaptic vesicles are neurotransmitter-filled cargo present at synapses that are essential for neuronal function. Therefore their size, content and transport are tightly regulated. Synaptic vesicle proteins are synthesized in the cell body, sorted at the Golgi and finally form precursors of synaptic vesicles (pre-SV) that recruit motors and become competent for transport. On reaching the synapse they form mature synaptic vesicles, dock at the synaptic plasma membrane and undergo fusion leading to release of neurotransmitters. Several molecules that regulate the transport and release of synaptic vesicles are known. However, there is an incomplete understanding of the early events in the cell body that lead to formation of a transport competent precursor. We are characterising mutants isolated from a forward genetic screen in *C. elegans* aimed at identifying novel regulators of pre-SV trafficking. One mutant *tb217* has subtle synaptic vesicle localisation defects in synapses of multiple neurons. These defects possibly lead to altered neurotransmission in *tb217* animals. We also observe that in *tb217,* the pre-SV motor UNC-104 (Kinesin-3) accumulates in the cell body and that *tb217* acts as a genetic enhancer of *unc-104* mutants. *tb217* does not have global trafficking defects as several markers appear to localise normally. Preliminary mapping places the mutation on chromosome 4 of *C. elegans*. Our observations suggest that this unknown gene may play a role early in the process of pre-SV trafficking possibly when motor-cargo interactions occur.

COMPARATIVE ANALYSIS OF PHYTO-CONSTITUTIONAL AND PHARMACOLOGICAL ACTIVITIES OF DIFFERENT SEASONAL TEA LEAF EXTRACTS

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Objective: To evaluate the impact of seasonal variation on phytoconstitutional content and *in vitro* anti-oxidants, antibacterial and wound healing activities of methanolic extract of tea leaves (*Camellia sinensis linn*.). **Methodology:** Phyto-constitutional content variation was qualitatively and quantitatively assessed for tea leaf extracts of autumn and rain variety (S_A and S_R). *In vitro* anti-oxidant activities in different concentrations (S_{A100}, S_{A200}, S_{R100} and S_{R200}) were studied adopting 1, 1-Diphenyl-2-picryl hydrazyl, super oxide anion, hydrogen peroxide, hydroxyl radical scavenging assay and measuring reductive ability. Antibacterial activity of both the extracts were evaluated against eight human pathogens (two Gram positive and six Gram negative) using disc diffusion method to determine minimum inhibitory concentration (MIC) of each. The influence of different concentrations of both the extracts (S_{A250} , S_{A500} , S_{R250} and S_{R500}) on wound closure were investigated using an excisional wound model on female wister rats (Sprague-Dawley) and histological studies were performed. **Results:** The S_R extract showed higher flavonoid content (90.1±6.3 and 95±3.9 mg quercetin equivalent/g for S_A and S_R respectively), presence of benzazulene analogue and elicited better anti-oxidant activities ($^{**}P< 0.01$). S_R showed significantly better antibacterial activities. Topical administration of S_{R500} caused significantly faster healing ($P< 0.05$), higher epithelialization and collagen deposition, less accumulation of macrophages and better angiogenesis in wound area as compared to S_{A500} and standard. **Conclusion:** S_R extract possessed superior wound healing properties due to its higher anti-oxidant and better antimicrobial spectrum coverage compared to S_A extract probably by possessing higher flavonoids and benzazulene derivative.

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FORMULATION AND EVALUATION OF BIO-DEGRADABLE IMPLANTS CONTAINING AN ANTI-CANCER DRUG

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Lack of selectivity of chemotherapy drugs for the tumour tissue is the major disadvantage of anti-cancer treatment. Targeted delivery is the most ambitiously pursued goal of modern cancer research. A firm strategic targeted therapy would minimise the systemic toxicity and increase the chances of cure. This study covers the formulation and evaluation of Cisplatin loaded chitosan-polyvinyl alcohol-gellan biodegradable implants for the development of a targeted anti-cancer drug delivery system. Multilayer discs with a central monolithic Cisplatin-polyvinyl alcohol-gellan layer sandwiched with peripheral chitosan layer were prepared by solvent casting method. Composition of polymers and the cross-linking agent were varied to study the effect on swelling, in vitro and in vivo drug release. Surface morphology was studied using scanning electron microscopy (SEM). Polymer degradation was studied both *in vitro* and *in vivo*, and biocompatibility was determined. Implants were evaluated for thickness and content uniformity. The *in vitro* and *in vivo* results showed that increase in concentration of calcium chloride and decrease in concentration of gellan prolonged the release of the drug. The diffusion coefficient was found to be directly proportional to the concentration of gellan while inversely proportional to cross-linking agent. Swelling studies indicated that the implants with highest gellan content showed highest swelling. Hence we deduced that the chitosan-polyvinyl alcohol-gellan implants could be suitable for targeted drug carrier systems in selective and long-term delivery of anti-cancer drugs to a specific body compartment.

TO STUDY AND EVALUATE MAGNETIC RESONANCE IMAGING AND ARTHROSCOPIC FINDINGS IN KNEE PROBLEMS WITH SPECIAL ATTENTION TOWARDS FALSE POSITIVE AND NEGATIVE REPORTS

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The purpose of this study was to evaluate the Magnetic Resonance Imaging (MRI) and Arthroscopic findings in internal derangement of knee (IDK). Between May 2010 to November 2012, 40 patients with IDK were prospectively assessed. After the physical exam MRI studies and arthroscopic surgery of the knee were performed. The sensitivity, specificity, positive and negative predictive values were estimated. Data was analyzed for the significance of correlation between MRI and arthroscopic findings of knee injury by Chi Square test. Out of 40 patients, 33 were males & 7 were females. Patients suffering from knee injuries ranged from 13 to 55 years of age. The sensitivity , specificity & accuracy of MRI for Anterior Cruciate Ligament was 100%, 43.75%, 77.5%, for Posterior Cruciate Ligament 80%, 85.71%, 85%, for Medial Meniscus 84.61%, 40.74%, 55%, for Lateral Meniscus 50%, 81.25%, 75% & for osteochondral injuries 70%,100%, 92.5% respectively when compared with arthroscopy. There were high incidences of false positive & false negative MRI reports. From our study we can conclude that arthroscopy still remains the gold standard in diagnosing the internal knee lesions. The use of MRI as a supplemental tool in the management of meniscal and ligament injuries should be highly individualized by an experienced surgeon.

A QUANTITATIVE ANALYSIS OF CELL CYCLE PHASES AND THE EGFR SIGNALING DURING EARLY SPERMATOGENESIS IN ADULT DROSOPHILA TESTIS

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Regulation of transit amplification (TA) of a progenitor cell is imperative for the tissue maintenance and organogenesis. The microenvironment partly imparts it. Adult Drosophila testis is an excellent model system to understand the molecular cell biology underlying TA control. The testis contains germline stem cells that produce gonialblasts, and each of these undergo four mitoses within an enclosure created by two somatic-lineage cells. Secretion of the ligand (spitz) from the germ cells activates EGFR signaling in the somatic cyst cells, which in turn plays a crucial role in regulating the germ cell proliferation. It remains unresolved as to how activation of EGFR regulates the division frequencies of male germline in a cell non-autonomous manner. The experimental observations revealed that ERK-phosphorylation (pERK), caused by EGFR signaling in the somatic-cyst cell, occurs for a brief period during each of the germline divisions. Quantitative analysis of the expressions of various cell cycle markers in the germline and pERK staining of the somatic cyst cells indicated that the periodic ERK-phosphorylation is primarily correlated to the G1 phase of germ cell cycle. These results provide a new insight into the mechanism of cell cycle attenuation during the early stage of germline development.

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BRANCHED GOLD NANOPARTICLES- A THERAGNOSTIC AGENT FOR CANCER

Sisini Sasidharan,[1] Dhirendra Bahadur[2] and Rohit Srivastava[1]

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Cancer, which tops the list of health concerns all over the world calls for an early detection, effective treatment and complete eradication. Photo-thermal therapy, harnessing light energy to ablate the tumor, in combination with diagnostic modality would be an ideal approach. Branched gold nanoparticles (BGNs), with marked photo-thermal efficiency, X ray-computed tomographic contrast ability and along with surface enhanced Raman spectroscopic property would be an ideal choice. Various approaches for synthesis of these BGNs have been reported, however poor stability and lack of functionality limit its use for biomedical application. Hence we report a novel concept of stabilizing BGNs with albumin, a non-toxic, non-immunogenic and biodegradable protein, resulting in particles of ~100nm in size and good stability with zeta potential value of -29mV±3mV. These albumin stabilized BGNs exhibited surface plasmon resonance with λ_{max} at 795nm and hyperthermic response. Cytotoxicity evaluation with oral epithelial carcinoma KB cell line and mouse fibroblast L929 cells revealed no apparent toxicity at concentrations even upto 3 µg/ml . Further exploration of its properties such as X ray-CT imaging and suface enhancement of Raman spectra are being carried out to offer albumin stabilized BGNs as a single agent for minimally invasive treatment and diagnosis of cancer.

9 countries are represented at this conference:1. India, 2. USA, 3. Israel, 4. UK, 5. Malaysia, 6. Japan, 7. Germany, 8. Switzerland and 9, The Netherlands.

OCULAR SURFACE RECONSTRUCTION USING ORAL MUCOSAL STEM CELLS: FROM BENCH TO BEDSIDE

Sudip Sen[1], Noopur Gupta[2], Anand Gupta[3], Ajoy Roychoudhury[3], Seema Sen[4], Tapas C Nag[5], Sujata Mohanty[6], Radhika Tandon[2].

Department of Biochemistry[1], Department of Ophthalmology[2], Dr. Rajendra Prasad Centre for Ophthalmic Sciences, Department of Oral and Maxillofacial Surgery[3], Department of Ocular Pathology[4], Dr. Rajendra Prasad Centre for Ophthalmic Sciences, Department of Anatomy[5], Stem Cell Facility[6], All India Institute of Medical Sciences, New Delhi – 110029, India

Background: Ocular surface disease (OSD) arising from limbal stem cell (LSC) deficiency results in corneal opacity, loss of vision and dry eye. In cases of bilateral OSD, autologous oral mucosal epithelial cell (OMEC) transplantation is an alternative to limbal allograft transplantation. Autologous OMEC was characterized and used for ocular surface reconstruction in patients with bilateral total LSC deficiency. **Methods:** Phase I – Cultivating and characterizing OMEC in 20 patients. Phase II – A single arm, non-randomized clinical trial involving cultivation and transplantation of autologous OMEC in 10 patients. Characterization by morphology, transmission electron microscopy (TEM), RT-PCR and immunocytochemistry. Post-operative follow-up included clinical and slit lamp examination, impression cytology, assessment of vision and tear formation. **Results:** Morphology and TEM revealed a confluent sheet of OMEC connected to each other by desmosomes, containing intracellular cytokeratins and abundant mucin granules. Presence of markers of differentiated, stratified epithelial cells (Cytokeratin K3, K4, K13 and connexin 43), progenitor stem cell markers (p63, p75, β_1-Integrin and ABCG2) and a variety of y membrane bound and gel forming mucins (MUC 1, 5B, 6, 13, 15 and 16) were corroborated by RT-PCR and immunocytochemistry. Impression cytology, clinical and slit lamp examinations revealed OMEC forming a stable ocular surface without any epithelial defect or conjunctival goblet cell invasion. Transplanted patients achieved better vision as well as symptomatic improvement for dry eye. **Conclusion:** OMECs are potential autografts in bilateral OSD. Clinical findings revealed that autologous OMEC transplantation is a viable alternative to LSC transplantation in bilateral severe OSD.

APEX-1 PROMOTES C-JUN DNA BINDING IN NOX-4 MEDIATED HEMANGIO-ENDOTHELIOMA (HE) TUMOR PROGRESSION

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TOP 10

Background: Apex-1 is multifunctional protein that plays a central role in the cellular response to oxidative stress. The two major activities of Apex-1 in DNA repair and redox regulation of transcriptional factors has been established. **Methods:** We used *in vivo* model where endothelial cell tumor formation was achieved by subcutaneous injection of EOMA cells into syngeneic 129 P/3 mice and also in *in vitro* set up where we knockdown different protein expression to check their specific involvement to the EOMA cell maturation and proliferation in the tumor. **Results:** There was significant decrease in the levels of AP-1 activity in nox-4 siRNA vs control siRNA. The level of c-Jun is relatively high in the tumor forming tissue compared to non-tumor forming tissue. Apex 1 also induces AP-1 transactivation on MCP-1 promoter. MCP-1 reporter activity in c-Jun knockdown cells and also with Apex-1 knockdown cells was significantly decreased. The use of E3330 (50mM), a specific inhibitor for Apex-1 redox function, caused significant reduction of c-Jun activity in time dependent manner. Subcutaneous injection of EOMA cells caused HE tumor formation occurred in all mice, after 3 days of injection we treated E3330 as previously described in one group of mice. After 7 days of post injection there was significant prevention of tumor development observed in E3330 treated group and it was further validated by measuring tumor volume which is about 50% lower compared to control (n=6). **Conclusion:** Modulation of Apex-1 causes reduced tumor formation demonstrates that Apex-1 is required for in vivo angiogenesis and highlights the potential clinical significance as therapeutic targets.

TOP 10

NOVEL STROMAL-DERIVED ONCOGENIC SIGNALS ENHANCE RAS-MEDIATED CELL PROLIFERATION

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The appreciated, yet relatively unexplored, role of the tumor microenvironment in cancer progression provides a novel avenue to target cancer. Oncogenic signaling networks between stromal and cancer cells inherently exist, but have yet to be readily identified. To systematically identify these signaling networks, I utilized the well-characterized vulvagenesis program of *Caenorhabditis elegans* (*C.* elegans). During vulva development, mesenchymal cells signal to adjacent epithelial vulva precursor cells via the Ras signaling pathway to promote the cell proliferation and patterning that form a mature vulva. This developmental signaling is akin to the cellular interaction in a tumor between epithelial cancer cells and mesenchymal stromal cells. Consistent with their hallmark role in the formation of many human cancers, activating mutations in the RAS (*let-60*) oncogene in *C. elegans* lead to the hyper proliferation of epithelial vulva precursor cells, which presents as a multiple-vulva phenotype. To elucidate signaling networks derived from the mesenchymal cells (which model stroma) that promote hyper proliferation in epithelial vulva precursor cells (which model cancer cells) in the context of mutant RAS (*let-60*), we conducted a genome-wide “stroma-specific” RNAi screen in *C. elegans*. The screen identified 60 genes, 42 with corresponding mammalian orthologs, whose activity in the mesenchymal cells contributed to the multiple-vulva phenotype. I am subsequently probing the mechanisms and pathways through which these genes act by microscopy of fluorescent reporters and computational pathway analysis. The current challenge is to translate the identified mammalian orthologs into clinically relevant findings that target the tumor microenvironment of Ras driven cancers.

KERATINOCYTE-DIRECTED CONDITIONAL ABLATION OF DICER INDUCES P21$^{WAF1/CIP1}$ CAUSING IMPAIRED BARRIER FUNCTION OF THE REPAIRED SKIN

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Homeostasis of adult tissue is maintained by molecular silencers called microRNA (miRs) that post-transcriptionally silence coding genes. Injury transiently silences these silencers to unleash adult tissue development towards the healing process. Once the wound is closed, miRNA biogenesis is bolstered to turn off tissue development averting neoplasia. We report that Dicer, one of the key RNase III responsible for miRNAs maturation, plays an important role in re-establishing miR-dependent silencing at the time of wound closure. Dicer expression is dysregulated in several human disease conditions. Compromised dicer function predicts poor health outcomes. We observed that non-healing diabetic wounds feature compromised dicer expression. Keratinocyte-specific conditional (K14/Lox-Cre) dicer ablated mice were generated. Excisional wounds were developed on the dorsal skin. miRNA expression profiling of skin and wound-edge tissue revealed a global up regulation of miRNAs during wound closure on day 14 post wounding. During wound closure, dicer protein expression increased by >2.5 fold (n=4; p<0.001). Barrier function of the skin was compromised in keratinocyte-specific dicer ablated mice because of impaired loricrin expression. *In vitro* studies with HaCaT human keratinocytes showed that loricrin expression was inversely related to the expression of the cyclin dependent kinase inhibitor p21$^{waf1/CIP1}$. Real time PCR of p21$^{waf1/CIP1}$ from laser captured wound-edge keratinocytes revealed more than 2.5 fold elevated mRNA expression in dicer ablated skin epidermis compared to normal epidermis (n=6; p<0.001). Increased expression of p21$^{waf1/CIP1}$ in keratinocyte-specific dicer ablated wound edge tissue was also confirmed by Western blot and immunohistochemistry. Suppressing p21$^{waf1/CIP1}$ by p21$^{waf1/CIP1}$ anti-sense adenovirus in keratinocyte-specific conditional dicer ablated mice improved wound healing suggesting a role of dicer in the suppression of p21$^{waf1/CIP1}$. These results establish that dicer enables p21$^{waf1/CIP1}$ silencing helping re-establish barrier function of the wounded skin. *[Supported by NIH RO1 GM-069589 and GM-077185]*

MANNOSE RECEPTOR (CD206)-MEDIATED SIGNALING IN HUMAN MACROPHAGES IN THE CONTEXT OF TUBERCULOSIS

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Mycobacterium tuberculosis (M.tb), the cause of tuberculosis (TB), is a communicable, highly adapted airborne bacterium of humans that infects more than a third of the world's population. Resident macrophages in the lung alveolus called alveolar macrophages (AMs) are among the first immune cells to interact with *M.tb* and serve as its niche. AMs are immunoregulatory cells which express abundant mannose receptors (MR), a prototypic pattern recognition receptor (PRR) involved in *M.tb* uptake, as well as major negative regulatory signalling molecules of inflammation. We have previously demonstrated that MR-mediated phagocytosis of *M.tb* leads to limited phagosome-lysosome fusion and upregulation of the nuclear receptor PPAR□, known to inhibit macrophage activation. However, the associated MR-specific downstream signaling molecules are unknown. Understanding MR signaling pathways is critical for considering targets for new host-directed therapies and is a goal of our research. Here we investigated the signaling molecules involved in MR-mediated phagocytosis and other immune functions using a primary human blood-derived macrophage model. *M.tb* infection of macrophages leads to phosphorylation of tyrosine residues in the MR cytoplasmic tail that enable the recruitment of tyrosine kinases which transmit the signals downstream. We have identified several MR-associated proteins by MALDI-TOF and Western blot using peptide pulldown assays with phosphorylated MR cytoplasmic tail peptides. In conclusion, we are identifying key signaling molecules and pathways used by the MR to transmit signals that initiate phagocytosis and other immune-related functions in human macrophages.

MESENCHYMAL STEM CELLS ISOLATED FROM BRONCH-ALVEOLAR FLUID ATTENUATE ENDOTOXIN-INDUCED ACUTE LUNG INJURY IN A PIG MODEL

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Mesenchymal stem (stromal) cells (MSCs) have self-renewing, differentiation and immunoregulatory properties. Therefore, MSCs are being evaluated as cellular therapy for several human diseases/conditions. MSCs are normally isolated from bone marrow. However, MSCs have been shown to exist in other tissues. In the present study, we isolated MSCs from bronchoalveolar lavage fluid (BAL) collected from 4-6 week-old specific pathogen free pigs. BAL-MSCs expressed mesenchymal markers (CD29, CD44 and CD90) and lacked the expression of a hematopoietic marker (CD45). The cells were multipotent and differentiated into osteocytes and adipocytes. BAL-MSCs also possessed immune-modulatory properties and profoundly suppressed the proliferatiion of T cells in response to a mitogenic stimulus. Co-culture of MSCs with T cells caused these cells to produce increased levels of an anti-inflammatory cytokine (IL-10). Next we examined if BAL-MSCs can attenuate endotoxin-induced acute lung injury in pigs. Acute lung injury was induced in 4-5 week-old commercial pigs by intra-tracheal inoculation of *E.coli* lipopolysaccharide (LPS). Twenty four hours after LPS inoculation, PKH26 labelled BAL-MSCs ($2x10^6$/kg) were administered intra-tracheally and 3 days after MSC-inoculation pigs were euthanized. BAL-MSCs were detected in the lungs of lipopolysaccharide-MSC-inoculated pigs. Gross and microscopic lung lesions were significantly less in lipopolysaccharide-MSC-inoculated pigs as compared to lipopolysaccharide-inoculated pigs. There was an upregulation of the anti-inflammatory cytokine (IL-10) in the lungs of MSC-inoculated pigs. These results suggest that MSCs derived from BAL of pigs engraft in the injured lung modulate the inflammatory response and enhance tissue repair in a pig model of acute lung injury.

DEVELOPMENT OF NOVEL CURCUMIN ANALOGS FOR THE TREATMENT OF HEAD AND NECK CANCER

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Head and neck squamous cell carcinoma (HNSCC) remains a major health care problem worldwide, comprising almost 50% of all malignancies in some developing nations. Chemotherapy constitutes the standard modality of treatment for HNSCC. However, many patients fail to respond and relapse after such treatment due to the acquisition of chemoresistance. Therefore, there is an urgent need to develop novel drugs that could reverse the resistant phenotype. Curcumin, the constituent of the spice turmeric has been shown to demonstrate anti-inflammatory, anti-oxidant and anti-proliferative properties. However, use of curcumin has been limited due to its poor bio-absorption. Recently, we have developed a novel class of curcumin analogs, based on diarylidenylpiperidones (DAP), by incorporating a piperidone link to the beta-diketone structure and fluoro substitutions on the phenyl groups. Our results demonstrate that H-4073 (a parafluorinated variant of DAP) is a potent anti-tumor agent and it significantly inhibited cell proliferation in all the HNSCC cell lines tested in a dose-dependent manner. In addition, pretreatment of cisplatin-resistant HNSCC cell lines with H-4073 significantly reversed the chemo-resistance. H-4073 mediated its anti-tumor effects by inhibiting JAK/STAT3, FAK, Akt and VEGF signaling pathways. In the SCID mouse xenograft model, H-4073 significantly enhanced the anti-tumor and anti-angiogenesis effects of cisplatin, with no added systemic toxicity. Interestingly, H-4073 inhibited tumor angiogenesis by blocking VEGF production by tumor cells as well as directly inhibiting endothelial cell function. Taken together, our results suggest that H-4073 is a potent anti-tumor agent and it can be used to overcome chemotherapy resistance in HNSCC.

ROLE OF PRO-OPIOMELANOCORTIN IN WOUND HEALING

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Pro-opiomelanocortin is a precursor polypeptide that is eventually cleaved to form several critical regulatory hormones for the body. Hormones that are produced as a result of the cleavage of POMC include β-endorphin, adrenocorticotropic hormone (ACTH), and α-MSH. POMC has been shown to play a role in energy maintenance and production of adrenal hormones. We have recently reported cross-talk between inflammation and opioid peptides in neutrophils at sternotomy wound-site. However, the role of POMC in wound repair is not known. To determine the significance of POMC at the wound site, we generated POMC gene knockdown heterozygous mice where over 90% decreases in POMC levels were noted as compared to wild type mice. After successful knockdown of the gene, a wound closure study was conducted over the course of 10 days post wounding. Full thickness excisional wounds were placed on the dorsal skin of the mice using a punch biopsy tool (6 mm). An 8 mm silicon stent was placed to prevent local contraction of the wound. A significant ($p<0.005$; $n=4$) delay in wound healing was noted in POMC heterozygous knockdown mice as compared to corresponding age matched wild type mice. Currently studies are ongoing to determine what phase of wound healing is affected by the POMC knockdown. In summary, polymorphonuclear neutrophils at the wound site generate POMC in the inflammatory phase that in turn is required for a successful closure of the wounds. *[Supported by NIH RO1 DK076566(SR), GM069589, GM007185 and NR013898]*

DEVELOPMENT OF A COMPUTATIONAL HISTOLOGIC ASSESSMENT OF DERMAL SCARRING (CHADS) TOOL TO VALIDATE A NOVEL SKIN REGENERATIVE HYDROGEL

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More than 100 million patients acquire scares annually in the developed world. Currently, there is no available anti-scar therapy. Viral over-expression of IL-10 results in postnatal regenerative wound healing. We hypothesize that delivery of IL-10 in a more clinically translatable sustained release hydrogel (HH10) can result in regenerative healing in postnatal wounds. Dorsal wounds in C57BL/6J mice were created ($n=20$) and harvested in 28 days post wounding. Histological evaluation (H&E) and capillary density (CD31 + caps/HPF) of uninjured skin and scars were performed. Observed differences were used to establish 5 quantifiable scar parameters. In vivo wound healing experiments testing the efficacy of HH10 were performed. Treatment groups included HH10, Gel control, Lentiviral IL-10 (LV-IL-10) or PBS ($n=4$/group). Histological analysis demonstrates significant differences between un-injured skin and scar in epidermal height, nuclear orientation of the basal keratinocytes, scar area, dermal appendages and vascular density. HH10 restores epidermal and dermal scar parameters to the levels observed in un-injured skin. HH10 and viral over-expression of IL-10 are equally potent in achieving attenuation of scar. Gel treatment without IL-10 improves wound healing compared to PBS, but not to the levels seen with HH10 or LV-IL-10. Using a novel quantifiable method to assess scars histologically, HH10 results in restoration of epidermal and dermal parameters to the levels observed in unwounded skin, the benchmark of regenerative healing. HH10 obviates some of the translatable concers with IL-10 gene therapy. Therapeutic benefits extend beyond cosmetic benefits and may apply to any disease characterized by excessive fibroplasia.

REPRODUCTION OF SKIN CELLS *IN VIVO*

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Recent advances in in vitro nuclear cell reprogramming have opened up the possibility for the development of patient specific therapies, and are thus a great leap forward in translational regenerative medicine. Although lineage commitment has been thought to be an irreversible process under physiological conditions, new evidence suggests that nuclear cell reprogramming can also be induced in vivo, which could potentially facilitate the transition from the lab bench to the clinic in some cases. Nevertheless, to realize the full potential of in vivo nuclear reprogramming, a safer, more efficient and better-controlled approach for the delivery of complex combinations of reprogramming factors is needed. Although in vivo cell reprogramming has been successfully demonstrated recently, heavy reliance on viral methods is in conflict with clinical applications. Our newly developed nanochannel electroporation (NEP) patch technology allows for non-viral in vitro as well as in vivo gene delivery in a targeted, controlled and benign manner, which is not attainable by existing technologies. Plasmids encoding for specific reprogramming transcription factors were used as model cargo. Tissue transfection was characterized by fluorescence microscopy and qRT-PCR. A specific cocktail of transcription factors was found to be enhanced the transdifferentiation of adult fibroblast into endothelial cells both *in vitro* as well as *in vivo* where ischemic tissues re-gained significant vascularization following NEP-based delivery of such reprogramming factors. Here we explored the reprogramming amenability of adult skin fibroblast to endothelial cells by the use of nano electrotransfection patch.

NEURONAL NA+ CHANNELS AS AN ANTI-ARRHYTHMIC TARGET IN MANAGEMENT OF CATECHOLAMINERGIC POLYMORPHIC VENTRICULAR TACHYCARDIA

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Na^+/Ca^{2+}-imbalance is associated with arrhythmias resulting from diastolic Ca^{2+} release (DCR). Recent evidence suggests Na^+-channel blockade with class IC antiarrhythmics to be a promising therapy for pathologies, including catecholaminergic polymorphic ventricular tachycardia (CPVT). However, the specific mechanism(s) as to how Na^+/Ca^{2+} dysregulation contribute to arrhythmias is unknown. Confocal microscopy of ventricular myocytes isolated from CPVT mice lacking the cardiac calsequestrin was used to assess Ca^{2+} handling response to isoproterenol (Iso) and pharmacological interventions, while electrocardiograms were acquired during catecholamine challenge to assess the roles of various pools of Na^+ channels in CPVT. We identify two pools of Na^+ channels: one composed of cardiac-type Na^+-channels localized to cell periphery, and a '<u>local pool</u>' comprised of neuronal Na^+-channels colocalizing with RyR2 in the T-tubules. Augmenting function of both Na^+-channel pools with ATX-II in the presence Iso resulted in Ca^{2+}-store overload and activation of Ca^{2+}/calmodulin-dependent protein kinase II, which precipitated DCR. These, in turn, translated into frequent arrhythmias in CPVT mice. Selectively functional augmentation of 'local pool' neuronal Na^+-channels with β-Pompilidotoxin precipitated DCR on the cellular level causing frequent arrhythmias during catecholamine challenge *in vivo*. However, increasing local Na^+ fluxes reduced Ca^{2+}-store load suggesting that local elevation in cytosolic Ca^{2+} rather than global Ca^{2+}-store overload underlies DCR and arrhythmias under such conditions. These data suggest two distinct mechanisms for Na^+/Ca^{2+} dysregulation-mediated arrhythmias. The first relies on Ca^{2+}-store overload and the other on local contribution of Na^+-Ca^{2+} exchange to DCR. Importantly, perturbation of the local Na^+-Ca^{2+} signaling is sufficient for arrhythmia reduction.

POSTERS
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5-7 PM

FGF2 AND BDNF: IN SEARCH OF A POTENT INDUCER FOR BONE MARROW DERIVED MESENCHYMAL STEM CELLS INTO DOPAMINERGIC NEURONS

Sujata Mohanty[1], Manisha Singh[1], Sushmita Bose Nandy[2], Rinkey Sharma[1]

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Bone Marrow derived Mesenchymal Stem Cells (BM-MSCs) have been reported to differentiate successfully into dopaminergic (DA) neurons, whose degeneration is the main cause of Parkinson's disease. Different inducers have been employed for *in vitro* differentiation of BM-MSCs into DA neurons. In this study, we selected FGF2 and BDNF and explored their potential as inducers to generate DA neurons from BM-MSCs.

After obtaining Institute Ethical Clearance, cryopreserved BM-MSCs (N=7) were revived and expanded *in vitro* in DMEM-LG with 10% FBS. The basic constituents of the induction media (IM) consisted of neuro-basal media with B27 supplement, L- glutamine, Pen-Strep and epidermal growth factor; however, IM-1 consisted of FGF2 and IM-2 consisted of FGF2 for first nine days and BDNF+ FGF2 for last three days. Un-induced MSCs in expansion medium were treated as control group. Cells of both control and induction groups, were analysed at the end of 12 days for the change in their morphologies, length of the neuritis, relative expression of DA neuron specific genes, expression of neuron specific markers at protein levels by flow cytometry and immunofluorescence.

Cells treated by different inducers showed a remarkable change in their morphology from spindle shaped to elongated cells bearing distinct cell bodies and dendritic outgrowths. Flow cytometric analysis revealed increase in number of cells expressing neuron specific markers in induced BMSCs as compared to control samples. These results were in concordance with confocal microscopy analysis performed for various DA neurons specific proteins.

Based on the above observations, it is inferred that both FGF2 and BDNF act as efficient neuronal inducers. However, BDNF helps further in coaxing BM-MSCs towards dopaminergic neuronal sub-pecification. Our method of neuronal differentiation is both cost effective and time savvy. Further analysis of functionality of these *in vitro* generated dopaminergic neurons will substantiate our results.

OSU - BY THE NUMBERS

Awards by Sponsor:

November 1, 2014, through November 30, 2014

SPONSOR	NO. OF AWARDS	AWARDS AMOUNT
National Institutes of Health	48	$6,867,800
National Science Foundation	7	$698,442
Department of Education	4	$971,279
Department of Defense	17	$2,745,547
Department of Energy	11	$836,955
Department of Agriculture	10	$861,600
National Aeronautics and Space Administration	5	$243,632
Other Federal	6	$134,903
Total Federal	**108**	**$13,360,158**
Industry	192	$4,007,871
State of Ohio	9	$436,541
Private Agencies	24	$1,117,664
Other Non-Federal	1	$40,000
Total Non-Federal	**226**	**$5,602,076**
TOTAL	**334**	**$18,962,234**

Source: (http://us7.campaign-archive1.com/OSU; Office of research)

DEVELOPMENT OF MAGNESIUM-PCL NANOCOMPOSITE BIOMATERIAL FOR ORTHOPEDIC APPLICATIONS

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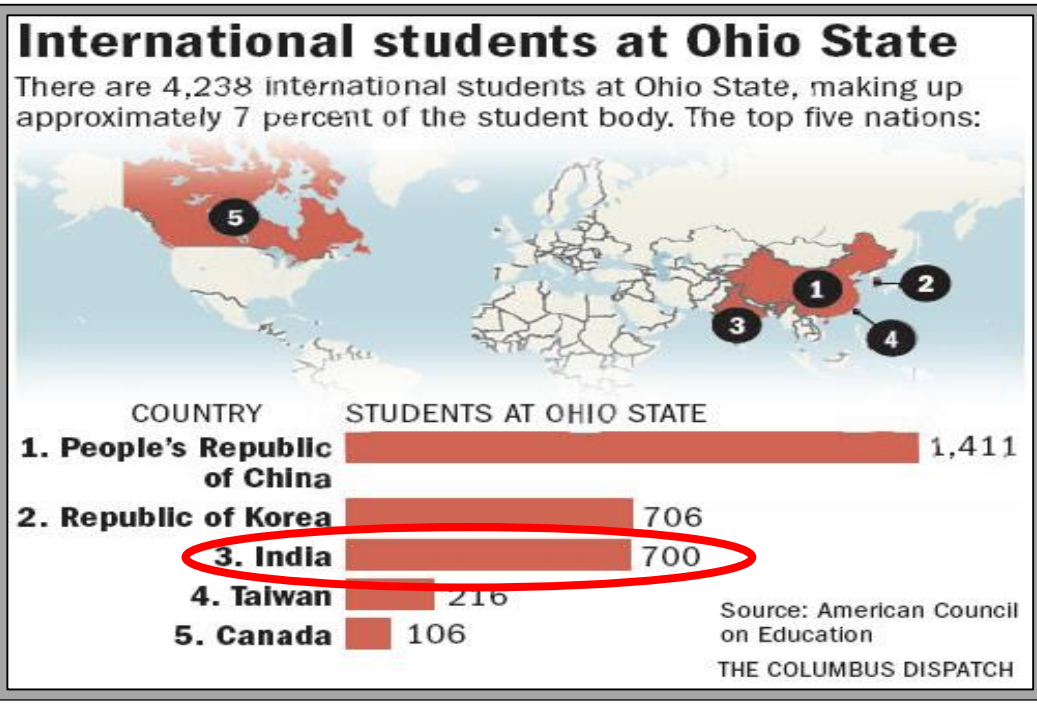
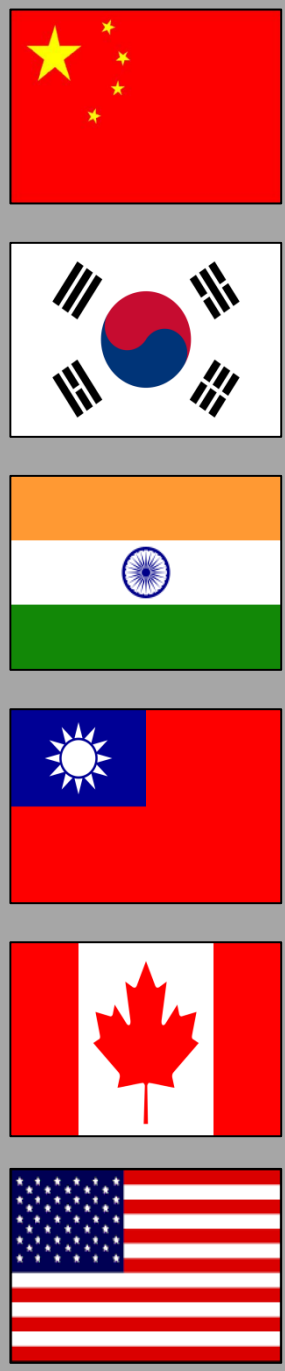
NanoBios Lab, Department of Biosciences and Bioengineering, Indian Institute of Technology Bombay, Mumbai- 400076, India

Introduction: The objective of this piece of research work was to develop nanocomposite (metal nanofillers-Mg in polymer matrix-PCL) biomaterial with mechanical strength matching that of bone (strong and sturdy), good biocompatibility, good osteoconduction and inexpensive in cost, thus, having more chances of mass penetration and mitigating drawbacks of metallic devices while enjoying benefits of polymeric devices which shall benefit the cause. **Methods:** Magnesium nanoparticles (Mg NPs) were synthesized using lithium reduction method. Characterization studies performed using XRD, FEG-SEM/EDX, FEG-TEM, DLS, Zeta analysis, etc. Mg-PCL nanocomposite tensile testing samples (0.5, 1, 3, 5, and 10% of Mg filler) were prepared using twin-screw extrusion followed by injection molding, respectively. Thin sheet samples prepared by compression molding of extrudate were subjected to *in-vitro* studies viz. biomineralization, biocompatibility (cell viability using MTT assay, cell attachment). Crystallization behavior of composites were studied using DSC. **Results:** Characterization studies of magnesium nanoparticles using XRD analysis revealed characteristic diffraction peaks indexed to various crystal planes of hexagonal Mg particles. FEG-SEM/EDX, FEG-TEM, DLS and zeta analysis data showed hexagonal shaped monocrystalline Mg nanoparticles with Mg and O as main constituents, size range of 100-300 nm with PDI 0.24 indicating stability of dispersion and positive surface charge. Mechanical properties (tensile strength and elastic modulus) of the synthesized nanocomposites did not improve significantly, attributed by preservation of crystalline structure of neat PCL in DSC. The findings of these *in-vitro* studies were encouraging as nanocomposites showed better bio-mineralization and comparative cell viability and cell adhesion to pristine polymer. **Conclusion:** Mg-PCL biocomposite can be explored as potential orthopedic biomaterial owing to its excellent bioactivity and biocompatibility, though there is scope for improvement on the mechanical front.





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3D COMPOSITE BONE GRAFT SUBSTITUTE FOR BONE REGENERATION

Kunal Khanna, Atul K Singh, Jayesh R Bellare

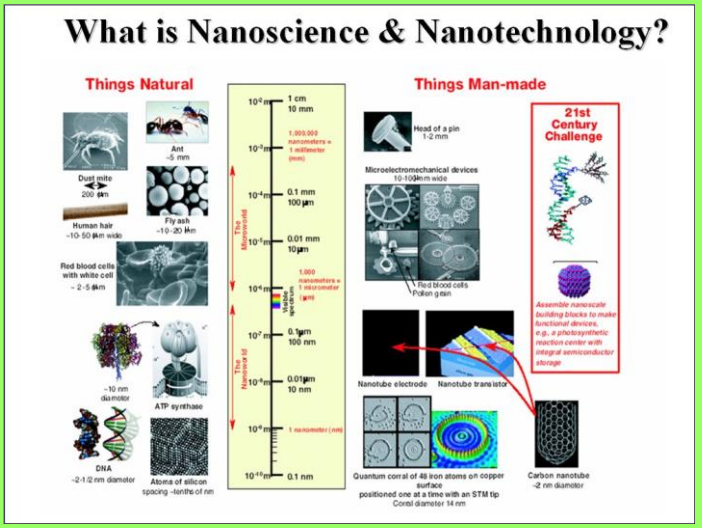
Center for Research in Nanotechnology and Science, IIT-B, Mumbai, India

Department of Chemical Engineering, IIT-B, Mumbai, India

There is a very significant and well-known clinical need for development of new osteo-inductive materials and the establishment of alternative therapies for the treatment of bone tissue loss or failure resulting from injury or disease, as the transplantation of tissues in these patients is severely limited by donor scarcity and is highly associated to the risk of immune rejection and disease transfer. Bone is one of the few tissues in the adult human body whose ability to regenerate spontaneously has long been recognized, provided that the defect does not exceed a certain limit in size. These 'critical-sized defects' can either result from congenital deformities, for example in the skull (cleft palate, facial clefts, facial asymmetry, trauma or tumor resection), or degenerative diseases such as osteoarthritis and osteomyelitis. Three-dimensional porous visco-elastic scaffolds are seen as one approach to enhance bone regeneration by creating and maintaining channels that facilitate cell proliferation. Hence we present studies of our newly developed biodegradable and resorbable materials that are extremely useful to heal periodontal and maxillofacial bone defects: 3-D osteogenic scaffold. The surface morphology and physio-chemical properties of our scaffold revealed that the ionic interactions between groups present in composite of 3-D n-HA/gel/CMC scaffold facilitated structural stability and integrity of the composite scaffold. Evaluation of the *in vivo* performance by Radiography and Micro CT of large defect sites treated with scaffold and membrane showed expedited healing in rabbit tibia model in comparison to sham. Thus, the new materials developed here are ready for human clinical trials and could help in the surgical management of various dental and craino-maxillofacial conditions.

Nanotechnology ("nanotech") is the manipulation of matter on an atomic, molecular, and supramolecular scale. A more generalized description of nanotechnology was subsequently established by the National Nanotechnology Initiative, which defines nanotechnology as *"the manipulation of matter with at least one dimension sized from 1 to 100 nanometers."*

Investments in Nanotech:
USA 3.7 billion dollars.
European Union 1.2 billion
Japan 750 million dollars



- *The concepts that seeded nanotechnology were first discussed in 1959 by renowned physicist Richard Feynman in his talk There's Plenty of Room at the Bottom, in which he described the possibility of synthesis via direct manipulation of atoms.*
- *The term "nano-technology" was first used by Norio Taniguchi in 1974, though it was not widely known.*
- In 1980s two major breakthroughs incepted the growth of nanotechnology in modern era:

1. Invention of the scanning tunneling microscope in 1981 Gerd Binnig and Heinrich Rohrer at IBM Zurich Research Laboratory received a Nobel Prize in Physics in 1986.
2. Fullerenes were discovered in 1985 by Harry Kroto, Richard Smalley, and Robert Curl, who together won the 1996 Nobel Prize in Chemistry

en.wikipedia.org/wiki/Nanotechnology

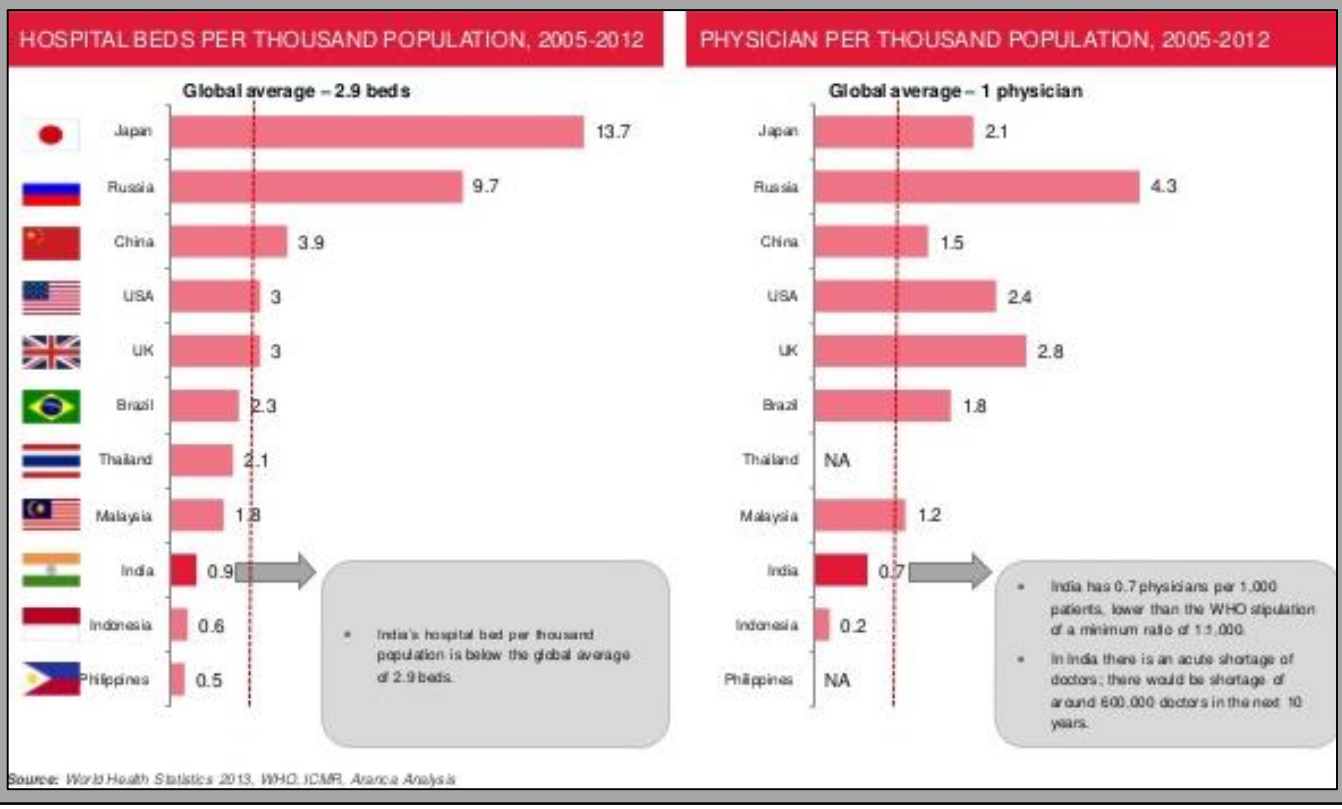
NANO-BIOCOMPOSITES SCAFFOLD FOR BONE RECONSTRUCTIVE SURGERY

Atul Kumar Singh[1], Rohit Teotia[2], S. Vijayalakshmi[1], Jayesh R Bellare*[3]

[1]Centre for Research in Nanotechnology and Science; [2]Department of Biosciences and Bioengineering; [3]Department of Chemical Engineering, Indian Institute of Technology-Bombay, Powai, Mumbai-400076, India

Purpose of the Study: The aim of our study was to develop an ideal bone graft by preparing a nano-bioactive glass (NBG) powder, electrospun membranous (2D) nano-fibers and biodegradable 3D composites as a biomimetic scaffold. **Methodology:** Different compositions of 3D scaffold were prepared using glutaraldehyde (GA) vapor-phase crosslinking with freeze-drying method. Membranous 2D scaffolds were prepared by electrospining. NBG powder was prepared here via sol-gel method. Surface morphology of scaffolds was investigated by SEM and TEM. Surface topography of scaffolds was studied by AFM. Hemocompatibity, simulated body fluid (SBF) soaking studies and biocompatibility of scaffolds were studied with MG63 osteoblast cells and observed by SEM and confocal. *In vivo* implantation of these nano-materials was done in adult male New Zealand white rabbits and SD rats. **Results:** We have successfully prepared NBG particles, 2D and 3D composite biomaterials. SEM micrographs revealed 3D scaffolds with wide distribution of well connected pores (average pores of 250±10μm) and randomly oriented smooth nanofibers (diameter 300-700 nm) in electrospun 2D scaffold. Dark field TEM images confirmed presence of n-HA crystallites in composite matrix. Spiky ridges observed on 3D and 2D scaffolds through AFM suggested efficient surface nucleation of n-HA in presence of gelatin in the scaffold. Hemolysis was found within permissible limit (5%). Cells adhere and grow profusely on both 3D composite and membranous scaffolds, indicating that both 3D composite and 2D membranous scaffolds were suitable for attachment and proliferation of MG63 cells. Hemolysis was found within permissible limit (5%). Bioactivity of NBG powders were confirmed by the development of hydroxyapatite layer (HA) over the surface of NBG pellets after soaking in SBF. *In vivo* performance of nano-materials proves as potential biomaterials for bone regenerative medicine. The ingrowths and bone remodelling observed at the defect site treated with the nano-materials, underscoring their use as a biomaterial for clinical applications, particularly in orthopaedics and dentistry.

Did you know?



INDIGENOUS HOLLOW FIBER MEMBRANE FABRICATION FOR KIDNEY DIALYSIS

Rohit Teotia[1], Surendra Verma[2], Sujith Das[2], Jayesh Bellare[2]

[1]Department of Biosciences and Bioengineering, [2]Department of Chemical Engineering
IIT Bombay, Mumbai-400076, India

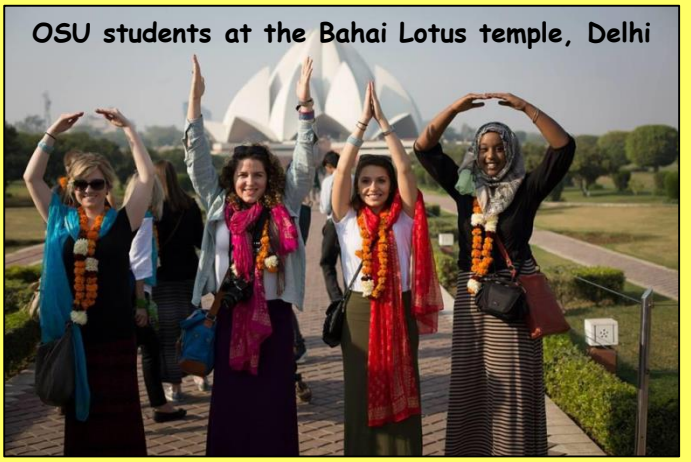
End stage renal disease (ESRD) is complete failure of kidney functions, an unfortunate but widespread medical condition, where kidneys can no longer remove wastes, concentrate urine, and regulate many other important body functions. Diabetes and high blood pressure are two leading causes of ESRD, accounting for more than 60% of cases. Hemodialysis is most effective and widely used mode to regulate kidney functions artificially. Hemodialysis utilizes a dialyzer to perform purification function of the kidney by removing metabolic waste products such as urea, creatinine, uric acid, and inorganic phosphate as well as free water from the blood. The hemodialyzer cartridge (disposable blood filter) is the key component of this treatment technology and is currently imported. The treatment requires long (2-3 hr) and frequent (2-3 times a week) visits at a dialysis centre. The cost and time premium is borne by the patients making it prohibitively expensive for most. The core component of cartridges is hollow fiber membrane.

Our indigenous approach for better HFM fabrication: We have successfully developed indigenous and low-cost pilot plant for continuous production of hollow-fiber membranes for used in hemodialysis and other applications at production rate of several kilometers/day. Membrane morphology and properties which are responsible for the separation performance can be controlled by in-build spinning pilot plant. We have formulated a special membrane material. All biocompatibility results including protein adsorption, oxidative stress, platelet adhesion, contact activation and complement activation claims superior biocompatibility of our membrane. Less protein adsorption and platelet adhesion allows membrane to be reused. Contact activation implies that contact of membrane with blood does not activate any blood coagulation pathways. Complement activation experiment shows no inflammatory response from the body. It is highly efficient in removing urea toxins.

Significance of our product and technology:

1. High performance- 10x greater than commercial hemodialyzer (as our published data)
2. Superior bio-compatibility: Lesser side reactions and improved quality life of renal patient
3. Cost reduction due to indigenous production: Wider population reach
4. Smaller dialysis time due to high flux: Benefits to patients and dialysis centre
5. This could lead to research into newer devices such as implantable/wearable artificial kidneys, including cell based ones, and other bio-artificial organs.

OSU STUDENTS IN INDIA



OSU students at the Bahai Lotus temple, Delhi

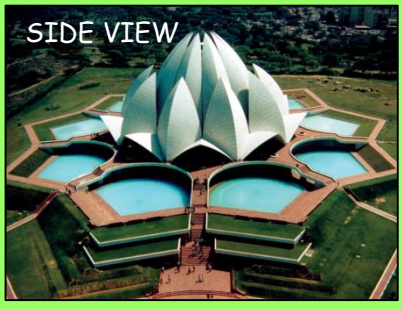
DEVELOPMENT OF HERBAL MICRO-HYDROGELS FOR BONE INJURIES

Shreya Agrawal, Ajay V Suryavanshi,
Bhushan N Kharbikar and R Srivastava
Nanobios Lab, Department of Biosciences and Bioengineering, IIT Bombay, Mumbai, India

Introduction: The objective of this project was to develop a herbal, injectable hydrogel that wound aid in fracture healing without the use of expensive ortho-biologics like bone marrow or bone morphogenetic proteins. Here, we utilized one of the most popular herbs for all bone related diseases in Indian sub-continent. Its bioactive principles have long been utilized as a reliable option for safe osteosynthesis by consuming its powder or applying the paste of its raw stem over the affected area. **Methods**: The hydrogel was prepared by crosslinking chitosan with sodium glycerophosphate under acidic pH. The herbal extract was obtained by hot percolation method. The herbal extract and hydrogel solutions (20% w/v) were blended under magnetic stirring. Physico-chemical and biological properties of bare and herbal hydrogels were investigated by characterization methods viz. ESEM, EDX, rheometry, gel degradation studies, drug release studies and *in vitro* cytocompatibility studies with L929 and MG63 cell lines using MTT assay. **Results**: The characterization results revealed that the hydrogel shows sol-gel transition at body temperature. Its surface morphology indicated presence of around 40 µ pore size to allow cell infiltration and osteo-conduction. Herbal hydrogel showed a degradation window of around 6 weeks, better biocompatibility and osteogenic properties as compared to plain hydrogel. It also induced hydroxyapatite crystal formation on osteoblast cells in simulated body fluid conditions. **Conclusions:** Results of the preliminary studies were encouraging and as-synthesized herbal hydrogels can be further explored for their potential towards fracture healing.

The Lotus Temple, located in New Delhi, India, is a Bahá'í House of Worship completed in 1986. Notable for its flowerlike shape, it serves as the Mother Temple of the Indian subcontinent and has become a prominent attraction in the city. The Lotus Temple has won numerous architectural awards and been featured in hundreds of newspaper and magazine articles. Like all other Bahá'í Houses of Worship, the Lotus Temple is open to all, regardless of religion, or any other distinction, as emphasized in Bahá'í texts.

http://en.wikipedia.org/wiki/Lotus_Temple



DEVELOPMENT AND EVALUATION OF BUCCO-ADHESIVE CONTROLLED RELEASE DELIVERY SYSTEM OF ATENOLOL

Jeethendra R. Babel, Bandarapalle Kishore, Satish C.S
Department of Pharmaceutics, PES College of Pharmacy, Bangalore-560050, Karnataka, India

The present work aims to prepare and characterize bucco-adhesive tablets of Atenolol using different muco-adhesive polymers such as chitosan, carbopol 934, sodium alginate and hydroxypropyl methylcellulose (HPMC) K4M in combinations. The formulation of buccal tablet dose is released at a slow rate due to the presence of the polymers of different concentrations. All the buccal tablet formulations were subjected to pre-compression and post-compression evaluation. *In vitro* drug release from the formulations were studied using buffer pH 6.8. From *in vitro* studies, formulations F10, F16, F17, F18 were selected for muco-adhesive studies. Formulations F16, F17, F18 were selected for *ex vivo* permeation studies using buffer pH 7.4. After all studies, formulation F18 containing chitosan, carbopol 934 and Hydroxypropylmethylcellulose (HPMC) K4M in the ratio of 4:3:1 selected as optimized formulation showed zero order release with optimum bucco-adhesive strength and exhibiting optimum drug release. Fourier Transform Infrared Radiation (FTIR) results showed no evidence of interaction between the drug and polymers.

THE BAHAI LOTUS TEMPLE – AN ARCHITECTURAL MARVEL

Guided by our vision of a world free of malnutrition, we guide original nutrition research, disseminate its findings and facilitate dialog to bring about positive change.

We work to ensure this through our three strategic areas which are to
» advance research,
» share best practice
» mobilize support
for the undernourished people of the world.

FORMULATION AND EVALUATION OF CHRONOMODULATED AND PULSATILE DRUG DELIVERY OF 5-FLUOROURACIL

Gaurav Ramesh Bhalkar, Ramkrishna, S.J. Shankar

Department of Pharmaceutics, PES College of Pharmacy, 50 Feet road, Hanumanthanagar, Bangalore – 560050, Karnataka, India

The severity of adverse effects varies as a function of choice of when during the 24 hrs the peak dose of medications was timed. The optimal chronomodulated schedule corresponds to peak rates at 4 pm for Oxaliplatin and at 4 am for 5-fluorouracil. The present study was aimed to develop the chronomodulated chemotherapeutic folfox regimen into an oral dosage form with novel tablet in a capsule technique. Coating the capsules with a pH sensitive polymer, Eudragit S 100 facilitates the colon targeting and the presence of an erodible polymer coat of Eudragit RSPO on the 5-fluorouracil tablet besides the presence of alginate in the tablet facilitates its controlled release. Based on its solubility profile, Oxaliplatin micro particles were prepared by using ionic gelation technique, the micro particles were prepared in 0.5% w/v acetic acid solution in the presence of sodium alginate, chitosan and Ca^{2+} ions with 60% yield and 68% encapsulation efficiency for the formulation A14M. FTIR and DSC studies show no chemical interactions between the drugs and the polymers used. The invitro, exvivo studies were carried out for 24 hrs. When administered at 7 am, 79% and 78% for Oxaliplatin at 4 pm, 74% and 76% for 5-fluorouracil at 4 am was released in *in-vitro*, *ex-vivo* studies respectively. The release profiles follow Korsmeyer Peppas model. Stability studies were conducted according to the ICH guidelines for A14T and A14M and the results showed that the formulations were stable.

A NOVEL NANOCARRIER BASED AMPHOTERICIN B DELIVERY SYSTEM FOR TREATMENT OF LEISHMANIASIS

Madhusudan Bhat[1], Amit Ranjan Maity[1], Susmita Mitra[2], Amit Kumar Dinda[1]

[1]Department of Pathology, All India Institute of Medical Sciences, New Delhi, India

[2]Amity Institute of Nanotechnology, Amity University, Noida, India

Amphotericin B (AmB), a polyene antibiotic, is known to be highly effective for the treatment of Leishmaniasis and systemic fungal infections, but its high nephrotoxicity in addition to other side effects have increased the health-risk related to use of the free drug. Liposomal carriers of AmB such as Ambisome and Amphicil have reduced the drug toxicity and enhance efficacy but they have disadvantages like instability in circulation and low shelf life. The objective of the following investigation was to develop a cost-effective nano-delivery system for AmB. Here, we engineered amphiphilic chitosan graft co-polymer with a hydrophobic core constituted by cholestrol. AmB was loaded into hydrophobic core. Size of the drug loaded NPs was 180 ± 7nm (TEM) and zeta potential of the nanoparticles was -3.7 ± 1.2mV. HPLC analysis revealed 70 ± 1% drug loading efficiency. The drug loaded NPs were hemo-compatible (<1% hemolysis) with 100% viability tested on J774 cell line (MTT Assay). H_2DCFDA assay revealed that there was no ROS generation. Rapid uptake of the drug loaded NPs by the macrophage cells were noted starting from 2 minutes with immobilization of intracellular parasite (*L. donovani*) within 3 hours and their lysis by 6 hours. Flow cytometric study with GFP expressing *L. donovani* also confirmed high parasitocidal activity. Confocal microscopic study revealed endosomal escape of the dye loaded NPs within 6 minutes and co-localization with parasitic vacuole. The present nanocarrier is stable, low cost and has a high efficacy against Leishmania infection suggesting it high translational potential.

FOR NAVIGATING THIS SOUVENIR BOOK SEE COLOR CODING ON PAGE 32

EVALUATION OF ANTI-HYPERTENSIVE EFFECTS OF LYCOPENE IN RATS

Mayank Bhatt[1], Shivalinge Gowda KP
Department of Pharmacology, PES College of Pharmacy, Bangalore – 560050, Karnataka, India

Based on the ethno-pharmacological use of lycopene in the treatment of hypertension, this study was designed to evaluate its anti-hypertensive effects in rats. Rats were divided into 5 groups (n=6). Group I was considered as normal control, group II received lycopene (30 mg/kg p.o.), group III received fructose (10 % w/v p.o.), group IV lycopene + fructose (30 mg/kg p.o. +10 % w/v p.o.) and captopril (20 mg/kg p.o.) for 6 week. After 24 h, animals were separated and invasive BP (carotid artery cannulation) and ECG was measured by AD instruments and power lab software. After cannulation the animals were connected to the data acquisition system (Power lab) for the recording of BP and ECG. After the experiment the rats were sacrificed using a recommended anaesthetic agent (Ketamine 100 mg/kg).From the results of this study, it was concluded that the lycopene showed a significant anti-hypertensive effect in fructose induced hypertensive rats.

OSU News

Student-founded biotech company garners business plan competition awards

Genetesis LLC, a biotech company founded by Peeyush Shrivastava, a second year biomedical science major, was one of four companies to receive $250,000 in the 43 North Business Plan Competition, the world's largest business idea competition. Genetesis was selected as a finalist from more than 6,900 applicants from 96 countries and all 50 states. The company's technology is geared towards optimizing drug design for the treatment of heart rhythm disorders through the application of novel algorithms that analyze real-time functional heart electrophysiology. Genetesis also won the $10,000 People's Choice Award for generating the most tweets using a designated hashtag unique to their company over a two week period.

http://us7.campaign-archive1.com/OSU
(Office of research)

FORMULATION AND *IN VITRO* EVALUATION OF HYDROGELS CONTAINING AN ANTI-HYPERTENSIVE DRUG AS SUSTAINED DRUG DELIVERY SYSTEM

Chandrasekar Likitha, Venkata Anusha Mantena, Satish C.S.
Department of Pharmaceutics, PES College of Pharmacy, Bangalore-560050, Karnataka, India

In the present study, pH-sensitive Losartan hydrogels using Gelatin and acrylamide (AAm) was prepared for the controlled release of Losartan. The hydrogels were synthesized by free radical polymerization technique. Ammonium persulphate (APS) was used as polymerization initiator. N,N′-Methylene bisacrylamide was used for crosslinking of acrylamide and gelatin to form IPN. Eight formulations were prepared by varying the concentration of polymers and crosslinking agents in order to study the swelling and *in vitro* drug release profiles. The amount of APS was kept constant in all the formulations. The compatibility of drug with the polymers was confirmed by Fourier transform infrared spectroscopy (FT-IR) and Differential scanning calorimetry (DSC). The X-ray diffraction (XRD) studies were carried out to check the nature of the drug in the hydrogels formulations. The IPN hydrogels swelled in alkaline pH and swelling was minimal in acidic pH. It was found that as the concentration of crosslinking agents were increased, there was a decrease in swelling. The release data showed that, as the concentration of acrylamide was increased; swelling decreased in the acidic pH but increased in the basic pH resulting in increased release of the drug in the intestine. The preliminary results suggest that acrylamide and gelatin IPN hydrogels can be used for the pH sensitive sustained release drug delivery of Losartan.

INHIBITION OF T-CELL MEDIATED HYPER-INFLAMMATORY RESPONSES BY STEROIDAL LACTONE VIA DIRECT INTERACTION WITH CELLULAR THIOLS AND BLOCKING NF-kB:DNA INTERACTION

Lokesh Gambhir, Rahul Checker, Deepak Sharma and Santosh K. Sandur

Radiation Biology & Health Sciences Division, Bioscience Group, Bhabha Atomic Research Centre, Mumbai, India

Withaferin A (WA), a steroidal lactone isolated from the ayurvedic medicinal plant *Withania somnifera*, has been shown to suppress NF-kB pathway in multiple tumor cell types. However, its effect on T cell mediated immune responses and the mechanism underlying NF-kB suppression remains to be elucidated. Since NF-kB is a redox sensitive transcription factor indispensable for mitogen induced inflammatory responses, the present study was undertaken to explore the molecular mechanism of inhibitory action of this transcription factor. WA inhibited mitogen induced nuclear translocation of NF-kB in lymphocytes and suppressed the direct binding of nuclear NF-kB to its consensus sequence which was significantly abrogated in the presence of reducing agent. MALDI-TOF analysis using a synthetic NF-kB p50 peptide containing the Cys-62 residue suggested that WA can modify the critical cysteine residue of NF-kB. Further, WA inhibited mitogen induced T-cell and B-cell activation and proliferation in vitro. It also suppressed T cell effector function by inhibiting secretion of IL-2, IL-4, IL-6 and IFN-γ. WA increased basal reactive oxygen species (ROS) levels, depleted intracellular GSH/GSSG ratio and abrogated the immunosuppressive effects of WA by thiol containing anti-oxidants. The redox modulatory effects of WA in T cells were attributed to the direct interaction of WA with GSH. WA treatment of allogenic lymphocytes delayed induction of graft-versus-host disease *in vivo*. In conclusion, our results indicate that perturbation in cellular redox status due to interaction with cellular thiols and direct inhibition of NF-kB binding to DNA might be responsible for its anti-inflammatory effects.

FOR INFORMATION ON DANCE TROUPE PERFORMANCES AT GALA DINNER SEE PAGE 71

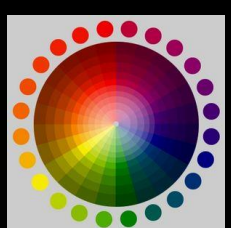
SILVER-ZINC COUPLED BIOELECTRIC DRESSING DISRUPTS BACTERIAL BIOFILM BY TARGETING QUORUM SENSING AND ANTIBIOTIC RESISTANCE

Piya Das Ghatak[1], Jaideep Banerjee[1], Savita Khanna[1], Sashwati Roy[1], Craig Herman[1], Jay L Zweier[1], Daniel Wozniak[1], Chandan K Sen[1].

[1]Comprehensive Wound Center, Davis Heart & Lung Research Institute, The Ohio State University Wexner Medical Center, Columbus, OH

Pseudomonas aeruginosa biofilm is often associated with chronic wound infection. BED consists of a matrix of silver-zinc coupled biocompatible microcells, which in the presence of conductive wound exudate gets activated to generate electric field (0.3- 0.9V). Growth (O.D and CFU) of pathogenic *Pseudomonas aeruginosa* strain PAO1 in LB media was markedly arrested in the presence of the BED ($p<0.05$, n=4). PAO1 biofilm was developed in vitro using a polycarbonate filter membrane model. Grown overnight in LB medium at 37ºC bacteria were cultured on sterile polycarbonate membrane filters placed on LB agar plates and allowed to form a mature biofilm for 48h. The biofilm was then exposed to BED or placebo for the following 24h. Structural characterization using scanning electron microscopy demonstrated that BED markedly disrupted biofilm integrity in a setting where no significant effect was observed using a commercial silver dressing commonly used for wound care. Staining of extracellular polymeric substance, PAO1 staining and a vital stain demonstrated decrease in biofilm thickness and number of live bacterial cells in the presence of BED (n=4). BED repressed the expression of quorum sensing genes lasR and rhlR ($p<0.05$, n=3). BED was also found to generate micromolar amounts of superoxide (n=3) which are known reductants and represses genes of the redox sensing multidrug efflux system mexAB and mexEF (n=3, $p<0.05$). BED also down-regulated the activity of glycerol-3-phosphate dehydrogenase, an electric field sensitive enzyme responsible for bacterial respiration, glycolysis, and phospholipid biosynthesis ($p<0.05$, n=3). This work presents first evidence on the molecular basis of the anti-biofilm properties of BED.

For navigating this souvenir book see color coding on page 32



WOMEN ARE MORE VULNERABLE TO NCDS IN RURAL BENGAL

Sujay Ghosh[1], Dipesh Kr. Das[2], Tapas Saha[2] & Partha Sarathi Mukherjee[2]

[1]Institute of Post Graduate Medical Education & Research, Kolkata, [2]Liver Foundation, West Bengal, Kolkata, West Bengal, India

Background: Non-communicable diseases (NCDs) contribute nearly half of all deaths in India and significant morbidity and disability. Prevalence of NCDs is also increasing in rural India. As 'the risk factors of today are the diseases of tomorrow', therefore identification of such factors and periodical assessment are very important to prevent NCDs at the present time. **Objective**: Determine the prevalence of common risk factor of NCDs in a rural population for proper allocation of resources. **Method:** This cross-sectional study was conducted in 8 villages of Birbhum district (September to November 2013). We evaluated 166 males and 230 females, aged 18 years and above. All the subjects were apparently healthy and without any medication. Anthropometrical measurements like Height, Weight, Waist Circumference (WC), Hip Circumference were measured. Body Mass Index (BMI), Waist Hip Ratio (WHR) was calculated and different biochemical markers like Blood Pressure (BP), High Density Lipoprotein (HDL), Triglycerides, C-Reactive Protein (CRP), Fasting Blood Sugar (FBS) were estimated. **Results:** It was found that women were more likely to be hyperglycaemic (21% vs 20%), hypertensive (25.3% vs 23.5%), dyslipidaemic (lower HDL 85% vs 70%), obese/overweight (30.8 vs 13.8%), with elevated hsCRP (21% vs 18%) especially with greater central obesity (as defined by waist circumference 19.1% vs 4.2%).It was also observed that 2.43% men and 7.65% women showed metabolic syndrome when BMI, HDL and BP were considered. On the other hand 4.26% men and 9.36% women showed metabolic syndrome when WC, HDL and BP were considered. **Conclusion:** The prevalence of metabolic risk factors is more among the rural women than their male counterpart.

NITRONES REDUCE HYPERGLYCEMIA-INDUCED ENDOTHELIAL DYSFUNCTION IN BOVINE AORTIC ENDOTHELIAL CELLS

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Nitric oxide derived from endothelial nitric oxide synthase is largely what allows the endothelium to regulate vascular homeostasis. Endothelial dysfunction is “characterized by a shift of actions in the endothelium toward reduced vasodilatation, a pro-inflammatory state and prothrombic properties”. Complications due to this dysfunction include; atherosclerosis, diabetes, chronic coronary heart disease, and heart failure. Specifically in diabetes mellitus type 2, elevated levels of intracellular glucose increase cellular reactive oxygen species (ROS) generation through enzymes (NADPH oxidase and xanthine oxidase), increased mitochondrial metabolism (Electron Transport chain, ATP production) and direct glucose oxidation. Because antioxidant enzymes (superoxide dismutase, catalase, glutathione peroxidase) are unable to suppress increased ROS formation, radicals damage important enzyme such as endothelial nitric oxide synthase. Nitrones like α-phenyl-n-tert-butyl nitrone and 5,5-dimethyl-1-pyrroline-N-Oxide nitrone, stabilize radical anions through spin trapping. Furthermore, nitrones have been shown to modulate endogenous antioxidant enzyme activities, as well as restored endothelial nitric oxide synthase functionality after ROS induced dysfunction. This study assessed whether nitrones could reduce endothelial dysfunction in a hyperglycemic system. We observed that the nitrones indeed decreased intracellular ROS concentrations; specifically, we witnessed a substantial decrease in superoxide radicals, effectively diminishing the formation of other ROS. Hyperglycemic bovine aortic cells treated with 50 µM of various nitrones had increased viability, lower mitochondrial membrane potentials in comparison to hyperglycemic cells, and increased NO bioavailability. These results suggest that nitrones are able to reduce hyperglycemia induced endothelial dysfunction and increase nitric oxide bioavailability in BAECs

FORMULATION AND *IN VITRO* EVALUATION OF SUSTAINED RELEASE MATRIX TABLETS OF AN ANTI-DIABETIC DRUG USING INTERPOLYMER COMPLEX

Sona Elizabeth Jacob, Shankar S.J, Anudeep Kalikonda

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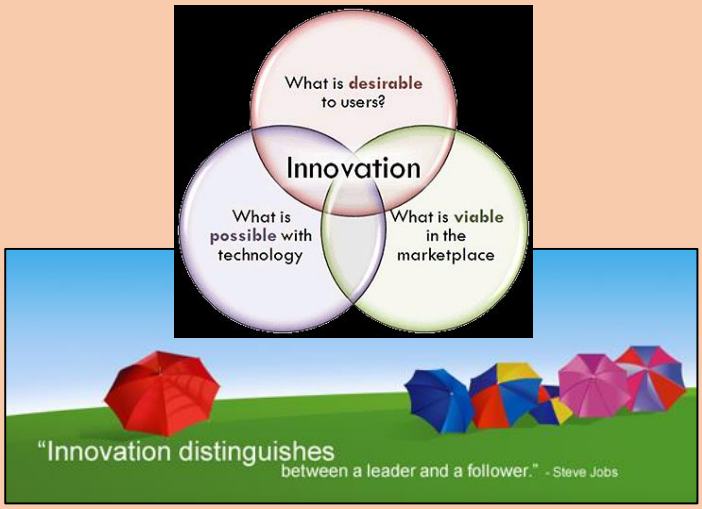
Matrix tablets based on chitosan and carbopol, which were complexed to form inter-polymer complexes were employed as matrices for studying the release of gliclazide, an anti-diabetic drug. The inter-polymer complexes were used as a rate-controlling polymer. The release kinetics of gliclazide was evaluated in pH 1.2 HCl buffer solution, phosphate buffer of pH 7.2 at 37°C. The drug release in phosphate buffer was slower compared to HCl buffer of pH 1.2. Fitting the data of release studies in Peppas model indicated that the release of drug from IPCs in phosphate buffer of pH 7.2 and pH 1.2 showed both zero order and non-Fickian diffusion mechanisms. With increasing carbopol percentage in the inter-polymer complex, rate of drug release was retarded and almost the entire loaded drug was released within 24 hours in phosphate buffer (pH 7.2) for the optimized formulation.



FORMULATION AND EVALUATION OF EXTENDED RELEASE HYDROGEL OF AN ANTI-RETROVIRAL DRUG

Kapadiya Palak, SJ Shankar, Reddy P Premkumar

Department of Pharmaceutics, PES college of Pharmacy, Banglore-560 050, Karnataka, India

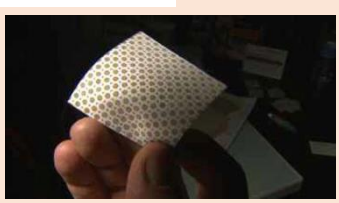
An alginate–guar gum hydrogel cross linked with glutaraldehyde was used for the extended delivery of stavudine by inotropic gelation technique. The cross linked alginate–guar gum matrix was used for drug loading process and performed in aqueous environment. The release profiles of stavudine hydrogels were studied using simulated gastric and intestinal media. The beads having an alginate to guar gum percentage combination of 2.4:1.6 showed desirable characters like better encapsulation efficiency and bead forming properties. The glutaraldehyde concentration giving maximum (100%) encapsulation efficiency and the most appropriate swelling characteristics was found to be 0.5% (w/v) and ionic solution concentration as 0.5% (w/v). Presence of guar gum and glutaradehyde crosslinking increased entrapment efficiency and prevented the rapid dissolution of alginate in higher pH of the intestine, ensuring a controlled release of the entrapped drug. Twelve formulations were prepared by varying drug-polymer ratio and concentration of polymers and crosslinking agents in order to study the swelling and *in vitro* drug release profiles. The compatibility of drug with the polymers was confirmed by Fourier transform infrared spectroscopy (FT-IR), Scanning electron microscopy (SEM) and Differential scanning colorimeter (DSC).

FORMULATION AND EVALUATION OF MUCO-ADHESIVE TABLETS OF AN ANTI-INFLAMMATORY DRUG USING INTER POLYMER COMPLEX

Anantha Nanduri, Shankar S.J., Ganeshwar Reddy

PES College of Pharmacy, Bangalore, Karnataka – 560050, India

Sustained release tablets based on muco-adhesive polymers like chitosan (CH), Sodium Alginate (SA), Pectin (PE), were complexed to form inter-polymer complexes of CH-SA and CH-PE and were employed for studying the release of Ibuprofen, a non-steroidal anti-inflammatory drug. The inter-polymer complexes were used as rate-controlling polymers. The tablets were prepared by wet granulation technique and were subjected to pre-compression and post-compression evaluation. The *in vitro* release rate of Ibuprofen was evaluated in a pH 1.2 HCl buffer solution and a pH 7.2 phosphate buffer at 37ºC. When the rate of drug release from the tablets containing CH-SA and CH-PE inter-polymer complexes was compared, it was found that increasing pectin percentage in the inter-polymer complexes retarded the rate of drug release more than sodium alginate and almost the entire loaded drug was released within 12 hours in phosphate buffer for the optimized formulation. Fitting the data of release studies in Peppas model indicated that the release of drug from IPCs in acidic buffer of pH 1.2 and phosphate buffer of pH 7.2 showed non-Fickian diffusion mechanisms.



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http://procellera.com/news-events/in-the-news

DEVELOPMENT AND EVALUATION OF BUCCO-ADHESIVE CONTROLLED RELEASE DELIVERY SYSTEM OF CARVEDILOL

Ashritha K, Satish C.S., Pole Sandeep Kumar

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The present work aims to prepare and characterize bucco-adhesive tablets of Carvedilol using different muco-adhesive polymers such as carbopol 971P, sodium carboxy methylcellulose, hydroxypropyl methylcellulose K4M and hydroxypropyl methylcellulose K15M in combinations. All the buccal tablet formulations were subjected to pre-compression and post-compression evaluation. *In vitro* drug release from the formulations was studied using buffer pH 6.8. From *in vitro* studies, formulations F7, F9, F10, F14 and F15 were selected for muco-adhesive studies. Formulations F10, F14 and F15 were selected for *ex vivo* permeation studies using buffer pH 7.4. From these studies, formulation F14 containing hydroxypropyl methylcellulose K4M, hydroxypropyl methylcellulose K15M and carbopol 971P in the ratio of 3:2:1 were selected as an optimized formulation showing zero order release with optimum bucco-adhesive strength and exhibiting optimum drug release. Fourier Transform Infrared Spectroscopy results showed no evidence of interaction between the drug and polymers. The results indicated that delivery of Carvedilol to the systemic circulation via the buccal route improved its bioavailability and also was found to be stable during stability studies conducted for 3 months as per ICH guidelines.

Council of Scientific and Industrial Research (CSIR) established in 1942, is an autonomous body and India's largest research and development (R&D) organisation, with 37 laboratories and 39 field stations or extension centres spread across the nation, with a collective staff of over 17,000.

- Developed the first transgenic Drosophila model for drug screening for cancer in humans.
- First to introduce DNA fingerprinting in India.
- Topped list of holders of U.S. patents.
- Successfully challenged the grant of patent in the USA for use of haldi (turmeric) for wound healing & neem as insecticide.
- In 2009, completed the sequencing of the Human Genome.

http://en.wikipedia.org/wiki/Council_of_Scientific_and_Industrial_Research

ISOLATION AND *IN VITRO* EVALUATION OF DIARYLHEPTANOIDS FROM *ZINGIBER OFFICINALE*

Ramya Krishna T*, Baby Sai Sri, Abhilash K, Gururaja G M, Deepak M, Shekhar Dethe, Saravanan J.

*Phytochemistry Dept, R & D Centre. Natural Remedies Pvt Ltd. Bengaluru, 560050; *PES College of pharmacy, Bengaluru-560050, India*

Zingiber officinale (Zingiberaceae) commonly known as Sunthi/ginger is an important drug of Indian System of Medicine and used traditionally since long time. Ginger has been reported to possess various pharmacological activities such as anti-emetic, anti-pyretic, analgesic, anti-arthritic, and anti-inflammatory activities. The aim of the study was the isolation of marker compounds and evaluation for anti-cholesterol activity. The dried, coarsely powdered ginger was extracted with methanol, three times and concentrated to get a thick paste. The extract was further chromatographed over silica and finally purified by using preparative HPLC. The chemical constituents from *Zingiber officinale* rhizomes are diarylheptanoids, namely 3- acetoxy- 1,5- epoxy-1- (3,4-dihydroxy-5- methoxyphenyl)-7- (4- hydroxy-3-methoxyphenyl) heptane, 1,5-epoxy-3-hydroxy-1-(3,4-dihydroxy-5- methoxyphenyl)-7-(4- hydroxy-5-methoxyphenyl) heptane, 5-hydroxy-1-(4-hydroxy-3-methoxyphenyl)-7-(3,4-dihydroxy-5-methoxyphenyl) heptan-3-one are isolated. The chemical structures of these compounds were characterized and identified by spectral analyses and quantified by HPLC. All individual compounds were tested by lipase inhibition assay for anti-cholesterol activity. Encouraging results were obtained.

LIPID BASED NANOPLATFORM FOR TRANSDERMAL IRON DELIVERY

Mudra Kapoor and Rinti Banerjee

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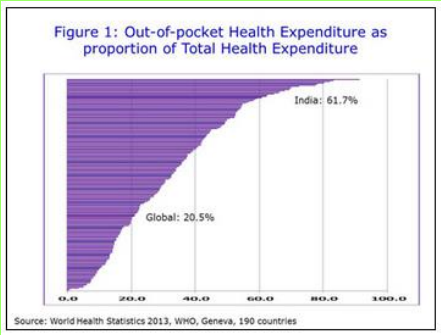
Introduction: Iron-deficiency anemia (IDA) affects more than 500 million people worldwide. Oral supplements are easily available in market but gastrointestinal (GI) irritation, nausea and constipation forestalls patient compliance. We have developed a novel treatment for IDA using transdermal micronutrition of ferrous through lipid based nanocarriers which is gentle on skin and bypasses GI tract and other undesired effects. The current work deals with formulating Ferrous liposomes prepared using unique combination of lipids to fluidise stratum corneum, which are conjugated to Ferrous bisglycinate(Febg) via amide linkage. These liposomes will deliver ferrous directly through skin into systemic circulation without external energy source and potentially improve patient experience and compliance. **Methods & Results:** Febg liposomes are prepared, characterized and incorporated into dermal and eye cosmetics for daily supplementation of iron.70% Febg was conjugated to phospholipid and unsaturated fatty acid liposomes analysed by ICP. Mean particle size of nanoparticles were 75 ± 4.05 nm, zeta potential -23.57 ± 1.3 meV and polydispersity 0.21. Surface morphology was studied by FEG-TEM and SPM techniques which shows floral cluster of spherical liposomes. Iron nanoparticles embedded in cosmetics showed efficacious ferrous release *invitro* performed on excised rat skin and goat intestinal mucosa. **Conclusion:** These particles have shown reproducible results *invitro* and have potential for commercial iron supplementation especially for women at reproductive age, pregnancy and during menopausal period.

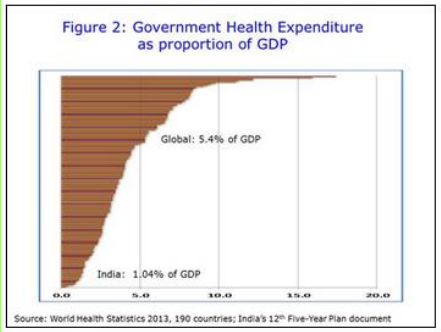
DEVELOPMENT OF NOVEL BIO-INSPIRED MICRONEEDLE-BASED TRANSDERMAL ANTI-EMETIC PATCHES FOR MANAGEMENT OF CHEMOTHERAPY INDUCED NAUSEA AND VOMITING

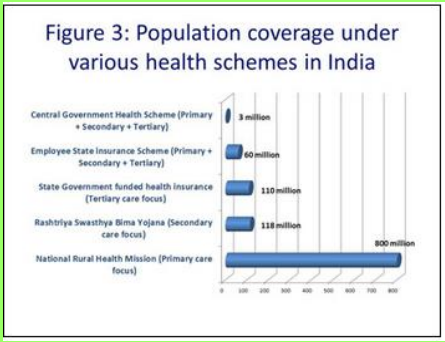
Bhushan N Kharbikar, Sayantan Ghosh, and Rohit Srivastava

NanoBios Lab, Department of Biosciences and Bioengineering, Indian Institute of Technology Bombay, Mumbai- 400076, India

Introduction: Prevention and control of emesis are paramount in the treatment of cancer patients. The widely accepted routes for administering anti-emetics are oral and parenteral. These routes have several disadvantages viz. poor patient compliance, painful injections, non-feasible self-administration, high-cost, poor bio-availability and lack of programmability. This piece of work focuses on developing a novel bio-inspired microneedle-based transdermal drug delivery patches which imitate parenteral administration with lower doses of drugs resulting in lesser notified side-effects and better patient compliance. **Methods:** We researched natural microneedles viz., cactus spine and wasp sting, mosquito fascicle and commented on the applied model for ensuring the structural integrity of the microneedles. We fabricated hollow silicon microneedles with the optimized parameters using DRIE characterized using SEM. Mechanical characterization viz., nano-indentation, compression testing was carried out for its structural stability. We fabricated PDMS drug chamber by soft lithography and loaded the drug. Integration of PDMS drug chamber with microneedle was carried out using PDMS as glue to give completed microneedle drug delivery device. We performed *ex-vivo* skin permeation studies using Si-microneedle on rat skin using a model drug. Further we performed *in-vitro* cytotoxicity studies on L929 murine fibroblast cell line. **Results and Conclusion:** We have successfully fabricated a silicon microneedle. Physicochemical and mechanical characterization established the microneedle's structural stability. *In-vitro* cell viability testing established its biocompatibility and *ex-vivo* model drug permeation test proved that the design is suitable for drug delivery in all respects like programmability etc. We have successfully completed the system integration for a bio-inspired microneedle based transdermal anti-emetic patch.







A COMPARATIVE VIEW OF HEALTH RELATED EXPENSES IN INDIA

FORMULATION AND EVALUATION OF ORALLY DISINTEGRATING TABLETS OF CETIRIZINE HYDROCHLORIDE

Alca B. Kurian[1], Manjula Talluri[2], Dinesh M. Chandra[3]

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Cetirizine hydrochloride is an anti-histaminic agent. In the present study, an attempt was made to mask the bitter taste of Cetirizine hydrochloride by using ion exchange resin Kyron T-114 and to formulate an optimized formula using super-disintegrants. The ion exchange resin complex was prepared by batch technique. Various parameters viz., drug: resin ratio, pH, temperature and stirring time were optimized to successfully formulate the tasteless drug resin complex. The drug resin complex was evaluated for taste *in-vitro* evaluation. The obtained drug resin complex was formulated into oro-dispersible tablets. Conventional method of preparation of oro-dispersible tablets involving a compaction process was adopted for the preparation of the formulation. Various super-disintegrants were tried viz., croscarmellose sodium, sodium starch glycolate and crospovidone in different concentrations and were evaluated for pre-compression, post-compression parameters and *in-vitro* dissolution studies. Drug release from drug resin complex in salivary pH 6.8 (phosphate buffer pH 6.8) was insufficient to impart bitter taste. Complete drug release was observed at gastric pH 1.2 (0.1 N HCl). The formulation F010 with 5% crospovidone showed a comparative result with that of reference product. F010 was kept for stability studies in different conditions of 25 ºC/ 60% RH, 30º C/ 65% RH and 40 ºC/ 75% RH for 1, 2 and 3 months for each condition respectively. It was concluded that F010 is the best formulation in supporting industrial standards which showed comparative results with that of reference product.

DEVELOPMENT OF CONTROLLED RELEASE SPONGE FOR PREVENTION AND TREATMENT OF ORTHOPAEDIC DEVICE RELATED INFECTION

Vaishali Pawar, Dr. Arun Mullaji,
Dr. Gautam Shetty and Rohit Srivastava

Department of Biosciences and Bioengineering, Indian Institute of Technology Bombay, Mumbai 400076, India

Orthopaedic device related infection (ODRI) is a major complication in orthopedic surgery and is a common cause of re-operation, increased morbidity and treatment cost to the patient. Long-term administration of intravenous antibiotics may lead to a risk of antibiotic resistance and toxicity. Thus we are trying to develop a biodegradable local antibiotic eluting implant for the prophylaxis and treatment of ODRI. We have fabricated a biodegradable, biocompatible controlled released antibiotic loaded polymeric sponge. Antibiotic loaded sponge was further characterized by FTIR, SEM and *in vitro* drug release study. Drug release from sponge can be modulated according to requirement of patient and to meet up this requirement sponge is loaded with antibiotic micro-particles. Therefore, depending upon need controlled release of antibiotic is possible, which enables maintenance of aseptic conditions for a longer duration and helps with achieving complete recovery without any complication.

WIRELESS ELECTROCEUTICAL DRESSING LOWERS COST OF NEGATIVE PRESSURE WOUND THERAPY

Piya Das Ghatak[1], Richard Schlanger[1], Kasturi Ganesh [1], Lynn Lambert [1], Gayle M Gordillo[1],Sashwati Roy[1]

[1]Comprehensive Wound Center, Davis Heart & Lung Research Institute, The Ohio State University Wexner Medical Center, Columbus, Ohio

Objective: To test whether use of a wireless electroceutical dressing (WED) (Procellera®, Vomaris Inc) in conjunction with 5-day Negative Pressure Wound Therapy (NPWT) (VAC®) may reduce the number of dressing changes required per week with this therapy. ***Approach:*** At the Ohio State University Comprehensive Wound Center, chronic wound patients (N=30) undergoing NPWT were randomized into two arms following consenting as approved by the institutional review board. The control arm received standard of care NPWT where dressing change was performed thrice a week. The test arm received the same care except that WED was added as an interface layer and dressing change was limited to twice a week. ***Results:*** Reduced cost of NPWT wound care was achieved by using WED. Despite fewer dressing changes in wounds dressed with WED, closure outcomes were comparable with no signs of any wound complication, including infection. Interestingly, patients treated with WED consumed significantly lower amounts of pain medication suggesting reduced discomfort during the NPWT treatment process. The beneficial outcomes were achieved when the cost of NPWT care during the week was significantly lower in the WED treated group compared to patients in the control arm. ***Innovation:*** This work introduces a novel technology platform involving a WED which may be used in conjunction with NPWT. If used as such, NPWT is effective in decreasing the frequency of dressing change and lowering the cost of care. ***Conclusion:*** This work points towards the benefit of using WED in conjunction with NPWT. A larger clinical trial investigating the cost-effectiveness of WED in wound care is warranted.

THE ROSS HEART HOSPITAL

- Ohio State's Richard M. Ross Heart Hospital is a 150-bed facility that combines the latest technology with patient-focused care to create the best possible healing environment. Each floor is dedicated to a specific service, such as cardiac surgery or vascular medicine, and we offer universal patient rooms. This means rooms are designed to be adaptable, allowing most patients to stay in the same private room throughout their hospitalization rather than having to move from room to room as their medical needs change.
- Ohio State's heart and vascular experts offer the best care in central Ohio. No other hospitals or heart centers in central Ohio are ranked among the nation's best by U.S. News & World Report. Only Ohio State.

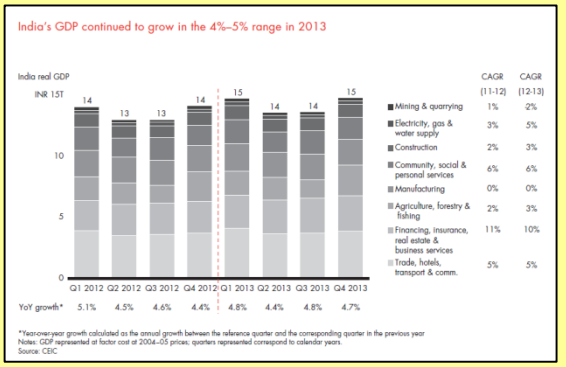
(http://wexnermedical.osu.edu/patient-care/healthcare-services/heart-vascular)

DEVELOPMENT AND VALIDATION OF NOVEL ANALYTICAL METHODS FOR ESTIMATION OF OPIOID ANTAGONIST NALOXANE HYDROCHLORIDE INJECTION

Raghu RK, Lakshmi Sravanthi, Nagaraj
Department of Pharmaceutical Analysis, PES College of Pharmacy, Bangalore-560 050, India

Study was done for stability indicating method by RP-HPLC method. For Assay method, chromatographic conditions were (I) Column: Inertsil ODS3V, 150×4.6MM, (II) column temp:45ºC,(III) Flowrate:1.0ml/min, (IV) Injection volume:10µL, (V) Wavelength:280 nm for naloxane hydrochloride and 256 nm for methyl paraben and propyl paraben, (VI) Pump Mode:gradient. The selected chromatographic conditions were found to effectively separate naloxane hydrochloride (Rt 5.7 min), methyl paraben (Rt 12.0 min) and propyl paraben (Rt 14.5 min). The total elution time was 22 min. The detector response was found linear with a correlation coefficient of 0.999, 1.000 and 0.998 for naloxane hydrochloride, methyl paraben and propyl paraben respectively. The related substances study was performed for which the conditions were (I) Column: Zorbax, SB-C8, 150 X 4.6 mm, 3.5µ, (2) Detector Wavelength: 280nm, (3) Flow rate: 1.0mL/min^{-1},Injection volume: 30 µL, column oven temperature:45°C, Runtime: 60 min. The selected chromatographic conditions were found to effectively separate naloxane hydrochloride (Rt 19.879 min) and its related compounds. The total elution time was 60 min. The detector response found linear with a correlation coefficient of 1.000 for naloxane hydrochloride and related compounds. The method performance at lower to higher levels (LOQ to 200%) is linear, precise and accurate. Commercial formulation and laboratory prepared mixtures were successfully analyzed using the developed method.

FORGING TIES FOR A PRODUCTIVE FUTURE



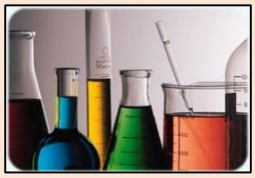
Leading Destinations of U.S. Study Abroad Students, 2012-2013	
1. United Kingdom	36,210
2. Italy	29,848
3. Spain	26,281
4. France	17,210
5. China	14,413
6. Germany	9,544
7. Costa Rica	8,497
8. Australia	8,320
9. Ireland	8,084
10. Japan	5,758
11. South Africa	5,337
12. Argentina	4,549
13. India	4,377

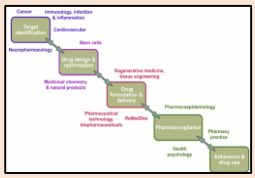
FORMULATION AND EVALUATION OF SUSTAINED RELEASE SOLID DOSAGE FORM OF DULOXETINE HYDROCHLORIDE

P.Narendra Reddy, Yeturi Karthik and Manjula Talluri

Department of Pharmaceutics, PES College of Pharmacy, Bangalore – 560050, Karnataka, India

The aim of the present work was to formulate a simple and stable formulation of sustained release tablets of duloxetine hydrochloride. Duloxetine hydrochloride is a potent anti-depressant drug used in the treatment of major depressive disorder. The formulation was developed using wet granulation technique. Hydroxy propyl methyl cellulose 5cps and Hydroxy propyl methyl cellulose 15cps were the polymers used in the formulation. The drug was protected from the degradation in acidic environment by coating the tablet with enteric polymer Hypromellose pthalate HP55. Various other parameters like bulk density, tapped density, Hausner's ratio, Carr's index and angle of repose were also studied in the formulation. The *in-vitro* release of the formulation was carried out in 0.1N HCL for 2hrs and in phosphate buffer of pH 6.8 for 90mins. The percentage drug release was found to be 0.94% in 0.1N HCL after 2hrs and 89.8% at the end of 90min in phosphate buffer of pH6.8. The release kinetics models were analyzed using the zero order model, first order model, & higuchis square root equation. The optimized formulation F8 followed the higuchis matrix diffusion release kinetics. FT-IR (infrared spectroscopy) studies were performed to confirm the compatibility of the drug and excipients. A three month stability study was conducted that confirmed that the optimized formular was stable.





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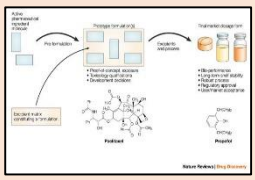
FORMULATION OF ORO-DISPERSIBLE TABLETS OF SIMVASTATIN A ND EVALUATION OF EFFECT OF PACKING ON THE STABILITY OF FORMULATION

Shakti Saha, Alca B Kurian, Manjula Talluri, Jyothikrishna Kommineni

Department of Pharmaceutics, PES College of Pharmacy, Bangalore-560050, Karnataka, India

Dyslipidemia is one trigger of many cardiovascular diseases. Statin drugs are potent therapeutic agents and offer safer alternatives in managing dyslipidemia. Simvastatin is one of the world's top most selling drug and is available in market in combination with ezetimibe and niacin. Though these wonder drugs have emerged as potent medications for dyslipidemia, they are not useful for certain population viz., geriatrics, hospitalized patients etc., for whom swallowing the solid form provides great discomfort. Therefore, the present project work was planned for the formulation of oro-dispersible tablets of Simvastatin and evaluation of the effect of packing on the stability of the formulation. In the present study, the conventional method of preparation of oro-dispersible tablets of Simvastatin which involves compaction process was adopted. Oro-dispersible tablets were prepared by hydro-alcoholic granulation method using hydroxypropyl β-cyclodextrin taken in 1:1 (drug: HPβCD) concentration. The optimized formulation was charged for stability in two packing conditions; ALU-ALU blister packing and high density polyethylene (HDPE) container and found that both the packages stored at 25°C/60% RH were within the limits for dissolution assay, impurity levels (particularly impurity A), whereas formulations stored in ALU-ALU package at 40°C/75% RH were out of limits High density polyethylene container were within the limits. Therefore, it was concluded that the high density polyethylene container is the best packing material for Simvastatin oro-dispersible tablets prepared by hydro-alcoholic granulation method.



http://www.nature.com/nrd/journal/v3/n11/fig_tab/nrd1550_F2.html

EVALUATION OF ANTI-UROLITHIATIC ACTIVITY OF EXTRACTS OF *BUTEA FRONDOSA* LEAVES

Amit Shah, Mukund Handral, Bhalodia Rajkumar
PES College of Pharmacy, Hanumanthanagar, Bangalore-560050, India

Urolithiasis is a complex process that is a consequence of an imbalance between promoters and inhibitors in the kidney resulting from a succession of several physico-chemical events including supersaturation, nucleation, growth, aggregation, and retention of factors within the kidney. Ancient history of Ayurveda has used various parts of *Butea frondosa* for the ailments of kidney disorders as it possesses anti-oxidant, anti-inflammatory and free radical scavenging potentials, thereby classifying these products as anti-urolithiatic agents. *B. frondosa* leaves were used in the present study to screen for its anti-urolithiatic activity. Anti-urolithiatic effect of extracts were evaluated by using ethylene glycol induced hyperoxaluria and zinc disc implanted in urinary bladder induced stones. Administration of the alcoholic and aqueous extracts of *B. frondosa* for 28 days inhibited urolithiasis, measured by changes in the level of creatinine, BUN, calcium, magnesium, phosphate and uric acid. The anti-urolithiatic activity could be due to glycosides, flavanoids, isoflavanoids and sterols possessing anti-oxidant and anti-inflammatory activity in leaves.

HUMAN PLATELET AGGREGATION IS INHIBITED BY ORAL SUPPLEMENTATION OF *PHYLLANTHUS EMBLICA* EXTRACT

James M. Spieldenner[4], Amitava Das[4], Andrea Colcord[1,4], Cameron Rink[2,3,4], Sashwati Roy[1,2,3,4], Chandan K. Sen[1,2,3,4]
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Up to 40% of Americans are resistant to cyclooxygenase-1 (COX-1) inhibitors such as acetylsalicylic acid (Aspirin) and up to 25% are resistant to Adenosine diphosphate (ADP) $P2Y_{12}$ antagonists such as clopidogrel (Plavix™). Ellagic acid inhibits platelet response to collagen and ascorbic acid inhibits platelet response to ADP. The fruit of *Phyllanthus emblica* (“Indian Gooseberry”) has a long history of use in Ayurvedic medicine and provides a rich, natural source of ellagic and ascorbic acids. In this light, we sought to test whether *P. emblica* supplementation could elicit an anti-platelet response in humans. In this study, overweight to obese volunteers (BMI: 25-35, mean age=34.5, N=20) were orally supplemented with 500mg *P. emblica* extract twice daily for 12 weeks. Platelet function was assessed turbidimetrically in platelet rich plasma using arachidonic acid (0.5mM), ADP (10µM), and collagen (2µg/mL) agonists. Aggregometry was performed at baseline, during supplementation (weeks 4, 8, and 12), and post-supplementation (weeks 13 and 14). After 8 weeks of supplementation, a significant inhibitory effect on collagen-induced platelet aggregation ($p < 0.0001$) and ADP-induced platelet aggregation ($p < 0.01$) was observed. The effect on collagen-induced platelet aggregation remained throughout the post-supplementation period whereas the effect on ADP-induced platelet aggregation was insignificant after 12 weeks of supplementation, but returned during the post-supplementation period (weeks 13 and 14, $p < 0.05$). Herein we characterize the effect of oral *P. emblica* supplementation on human platelet aggregation for the first time. The current findings suggest that oral supplementation of natural *P. emblica* inhibits platelet aggregation.

FORMULATION AND EVALUATION OF CEFUROXIME AXETIL FLOATING TABLET USING NATURAL POLYMERS AS EXCIPIENTS.

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The present work aims at formulation and evaluation of a gastro-retentive floating tablet of cefuroxime Axetil by direct compression technique using sodium bicarbonate as gas generating agent and xanthum gum as a polymer. The tablets were prepared by using generally approved excipients that were compatible with the cefuroxime Axetil. All the formulations were subjected to pre-compression and post-compression parameters. The floating lag time were found to have less value (<2 min). *In vitro* drug releases from the formulations were studied using 0.1N HCL for 12 hours. The assay of the formulations revealed that the drug content was within the limits. The results indicated that F11 released the drug at the desired rate and also was found to be stable during stability studies conducted for 3 months. The release mechanism of cefuroxime Axetil from floating tablet having 'n' value between 0.509-0.578 indicated that the release followed Fickian diffusion mechanism.

AIIMS INNOVATIONS

Squatting Above Knee Prosthesis
Invented by Dr. SK Varma and Mr. SH Mulla.

A majority of the activities of daily living in India require squatting or cross – legged sitting positions, e.g. eating, preparing food, home making, working in the farms, sitting in meetings of religious gatherings, attending school etc. It is so integrated in the routine life style that when someone loses the leg above the knee (amputation), current designs mean a total change in life style from floor level to chair level living. That means, the activities the person used to perform sitting on the ground, would have to be done sitting on a chair or stool. This inability to squat or to sit Cross-legged occurs in a conventional above knee prosthesis because the knee flexion in such a prosthesis is not allowed beyond 100 degrees.

At AIIMS a new above-the- knee prosthesis permits squatting as well as cross-legged sitting. This is the world's first design.

Left - new invention compared to current standard on right.

FORMULATION AND IN VITRO EVALUATION OF SOLID DISPERSION OF SIMVASTATIN

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An attempt has been made to improve the solubility of a poorly water soluble drug, Simvastatin, a drug used for the treatment of hyperlipidemia, by solid dispersion techniques and complexation using various carriers. Solid dispersion of Simvastatin in mannitol, PEG-4000, Urea, Poloxamer-188, PVP K-30 were prepared by solvent evaporation method and fusion method. By using kneading method, β-Cyclodextrin complexation of Simvastatin were prepared. The dissolution rates of Simvastatin from solid dispersions was significantly higher than their corresponding physical mixtures. The increase in dissolution rate depended on the type, ratios of drug to carriers and selection of the method of preparations of solid dispersions. *In vitro* dissolution were carried out in 0.5% SLS in 1.2 pH buffer. Of the polymers tested, poloxamer-188 resulted in highest increase in dissolution rate of the drug. The solid dispersion prepared with poloxamer-188 using fusion method at 1:4 ratio showed highest dissolution rate of drug compared to other formulations and marketed product. Solid dispersion containing poloxamer-188 was further investigated by X-ray powder diffraction, differential scanning calorimetry (DSC) and FTIR. Results showed that there was no interaction between drug and carrier used and study revealed decreased crystallinity of Simvastatin. The dissolution rate enhancement was attributed to increased wettability, dispersibility and decreased crystallinity of Simvastatin by carrier and also micellar solubilizing property of poloxamer-188 and approximately 100% of drug dissolved within 120 min. So this amorphous solid dispersions could be useful for further formulation as a suitable competitive dosage forms.

COMPOSITE INJECTABLE GEL AS A LOCAL DRUG DELIVERY SYSTEM FOR PAIN MANAGEMENT IN OSTEOARTHRITIS

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Local drug delivery systems in the diseased region plays an important role in treating many diseases with minimal systemic side effects. For instance, in case of Osteo-arthritis (OA), the severe systemic toxicity issues of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) can be addressed using local drug release systems like, intra-articular drug delivery systems (IA-DDS). Injectable thermogels or *in situ* thermogels are one such local DDSs which are solution at room temperature while gels at physiological or body temperature (37°C). Chitosan based thermogels are heavily researched natural polymer based system. The major drawback of the Chitosan based thermogels are its rapid and uncontrolled drug release profile. In order to overcome this limitation, we proposed a composite *in situ* gel which comprise of *in situ* chitosan gel into which Etoricoxib loaded PCL (Poly Caprolactone) microparticles were embedded. Etoricoxib loaded PCL microparticles is prepared by Oil/Water (O/W) emulsion solvent evaporation method. The particles are found to be smooth and spherical using SEM. The *composite in situ* gels (CICGs) is prepared by dispersing PCL microparticles in the chitosan-AHP (Ammonium hydrogen phosphate) solution and incubated at 37°C for 12 minutes. The *in vitro* drug release studies of CICGs is compared with release kinetics of PCL microparticles. In case of CICGs, the drug is released in a much more controlled manner when compared to PCL microparticles alone. The *in vitro* biodegradation studies of in situ chitosan gels were done in PBS containing 1mg/ml Lysozyme. Initially till 9 days, the degradation of bare chitosan gel (BCGs) (30%) was comparatively faster when compared to the CICGs system (26%). After that, the CICGs starts degrading faster than the bare chitosan. *In vitro* biocompatibility studies of the leachates from the gels on four cell lines L929, NIH3T3, HIG 82 and MG 63 were performed and the gels were proved to be biocompatible for all the cell lines. Thus this novel composite *in situ* gelling system can be a good, non-invasive local drug delivery system for the controlled delivery of drugs to the diseased regions.

A WIRELESS ELECTROCEUTICAL WOUND DRESSING DISRUPTS MIXED SPECIES BACTERIAL BIOFILM IN A PORCINE PRE-CLINICAL MODEL

Kasturi Ganesh MD, Sashwati Roy PhD, Daniel Vanzant BS, Sriteja Dixith MS, Piya Das Ghatak MS, Shomita Mathew PhD, Elizabeth Schwab BS, Mathew Joseph BS, Lynn Lambert CHT, Chandan K. Sen, Ph.D

Comprehensive Wound Center, Center for Regenerative Medicine and Cell Based Therapies, Department of Surgery, The Ohio State University Wexner Medical Center, Columbus, OH

Recently our laboratory reported the first pre-clinical model for chronic wound mixed species biofilm infection. Biofilm infection limits wound healing by compromising the barrier function of the repaired skin. While many attempts have been made to develop biofilm disrupting drugs, current outcomes are not satisfactory. Microbes rapidly acquire drug resistance. To address this limitation, we developed a wireless electroceutical dressing (WED) and tested its anti-biofilm properties in a long-term (56d) pre-clinical model for chronic wound mixed species biofilm infection. WED consists of a matrix of silver-zinc coupled biocompatible microcells, which in the presence of conductive wound exudate gets activated to generate electric field (0.3- 0.9V). Domestic Yorkshire pigs (N=15) were subjected to full-thickness burn (2”x2”). A clinically relevant mixed-species (*Acinetobacter baumannii* 19606 and *Pseudomonas aeruginosa* PAO1) infection was established. On the day of infection, wounds were either treated with placebo dressing or WED twice a week for up to 56 days. SEM demonstrated that compared to placebo, WED disrupted biofilm aggregates attached to the wound surface. WED significantly decreased ($p<0.05$,n=5) PAO1 burden on d35 post-infection. Closure of placebo treated biofilm infected wounds featured disrupted barrier function as indicated by high transepidermal water loss (TEWL). WED corrected ($p<0.05$,n=7) leakiness of such repaired skin. Next, we tested the efficacy of WED in eradicating already established biofilm infections in porcine burn wounds, resembling the clinically presented chronic wounds with biofilm infections. Wounds were infected for 7d to establish multispecies biofilm. Treatment of biofilm infected wounds with WED showed improved healing outcomes. WED significantly ($p<0.05$,n=5) improved wound re-epithelialization in biofilm-infected wounds. In summary, this work presents the first *in vivo* evidence demonstrating that WED is effective in preventing biofilm infection as well as in disrupting established biofilm from cutaneous wounds.

TRIPADVISOR TOP 5 RESTAURANTS IN MUMBAI (OUT OF 6768)

1. **SHREE THAKER BHOJANALAY** ($6-8, Indian/Veg)
31, Thaker Bhojanalaya Building, Dadiseth Agyari Marg | Marine Lines, Mumbai (Bombay) 400002, India, (022) 22011232

#2. **O:H CHA KITCHEN AND BAR** ($8-24, Thai)
Unit 1, New Mahalaxmi Silk Mills Premises | Mathurdas Mills Compound, Lower Parel, Mumbai (Bombay) 400013, India, +91 22 6633 4455

#3. **PESHAWARI** – 2014 TRAVELLERS CHOICE WINNER (upto $ 100, Indian/Non veg)
Sahar Airport Rd | Andheri East, Mumbai (Bombay) 400069, India, 22-28303030-1879

#4. **DUM PUKHT** (Indian/Non veg)
Sahar Andheri (E), Mumbai 400 099, Maharashtra, India, Tel : (91) (22) 28303030,
Email: reservations.itcmaratha@itchotels.in

#5. **KONKAN CAFE** – CERTIFICATE OF EXCELLENCE, 2014 (Indian coastal/seafood)
90 Lobby Level | Vivanta By Taj President Hotel, Cuffe Parade, Mumbai (Bombay) 400005, India
+91 22 25665 0808

tripadvisor

From more information:
http://www.tripadvisor.com/Restaurants-g304554-Mumbai_Bombay_Maharashtra.html

SMART POLYMERIC GELS FOR ON-DEMAND TRANSDERMAL DRUG DELIVERY FOR PAIN MANAGEMENT

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On demand drug delivery systems (OD-DDS) have attracted great interest for their immense potential in treatment of various diseases. OD-DDS works by employing one among or combinations of various stimuli like temperature, ultrasound, magnetic fields, electric fields etc. At present, OD-DDS is extensively explored in the area of cancer therapy as triggered drug delivery systems. In this work, we propose a novel non-invasive, patient friendly, thermo-responsive polymer based transdermal patch for the treatment of pain and inflammation. Using this patch, patients can themselves administer drug by the application of heat using heat pad whenever they experience pain. The transdermal patch is made up thermo-responsive polymer, Poly (N-Vinyl Caprolactam) grafted onto Chitosan (PNVCL-*g*-CS) gel loaded with a Non-steroidal anti-inflammatory drug (NSAID) for treatment of pain. PNVCL is a water soluble, biocompatible polymer which exhibits phase transition at ~ 33° C. However the phase transition temperature of the polymer has to be increased to around 35°C for the desired application of triggered drug release on application of heat locally. To achieve this, PNVCL is grafted onto the chitosan, which is also a hydrophilic, biodegradable, biocompatible polymer and optimized to the desired phase transition temperature by varying its grafting ratio. The gel is characterized by Fourier Transform Infra-Red Spectroscopy (FT-IR) to confirm the grafting of the polymers and Differential Scanning Calorimetry (DSC) studies to determine the phase transition temperature. Drug loading is done with two model pain relieving drugs, namely Etoricoxib (hydrophobic drug) and 4-Acetamidophenol (hydrophilic drug) and it's *in vitro* pulsatile drug release kinetics at normal skin temperature (32°C) and at desired higher temperature (39°C) has been determined. Drug permeation experiment through skin is carried out to compare the release of both hydrophilic and hydrophobic drugs. PNVCL-*g*-CS gel is found to be biocompatible *in vitro* by performing cell viability assay in mouse fibroblast L929 and NIH 3T3 cell lines. Hence, the thermo-responsive PNVCL-*g*-CS gel can be a promising on-demand smart drug delivery system for the pain management application.

KNOCKOUT OF MICRORNA-21 LEADS TO INCREASED INFLAMMATORY RESPONSE DURING WOUND HEALING

Brian Rhea, Mithun Sinha, Subhadip Ghatak, Amitava Das, Savita Khanna, Sashwati Roy and Chandan K. Sen

Comprehensive Wound Center, Davis Heart and Lung Research Institute, Department of Surgery, The Ohio State University, Columbus, Ohio- 43210

Wound healing is a complex and dynamic process of replacing devitalized tissue layers at the site of injury. The wound-healing process consists of integrated and overlapping phases of inflammation, proliferation, and tissue remodeling. In the inflammatory phase, neutrophils followed by macrophages infiltrate to the wound area to clear the dead tissues and bacterial debris. Regulation of these stages of wound healing is determined by the micro environmental cues present locally. The involvement of non coding RNAs as regulators of biological processes including wound healing has been reported. MicroRNAs (miRs) are small non coding RNAs that regulate gene expression. They play important role in wound angiogenesis, epithelial-mesenchymal transition among others. Our lab has earlier reported that miR-21 enhances engulfment of apoptotic cells by macrophages. To further characterize the role of miR-21 in wound healing, in the present study, we have generated a K14 Cre-miR-21$^{fl/fl}$ mice model. These transgenic mice had targeted knock out of miR-21 in epithelium of the skin. Using this model, we have shown that resolution of inflammatory phase gets delayed in wounds of these transgenic mice. Immuno-histochemical staining revealed abundance of macrophages. Cytokine analysis from the wound fluid of these transgenic mice revealed presence of inflammatory cytokines which are predicted to be regulated by miR-21. The transgenic mice showed compromised quality of healed wounds. We hypothesize that miR-21 plays an important role by governing the quality of wound healing. Further studies are being carried out to elucidate the biological pathways for miR-21 mediated wound healing.

ENGULFMENT OF APOPTOTIC CELLS BY MACROPHAGES: A ROLE OF MICRORNA-21 IN THE RESOLUTION OF WOUND INFLAMMATION

Amitava Das[1], Kasturi Ganesh[1], Savita Khanna[1], Chandan K. Sen[1] and Sashwati Roy[1]

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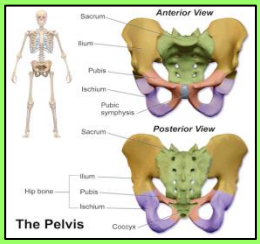
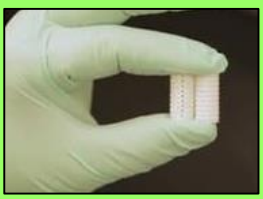
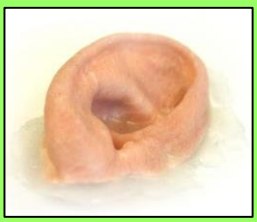
At an injury site, efficient clearance of apoptotic cells by wound macrophages or efferocytosis is a prerequisite for the timely resolution of inflammation. Emerging evidence indicates that microRNA-21 (miR-21) may regulate the inflammatory response. In this work, we sought to elucidate the significance of miR-21 in the regulation of efferocytosis-mediated suppression of innate immune response, a key process implicated in resolving inflammation following injury. An increased expression of inducible miR-21 was noted in postefferocytotic peripheral blood monocyte-derived macrophages. Such induction of miR-21 was associated with silencing of its target genes PTEN and PDCD4. Successful efferocytosis of apoptotic cells by monocyte-derived macrophages resulted in the suppression of LPS-induced NF-κB activation and TNF-α expression. Interestingly, bolstering of miR-21 levels alone, using miR mimic, resulted in significant suppression of LPS-induced TNF-α expression and NF-κB activation. We report that efferocytosis-induced miR-21, by silencing PTEN and GSK3β, tempers the LPS-induced inflammatory response. Macrophage efferocytosis is known to trigger the release of anti-inflammatory cytokine IL-10. This study demonstrates that following successful efferocytosis, miR-21 induction in macrophages silences PDCD4, favoring c-Jun–AP-1 activity, which in turn results in elevated production of anti-inflammatory IL-10. In summary, this work provides direct evidence implicating miRNA in the process of turning on an anti-inflammatory phenotype in the postefferocytotic macrophage. Elevated macrophage miR-21 promotes efferocytosis and silences target genes PTEN and PDCD4, which in turn accounts for a net anti-inflammatory phenotype. Findings of this study highlight the significance of miRs in the resolution of wound inflammation. *Supported by NIH RO1 DK076566(SR), GM069589, GM007185 and NR013898(CKS)*

3D PRINTED PARTS







TOCOTRIENOL VITAMIN E INDUCES ARTERIOGENESIS AND PROTECTS AGAINST ISCHEMIC STROKE BRAIN INJURY

Seth Teplitsky, Savita Khanna, Mallory Heigel, Chandan K. Sen, Cameron Rink

Dorothy M. Davis Heart and Lung Research Institute, Department of Surgery, The Ohio State University Wexner Medical Center, Columbus, OH

Cerebrovascular collaterals refer to blood vessels that anastomose and are capable of retrogradely perfusing the stroke-affected brain. Importantly, cerebrovascular collaterals are documented to protect the brain from ischemic stroke brain injury. While there is interest in identifying therapies to improve collateral flow, mechanisms to do so remain poorly studied. Our work rests on the striking observation that supplementation of lesser-characterized vitamin E family members, tocotrienols (TCT), improves collateral blood flow during ischemic stroke[1]. Here, we employ TCT to characterize mechanisms of vascular remodeling, termed arteriogenesis, for improved collateral blood flow during ischemic stroke. C57/BL6 mice (N=24, 5 wks old) were orally gavaged 5d/week with TCT (50 mg/kg) or a volume-matched vehicle control placebo. After 4 or 10 weeks of supplementation, mice were subjected to ischemic stroke using the intraluminal thread method of middle cerebral artery occlusion (MCAO). Successful MCAO was validated by laser Doppler flowmetry. While ischemia persisted (30min post-MCAO), intracardiac injection of a FITC-conjugated *Lycopersicon esculentum* lectin (FITC-lectin, 0.5 mg/ml) enabled selective staining of patent vessels in stroke-affected and contralateral control brain. On the basis of staining, TCT supplemented mice exhibited more patent blood vessels in stroke-affected S1 cortex. FITC-tagged vessels were then cut (mean = 1.8×10^5 μm^2) and collected using laser capture microdissection. From the laser-captured samples, RNA isolation was performed followed by cDNA synthesis and real-time PCR for screening of pro-arteriogenic gene products; including metalloproteinases (MMPs) and their inhibitors (TIMPs). Taken together, outcomes identify novel TCT-sensitive mechanisms that enable arteriogenesis for protection against acute ischemic stroke.

[Supported by NIH NS42617 to CKS and AHA 12SDG11780023 to CR]

3D Printing Reshapes Healthcare

Printed livers, ears, hands, and eyes? 3D printing can change and save lives.

http://www.informationweek.com/healthcare/mobile-and-wireless/3d-printing-reshapes-healthcare

Ohio State Researchers Lead 3D Printing Movement

http://www.nbc4i.com/story/25530228/ohio-state-researchers-lead-3d-printing-movement

Don't forget to catch Dr. David Dean at the H3C

CELLULAR REDOX MANIPULATION AS A NOVEL STRATEGY FOR THE MANAGEMENT OF INFLAMMATION

Rahul Checker, Deepak Sharma and Santosh K Sandur

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Cellular redox balance is central to immune cell signaling and expression of inflammatory genes during an immune response. Further, the area of oxidant and redox control of inflammatory processes and the immune system is relatively unexplored and redox active agents provide us with an opportunity to fine tune these process for the benefit of the host. Based on these observations, we speculated that plumbagin (a pro-oxidant), which was earlier shown to inhibit pro-inflammatory transcription factor NF-κB in tumor cells, may show immunomodulatory effects. The immunomodulatory effects of plumbagin were studied *in vitro* in lymphocytes and macrophages and using mouse models. Plumbagin inhibited T-cell and B-cell activation, proliferation and cytokine secretion. It also inhibited activation-induced production of multiple inflammatory mediators (nitric oxide, TNF-α, IL-6, Cox-2 and PGE-2) by macrophages. It increased basal reactive oxygen species (ROS) levels, depleted intracellular GSH/GSSG ratio and the immunosuppressive effects were abrogated by thiol containing anti-oxidants. Plumbagin inhibited NF-κB and MAPKinase pathway in activated lymphocytes and macrophages. The redox modulatory effects of plumbagin were attributed to its ability to interact with free thiol groups present on proteins and its ability to induc S-glutathionylation of proteins including NF-κB. Plumbagin administration to mice could prevent mortality and morbidity associated with graft-versus-host disease and septic shock. It was also able to significantly delay allograft rejection in mouse model of skin transplantation. This study enhances our understanding of the role of cellular redox status in inflammatory responses and pro-oxidants may find therapeutic application for the treatment of immune disorders.

CONSTITUTIVE ANTI-OXIDANT DEFENSE SYSTEMS MANAGE IONIZING RADIATION INDUCED OXIDATIVE STRESS AND ACT AS A MAJOR DETERMINANT OF INTRINSIC TUMOR RADIORESISTANCE

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Ionizing radiation (IR) induced oxidative stress in tumor cells is effectively managed by constitutive and inducible antioxidant defense systems. In order to understand relative contribution of these systems in determining tumor radioresistance, systematic studies monitoring their levels needs to be carried out with respect to radioresistance and time after irradiation. In this study, we have measured spatio-temporal changes in cellular redox regulatory parameters after IR exposure in human T cell lymphoma (Jurkat) cells. These parameters include levels of ROS, thiols (surface and intracellular), activity of antioxidant enzymes and ratio of NADPH/NADP. We monitored early (up to 6h) and late (up to 48h) responses of these systems and observed that, IR induces biphasic response in tumor cells. Restoration of cellular redox homeostasis mainly relies upon two important constitutive antioxidant regulatory networks: glutathione and thioredoxin. There is decrease in GSH/GSSG ratio at early time points after IR exposure whereas increase in activity of Trx/TrxR which are restored to basal levels at later time points. These systems complement each other and assist in activation of inducible antioxidant defense in the form of activation of Nrf2 which binds to antioxidant response element (ARE). This leads to coordinated induction of battery of antioxidant genes imparting radioresistance to tumor cells. During late response there is increase in cellular thiol content improving antioxidant buffering capacity of cells. Disruption of either glutathione or thioredoxin metabolism leads to partial impairment of cellular ability to survive against IR induced damage.

TLR7/8 AGONISTS AID IN REVERSING FcγR SUPPRESSION AND ENHANCE ANTIBODY-MEDIATED CLEARANCE OF B-CLL CELLS

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[1]Division of Pulmonary, Allergy, Critical Care and Sleep Medicine; [2]Division of Hematology, The Ohio State University Wexner Medical Center, Columbus, OH 43210; [3]3M Drug Delivery Systems Division, St. Paul, MN 55144. [4]VentiRx Pharmaceuticals, Inc., Seattle, WA 98101

Fcγ receptors (FcγR) are critical mediators of monoclonal antibody-based antitumor therapies, but the relatively low rate of complete remissions points to a need for further optimization of such treatments. One well-known phenomenon that may hinder antibody therapy is that of tumor-mediated immune suppression. Toll-like receptor (TLR) agonists have been extensively studied for their potential to reverse this suppression, thus leading to more effective tumor cell clearance. Here, we tested the effects of TLR7 versus TLR8 agonist treatment on monocyte FcγR expression and function. We found that TLR8 activation led to significantly greater changes in FcγR expression and function, as well as in the downstream inhibitory inositol phosphatase SHIP-1. Surprisingly, we found a qualitative difference between TLR7 and TLR8, in that TLR8 but not TLR7 agonist treatment downregulated the expression of the inhibitory FcγRIIb. Because B-CLL cells express the b1 isoform of FcγRIIb, we tested the effects of TLR7 and TLR8 agonists on these cells and found that although these cells could respond by making TNFα, the agonists did not modulate the expression of either FcγRIIb or CD20, the antigen for rituximab. Taken together, these results suggest that TLR8-selective agonists are powerful modulators of FcγR expression and function, and that they should be examined as potential adjuvants for antitumor antibody therapy.

PROFESSIONAL SPORTS TEAMS IN OHIO

AMERICAN FOOTBALL: CINCINNATI BENGALS, CLEVELAND BROWNS
BASEBALL: CINCINNATI REDS, CLEVELAND INDIANS
BASKETBALL: CLEVELAND CAVALIERS
ICE HOCKEY: COLUMBUS BLUE JACKETS
SOCCER: COLUMBUS CREW

FREE FLAP OUTCOMES IN HEAD AND NECK RECONSTRUCTION: A STUDY AT KAILASH CANCER HOSPITAL & RESEARCH CENTRE

Dr. Rajesh A Kantharia, Shehnaz Kantharia, Yogesh Bhatt

Kailash Cancer Hospital and Research Centre, Goraj, India

Background: The goal of onco-reconstructive surgery is to repair the defect primarily, maintain and preserve function and achieve acceptable cosmesis. The reconstructive technique should not delay adjuvant treatment, prolong hospitalization or increase complication rate. Microsurgical techniques are the best forms of reconstruction when the local tissues are unavailable or inadequate. **Objective:** To determine the success rate and complication rate of free flap reconstruction at a non-academic tertiary-care referral center in rural India. **Study Design:** Single Institutional retrospective cohort study. **Main Outcome Measures:** Flap success rate, anastomosis-related complications, and non-anastomotic complications. **Results:** From 2009 -2013, Department of Head & Neck Surgery and Plastic & Reconstruction Service, KCHRC, Goraj performed 360 micro vascular free flaps: 324 radial forearm, 09 anterolateral thigh and 27 fibula. Overall flap success rate was 98%. The overall anastomotic complication rate was 4.5% and non-anastomotic complications consisted mostly of salivary leak (18%), minor flap dehiscence (20%), non-anastomotic hematoma (9%), and partial flap loss (3%). **Conclusion:** Micro vascular free-flap transfer is a safe technique which can be easily offered to patients in a rural setting with comparable outcomes. Our patients accepted micro vascular procedure in spite of the additional cost because of its advantages.

SOURCE: WIKIPEDIA

Formation	January 3, 1954
Purpose	Nuclear research
Headquarters	Trombay, Mumbai, Maharashtra
Location	India
Director	Shekhar Basu
Parent organization	Department of Atomic Energy
Budget	13.61 billion (US$220 million) (2008-09)
Website	barc.gov.in
Formerly called	Atomic Energy Establishment, Trombay

ACQUISITION OF DRUG-RESISTANCE SWITCHES INVASION MECHANISM IN EPITHELIAL OVARIAN CANCER CELLS (OCCs)

Aastha Kapoor, Shamik Sen

Dept. of Biosciences and Bioengineering, IIT Bombay, India

Low survival rates in advanced stage ovarian cancer patients is attributed to acquisition of drug resistance against widely used chemotherapy drugs cisplatin (Cis) and paclitaxel (Pac). While molecular mechanisms underlying drug resistance is a subject of broad interest, how these molecular level changes alter the phenotype of drug resistant cells and its implication remains unclear. Here, we have performed a comparative study of the biophysical changes which occur in cisplatin resistant (Cis^{LR}) and paclitaxel resistant (Pac^{LR}) ovarian cancer cells (OCCs) compared to drug sensitive (CTL) OCCs. Compared to CTL cells, both Cis^{LR} and Pac^{LR} cells were more rounded, and possessed higher baseline contractility and lower cortical stiffness. Moreover, compared to CTL cells which exhibited high levels of collagen degradation mediated by proteases, Pac^{LR} cells showed no visible proteolytic degradation. In contrast, Cis^{LR} cells exhibited a a combination of proteolytic degradation and force driven remodeling. Together, our results are indicative of a mesenchymal to amoeboidal transition (MAT) in OCCs upon acquisition of drug resistance, and raise the possibility that targeting molecular players involved in effecting this transition may reverse drug resistance.

AKT ACTIVATION: A BLESSING IN DISGUISE FOR BREAST CANCER THERAPY

Neha Rai[1], Munna Sarkar[2], Sanghamitra Raha[1,3]

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Akt activation causes therapeutic resistance in breast cancer. Most of the molecular alterations are associated with increased Akt activity/ activation thus making the breast cancer cell less sensitive to drugs. Akt activation enables the cancer cells to evade cell death. As a result the majority of the drugs which are currently used for treatment of breast cancer are targeted to inhibit Akt activation. Although reactive oxygen species (ROS) induction plays an important role in apoptosis induction in breast cancer, its association with Akt activation mediated apoptosis has not been studied earlier. However we report an uncommon cell specific pathway by which a Non-steroidal anti-inflammatory drug (NSAIDs), Piroxicam (Px) causes ROS/ Akt activation mediated apoptosis in breast cancer cells. We explored the role of Px, in triggering the apoptosis and examined the involvement of upstream cellular mechanisms in apoptosis induction by Px. Our studies with human breast cancer cells MCF-7 showed that Px induces ROS generation along with lowering of mitochondrial membrane potential which further leads to caspase-3 activation, and DNA fragmentation indicating apoptotic cell death. ROS release also lead to Akt activation as determined by inhibiting the ROS levels using antioxidant NAC (N- acetyl cysteine). On further evaluation it became evident that ROS mediated apoptosis induction was due to Akt activation (hyper phosphorylation at ser 473). Silencing the expression of Akt using siRNA and a specific Akt inhibitor, Triciribine further confirmed the findings. Thus we revealed an interesting approach for targeting the breast cancer cells by ROS mediated Akt activation.

PRE-CLINICAL STUDY ON PHARMACOKINETICS OF LIPOS AU NPS AND ITS EFFICACY IN PHOTOTHERMAL ABLATION: A NEW PARADIGM IN CANCER THERAPEUTICS.

Aravind Kumar Rengan[1], Amirali B. Bukhari[2], Arpan Pradhan[1], Renu Malhotra[2], Rinti Banerjee[1], Abhijit De[2]*and Rohit Srivastava[1]*

[1] Department of Bioscience and Bioengineering, Indian Institute of Technology – Bombay, Mumbai,
[2] Molecular Functional Imaging Lab, ACTREC, Tata Memorial Centre, Navi Mumbai, India

Photothermal therapy(PTT) for cancer is being researched with great promise in the recent past. There are two ongoing clinical trials (Aurolase therapy) using this strategy, exhibiting its potentiality to get translated to bedside. Thermo-sensitive liposomes were prepared by thin film hydration method followed by gold coating to form Liposome-Au nanoparticles (Lipos-Au NPs). These particles were tuned to have an NIR absorbance of 750nm that was put to use in optical/CT imaging and photothermal treatment. Engineered MCF-7 *fluc2*-TurboFP & HT1080-*fluc2*-TurboFP cancer cell lines were studied for their response to photothermal effect induced by the Lipos-Au NPs in the presence of 750nm continuous wave NIR laser. It was observed that the fluorescence of the cells exhibited by the dual reporter *firefly luciferase* 2 and TurboFP protein significantly reduced (P = 0.0034) when Lipos-Au NPs incubated with the cancer cells were irradiated with NIR laser. The luciferase enzyme activity was quantified using D-luciferin substrate addition at the end of 24 hours using the IVIS Lumina II imaging system. There was no luminescence observed in the cancer cells that were treated with both Lipos-Au NPs and NIR laser in comparison to the controls. In the ***in-vivo* tumor model,** there was a significant reduction (P <0.01) in tumor volume leading to prolonged survival. These findings hold great promise in translating such novel nanosystems into the clinics to improve patient health care.

The **Tata Memorial Hospital** is situated in Parel, Mumbai in India. It is a specialist cancer treatment and research centre, closely associated with the **Advanced Centre for Treatment, Research and Education in Cancer** (**ACTREC**). One of the fields of specialization of this hospital is in the treatment of acute lymphoblastic leukemia (A.L.L). The hospital claims to treat and cure 99% of the A.L.L patients. This hospital is also one of the few in India to have a P.E.T. scanner. The Director of this hospital is Dr. Rajendra A Badwe.

The Tata Memorial Centre is the national comprehensive cancer centre for the prevention, treatment, education and research in Cancer and is recognized as one of the leading cancer centres in this part of the world. This achievement has been possible due to the far-sighted and total support of the Department of Atomic Energy, under Dr. Homi N Sethna responsible for managing this Institution since 1962.

The Tata Memorial Hospital was initially commissioned by the Sir Dorabji Tata Trust on **28 February 1941** as a center with enduring value and a mission for concern for the Indian people.

The Tata Memorial Hospital and Cancer Research Institute merged as the two arms of the Tata Memorial Centre (TMC) in 1966 as a classic example of private philanthropy augmented by Government support with a mandate for Service, Education & Research in Cancer.

DON'T FORGET TO CATCH DR. BADWE'S TALKS AT THIS CONFERENCE!

SYNTHESIS AND CHARACTERIZATION OF GOLD ENCAPSULATED AND TAMOXIFEN-LOADED PLGA NANOPARTICLES FOR CANCER THERANOSTIC

Deepak Singh Chauhan, Mukesh Dhanka, Radhika Poojari, Rohit Srivastava

Department of Biosciences and Bioengineering, IIT Bombay, Powai, 400076, Mumbai, India

Synthesis of multi-functional nanoparticles is today's trend for the treatment of tumors. For the successful treatment of tumors, imaging of tumor is as critical as its therapeutic importance. Computed Tomography (CT) is one of the most frequently used imaging techniques in hospitals although less contrast due to body fluids have reduced its effectiveness. Multidrug resistance (MDR) is another cause of concern due to developing resistance in cancer cells for chemotherapy. Gold is commonly used biocompatible material exploited in medical research for various purposes like imaging, sensing etc. Polylactic-co-glycolic acid (PLGA) is one of the FDA approved biocompatible and biodegradable material and is being used in various therapeutic agents. Homocentric and eccentric encapsulation of gold nanoparticles inside PLGA nanoparticles leads to scattering of electromagnetic waves that opens up new avenues for the imaging using CT. d-α Tocopheryl polyethylene glycol succinate (TPGS) is known to inhibit P-glycoprotein (P-gp) that is mainly responsible for drug efflux from the cells. In this regard, gold nanoparticles encapsulated and tamoxifen loaded PLGA nanoparticles were prepared using TPGS as emulsifier for tumor imaging and its treatment.

THURSDAY, JAN 15TH, 1-3P

For those interested in Post Doc opportunities, please meet at the career corner within the ballroom. Please bring recent CV in hard and soft copies. If interested please send updated CV to -

Kasturi Ganesh Barki:
Kasturi.ganesh@osumc.edu

LASER CAPTURE MICRO-DISSECTION: AN ATTRACTIVE TOOL FOR 'OMICS' STUDY

Soma Datta, Ryan Dickerson, Scott Chaffee, Chandan K. Sen and Sashwati Roy

Department of Surgery, Center for Regenerative Medicine and Cell Based Therapies and Comprehensive Wound Center, Davis Heart and Lung Research Institute, The Ohio State University Wexner Medical Center, Columbus, Ohio 43210, United States of America

The molecular examination of pathologically altered cells and tissues at the DNA, RNA and protein level has modernized research and diagnostics in pathology. Tissues are a heterogeneous mix of different cell types; molecular alterations are often specific to a single cell type. Therefore, isolation of pure targeted cells is an important and essential step for the molecular analysis of cells involved in the progression of disease. Laser capture microdissection (LCM), a novel technique developed at the National Cancer Institute, is an easy, extremely fast and versatile method for the isolation of morphologically defined cell populations from complex primary tissues for molecular analysis. This study gives an outline of LCM technology and the principles of its downstream applications. The use of immunohistochemical staining in LCM allows the selection of cells according to phenotypic and functional characteristics. Recently, we have used immunofluorescence technique for capturing of biofilms from porcine wounds using LCM and also performed transcriptomic analysis of those captured biofilms. With powerful technologies and appropriate applications, LCM combines morphology and histochemistry with sophisticated molecular analysis and has provided significant new insight into cell biology and pathology.

TUNABLE NON-VIRAL VECTOR FOR EFFICIENT DELIVERY OF NUCLEIC ACID

Sarat Kumar Kottarath [1], Madhusudan Bhat[1], Susmita Mitra[2], Amit Dinda[1*]

[1]Department of Pathology, All India Institute of Medical Sciences, New Delhi, India

[2]Amity Institute of Nanotechnology, Amity University, Noida, India

Efficient non-viral vector for gene/nucleic acid delivery depends on the composition of the nano-carrier like polymeric, ceramic, and metallic nanoparticles (NPs). The nano-carrier design is important for its specific application. For RNA delivery cytosolic release of the payload is important, whereas for gene/DNA delivery it has to enter inside nucleus. Similarly for oral delivery the nano-carriers have to be stable in gastro intestinal environment. We have developed a tuneable system of nucleotide delivery based on layer-by-layer coating of the Calcium Phosphate NPs. Synthesis of the uncoated NP was done in reverse microemulsion followed by LBL coating with polyanion (polyacrylic acid) and polycation (chitosan). The alteration in size and zeta [ξ] potential after each layering was determined. Coating efficiency and the carrier stability in gastro intestinal tract, was evaluated by incubating the NPs at 37^0C for 4 hours in acidic (pH 4) and alkaline (pH 8) media followed by agarose gel electrophoresis. The cytosolic and nuclear localization capabilities following specific modifications of NPs were documented in cell culture studies. Efficiency of oral gene delivery with the NP was demonstrated by pRFP (red fluorescence protein) in mouse model. The present work confirms fabrication of biocompatible tuneable NP based non-viral vector for efficient delivery of nucleic acid which may have wide spectrum of therapeutic potential. *[Note: The current non-viral vector has been patented (3256/DEL/2012)]*

HIGH-RESOLUTION HARMONICS ULTRASOUND IMAGING FOR NON-INVASIVE CHARACTERIZATION OF WOUND HEALING IN A PRE-CLINICAL SWINE MODEL

Shomita S. Mathew-Steiner[1], Kasturi G. Barki[1], Surya C. Gnyawali[1], Sriteja Dixith[1], Jennifer Dickerson[1], Soma Datta [1], Jayne Kim[3], Heather Powell[3,4], Sashwati Roy[1], Valerie Bergdall[2], Chandan K. Sen[1]

Department of Surgery, Comprehensive Wound Center & Davis Heart & Lung Research Institute; [2]University Laboratory Animal Resources, [3]Department of Biomedical Engineering, [4]Department of Materials Science and Engineering, The Ohio State University, Columbus, Ohio

This work represents the first study employing non-invasive high-resolution harmonic ultrasound imaging to longitudinally characterize skin wound healing. Burn wounds (days 0-42), on the dorsum of a domestic Yorkshire white pig were studied non-invasively using tandem digital planimetry, laser speckle imaging and dual mode (B and Doppler) ultrasound imaging. Wound depth, as measured by B-mode imaging, progressively increased until day 21 and decreased thereafter. Initially, blood flow at the wound edge increased up to day 14 and subsequently regressed to baseline levels by day 21, when the wound was more than 90% closed. Coinciding with regression of blood flow at the wound edge, there was an increase in blood flow in the wound bed. This was observed to regress by day 42. Such changes in wound angiogenesis were corroborated histologically. Gated Doppler imaging quantitated the pulse pressure of the primary feeder artery supplying the wound site. This pulse pressure markedly increased with a bimodal pattern following wounding connecting it to the induction of wound angiogenesis. Finally, ultrasound elastography measured tissue stiffness and visualized growth of new tissue over time. We conclude that the tandem use of non-invasive imaging technologies has the power to provide unprecedented insight into the dynamics of the healing skin tissue. *[Supported by NIH NR013898, GM077185, GM069589, GM108014 and DoD W81XWH-11-2-0142].*

TAJ HOTEL FUN FACTS:
The dome of the hotel is made from steel as used in the Eiffel Tower. Jamsedji Tata imported the same steel during that time.

DECEASED DONOR TRANSPLANTATION IN INDIA: AN EMERGING FIELD

Christopher Taylor Barry[1,2], Sunil Shroff[2], Lalitha Raghuram[2], Sumana Navin[2], Ajay Sharma[3], Randhir Rao[3]

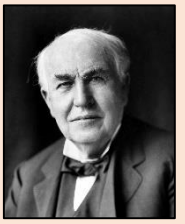
[1]Transplant Consultant for the Government of Rajasthan, [2]MOHAN Foundation, Chennai, Tamil Nadu, [3]Sawai Man Singh Government Hospital, Jaipur, Rajasthan, India

The vast majority of transplants currently performed in India are from living donors, necessarily limiting this activity to kidney and liver transplants. Since 2008, a few Indian States—notably Tamil Nadu—have enjoyed initial success in establishing sustainable and productive deceased donor transplant programs, but this activity is limited in volume and many parts of India have no such programs. Challenges in expanding deceased donor transplantation include public awareness of organ donation, professional education on acceptance of brain death declaration and organ donor management, and establishment of robust infrastructures modeled after successful programs elsewhere. We have empirically discovered that the main barriers to deceased donor transplantation lie not with public acceptance, but with professional attitudes toward brain death declaration in particular and transplantation in general. Focused professional educational efforts are being implemented regarding brain death certification, organ recovery surgery, infrastructure development, and public awareness, but much work still needs to be done to realize a national organ sharing network that is efficient, transparent, and accountable. If public and professional trust can be achieved, deceased donor transplantation has the potential to democratize transplant across all socioeconomic boundaries in India and to greatly curtail the need for an illegal organ trade.

NAMES YOU KNOW FROM OHIO!

Thomas A. Edison from Milan, Ohio developed the incandescent light bulb, phonograph, and early motion picture camera. →

← Neil Armstrong became the first man to walk on the moon. He was from Wapakoneta, Ohio.



KNOWLEDGE ABOUT HEPATITIS B VIRUS INFECTION AND CONSEQUENCE – A STUDY AMONG THE INFECTED PATIENTS OF WEST BENGAL

Tanushree Bose, Tapas Saha, Suvadip Neogi, Dipesh Kr. Das & Partha Sarathi Mukherjee

Liver Foundation, Kolkata-700016, West Bengal, India

Introduction: Approximately 780,000 Hepatitis B (HBV) related deaths occur every year across the world, emerging as a big challenge as the most common liver infection. On the other hand, this disease is very treatable and manageable at the present time due to the advancement of medical science. Considering the following two facts, perception about this illness and knowledge of hepatitis virus is very important, particularly for those who are infected with this virus. **Objective:** This study was aimed at understanding the knowledge about hepatitis B infection and consequence among the HBV infected patients who were under therapy. **Method:** A cross-sectional study was performed using a pre-tested self-administered, close-ended, questionnaire. 250 (Male = 161, Female = 89) Hepatitis-B infected patients were included in the study; it was carried out at the LFWB-BMSF molecular virology laboratory where patients were coming for different investigations. **Results:** 22% (n= 55) of patients were unfamiliar with the fact that the liver got affected in hepatitis. 66% (n= 165) patients knew about the route of HBV transmission.15.66% (n= 39) of patients considered that jaundice was the most harmful liver disease and 34% (n=85) had a concept that jaundice is synonymous to hepatitis. The majority of the patients (66.66%) (n =166) had heard about HBV vaccination, but 19% (n=48) were completely unaware about the preventive measures of hepatitis. About 2.8% (n=7) answered that isolation of patients is the only way of hepatitis prevention. It was observed that 30% (n=75) and 46%v (n=115) were unaware about the proper diet and the actual state of physical activity during hepatitis respectively. **Conclusion** Gross knowledge about Hepatitis B virus and related liver disease is inadequate in patients with Hepatitis B virus infection. Improvement in knowledge by educating the patients can help to combat the virus and the disease.

DETECTION, PREVENTION AND MANAGEMENT OF ADVERSE DRUG REACTIONS IN AN URBAN QUARTERNARY CARE HOSPITAL

Santosh Chandrashekar, Ibel C Fredy, Sandeep K, R. Srinivasan

Department of Pharmacy Practice, PES College of Pharmacy, Bangalore, India

Introduction: Pharmacovigilance also known as drug safety is defined as the science and activities relating to the collection, detection, assessment, monitoring and prevention of adverse effects or any drug-related problems. The World Health Organization (WHO) defines an adverse drug reactions (ADR) as 'a response to a drug that is noxious, unintended and occurs at doses normally used in man for the prophylaxis, diagnosis, therapy of disease, or for modification of physiological function'. This study detected and collected adverse drug reactions at a quaternary care hospital to assess their causality and severity. **Methodology:** This was a cross sectional retrospective study using a modified ADR form obtained from Central Drugs Standard Control Organization (CDSCO) and assessment was performed using different scale. **Results:** ADRs reported were commonly mild and moderate with a few occurrences of severe reactions. The ADRs were classified according to Naranjo scale as highly probable (2%), probable (15%), possible (70%), and unlikely (3%) of which commonly occurring were probable. **Conclusion:** The adverse drug reactions which occured in this quaternary care hospital reaction were numerous but most of which were in mild to moderate range. The prescribing of large number of medications causing low intensity of ADRs indicates the use of cautious responsibility due to direct liability and awareness.

http://blog.meraevents.com/2014/11/10/international-india-medical-tourism-congress/

EXAMINING TRANSNATIONAL GESTATIONAL SURROGACY AND MEDICAL TOURISM: PERSPECTIVES OF SURROGATE MOTHERS FROM INDIA

Sharvari Karandikar, Lindsay Gezinski

College of Social Work, The Ohio State University, Columbus, OH; Assistant Professor, College of Social Work, University of Utah, Salt Lake City, UT

The number of people traveling abroad for medical tourism is a disputed number that varies from a relatively small proportion of the world population to upward of 2 million people per year. In recent decades people from the global north are traveling to the global south for more affordable medical services. Transnational gestational surrogacy as an infertility treatment is a very common medical procedure and India is emerging as a top destination country for gestational surrogacy. Intended parents from all across the world seek services from infertility experts in India and opt for Indian surrogates for more affordable services. However, very little empirical evidence exists around the effects of surrogacy on the Indian woman's health, family, and other social contexts. The present qualitative study explored the motivations and experiences of 16 Indian women who become surrogate mothers for transnational couples. The respondents were illiterate women between the ages of 21 and 30 who had been surrogate mothers an average of three times. The primary motivation for surrogacy was financial. Women were unclear about the contracts that they signed, faced social isolation during pregnancy and reported lack of medical care post delivery. This study highlights the vulnerabilities of women who become surrogate mothers in India and draws attention to better health care facilities and need for social services to work hand-in hand with medical professionals who provide translational surrogacy services in India.

HIV EPIDEMIC:
GETTING TO ZERO – MUMBAI EXPERIENCE

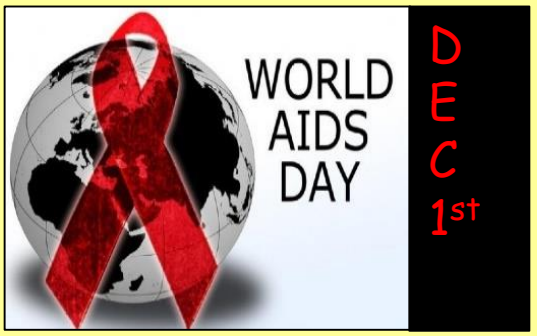
Padmaja Keskar*, Shrikala Acharya#, Roshni D'Souza#

**Mumbai Districts AIDS Control Society, Mumbai & Executive Health, Public Health Department, Municipal Corporation of Greater Mumbai; #Mumbai Districts AIDS Control Society, Mumbai, India*

Background: There is a strong global consensus that the tools now exist to end the HIV epidemic. The achievement of targets built on these tools over the past; now need to be fast tracked. Mumbai Districts AIDS Control Society in the metropolitan city of Mumbai has strived with concerted efforts towards bringing the HIV epidemic to an end. This paper presents the pattern of the HIV epidemic in different subgroups in Mumbai over the past 5 years. **Methodology:** Various preventive strategies like including all High Risk Groups based on emerging behavior patterns, expansion of Integrated Counseling and Testing services, strengthening blood transfusion services and universalization of Prevention of Parent to Child Transmission services to all sero-positive pregnant women with expansion of care, support and treatment facilities for people living with HIV have been implemented. Since 1998, rigorous monitoring of all these activities is being done through Strategic Information Management System. **Results:** The HIV prevalence trend has witnessed a significant decline among ante-natal clinic attendees considered proxy for the general population (0.58% in 2009 to 0.28% in 2013) and general population (8.29% in 2009 to 4.02% in 2013). The positivity among key population including female sex workers, injection drug users, transgender and men having sex with men has shown a decline (8.63% in 2009 to 0.61% in 2013). **Conclusion:** Partnership between the public and private sector is one of the key features of the city's HIV Programme and the strategy can be a role model for other urban metros in the country.

INAUGURATING THE NEW AIDS CLINIC IN BANDRA, MUMBAI (December 1, 2015)

WITH MAHENDRA WADIWALLA AND PADMAJA KESKAR (EXECUTIVE HEALTH OFFICER, MUNICIPAL CORPORATION OF GREATER MUMBAI)



RATIONAL USE OF EMPIRICAL ANTIBIOTICS IN THE MANAGEMENT OF SEPSIS AND SEPTIC SHOCK: A RETROSPECTIVE STUDY

Sohel Memon[1], Vineela Nekkanti[1] and R.Srinivasan[2]

Department of Pharmacy Practice, PES College of Pharmacy, Bengaluru, Karnataka, India

The abstract reviews principles in the rational use of empirical antibiotics in sepsis and septic shock and presents evidence based recommendations. Septic shock is a life threatening illness characterized by hypotension, impaired organ function or failure and metabolic abnormalities. The regional and institutional patterns of antibiotics resistance must be taken into consideration. Intravenous antibiotics should be administered as early as possible, and always within the first hour of diagnosis. Immediate recognition, diagnosis and treatment are key elements in reducing morbidity and mortality associated with this condition. The selection of appropriate antibiotic should be based on sound clinical judgment plus knowledge of antimicrobials used. The principles of rational therapy include the following:

1. Know the type of micro-organism or suspected organism being treated
2. Be familiar with resistant organism in both community and hospital
3. Initiate combination therapy with beta-lactam antibiotic plus an aminoglycoside or use mono-therapy with either a carbapenem or selected third generation cephalosporin.
4. After culture results are known, the antibiotic regimen should be narrowed to cover the specific infecting micro-organism using the least expensive and least toxic antibiotic available.
5. The beta-lactam antibiotics include all penicillins, cephalosporins, carbapenems and monobactams. Penicillins with extensive gram-negative coverage include all the carboxy(carbenicillin, ticarcillin, and ticarcillin plus clavulanic acid) and ureido (piperacillin, mezlocillin, azlocillin) penicillins. The third generation cephalosporins (cefoperazone, cefotaxime, ceftazidime, ceftizoxime, ceftriaxone, and moxalactam) have the broadest gram-negative coverage within the cephalosporin family.

INPATIENT WOUND CARE SERVICE IMPROVES QUALITY AND CONTINUITY OF CARE

Mary Angela Miller and Hanna Lohmeyer Foster

The Ohio State University Medical Center, Columbus, OH

In 2012 The Ohio State University Wexner Medical Center Comprehensive Wound Center, a component of the Center for Regenerative Medicine and Cell Based Therapies, launched an Inpatient Wound Care Service to enhance the quality of care for hospitalized patients and to increase continuity of care in coordination with existing ambulatory wound care clinics. The primary providers for the inpatient wound care service are two nurse practitioners. The program is supported clinically by the Wound Care Medical Director, physicians, and fellows in the Department of Plastic Surgery and Wound Ostomy Continence nurses. In its first full year of operation, the inpatient wound care service generated 686 consults, 937 patient encounters, 28 healed inpatients, and contributed to a 42% reduction in incidence of pressure ulcers across the health system. A fourfold increase in outpatient referrals resulted in improved continuity of care for 132 patients. Additional efficiency and quality outcomes achieved were eliminating repeated diagnostics and decreasing the time of care for wound closure. These, along with the increased surgeries generated as a result of the consults, financially support the program. Focusing on the overall clinical goals of the organization, service line, and expert mid-level and physician providers on the wound care team, The Ohio State University Wexner Medical Center has established an inpatient wound care service that has generated clear and compelling evidence of improved quality and coordination of care.

http://www.independentawakening.org/international-womens-day-quote-of-the-day-empowerment-of-women/

COST REDUCTION LABORATORY: IMPETUS TOWARDS BETTER HEALTH CARE IN A DEVELOPING COUNTRY

Suvadip Neogi, Tapas Saha, Tanushree Bose, Dipesh Kr. Das & Partha Sarathi Mukherjee

Liver Foundation, Kolkata-700016, West Bengal, India

Background: Viral hepatitis is emerging as an important public health challenge in India. About 40 million people (3.7%) are affected by Hepatitis B and 12 million (0.9%) by Hepatitis C. This mostly results in out-of-pocket health care expenditure of households in the country because chronic hepatitis, as a term, is exclusionary for insurance coverage by most insurance providers. India's per capita income was Rs 5,729 per month in 2012-13. Due to high cost, different diagnostic tests are beyond patients affordability, particularly the quantitative estimation of viral load; often resulting in poor treatment outcomes. **Methodology:** Establishment of a hepatitis diagnostic laboratory by philanthropic grant, to provide low cost, state-of-art molecular virological and biochemical diagnosis, thereby reducing their overall cost of care. Liver function test (LFT) was performed semi-automatically and hepatitis markers were detected quantitatively by ELISA and HBV DNA by RT-PCR. **Results:** The total cost of LFT of 1659 patients in our laboratory was INR 4, 14,750/- (USD 6912.50) whereas the market price for the same was INR 15, 92,640/- (USD 26544.00), thus 73.96% cost reduction in LFT was observed. Cost of HBV DNA quantitative analysis of 2398 patients was INR 28, 77,600 (USD 47960.00) in our laboratory, while the total cost of the same volume of the test was INR 1,31,89,000 (USD 219816.00) in the market, which is a 78 % cost reduction. Through such an initiative financial burden can be reduced among the patients at large. **Conclusion:** This concept of cost reduction laboratory corporate social responsibility (CSR) can serve as a model for more access towards better health care in developing countries.

WOMEN ARE MORE EMPOWERED IN BEHAVIOR MODIFICATION – A REPORT FROM RURAL BENGAL

Tapas Saha, Dipesh Kr. Das, Arka Sarkar & Partha Sarathi Mukherjee

Liver Foundation, Kolkata-700016, West Bengal, India

Background: Presently, 72% people of West Bengal live in rural areas and Bangalees comprise the majority. According to World Health Report 2002, cardiovascular diseases will be the largest cause of death and disability by 2020 in India; the contributing factors are mostly lifestyle related metabolic disorders. Regular exercise is an imperative determinant of healthy living and prevention of such metabolic disorders. Culturally Bengalis are not fond of exercise and traditionally less physically active. In rural areas, generally a woman limits their importance to household maintenance and dominating men are entitled for outdoor engagement even in 2014. Identification of perceptions, barriers, and motivations in doing exercise, particularly in rural settings is important for health protection. **Design:** A behavior modification program was implemented in 8 villages of Birbhum district with regular exercise schedule. 399 adult subjects were randomly selected (Male= 164 & Female= 235), anthropometric measurements were done and a pre-tested questionnaire was administered. **Results**: It was observed that 21.95% men and 30.21% women were overweight respectively. It was revealed that 58.54% men and 63.83% women agreed to participate in an exercise program, indicating that women are more positive towards health protection. After 6 months of exercise program, it was further observed that only 35.41% men were doing exercise regularly in comparison to 69.33% of women who were attending the regular exercise schedule (p value=0. 00) to ensure their better living. **Conclusion:** Empowered women in rural areas can play an important role in different public health interventions for an impactful outcome.

THE HOSPITAL CHAPLAIN AND THE PERPETUATION OF UNDERSTANDING IN THE HEALTH CARE ENVIRONMENT

James Schnell
Department of International Studies, The Ohio State University, Columbus, OH, USA

This article examines the communicative role of the hospital chaplain in the perpetuation of understanding within health care contexts. The communicative role of the hospital chaplain draws heavily on interpersonal skills. Considerations in this role include appropriate use of language, meaningful dialogue, listening, giving feedback, and serving as an intermediary between the patient and other members of the health care team. The health care team concept is also discussed. This team approach is relevant due to specialization in medicine, integration of these specialized talents, and focus on the whole patient (rather than just physiological considerations). Regarding the latter aspect, the hospital chaplain is recognized as a necessary member of the health care team that also includes physicians, nurses and other health care technicians.

INDIAN NATIONAL EMBLEMS

NATIONAL BIRD:
PEACOCK
(*Pavo cristatus*)

NATIONAL ANIMAL:
TIGER
(*Panthera tigris*)

NATIONAL FLOWER:
LOTUS
(*Nelumbo nucifera*)

http://india.gov.in/india-glance/national-symbols

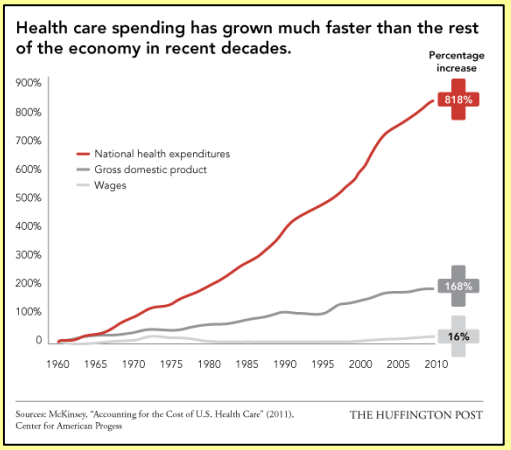
PRE-PAID SUBSCRIPTIONS FOR CHRONIC CARE MANAGEMENT: AN INNOVATION IN LAST MILE CARE DELIVERY

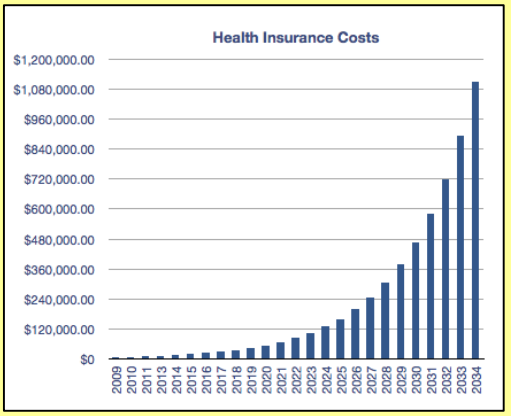
Rithika Venkatesh, Aparna Manoharan, Zeena Johar
SughaVazhvu Healthcare, Tamil Nadu, India

There is an epidemiological transition underway in India with a growing burden of chronic disease affecting population health. Primary care is virtually non-existent, especially in rural parts of India. SughaVazhvu Healthcare, based out of Thanjavur, Tamil Nadu, was created in 2009 as a private, non-profit organization to reorganize the front-line primary care delivery through innovative solutions for an inaccessible rural Indian population. In 2013, SughaVazhvu Healthcare implemented an innovative subscription-based chronic care package to manage the high chronic disease burden. The chronic care package is comprehensive and includes clinic consultations, medications, patient education, home visits, diagnostics and phone support. Subscribers pay upfront payment either annually, biannually, or quarterly. The upfront payment ensures a minimum commitment period from the patient towards their well-being. This program seeks to overcome common care barriers, such as regular follow-ups, compliance with medication, and lifestyle changes, by sparking service demand through pre-paying for services. The innovative program recently completed its first full year of implementation at the pilot site, Andipatti, with a total of 64 subscription enrollments with an estimated 30 percent renewal rate. The bulk of subscriptions (72 percent) were for quarterly diabetes packages, priced at INR 300 (USD 5). The successful first year of implementation has provided key insights for further development and network-wide launch of the program.

TAJ FUN FACT:
Taj Hotel Mumbai was converted into a six hundred-bed hospital during World War I

HEALTH CARE SPENDING IN INDIA





PORT SINUS AFTER LAPAROSCOPIC SURGERY

Abhimanyu Basu

Professor of General Surgery, Institute of Post Graduate Medical Education and Research, Kolkata, India

Introduction : With increasing use of laparoscopy for various surgical procedures, the occurrence of persistent port site sinus due to infection is seen more often as a post-operative complication. However, lack of awareness of this entity leads to prolonged morbidity and repeat surgical interventions. In case of non healing sinus following laparoscopic surgery, keeping this possibility in mind will lead to early diagnosis and treatment. **Materials & Methods**: In this study we concentrate on the clinical diagnosis, management and prevention of this problem. Patients presenting with port hole infections after laparoscopic surgery were treated with a combination of oral clarithromycin and ciprofloxacin or levofloxacin. Patients who had persistent nodules were given injections of amikacin directly into the infection foci along with standard oral therapy. For prevention of infection, proper sterilization and storage of instruments is recommended. **Conclusions*:*** Port site infection is a problem faced by laparoscopic surgeons in developing countries which is preventable through proper sterilization of instruments and early clinical diagnosis and treatment.

DRUG INDUCED LIVER CELL INJURY IN AN *IN VITRO* SYSTEM

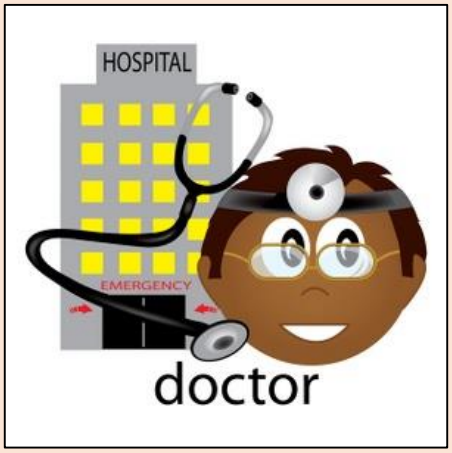
Debasree Bishnu

Centre for Liver Research, School of Digestive and Liver Diseases, Institute of Post Graduate Medical Education and Research, Kolkata 700020, India

This work is focused on the cellular mechanism of hepatocyte injury due to important anti-tubercular drugs – isoniazid (INH) and rifampicin (RMP) treatment and the relevant signaling pathways. Understanding the insights of INH and RMP induced liver cell injury and the intracellular signaling cascades will help in designing therapeutic options against anti-tuberculosis drug related hepatic injury. Cytochrome P 450 (CYP2E1) plays and important role in INH metabolism and may produce reactive oxygen species (ROS). Metabolism of INH is enhanced in the presence of RMP and produces additional toxic metabolites. Therefore to evaluate the role of CYP2E1 in the mediation of liver cell injury in response to INH and RMP, an *in vitro* system employing a stable human liver cell line (E47 cells) overexpressing CYP2E1 was used. INH and RMP induced cytotoxicity of E47 cells was studied using confocal microscopy, flow cytometry, Western blot analysis and qRT-PCR techniques in the presence and absence of various anti-oxidants. The involvement of mitochondria in INH and RMP induced hepatocyte injury via the evaluation of mitochondrial membrane potential and permeability transitions were also studied.

HEALTHCARE IN INDIA

Indicator	India	US	UK	Brazil	China	Bangladesh
Hospital Bed Density (per 10,000 persons)	12	31	39	24	30	NA
Doctor Density (per 10,000 persons)	6	27	21	17	14	3
Nurse Density (per 10,000 persons)	13	98	60	30	10	3



BASIC STUDIES ON THE DEVELOPMENT OF LIVER FIBROSIS

Bidhan Chandra Chakraborty

Centre for Liver Research, School of Digestive and Liver Diseases, Institute of Post Graduate Medical Education and Research, Kolkata 700020, India

This work is focused on the differential expression of NADPH oxidase (NOX) in different cellular components of liver during initiation and progression of liver fibrosis using an animal model. A Carbon tetrachloride (CCl4) treated mouse model was used for these studies. Differential expression of NOX in both parenchymal and non-parenchymal cells in different phases of development of liver fibrosis were studied with the aid of confocal microscopy, Western blot analysis, biochemical analysis of cellular anti-oxidant profile and qRT-PCR techniques. Additional histological and immuno-histochemical analyses were applied to the detection of cellular apoptosis, senescence and activation of hepatic stellate cells (the primary cells involved in the synthesis of extracellular matrix) in a time course of CCl4 treatment.

STUDY OF MALE GONADAL ACTIVITY IN MANGIFERIN INDUCED RATS COMPARED WITH CRUDE BARK EXTRACTS OF *MANGIFERA INDICA*

Arnab Das *[1], Tasneem Khandekar [1], Chaitali Bose [1], Subhasish Ghosal [2], Indrani Chakraborty [3], Nirmal Pradhan [#1]

[1] Post Graduate Department of Physiology, Hooghly Mohsin College, Chinsurah, Hooghly, [2]Department of Physiology, Presidency University, Kolkata, [3]Department of Physiology, Krishnanagar Govt. College, Nadia, West Bengal, India

Background: *Mangifera indica* is a well known medicinal plant in the world. Its bark extract is important in pharmaceutical research. Many reports are available on therapeutic uses of bark extract and mangiferin, but reports of mangiferin on male reproduction is mostly nil. So, our objective was to compare the effect of mangiferin with crude extract. **Methodology:** Six adult male rats/group were taken as vehicle (0.1ml 70% alcohol) control, extract (0.1ml) and mangiferin (1mg) treatment (intra-peritoneal)/100gm b.wt./day for 14 days. **Results:** The results showed no significant change in testicular weight. But seminal vesicle and epididymal weights were significantly increased in pure mangiferin group than extract treatment, whereas seminal vesicle's weight in extract group and prostatic weight in both treated groups were significantly reduced than control. Similar reduction trend was also found in ascorbic acid of testis and liver but was increased in epididymis in mangiferin group than control. The prostatic fructose was significantly increased in both treated groups whereas in seminal vesicle it showed significant reduction only in pure mangiferin group. The serum cholesterol showed no change but testicular cholesterol was significantly increased in mangiferin group than extract treatment. The scanning electron microscopic study in seminiferous tubules showed qualitative degeneration of spermatogenesis in both treated testes but was predominant in extract treatment. **Conclusion:** From this study it may be concluded that gonadal inhibitory nature is quite different in extract treated group compard to pure mangiferin infusion.

CHARACTERIZATION OF ENERGY GENERATION IN *LEISHMANIA DONOVANI* AMASTIGOTE FORMS

Jay Jyoti Roy, Suman Das, Subhasish Mondal, Tanmoy Bera

Division of Medicinal Biochemistry, Department of Pharmaceutical Technology, Jadavpur University, Kolkata-700032, W.B., India

Leishmaniasis is a neglected tropical disease caused by protozoan parasites belonging to the genus *Leishmania.* One of the approaches to find out a new lead is exploration of metabolic (biochemical) differences between the invading microorganism and the host. Preliminary observation on the energy metabolism in amastigotes reveals that the mitochondrial electron transport chain is not fully functional and consequently ATP synthesis through electron transport chain in the amastigotes is not possible. Thus ATP synthesis is solely depends on the glycolytic enzymes. During excretion of the end product, protons are also trans- located along with these substrates, thus resulting in the formation of pH gradient across the plasma membrane of amastigotes. Amastigotes survive and multiply within phago-lysosomal environment of macrophage where they encounter low pH at around 4.5, low O_2 tension and scarcity of nutrients. Under these circumstances amastigotes produce their ATP from the stored polyphosphate organelles namely acido-calcisomes. It has been shown that NADPH acts as better electron donor compared to NADH for fumarate pyruvate and OAA as electron acceptor. Here it is important to mention that NADPH is generated through the pentose phosphate pathway and NADH through glycolysis pathway. It is unlikely that succinate & fumarate will act as electron donor and acceptor, because both of them have same redox potential. Here we expect that fumarate is undergoing transformation to pyruvate by metabolism and then pyruvate acts as electron donor for succinate. So we may conclude that various redox couples may act as generator through substrate level phosphorylation.

CLONING AND CHARACTERIZING A COMPLEMENTATION GROUP WITH PLEIOTROPIC DEFECTS IN THE *C. ELEGANS* TOUCH RECEPTOR NEURONS

Jyoti Dubey [1, 3, 4], Guru Prasad Reddy Sure[1] and Sandhya P Koushika [1, 2]

[1]National Centre for Biological Sciences, Bangalore, India; [2]Tata Institute of Fundamental Research, Mumbai, India; [3]Manipal University, Manipal, Karnataka, India; [4]Institute of Stem Cells and Regenerative Medicine, Bangalore, India

Touch receptor neurons in *C. elegans* are part of a mechano-sensory network and respond to gentle touch stimuli given to the animal. Early genetic studies have identified many genes involved in the development and differentiation of touch receptor neurons in *C. elegans*. We have isolated and characterized a complementation group in a genetic screen that has multiple defects in the cell biology of touch receptor neurons. This complementation group shows neuronal morphology and transport defects in touch receptor neurons. Presence of secondary and tertiary branches along the neuronal process indicate cytoskeletal defects. In addition touch receptor neurons specific mitochondrial and presynaptic vesicle transport defects have been observed. Using mapping and whole genome sequencing approaches, two possible candidate genes have been annotated, one codes for tubulin and second gene for putative transcription factor. The phenotypes are consistent with defects in two possible pathways: differentiation of touch receptor neurons or a unique mutation in a cell specific tubulin that abrogates transport. It would be interesting to investigate how cytoskeletal and transport phenotypes are related and how this protein brings about these phenotypes, directly or indirectly.

MOLECULAR CELL BIOLOGY OF SPERM RELEASE FROM DROSOPHILA TESTIS

Pankaj Dubey and Krishanu Ray

Department of Biological Sciences, Tata Institute of Fundamental Research, Mumbai, India

Spermiation, or, sperm release into the sperm bag, is an essential process in animal reproduction. It is one of the principal targets of fertility control pharmaceutics. Despite the large number of studies in mammalian systems, the molecular mechanism is still unclear. Drosophila provides an attractive model for studying the molecular cell biology of this process. Sperm development and differentiation occur within a somatic cell enclosure formed by the head and tail cyst cells in Drosophila testis. Mature spermatids coil-up within the cyst enclosure before they get released into the seminal vesicle. Using time-lapse confocal microscopy; we captured the actual release process to show that the tails of mature spermatid bundles enter the testicular duct before the heads come off the head cyst cell. A premature rupture of the cyst enclosure by the spermatids causes the spermiation failure. These observations refuted a longstanding model proposed by Tokuyasu (1972). In addition, we found a dynamic F-actin rich structure, called Actin Cap, which develop at the rostral ends of mature sperm head-bundle during spermiation, prevents mature sperm heads from breaching the head cyst cell. It offers a combination of a dynamic F-actin 'fence' and a 'battery ram' balancing the relentless push of spermatid heads. It offers a unique example of force-induced F-actin polymerization providing active molecular shield at the plasma membrane.

SPATIO-TEMPORAL CHARACTERISTICS OF OLFACTORY CILIA ASSEMBLY IN *DROSOPHILA MELANOGASTER*

Yogesh Gadgil, Kratika Bobra, Krishanu Ray

Department of Biological Sciences, Tata Institute of Fundamental Research, Mumbai, India

Primary cilia are hair-like cellular appendages that function as a cell signaling hub. Present almost ubiquitously, they have a characteristic bipartite cytoskeleton made entirely of microtubules. Sensory cilia are specialized forms of primary cilia responsible for picking up a variety of physico-chemical stimuli. Although they possess a template structure analogous to that of primary cilia, the distal segments of sensory cilia are highly diverse *in lieu* with the enormous diversity of stimuli they sense. Defects in the cilium assembly and functioning results in a plethora of physiological and developmental disorders collectively known as ciliopathies. At present, our understanding of how such complex ciliary structures assemble is incomplete. Previous studies in our lab indicated that the highly branched olfactory cilia of the fruit-fly, *Drosophila melanogaster,* assemble in discrete steps during the pupal stages. Consistent with this observation, we have now established that tubulin and associated proteins enter the cilium in brief phases in sync with the step-wise growth. We have also developed a novel assay for observing the cilium growth and associated transports in an intact pupa to study the dynamics and mechanisms of transport. The observations so far indicate that the regulated transport of cytoskeletal components and modifiers systematically assemble the elaborate distal branches.

Ohio State's University Hospital East, located on the eastern edge of downtown Columbus, blends the friendly atmosphere of a small community hospital with all of the advantages of belonging to a major academic medical center. University Hospital East is also home to the Comprehensive Wound Center, which features a limb preservation program for patients at risk of amputation that is unique in the region.

See more at:
http://wexnermedical.osu.edu/patient-care/locations-and-parking/University-Hospital-East#sthash.tQ7c3JMM.dpuf

Ohio State University and AIIMS Collaborate on India's First Stem Cells Regenerative Medicine Centre

"This venture will introduce a new discipline of medicine to India's premier seat of academic medicine and CRMCBT will provide expertise and advisory. There is a substantial need for regenerative medicine in India," Dr. Chandan K. Sen told IANS in an email interaction.

It will be funded by the department of biotechnology (DBT) and the Indian Council for Medical Research (ICMR).

http://www.vaultstemcell.com/medicalinnovation/ohio-state-university-and-aiims-collaborate-on-indias-first-stem-cells-regenerative-medicine-centre/

THE OHIO STATE UNIVERSITY

SOMATIC REGULATION OF GERM-CELL PROLIFERATION IN DROSOPHILA TESTIS: ROLES OF EGFR DOWNSTREAM SIGNALING

Samir Gupta, Shambhabi Chatterjee and Krishanu Ray
Tata Institute of Fundamental Research, Mumbai, India

Stem cell progeny often undergo transit amplification (TA) before differentiation. The extent and spatio-temporal control of TA defines organogenesis. The neighboring tissue and stem cell microenvironment plays a critical role in this regulation. In *Drosophila*, male germ line encapsulated by two somatic-origin cyst cells, which regulates the gonialblast (germline progenitor) proliferation (exactly four rounds of mitoses) before the spermatocyte differentiation. Previous reports documented that disruption of EGFR signaling in the somatic cyst cells causes extensive proliferation of undifferentiated germline cells. In addition, work from our laboratory established that cytoplasmic dynein and myosin V functions in the cyst cells are essential for the germline TA management. A limited screen for the molecular signaling downstream of EGFR activation in the somatic support cells identified distinct requirements of the ras-MAPK, rho/rac PI3K and Akt/mTor mediated pathways. Here we will report the results of the screen documenting relative contribution of different EGFR downstream cascades in germline TA regulation.

AXONAL TRANSPORT OF ACETYLCHOLINESTERASE IN *DROSOPHILA MELANOGASTER*

Anuttama Kulkarni[1, 2], Yasmin Khan[2] and Krishanu Ray[1]
[1]Department of Biological Sciences, TIFR, Mumbai 400005, [2]Department of Life Sciences, Sophia College, University of Mumbai, India

Acetylcholinesterase (AChE), involved in acetylcholine (ACh) mediated neurotransmission, is synthesized in the cell body of presynaptic neuron and transported to synaptic ends by fast axonal transport. Ectopic accumulation of AChE in axons is associated with severe neurological disorders including Alzheimer's syndrome. Genetic analysis suggested that the synaptic enrichment of AChE requires kinesin-2 motor. In order to understand the pattern and mechanism of AChE transport we expressed recombinant dmAChE, tagged with Turquoise (TQ) and Photo-achievable Green Fluorescent Protein m-Cherry (GPAC), respectively, in cholinergic neurons of Drosophila 3rd instar stage larvae; and monitored the movement by time lapse imaging of live preparations 76-80 hours after egg laying. We found that GPAC::AChE propagates in particulate forms in the axons with an average anterograde speed of 0.8 µm per sec. This is higher than the retrograde speed of 0.5µm per sec. The recombinant AChE was further co-purified using kinesin 2 tail fragments as baits suggesting that the endogenous proteins may bind to the motor. We will present a consolidated summary of observations and discuss overall implications of these findings in the maintenance of neuronal physiology.

CORTICOSTEROIDS VERSUS PENTOXIFYLLINE FOR ALCOHOLIC LIVER DISEASE: A COMPREHENSIVE REVIEW OF CURRENT STATUS

Vineela Nekkanti, Sohel Memon and R.Srinivasan
Department of Pharmacy Practice, PES College of Pharmacy, India

The abstract states that Alcoholic Liver Disease (ALD) is caused by excessive alcohol consumption and is a major social and economic burden in India. The available treatment modalities for alcoholic liver disease are nutritional therapy, drug therapy and liver transplant. Liver transplant generally requires 6 months of proven abstinence for eligibility.The drug of choice for patients with alcoholic liver disease is use of corticosteroids. Corticosteroids are contra-indicated in patients with severe alcoholic hepatitis and co-existent sepsis, gastrointestinal bleeding, and acute pancreatitis. Pentoxifylline is the second line of treatment for those patients, who are non-responsive to steroids. Pentoxifyllines inhibits the cytokine expression and macrophage inflammatory protein-1a, which thereby reduces the inflammation of liver in ALD. But pentoxifylline is thought to have poor impact on serum anti-TNF's level. Pentoxifylline is effective in decreasing the incidence of hepato-renal syndrome (HRS) and improves renal function in patients with alcoholic liver disease, but the proof of reducing mortality remains controversial. However, multiple trials have failed to show conclusive superiority of either pentoxifylline or corticosteroids.

NEAR INFRARED FLUORESCENT CHOLANGIOGRAPHY FACILITATES IDENTIFICATION OF BILIARY ANATOMY DURING LAPAROSCOPIC CHOLECYSTECTOMY

Sylvester Osayi, Edward Jones and Vimal Narula
Center for Minimally Invasive Surgery, The Ohio State University Medical Center, Columbus, OH

Background: Intraoperative cholangiography (IOC) is the current gold standard for biliary imaging during laparoscopic cholecystectomy (LC). Near-infrared fluorescence cholangiography (NIRF-C) is a novel, non-invasive method for real-time, intra-operative biliary mapping. The PURPOSE of this study was to assess the safety and efficacy of NIRF-C for identification of biliary anatomy during LC. **Methods:** Patients were administered indocyanine green (CG) prior to surgery. NIRF-C and IOC were used to identify extrahepatic biliary structures before and after partial and complete dissection of Calot's triangle. The successful identification of biliary structures as well as the time required for each technique was recorded. **Results:** Eighty-two patients underwent elective LC during the study period. Mean age and body mass index (BMI) were 42.6±13.7 years and 31.5±8.3kg/m^2 respectively. NIRF-C was significantly faster than IOC for delineation of biliary structures (1.9±1.7 vs. 11.8±5.3 min, $p<0.001$). IOC was unsuccessful in 20 (24.4%) patients while NIRF-C was unsuccessful in 4 (4.9%) patients. After complete dissection, the rates of visualization of the cystic duct, common bile duct, and common hepatic duct using NIRF-C were 95.1%, 76.8%, and 69.5% compared to 72%, 75.6%, and 74.3% for IOC. NIRF-C successfully delineated the biliary structures in 80% of the patients who had unsuccessful IOC. No adverse events were observed with NIRF-C. **Conclusions:** NERF-C is a safe and effective alternative to IOC for imaging extrahepatic biliary structures during laparoscopic cholecystectomy. This technique should continue to be evaluated under a variety of acute and chronic inflammatory conditions to more thoroughly determine its usefulness.

DEVELOPMENT AND VALIDATION OF ANALYTICAL METHODS FOR DETERMINATION OF PRAMIPEXOLE DIHYDROCHLORIDE AND ITS RELATED SUBSTANCES

Sumit Roshan, Ranjana Paudyal, Nagaraj

Department of Pharmaceutical Analysis, PES College of Pharmacy, Bangalore-560 050, India

Extensive survey was done for development of stability indicating method of pramipexole dihydrochloride (PD) tablet and its related substance, but it was found that no studies was reported for determination of related impurities obtained on forced degradation of PD. Hence this proposed work emphasizes the forced degradation study of PD and quantification of related impurity. In order to establish accurate and cost effective, HPLC method for quantification of related substance in PD was successfully developed and validated.

Assay :

Chromatographic Conditions:

Column: Hypersil BDS C18-250 mm X 4.6 mm, 5µ Thermo

Flow rate: 0.7 mL min^{-1}

Pump mode: Isocratic

Wavelength: 260 nm

The selected chromatographic conditions were found to effectively separate Pramipexole (Rt 4.679 min). The total elution time was 10 min. The detector response was found linear with a correlation coefficient of 1.000. The method performance at lower to higher (LOQ upto 200%) is linear, precise and accurate.

Related substances:

Chromatographic conditions:

Column: Hypersil ODS C18-250 mm X 4.6 mm, 5µ Merck

Wavelength: 260nm

Flow rate: 0.7 mL min^{-1}

Runtime: 50 min

The detector response was found linear with a correlation coefficient of 0.999.

DRUG INDUCED LIVER FIBROSIS IN AN *IN VITRO* SYSTEM

Suman Santra

Centre for Liver Research, School of Digestive and Liver Diseases, Institute of Post Graduate Medical Education & Research, Kolkata 700020, India

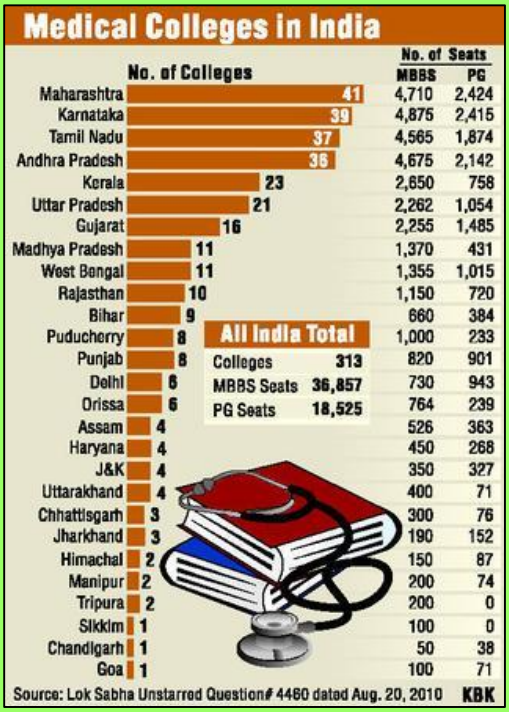
Liver fibrosis is a wound healing process involving cross talk of different cellular components of the liver in response to cellular stress. This work is focused on the impact of anti-tubercular drug isoniazid (INH) induced injured or dying hepatocytes on the hepatic stem cells (HSCs) fibrogenic response and the relevant signaling pathways. Understanding the mechanisms of INH induced HSCs activation in the liver could be of value in ameliorating some of the toxic effects of INH treatment. We have utilized an *in vitro* system employing stable human liver cells lines namely E47 cells (HepG2 cells over expressing CYP2E1) and LX2 cells (hepatic stellate cell line) either in co-culture using Boyden's chamber or culture of LX2 cells with dying INH treated E47 cells to study LX2 cell activation and the relevant pathways by flow cytometry, confocal microscopy, Western blot analysis and qRT-PCR techniques. We have also used shRNA to knock down specific genes that trigger stellate cell activation and COL1A1 and COL1A2 promoter regulation in INH-induced LX2 cells activation.

*** See page 163 ***

INDIAN UNDERGRADUATE MEDICAL DEGREE: **M.B.B.S**

TIMELINE: 5 YEARS

CAN START IMMEDIATELY AFTER HIGH SCHOOL



ESTABLISHMENT OF ROBUST LUNG FIBROSIS MODEL IN RODENTS USING DIFFERENT CHEMICALS

Sayanti Sau[1], Reddy Prasad V[1], Mukund Handral[2]

Department of Pharmacology, PES College of Pharmacy, Bangalore – 560050, Karnataka, India

Lung fibrosis is a common side effect of chemotherapeutic agents. Current evidence suggests that reactive oxygen species may play a key role in the development of lung fibrosis. Chemotherapeutic agents like mitomycin C and oxaliplatin were selected for the development of new model of lung fibrosis in Swiss albino mice. Mice were divided into five groups of 10 each. Group I was considered as normal control, II treated as Sham control (PBS treated), III, IV and V treated as tests (bleomycin (5U/kg), mitomycin C (5mg/kg) and oxaliplatin (15mg/kg) respectively). After 14 days of administration, the mice treated with these chemotherapeutical agents showed pronounced decrease in body weight and food consumption. The tested chemotherapeutic agents induced pulmonary injury and lung fibrosis and this was indicated by increased lung hydroxyproline content, lipid peroxidation, wet lung weight and elevated nitric oxide synthase, in lung tissues. On the other hand, these agents also reduced the glutathione levels and superoxide dismutase enzyme activity in lung tissues. Moreover, these agents also causes severe histological changes in lung tissues identified by infiltration of lymphocytes and neutrophils, increased collagen deposition and fibrosis. Thus, the finding of the present study is that the mitomycin C can be used for inducing lung fibrosis in the experimental animals. Further research is warranted to know the exact mechanism of action for this effect.

AN ALTERNATIVE TO ISOLATED CHICK ILEUM PREPARATION FOR THE FOUR POINT BIOASSAY OF ACETYLCHOLINE

Ankit Singh and Shivalinge Gowda K.P.

Department of Pharmacology, PES College of Pharmacy, Bangalore-560050, India

Biological assays are methods used for estimation of the potency of complex biological substance**.** Current restrictions in experiments with laboratory animals prompted the search for alternative tissues for biological testing. Tissues from poultry, sheep, goats etc., were suggested. Acetylcholine acts on M_3 receptors in the isolated chick intestine causing contractions. The height of contractions is proportional to the concentrations of acetylcholine in the organ bath (graded response). Therefore, the concentration of unknown acetylcholine can be determined by the bioassay against a standard acetylcholine. Though the 4 point bioassay is cumbersome, it provides fairly accurate results. For this purpose, a 4 point bioassay (2+2 dose assay) is used. Procedure in this bioassay included the finding of LDR curve plotted with varying concentrations of standard acetylcholine solutions and given test solutions**.** Two std. doses s1& s2 were selected from linear part of log dose response (LDR). Two test doses t1 & t2 were selected with response of T1 &T2 between S1 & S2; Also s2/s1 = t2/t1 = 2. Four point bioassay was performed using 4 doses (s1, s2, t1 and t2), in a randomized fashion in each set (i.e., 4x4=16 doses).Graph was prepared using mean of S1, S2 and T1, T2 against dose. The potency of unknown acetylcholine was calculated using the formula. This experiment may be included in the Pharmacy UG & Pharmacology PG curriculum as unnecessary scarification of animal is not required.

EFFECTS OF REPEATED SENSORY STIMULATION ON CARGO TRANSPORT IN TOUCH RECEPTOR NEURONS OF *C. ELEGANS*

Parul Sood[1], Kausalya Murthy[2], Aparna Ashok[2], T. Vinod Kumar[3], Gautam Menon[3], Sandhya P. Koushika [1]

[1]Department of Biological Sciences, Tata Institute for Fundamental Research, Mumbai; [2]National Centre for Biological Sciences, Tata Institute for Fundamental Research Bangalore; [3]The Institute for Mathematical Sciences, Chennai, India

Repeated stimulation over long time periods may result in an increased demand for various membrane and protein components required for synaptic neurotransmission. Such needs could be met in part by altering cargo transport along the axon. We investigate the effects of repeated touch stimulation on cargo transport in touch receptor neurons of *C. elegans*. We observe an increased local flux of precursors of synaptic vesicles (pre-SVs) in response to repeated gentle touch stimuli. In addition, there is a concomitant reduction in intensity of stationary precursors of synaptic vesicles. We are attempting to investigate the mechanism of vesicle mobilization in the touch neurons and if these effects are cargo specific.

UNC-16/JIP3 LIMITS THE DENSITY OF MITOCHONDRIA IN C.ELEGANS NEURONS BY MAINTAINING THE BALANCE OF ANTEROGRADE AND RETROGRADE TRANSPORT

Guruprasada Reddy Sure[1,2], Nikhil Mishra[3], Anjali Awasthi[1,4], Swathi Devireddy[1], Swetha Mohan[1], Sandhya P. Koushika[3]

[1]National Centre for Biological Sciences, Tata Institute of Fundamental Research, Karnataka, [2]Sastra University, Tamil Nadu, [3]Department of Biological Sciences, Tata Institute of Fundamental Research, [4]BITS-Pilani, Rajasthan, India

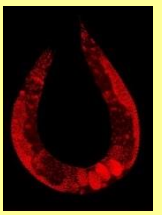
The regulation of mitochondrial density in the neuronal process remains poorly understood and is likely to depend on axonal transport. We show that the density of mitochondria in the touch receptor neurons (TRNs) of adult *C. elegans* is constant. The presence of mitochondria in the neuronal process depends on both the kinesin heavy and light chains but not MIRO-1. Further, the dynein heavy chain controls the density and retrograde flux of mitochondria in the TRN. UNC-16/JIP3 is a kinesin-1 adaptor protein known to play roles in axonal transport of multiple cargo. Mutants in *unc-16* show increased mitochondrial density and elevated levels of both the kinesin heavy and light chains in neurons. Genetic analysis shows that, the increased mitochondrial density at the distal end of the neuronal process in *unc-16* depends at least in part on dynein. We observe a net anterograde bias in flux of mitochondria in the neuronal process of *unc-16* likely as a result of both increased kinesin-1 and decreased dynein in the neuronal processes. Our study shows that UNC-16 limits mitochondrial density in the neuronal process through changes in axonal transport.

is a free-living (not parasitic), transparent nematode (roundwor m), about 1 mm in length, that lives in temperate soil environments.
In 1963, Sydney Brenner proposed research into *C. elegans* primarily in the area of neuronal development. In 1974, he began research into the molecular and developmental biology of *C. elegans*, which has since been extensively used as a model organism.

First multicellular organism to have its whole genome sequenced, and as of 2012 Only organism to have its connectome (neuronal "wiring diagram") completed.

Nobel Prizes involving *C. elegans*

- 2002, the Nobel Prize in Physiology or Medicine was awarded to Sydney Brenner, H. Robert Horvitz and John Sulston for their work on the genetics of organ development and programmed cell death.
- 2006 Nobel Prize in Physiology or Medicine was awarded to Andrew Fire and Craig C. Mello for their discovery of RNA interference
- 2008, Martin Chalfie shared a Nobel Prize in Chemistry for his work on green fluorescent protein.



C. elegans with nuclei stained with Texas red

MECHANICAL RIGIDIFICATION OF SUMO PROTEINS UPON LIGAND BINDING

Anju Yadav, Hema Chandra Kotamarthi, and Sri Rama Koti Ainavarapu

Department of Chemical Sciences, Tata Institute of Fundamental Research, Mumbai 400005, India

Protein-ligand interactions play a key role in many cellular processes and detailed knowledge of such interactions would help in understanding the relationship between protein structure and function. Upon ligand binding, many proteins undergo conformational changes that can also alter the mechanical properties of proteins. Here, we investigate how binding of substrate affects the mechanical properties and the underlying energy landscapes of SUMO (Small ubiquitin related modifiers) proteins. Small ubiquitin related modifiers have structural topology that is similar to ubiquitin but with lower mechanical stability. Small ubiquitin related modifiers interact with many target proteins and enzymes during post-translational modifications known as SUMOylation. We have performed single-molecule force spectroscopy (SMFS) experiments on two Small ubiquitin related modifiers proteins (SUMO1 and SUMO2) with and without small peptide based substrates. Our study shows that highly flexible SUMOs upon binding to target proteins become less flexible (or rigidify) and this may affect downstream events during SUMOylation. Unfolding forces of SUMOs significantly increased upon binding to peptides. Earlier SMFS studies showed that ligand binding (small ions and large proteins) might affect protein mechanical stability. The rigidification (or reduced flexibility) upon ligand binding might be a general mechanism by which ligand binding proteins regulate biological processes.

Mirror Lake is a small lake (pond) on the campus of The Ohio State University in Columbus, Ohio.

Michigan week tradition

It is a tradition for students to jump into the lake around midnight on the Tuesday night in late November prior to the annual football game between the Ohio State Buckeyes and the Michigan Wolverines. Even though students have jumped into Mirror Lake according to tradition since 1969, the modern tradition started in 1990 when Jim Jones led a parade of students on a traditional march around campus. At the end of the parade — at Mirror Lake — students made the celebratory jump. Approximately 12,000 people either jumped or were near the lake for the 2009 jump.

The Mirror Lake Jump event is not a university sponsored event, and people are encouraged not to participate by The Ohio State University.

LIGHTS ON MIRROR LAKE

MIRROR LAKE JUMP

COMPUTATIONAL INVESTIGATION OF ACTION POTENTIALS IN A SYNCYTIUM

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The smooth muscle of the bladder comprises an electrical 3-dimensional syncytium, the properties of which are not precisely understood. Using values for parameters from literature, we have already developed a 3-D computational model of the passive detrusor syncytium, on NEURON platform. The simulation results were in agreement with theoretical and experimental expectations. We then incorporated active channel mechanisms into each of the cells, thereby empowering them with the capacity to generate action potentials. It was found that the action potential shape and the syncytial topology, such as the extent and pattern of coupling between cells, all played an important role in determining their spread. The above approach and findings signify a wide scope for further exploration of factors determining the initiation and propagation of action potentials in a syncytium.

DEVELOPMENT OF AN ULTRASOUND RESPONSIVE DUAL THERAPEUTIC CARRIER FOR HIV

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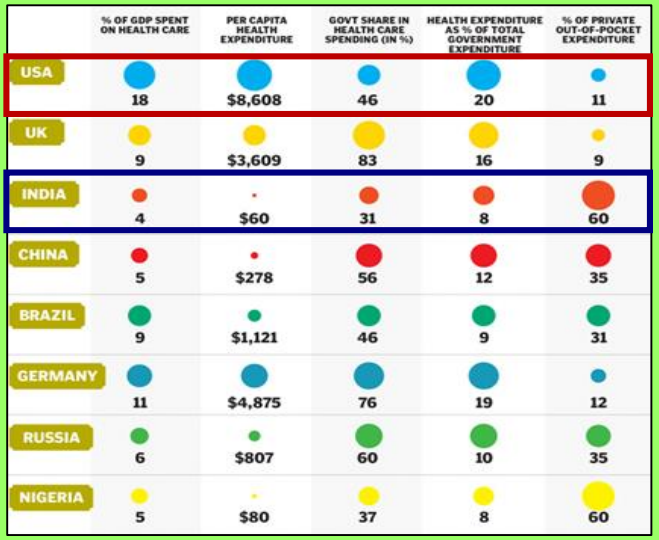
Since the emergence of Acquired Immunodeficiency syndrome (AIDS) in human community, people across the globe have been trying and making various attempts to cure this pandemic in a way or the other, but it has been very challenging for all of them to find a way to overcome this. A lot of manpower and money has been drained in both basic and applied research but still the outcome is same because various problems like side effects, poor bioavailability, lack of access to reservoir sites and drug resistance are being posed by the previous HIV treatments . So, on a same cause but with a different strategy that has been tried in case of cancer, we are interested in developing a novel actively targeted dual therapeutic carrier that can effectively deliver anti-HIV drug (Etravirine) in the HIV infected cells and also increase the transfection efficiency of siRNA specific for HIV *rev gene* by sonoporation in the lymphoid cells using high intensity focused ultrasound locally at the secondary lymphoid tissues (spleen, lymph nodes etc.).

It is the first time, ultrasonic therapy can be used as an attempt to overcome the limitations of the previous nanomedical and conventional therapies using phase conversion of perfluoro pentane (PFP) nanodroplets into microbubbles upon insonation.



COST COMPARISONS

Surgery	US (USD)	India (USD)
Bypass Surgery	130,000	10,000
Heart Valve Replacement	160,000	9,000
Angioplasty	57,000	11,000
Hip Replacement	43,000	9,000
Hysterectomy	20,000	3,000
Knee Replacement	40,000	8,500
Spinal Fusion	62,000	5,500

BIOPHYSICAL MODELLING OF AFFERENT NEURONS CONTROLLING THE BLADDER SMOOTH MUSCLES

Satchithananthi.A and Rohit Manchanda
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One of the important visceral organs involved in micturition is the bladder which is primarily involved in storage and voiding. There is a complex neural network that controls the functioning of this organ, it involves pathways at many levels of the brain, the spinal cord and the peripheral nervous system, ensuring that cycles of bladder filling and voiding take place in accordance with physiological demand. The complexity of the neural circuits involved has started to elucidate, the disorders pertaining to bladder namely the overactive bladder (OAB) though not an immediate life threatening condition can cause substantial deterioration of one's lifestyle. In order to be able to find out the causes of bladder disorders it is essential to understand the mechanisms that are involved in healthy functioning of the bladder. The computational model gives a virtual platform to understand and interpret the healthy bladder as well as what goes wrong in pathological conditions, this holds potential for directing research efforts towards their diagnosis and treatment. The prelimnary model of the afferent neurons, the alpha and beta nerve fibers has been found to mimic the healthy bladder function, this model can be further perfected to find out the causes in pathological conditions.

SHOPPING

For clothes, walki to **FabIndia** near Jehangir Art Gallery, and opposite that there is also a modern Westside shop which usually has a fairly large collection of Indian wear.

A 10-minute taxi ride will also bring you to the Crawford Market area where there are many fabric shops and clothes shops.

Mangaldas Market in this area is one of the big fabric wholesale markets. There are also many big shops here for wedding clothes, Indian traditional wear etc.

For curios, handicrafts etc you can explore **Colaba causeway**.

COLABA CAUSEWAY

MANGALDAS MARKET

http://www.tripadvisor.com/ShowTopic-g304554-i4228-k6880580-Things_to_do_near_Taj_Mahal_hotel_Mumbai-mumbai_Bombay_Maharashtra.html

ROLE OF LARGE CONDUCTANCE VOLTAGE AND CALCIUM ACTIVATED POTASSIUM CHANNELS IN URINARY BLADDER SMOOTH MUSCLES

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Ion channels are one of the most important and crucial part of any tissue. The variants help in controlling and modulating the excitability of the cell. These play a role in the rising and falling phase of the action potential. Out of these, there is a unique ion channel that is controlled by both membrane potential as well as rise in intracellular concentration. These are known as the large conductance voltage and calcium activated potassium (BK) channels. These channels play the most dominant role in the repolarisation phase of the action potential. The aim here is to create a computational model for the BK channels in urinary bladder smooth muscles by implementing the Hodgkin-Huxley formalism. The computational model will imbibe in it the dynamics of intracellular calcium signalling that plays an important role in activating the channel. These channels are currently the most probable targets for various pharmacological drugs to treat a variety of smooth muscle dysfunctions. For instance, mallotoxin, a drug that enhances opening of this channel, has already been patented for hypertension. By creating an accurate channel model, one can then use it to quantitatively and qualitatively study its effect on the functioning of smooth muscle tissues under normal and pathophysiological conditions. This work could then help in testing and validating proposed theories, alongside experimental work.

ULTRASOUND AND THERANOSTICS FOR DRUG DELIVERY TO THE CENTRAL NERVOUS SYSTEM

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Drug delivery to the central nervous system (CNS) is limited by the blood brain barrier (BBB) which is a major obstacle in the treatment of a number of diseases. Ultrasound is a well established modality for diagnostic imaging and in a relatively modern development, is being used as an external trigger to control the spatial and temporal delivery of drugs. This integration of ultrasound as a diagnostic imaging modality into therapeutic interventions has resulted in a whole new technology termed as “Theranostics” (THERApeutics + DiagNOSTICS). The present study explores the use of "smart nanoparticles” loaded with therapeutic agents, modified to be made ultrasound responsive, for precise delivery of drugs to the CNS bypassing the BBB. The use of ultrasound also induces temporary disruption of the BBB, further aiding this drug delivery to the CNS. Also, the smart nanoparticles have been conjugated to ultrasound contrast agents, helping in real time diagnostic imaging using ultrasound. Thus, the present study utilizes a combination of strategies to help in theranostics and resulting in increased bioavailability of therapeutics to the CNS. It has a great potential to be overcome the blood brain barrier and improve drug delivery to treat various diseases of the CNS.

NANOCARRIER FOR THE NON INVASIVE TREATMENT OF POSTERIOR SEGMENT OCULAR DISEASES

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According to the World Health Organization, posterior segment diseases like Age-related macular degeneration (AMD) and Diabetic Retinopathy are among the major causes of blindness and visual impairment. Other posterior segment disease like ocular cancer (retinoblastoma) in higher stages may even need enucleation of eye. The treatment of these diseases in present days involves the use of painful intravitreal or periocular injections. In addition to being highly invasive, their frequent use can lead to conditions like retinal detachment and intravitreal hemorrhage. Topical administration of drugs for treatment of these diseases is limited by low ocular drug absorption in the posterior segment tissue. Hence, there is a need for better ocular drug delivery system. Nanotechnology has immense potential for drug delivery to the posterior segment of eye. The present study leverages a novel nano-carrier for drug delivery to the posterior segment of eye. This nanocarrier has been designed for enhanced ocular penetration with controlled and sustained drug delivery at target site. Thus, the study aims at an effective and non-invasive treatment of posterior segment ocular diseases.

INTERSTITIAL CELLS OF CAJAL AS PACEMAKERS: MODELLING AND ANALYSIS

Swapnil Joshi, Rohit Manchanda

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The urinary bladder shows myogenic, low-level, non-voiding, background spontaneous depolarization, which are believed to help in maintaining bladder tone and shape while it is being filled. Interstitial cells of Cajal (ICC) which are known produce similar kind depolarization in the gastrointestinal tract are also found in the urinary bladder. For better understanding of these spontaneous depolarization, a computational model can be helpful. The hypothesis is stated 'ICC are responsible for the generation of slow waves which causes spontaneous, low level contractions in the bladder that helps in maintaining the tone of the bladder while it is being filled.' Due to unavailability of data for bladder, modelling of ICC pacemaker model of gastrointestinal tract based on existing mathematical models is done From the physiological model parameters on which modelling can be carried out are identified. The biophysical models to be used in modelling are described. Steps to formulate the computational model are laid down. Modelling of involved voltage dependent ion channels is done. Results are validated against the experimental data available.

is a festival also known as the festival of colors or the festival of love. It is an ancient Hindu religious festival which has become popular with non-Hindus in many parts of South Asia, as well as people of other communities outside Asia.

SOURCE: WIKIPEDIA

SEN LAB HOLI 2013

Tweet your comments here or follow comments specific to the OSU-India conference in Mumbai
#healthyOSUIndia

THE ROAD TO THE CONFERENCE: THE MAKING OF H3C

Jan 23-24, 2014 Washington DC Visits Conference Discussions

Embassy of India
Washington, D.C., USA

Meeting with Department of Commerce/Select USA.
Vinai Thummalapally, Executive Director, Select USA

Taranjit Singh Sandhu, Deputy Chief of Mission
Tarun Mohindra, Counsellor, Science and Technology

Attended Republic Day Reception At Embassy Residence of Ambassador Dr. S. Jaishankar

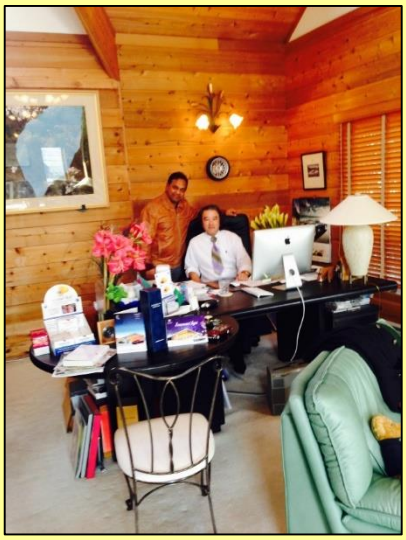
Jan 23-24, 2014 OSU Visits Washington DC for Conference Discussions with DoC

Discussions with Mayor Michael Coleman about the Conference

THE CITY OF COLUMBUS
MICHAEL B. COLEMAN, MAYOR

MORE VISITS

WITH GALA DINNER PERFORMER – BICKRAM GHOSH AT HIS RESIDENCE IN KOLKATA



WITH PATRON YUKI HAYASHI, PRESIDENT, OSATO INTL AT GIFU, JAPAN

WITH THE HIGHER EDUCATION MINISTER OF WEST BENGAL – PREPARATION FOR PRE-CONFERENCE IN KOLKATA

ON A TONGA RIDE IN MUMBAI WITH M. WADIWALLA

WITH DR. GHOSAL AT NATREON R & D , KOLKATA

WITH VICE-CHANCELLOR, PRESIDENCY UNIVERSITY, KOLKATA, WEST BENGAL

MEETING SCHEDULE IN INDIA – JULY 2014

Date	Name of the Organization	Time	Name of the Contact Person	Address
22nd July 2014	BD Interview	8:00 am 9:00 am	Dinesh Dandekar final round of interview	Taj Mahal Palace, Apollo Bunder, , Bombay-
22nd July 2014	TATA Memorial Hospital	10:30 am - 11:00 am	Dr. Anil D'Cruz and Dr. Badwe	Dr E Borges Marg, Parel, Mumbai
22nd July 2014	TIFR	2:00 pm - 3:00 pm	Sandhya Koushika, Vidita Vaidya,Shobhona Sharma	West canteen lounge in TIFR , Navy Nagar, Colaba
22nd July 2014	BARC	12:00 pm - 1:30 pm or 3:30 pm - 7 pm TBD	Dr. Subrata Chattopadhyay , Dr. Soumyakanti Adhikari	RPCD, Chemistry Group,Bhabha Atomic Research Centre, Trombay, Mumbai
23rd July 2014	StemRx Bio Science Solutions, Dr. Mahajan's Hospital & ITC	9:00 am - 9:30 am	Dr. Pradeep Mahajan	Taj Mahal Palace, Apollo Bunder, , Bombay
23rd July 2014	US Commercial Service	11:00 AM - 11:45 pm	Mrs. Ruma Chatterjee, Ms. Camille Richardson	American Consulate General,Bandra (East). Mumbai (India) – 400051.
23rd July 2014	Lilavati Hospital	12:30 PM - 1:30 pm	Dr. Gopinath Rachmale, Dr Mohandas Shetty, Dr. Satyanand Shastri	Mumbai, Maharashtra 400050
23rd July 2014	IIT Bombay	2:30 PM	Dr. Dusane, Dr. Swati Patankar	Dean (IR) Office, Bombay, Powai,
23rd July 2014	Cooper Hospital	Dinner TBD	DR. Mahindra Wadiwala	Juhu, Mumbai, Maharashtra 400056
24th July 2014	Bombay Hospital	12:00 PM	Dr. Gautam	Taj Mahal Palace,
24th July 2014	Battelle India	2:00 pm - 3:30 pm	Shailendra Porwal	Taj Mahal Palace, A,
	Apollo Institute		Dr. Dilip Mathai, Shomita	
	Wipro			
	Mumbai Medical Association		Dr. Ketan Mehta	
25th July 2014	Stryker	8:30 am - 9:30 am	S. Jayalakshmi, Mohit Malhotra, Dheeman Vaidya	Stryker India, Gurgaon.
25th July 2014	USIEF	11:00 am- 11:30 pm	Mr. Adam , Renuka Raja Rao (Country Coordinator)	USIEF,Fulbright House,
25th July 2014	FICCI	12:30 pm - 1:30 pm	Shobha Ghosh , Sarita Chandra	Federation House, New Delhi-110001
25th July 2014	Former Health and Education Minister, Delhi Govt.	2:00 pm - 2:30 pm	Dr. Harsh vardhan	Krishna Nagar,Delhi 110051
25th July 2014	US Embassy	3:00 pm - 4:00 pm	Sandeep Maini, Shibi Jose	Connaught Place,United States Department of State,Public Affairs Section ,American Embassy,
26th July 2014	Nature India	11:00 am - 12:00 pm	Subhra Priyadarshini, Dr. Varshaa	Taj Hotel
26th July 2014	AIIMS	12:30 PM	Dr. Manessh , Dr. Dinda, Dr. Misra	Directors office, AIIMS, in the AIIMS hospital building complex
28th July 2014	Department of Biotechnology	11:30 AM	Dr.S. R. Rao	CGO Complex, Lodhi Road New Delhi -110003
28th July 2014	CSIR	2:00 pm - 3:00 pm	Dr. Gokhale, Dr. Ghosh at Delhi, Dr. Amitava	at CSIR-Institute of Genomics & Integrative Biology (CSIR-IGIB), South Campus,,

WITH AIIMS ORGANIZING COMMITTEE

MEETING IN THE AIIMS DIRECTOR'S OFFICE

CHANDAN SEN WITH GUSTAD DAVER AND MAHENDRA WADIWALLA AT THE NEW HN RELIANCE FOUNDATION HOSPITAL INAUGURATED BY PRIME MINISTER MODI

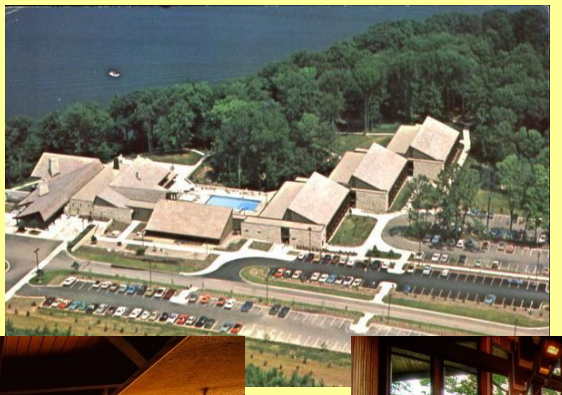
Dr. SEN and Dr. DINDA -OUTSIDE THE CONVERGENCE BUILDING, AIIMS

HOME OF THE FIRST PUBLIC REGENERATIVE MEDICINE CENTER IN INDIA

Shrimati Snehal Ambekar, Hon'ble Mayor, Mumbai with Mahendra Wadiwalla and Chandan Sen

Dr. Sanjay Desmukh Addl Municipal Commissioner, Dept. of Health, Mumbai with Mahendra Wadiwalla and Chandan Sen

CENTER FOR REGENERATIVE MEDICINE 3RD ANNUAL RETREAT AT THE MOHICAN LODGE, OH (AUGUST 1-2, 2014)



Over 60 speakers and 70 attendees representing **OSU**, Nationwide Children's Hospital, **All India Institute of Medical Sciences**, Cincinnati Children's Hospital Medical Center, Indiana University, NCRM, Northeast Ohio Medical University, U of Toledo, U of Akron, U of Cincinnati and Virginia Commonwealth participated in this event.

Topics covered areas ranging from Tissue Engineering, Stem Cell Therapies, Imaging and Wound Care.

AIM: To foster inter-collaboration development across campus/organizations in regenerative medicine. Speakers gave short 7 minute impactful talks that highlighted key findings for collaborative interest or unique infrastructure and resources used towards programmatic interests.

DISTINGUISHED GUEST FROM AIIMS – DR. SC SHARMA

INDIAN CULTURE: WHY IS THE COW CONSIDERED HOLY?

In the religion of Hinduism, the animal called a "**cow**" is thought to be **sacred**, or very holy.

1. Most Hindus respect the cow for her gentle nature which represents the main teaching of Hinduism, non-injury (ahimsa).
2. The cow also represents ghee and strength .

It has become a common myth for ignorants to ridicule Hindus by saying they "worship cows". However, Hindus don't worship cows, but in fact they respect it like any other animal as they believe all life has a soul in which God resides. Thus killing it would be - in a way - a crime.

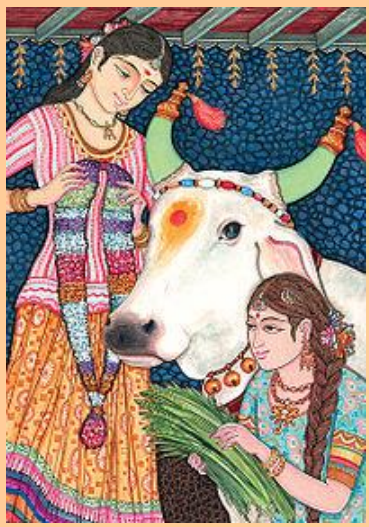
The cow is very honored in society, and most Hindus do not eat beef (the meat that come from cows). By honoring this gentle animal (living thing that is not a plant) that gives more than it takes, Hindus honor all creatures.

The cow was possibly revered because Hindus relied heavily on it for dairy products and for tilling the fields, and on cow dung as a source of fuel and fertilizer. Thus, the cow's status as a 'caretaker' led to identifying it as an almost maternal figure (hence the term *gau mata*).

In the olden days cattle being limited to select few fortunate folks, the cows enjoyed the status that gold or money enjoys today.

QUOTE:
"One can measure the greatness of a nation and its moral progress by the way it treats its animals. Cow protection to me is not mere protection of the cow. It means protection of all that lives and is helpless and weak in the world. The cow means the entire subhuman world."
- Mahatma Gandhi.

SOURCE: WIKIPEDIA



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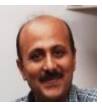
Krishanu Ray, PhD 	Tata Institute of Fundamental Research	krishanu@tifr.res.in
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