

ITMAT 2024

19th Annual
International Symposium

Oct. 14 –15, 2024

From Embryoids to the
Elderly: Translational science
across the lifespan



ITMAT 19th Annual International Symposium
Monday and Tuesday, October 14-15, 2024
Perelman School of Medicine, University of Pennsylvania
Smilow Center for Translational Research (SCTR)
The Arthur H. Rubenstein Auditorium
3400 Civic Center Boulevard, Philadelphia, PA

From Embryoids to the Elderly: Translational Science Across the Lifespan

Monday, October 14 (Day 1)

8:20 ***Introductions***

Garret A. FitzGerald, MD, FRS, Director, Institute for Translational Medicine and Therapeutics, Perelman School of Medicine, University of Pennsylvania

8:25 Jonathan A. Epstein, MD

Interim Executive Vice President, University of Pennsylvania for the Health System & Dean, Raymond and Ruth Perelman School of Medicine, William Wikoff Smith Professor of Medicine

Session 1: *Developmental and Early Human Biology*

Chairs: Marisa Bartolomei, MD, PhD, Perelman Professor of Cell and Developmental Biology, Perelman School of Medicine, University of Pennsylvania and Rajan Jain, MD, Depts of Medicine & Cell & Developmental Biology, Perelman School of Medicine, University of Pennsylvania

8:30 ***Modelling post-implantation human development to yolk sac blood emergence***

Mo Ebrahimkhani, MD, Pathology & Bioengineering, University of Pittsburgh School of Medicine

9:00 ***Embryomimetics: a new frontier in modeling human embryo development in vitro***

Mijo Simunovic, PhD, Columbia University

9:30 ***Multi-chamber cardioids unravel human heart development and cardiac defects***

Alison Deyett, BSc, Institute of Molecular Biotechnology (IMBA) of the Austrian Academy of Sciences

10:00 ***Coffee Break***

Chairs: Deborah A. Driscoll, MD, Senior Vice President, Clinical Practices of the University of Pennsylvania, Vice Dean for Professional Services, Luigi Mastroianni, Jr. Professor of Obstetrics and Gynecology, Perelman School of Medicine, University of Pennsylvania and Celeste Durnwald, Obstetrics and Gynecology, Perelman School of Medicine, University of Pennsylvania and Celeste P. Durnwald, MD, Associate Professor of Obstetrics and Gynecology, Perelman School of Medicine, University of Pennsylvania

10:30 ***What causes severe morning sickness: using genetics to solve an unmet need in women's health***

Marlena S. Fejzo, PhD, Center for Genetic Epidemiology, Department of Population and Public Health Sciences, University of Southern California Keck School of Medicine

11:00 ***Oxytocin and adipose tissue: a new role for an ancient hormone***

Evan D. Rosen, MD, PhD, Chief, Division of Endocrinology, Diabetes, and Metabolism, Beth Israel Deaconess Medical Center and Professor, Harvard Medical School

11:30 ***Deciphering maternal-fetal cross-talk in the human placenta during parturition using single-cell RNA sequencing***

Nardhy Gomez-Lopez, MSc, PhD, Washington University School of Medicine

12:00 ***Lunch***

Session 2: *Extracting Information from Translational Data*

Chairs: Marylyn Ritchie, PhD, Edward Rose, M.D. and Elizabeth Kirk Rose, M.D. Professor, Director, Institute for Biomedical Informatics, Perelman School of Medicine, University of Pennsylvania and Lyle H. Ungar, PhD, Computer and Information Science, Perelman School of Medicine, University of Pennsylvania

1:00 ***Perturbational phenotyping to systematically identify new disease subsets***

Calum A. MacRae, MD, PhD, Harvard Medical School/Mass General Brigham

1:30 ***Computational neuroimaging of population mental health***

Janine Bijsterbosch, PhD, Radiology, Washington University in St. Louis

2:00 ***AI and the heart: understanding how cardiac motion predicts human health***

Declan O'Regan, FRCP, FRCR, PhD, Imperial College London

2:30 ***Break***

Chairs: Joshua L. Dunaief, MD, PhD, Adele Niessen Professor of Ophthalmology, Vice Chair for Research, Department of Ophthalmology, Perelman School of Medicine, University of Pennsylvania and Anurag Verma, PhD, Translational Medicine and Human Genetics Perelman School of Medicine, University of Pennsylvania

3:00 ***Quantitative phenotyping of age-related vascular pathologies from patient imaging data in Penn Medicine Biobank***

Elena P. Sorokin, PhD, Principal Data Scientist, Calico Life Sciences LLC

3:30 ***Links between ocular and systemic health: insights from phenome- and genome-wide analyses***

Nazlee Zebardast, MD, MSc, Ophthalmology, Massachusetts Eye and Ear

4:00 ***Conclusion***

6:30 **Reception and Dinner: The College of Physicians of Philadelphia**
19 South 22nd Street, Philadelphia

The First 1000 Days Project: A Novel Framework for Modeling Child Development

Uri Hasson, PhD, Psychology and Neuroscience, Princeton University

Transportation will be provided to and from the dinner. Buses will depart from the front of the Perelman Center for Advanced Medicine (circular driveway in front of building that connects to the Smilow Center for Translational Research) at 6:10PM and will return to the Hilton Inn at Penn at approximately 9:00PM.

Speakers and chairs may take a shuttle bus from the Hilton Inn at Penn, Walnut Street entrance, departing at 6:10PM, returning to the hotel at approximately 9:00PM.

Tuesday, October 15 (Day 2)

Session 3: *Sleep and Circadian Biology*

Chairs: Ron C. Anafi, MD, PhD, Sleep Medicine, Perelman School of Medicine, University of Pennsylvania, and Aalim M. Weljie, Pharmacology, Perelman School of Medicine, University of Pennsylvania

9:00 ***Are neanderthals keeping me up at night?***

John A. (Tony) Capra, PhD, Head of the Division of Bioinformatics, Department of Epidemiology and Biostatistics, University of California, San Francisco

9:30 ***Unlocking metabolic mysteries of sleep: before and after the Zzzs***
Amita Sehgal, PhD, Neuroscience, Director, Chronobiology and Sleep Institute, Investigator, HHMI, Perelman School of Medicine, University of Pennsylvania

10:00 ***Prolonged sleep deprivation induces a cytokine- storm-like syndrome in mammals***
Eric Erquan Zhang, PhD, Principal Investigator, NIBS, Beijing

10:30 ***Coffee break***

Session 4: *Therapeutic Innovation in Translational Science*

Chairs: Sir Keith Peters, Emeritus Regius Professor of Physic, University of Cambridge and Katalin Susztak, MD, PhD, Perelman School of Medicine, University of Pennsylvania

11:00 ***Microrobots and their coming impact on healthcare***
Bradley J. Nelson, PhD, Prof. Dr., Swiss Federal Institute of Technology (ETH)

11:30 ***Advancing drug delivery: fortuitous tropisms vs cognizant targeting***
Vladimir Muzykantov, MD, PhD, Founders Professor of Nanoparticle Research, Perelman School of Medicine, University of Pennsylvania

12:00 ***Driving the new CAR-T models***
Marcela Valderrama Maus, MD, PhD, Harvard Medical School

12:30 ***Therapeutic gene editing for cardiovascular and metabolic diseases: from the leading cause of death to N-of-1 disorders***
Kiran Musunuru, MD, PhD, MPH, ML, MRA, Cardiovascular Medicine and Genetics, Perelman School of Medicine, University of Pennsylvania

1:00 ***Lunch Break***

Session 5: *Intercepting Age-Related Decline*

Chairs: Virginia Man-Yee Lee, PhD, The John H. Ware 3rd Endowed Professor in Alzheimer's Research, Director, Center for Neurodegenerative Disease Research, Perelman School of Medicine, University of Pennsylvania and Nick van Bruggen, PhD, Fellow, Human Imaging, Calico Life Sciences LLC

2:00 ***Quantifying aging, longevity and rejuvenation***
Vadim Gladyshev, PhD, Harvard Medical School, Brigham and Women's Hospital

2:30 ***ROS-induced ribosome impairment underlies ZAKα-mediated metabolic decline in obesity and aging***
Anna Constance Vind, PhD, Center for Gene Expression, Department of Cellular and Molecular Medicine, University of Copenhagen

3:00 ***Break***

Chairs: Jay A. Gottfried, MD, PhD, Vice Chair of Research, Department of Neurology Arthur H. Rubenstein University Professor, Perelman School of Medicine, University of Pennsylvania and Daniel J. Rader, MD, Seymour Gray Professor of Molecular Medicine, Chair, Department of Genetics, Perelman School of Medicine, University of Pennsylvania

3:30 ***Hippocampal remapping and spatial memory decline in aging***
Li Zheng, PhD, Research Scientist, The University of Arizona

4:00 ***Plasma proteomics biomarkers of longevity***
Eugene Melamud, PhD, Principal Investigator, Calico Life Sciences LLC

4:30 ***Concluding Remarks***
Garret A. FitzGerald, MD, FRS, Director, Institute for Translational Medicine and Therapeutics, Perelman School of Medicine, University of Pennsylvania