

RRS SIG & GENETICS SIG WORKSHOP: *ADVANCED MULTI-OMIC TECHNOLOGIES IN REPRODUCTIVE SCIENCES*



AGENDA



WEDNESDAY, SEPTEMBER 20TH 2023

12:00 PM – 6:00 PM EST

ROOM: PIER 9



RRS SIG & Genetics SIG Workshop: Advanced Multi-Omic Technologies in Reproductive Sciences

11:00 am - 11:50 am EST

Lunch

11:50 am - 12:00 pm EST

Introduction & Welcome

Andrée Gauthier-Fisher and Jay Baltz

12:00 pm - 12:40 pm EST

Lecture 1: Deploying AI for Clinical Use

Dr. Michael Brudno



Michael Brudno is a Professor in the Department of Computer Science at the University of Toronto, as well as the Chief Data Scientist at the University Health Network (UHN). His main research interest is the development of computational methods for the analysis of clinical datasets, especially the capture of precise clinical data from patient encounters, using both refined User Interfaces, and mining of unstructured data (based on Machine Learning methodology). His overall research goal is to enable the seamless automated analysis of patient data based on automatically captured information from a clinical encounter, thus streamlining clinical workflows and enabling faster and better treatments.

12:40 pm - 1:20 pm EST

Lecture 2: Using Single-Cell Genomics to Advance Our Understanding of Human Development

Dr. Sophie Petropoulos

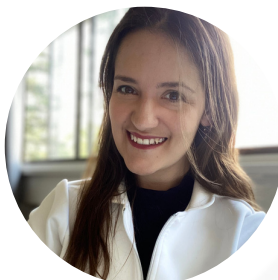


Sophie Petropoulos is currently an Associate Professor at the Karolinska Institutet, Department of Clinical Science, Intervention, and Technology and the Centre de Recherche de Centre Hospitalier de l'Université de Montréal and the University of Montreal, Department of Medicine. Her research focuses on early human development and fertility, using cutting edge molecular biology techniques including single-cell genomic-sequencing (RNA, small noncoding RNA, methylation), single-molecule RNA FISH, imaging, phenotyping, in vitro and in vivo models, and bioinformatics. The overall goals of her research program are to determine fundamental mechanism(s) underlying human embryo preimplantation development and to identify external factors which may reprogram the offspring's life-trajectories and ultimately manifest in disease/disorders later in life.



1:20 pm - 2:00 pm EST

Lecture 3: Multiomics Assessment of Mitochondria in Gametes and Embryos



Dr. Camila Bruna de Lima

Camila has obtained a bachelor's degree in biomedical sciences from the State University of Sao Paulo, Brazil, a master's degree in Human Reproduction and a PhD in Biotechnology. Her research has focused how mitochondrial metabolism impacts the epigenetic profile of bovine gametes and embryos. Currently, she is a postdoc in the lab of Dr. Marc-André Sirard at Université Laval where she studies the modulation of cytosine methylation in mitochondrial DNA during initial embryonic development.

2:00 pm - 2:20 pm EST

Trainee Abstract Presentations

To be announced...

2:20 pm - 2:50 pm EST

Health Break

2:50 pm - 3:30 pm EST

Lecture 4: Engineering Folliculogenesis in vitro Using a Multi-Omics Approach



Andrea Jones

Andrea Jones is a PhD candidate in the Biomedical Engineering Department at the University of Michigan working under her advisor, Dr. Ariella Shikanov. Andrea earned her Bachelor of Science in Biological Systems Engineering at Virginia Tech and subsequently completed her Master of Science at the University of Michigan in Biomedical Engineering. Her research interests are in engineering an in vitro ovarian follicle culture system to restore fertility and understanding human follicle development through next-generation sequencing technologies. Her dissertation focuses on the application of single-cell sequencing and spatial transcriptomics to identify the mechanisms driving early follicle development, and to design an in vitro follicle culture system using novel biomaterials. Andrea is the recipient of a Ruth L. Kirschstein Predoctoral Individual National Research Service Award (F31) from the National Institutes of Health (NIH) and the Gridley McKim-Smith Women's Health Fellowship from the Foundation for Women's Wellness.



3:30 pm - 4:10 pm EST

Lecture 5: The Epigenome From the Oocyte to the Embryo: What Can We See Now?

Dr. Julie Brind'Amour



Dr. Brind'Amour did her postdoctoral training at the University of British Columbia where she has developed tools to study epigenetic remodeling during development and investigated the role of endogenous retroviruses on the evolution of the maternal epigenome in mammals. She recently joined the Université de Montréal as an assistant professor, where her laboratory uses a combination of molecular biology, genomic sequencing and bioinformatics analysis tools to answer questions related to the transition from the maternal epigenome to that of the embryo. Specifically, research in her lab focusses on how genetic mutations or interventions can introduce of epigenetic "errors" in the maternal germline and the early embryo, resulting in severe developmental disorders and fetal lethality.

4:10 pm - 4:50 pm EST

Lecture 6: Advanced Single-Cell Omics Technologies and Stem-Cell Embryo Models to Understand Early Human Development

Dr. Vincent Pasque



Vincent Pasque is a Belgian Associate Professor of Stem Cell and Developmental Biology at KU Leuven, specializing in gene regulation, epigenetics, and chromatin structure during development and reprogramming to pluripotency. He earned his PhD in 2023 at the University of Cambridge, where he identified macroH2A histone variant as a barrier to somatic cell reprogramming under the mentorship of Dr. John Gurdon. Dr. Pasque's lab studies gene regulatory programs and epigenetic mechanisms underlying early mammalian development and reprogramming to pluripotency. They use various mammalian systems and interdisciplinary methods, including single-cell (multi)omics, advanced imaging, computational approaches, CRISPR and RNA interference. Dr. Pasque identified several chromatin regulators that oppose the induction of alternative cell fates and characterized new stem-cell based human post-implantation models.

4:50 pm - 5:10 pm EST

Trainee Abstract Presentations

To be announced...

5:10 pm - 6:00 pm EST

Social Networking