# SBME ANNUAL SYMPOSIUM

## June 4, 2024 | 12:00 pm - 2:00 pm

# Trainee Poster List

***Poster Presentation Generously Sponsored by:***

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**UBC** School of Biomedical Engineering

| | POSTER TITLE | PRESENTER | SUPERVISOR |
|---|---|---|---|
| 1 | Evidence of leakage in every genomic DNA trained sequence-to-expression deep learning models trained to date and ways to overcome it | Abdul Muntakim Rafi | Carl de Boer |
| 2 | Electrogenic Dynamics of Biofilm Formation: Correlation Between Genetic Expression and Electrochemical Activity in Bacillus subtilis | Adel Yavarinasab | Carolina Tropini |
| 3 | In Vivo Angiography and Multimodal Endobronchial Optical Coherence Tomography | Adrian Tanskanen | Pierre Lane |
| 4 | Microbial intestinal dysbiosis drives long-term allergic susceptibility by sculpting an ILC2-B1 cell–innate IgE axis. | Ahmed Kabil | Kelly McNagny |
| 5 | Photoacoustic needle tip localization during ultrasound biopsy procedures | Antonio Pinos Benitez | Engineers in Scrubs |
| 6 | Shadowing an Endoscopic Rhinology & Skull Base Surgeon from an Engineer's Perspective: Scientists Immersion in Medicine Program | Alex Pieters | Karen Cheung |
| 7 | Clinical Congruence Score: A Semantic Bridge Between Large Language Models and Large Vision Models in Digital Pathology | Ali Khajegili Mirabadi | Ali Bashashati |
| 8 | A Combined Synthetic Biology and Mathematical Modeling Approach for the Large-Scale Supply of Human Pluripotent Stem Cells | Ali Shahdoost | Nika Shakiba |
| 9 | 3D & 2D generation of multi-species PSC-derived retinal graft for use in retinal cell therapy for treating blindness | Ali Otadi | Laver Group |
| 10 | BreathPod: Non-Invasive Diagnostics through Breath Analysis | Alireza Bahari | Jane Hill |
| 11 | Microscale Molecular Gradients on Open Biological Surfaces for Tumor Modelling | Alisa Da Silva | Govind Kaigala |
| 12 | The inconsistencies in spinal cord injury mechanical parameters in porcine models | Amirhossein Borjali | Peter Cription |
| 13 | Towards Mitigating Intimate Partner Violence - development of a neck cuff for animal modelling of non-fatal strangulation | Angela Li | Peter Cripton Cheryl Wellington |
| 14 | Applying Near-Infrared Imaging Intraoperatively to Assess Transplant Kidney Quality and Metabolic Function | Arshdeep Khurana | Babak Shadgan |

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|---|---|---|---|
| 14 | Decoding Cancer Promoter Regulatory Logic through Random Mutagenesis Using CRISPR-Cas9 Base Editors | Asfar Lathif Salaudeen | Carl de Boer |
| 15 | Towards Mitigating Intimate Partner Violence - development of a neck cuff for animal modelling of non-fatal strangulation | Angela Li | Peter Cripton<br>Cheryl Wellington |
| 16 | Applying Near-Infrared Imaging Intraoperatively to Assess Transplant Kidney Quality and Metabolic Function | Arshdeep Khurana | Babak Shadgan |
| 17 | Decoding Cancer Promoter Regulatory Logic through Random Mutagenesis Using CRISPR-Cas9 Base Editors | Asfar Lathif Salaudeen | Carl de Boer |
| 18 | Step Aside: Understanding Collision Avoidance Strategies in Children with and without Developmental Coordination Disorder | Beatrice Gonzales | Timothy Bhatnagar |
| 19 | Studies of supercoiling-induced denaturation within DNA plasmids using single-molecule Convex Lens-induced Confinement microscopy | Bianca Caminada | Sabrina Leslie |
| 20 | A scalable computing framework for whole-body mouse cell lineage reconstruction | Brett Kiyota | Nozomu Yachie |
| 21 | Myocardial infarction scar cell dynamics in a hyper-regenerative model: identification of new therapeutic targets | Bruce Lin | Fabio Rossi |
| 22 | Investigating the Effect of Invariant Natural Killer T Cell Receptor on T Cell Development and Function from Human Pluripotent Stem Cells | Charles Lau | Peter Zandstra |
| 23 | 3D bioprinting retinal graft to create multi-layer, custom patterned implants for the treatment of retinal-based blindness | Christopher Laver | Laver Group |
| 24 | Quantifying multi-layer retinal graft stratification across multiple imaging modalities to enhance cell therapy development for blindness | Corey Kelly | Laver Group |
| 25 | Symmetry-breaking, scaling and growth control in adherent pluripotent stem cell-derived developmental organoids | Daniel Aguilar Hidalgo | Peter Zandstra |
| 26 | Multiplexable production of monoclonal pseudoviruses for high-throughput viral variant screening | David Mackay | Nozomu Yachie |
| 27 | Studying knee cartilage mechanics using the MRI magnetisation transfer ratio | Edward Hoptioncann | David Wilson |

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| 28 | A soft and implantable device for bladder management | Elham Mohseni | Dena Shahriari |
| 29 | Aggregate size determines lineage competence in iPSC-derived blood differentiation | Elizabeth Castle | Peter Zandstra |
| 30 | Identifying prophylactic implant designs and features to increase predicted femur force and prevent hip fracture in a fall | Emily Bliven | Orthopaedic and Injury Biomechanics Group |
| 31 | Intracellular Dynamics of LNP-mediated mRNA Delivery: A Single-Cell Exploration Toward Enhanced Therapeutics and Vaccine Developments | Eric Boateng | Sabrina Leslie |
| 32 | Engineering CAR-expressing innate lymphoid cells (ILCs) from human pluripotent stem cells (hPSCs) for cancer immunotherapy | Grace Kuo | Kelly McNagny |
| 33 | Uncovering Heterogeneity in Beta Cell Differentiation | Hourieh Movasat | Nika Shakiba |
| 34 | Cellular Societies: Balancing Individual Goals with Collective Viability in Embryo Development | Ipek Egilmez | Nika Shakiba |
| 35 | Photocrosslinkable GelMA hydrogels support neurite outgrowth in a microscale in vitro spinal cord injury model | Iryna Liubchak | Karen Cheung |
| 36 | Does Inhibitory Repetitive Transcranial Magnetic Stimulation Modulate Heart Rate Variability in Depression? | Jaeyoon Kim | Fidel Vila-Rodriguez (NINET Lab) |
| 37 | Dynamics of Player Movements in Female Soccer: Implications for ACL Injury Risk | Jason Fu | Human Motion Biomechanics Lab (HuMBL) |
| 38 | Multipath Contrast Imaging for Oral Cancer Management | Jeanie Malone | Pierre Lane |
| 39 | Comparison Analysis of SPLICS and MCS-DETECT for Detecting Mitochondria-ER Contact Sites (MERCs) | Jieyi Zheng | Ivan Robert Nabi |
| 40 | Temporal effects of chimeric antigen receptor (CAR) intracellular domain combinations in T cell development from iPSCs. | Jiyoung Yun | Peter Zandstra |

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| 41 | Investigating the Role of Intercellular Mitochondrial Transfer in Cell Competition of Human Embryonic Stem Cells | Joshua De Guzman | Nika Shakiba |
| 42 | The Detection of Cardiac Fibrosis from ECG and the Role of Machine Learning: A Review of Existing Literature and Future Directions | Julia Handra | Roger Tam |
| 43 | Towards Personalized Pressure Injury Prevention in SCI: Soft Sensing Technology & Data-Driven Algorithms | Justin Wyss | John Madden & Babak Shadgan |
| 44 | Video based estimation of efforts in stationary cycling using computer vision and machine learning | Ka Chun (Kelvin) Lee | Pawel Kudzia |
| 45 | Investigation of Local Effects of Transposable Elements in Preimplantation Embryos | Kai Wei Chang | Nika Shakiba |
| 46 | Invariant Natural Killer (iNKT) Cell Expansion and Functionality Testing | Karina Akhmedova | Peter Zandstra |
| 47 | Computational Investigation of the Developmental Pathways of Stem-cell Derived Islet Cells | Katarina Zosel | Francis Lynn |
| 48 | Scientists′ Immersion in Medicine: Observations & Learnings in Cardiovascular Surgery | Ke Xin (Katie) Chen | Scientists' Immersion in Medicine (SIiM) |
| 49 | Neurologist on Wheels | Keely Shay Maki | St. Paul's Neurology |
| 50 | Allogeneic regulatory T cell therapy to treat chronic inflammation | Kevin Salim | Megan Levings |
| 51 | Microfluidic integration with silicon photonic biosensors: challenges and future directions | Kowsar Heydari | Karen Cheung |
| 52 | Sex-biased thymus architecture guides T cell development through spatially defined niches | Laura Stankiewicz | Peter Zandstra<br>Fabio Rossi |

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| 53 | Humanized DRAGA mouse model recapitulates human T-cell differentiation in the mouse thymus with HLA-matched donors | Laura Gonzalez | Connie Eaves<br>Peter Zandstra |
| 54 | Developing surface functionalization strategies for robust point-of-care silicon photonic biosensors | Lauren Puumala | Karen Cheung |
| 55 | Generating CD4+ Helper T cells from Human Pluripotent Stem Cells | Lauren Durland | Peter Zandstra |
| 56 | Association between Long Range Temporal Correlations in Functional MRI BOLD Signal and the Excitatory/Inhibitory Ratio | Lydia Sochan | Alexander Weber |
| 57 | Narrowing the Window of Opportunity: The Impact of Early-Life Microbial Dysbiosis on Immune Development and Susceptibility to Allergic Disease | Maggie Chopra | Kelly McNagny |
| 58 | Generation of T-cell-derived-iPSC retinal pigment epithelium (RPE) graft for treating common forms of blindness | Margaret Javier | Laver Group |
| 59 | The cell-type-specific spatial organization of the anterior thalamic nuclei in the mouse brain | Margarita Kapustina | Mark Cembrowski |
| 60 | iPSC-derived myogenic progenitors deliver in vivo cell therapeutics | Mark Hamer | Fabio Rossi |
| 61 | Enhancing iPSC-derived CAR-T Cell production via small molecule inhibition of Lin28B | Matthew Chan | Peter Zandstra |
| 63 | Engineering immune cell interactions to study their responses to drugs and cytokines within the tumor microenvironment | Megha Srinivas | Govind Kaigala |
| 64 | Adverse Event Prediction in Transvenous Lead Extraction Through AI-Based Preoperative Screening | Michael Diaz Stewart | Ali Bashashati |
| 65 | Identification Of Gene Regulatory Networks Essential For Hematopoietic progenitor cell And T cell Emergence From Human Pluripotent Stem Cell Via CRISPR Screens | Mona Siu | Peter Zandstra |
| 66 | Cell 2 Spec: Spatio-temporally resolved sparse-cell proteomics | Nadège Oger | Govind Kaigala |

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| 67 | We Don't Talk Anymore: Disruptions to the Lacunocanalicular Network in Prostate Cancer Bone Metastasis | Naomi Jung | Rizhi Wang |
| 68 | Bile acid metabolites moderate pathogenic ILC3/Th17 cell-driven intestinal fibrosis by restraining ROR-dependent IL-17 production | Natalia Nayyar | Kelly McNagny |
| 69 | A 3D synthetic microfluidic retina for rapid iteration of regenerative retinal cell therapies. | Nathan Howerton | Laver Group |
| 70 | Generation of  T-Cell-Derived-HIPSC Photoreceptor Graft for Treating Common Forms of Blindness | Noah Tourigny | Laver Group |
| 71 | Development of a novel retinal-graft migration & synaptogenesis assay using GelMA-coated custom 3D-printed microwells | Owen Liu | Laver Group |
| 72 | Computational investigation of impact of gyral geometry on low-intensity transcranial focused ultrasound neuromodulation for a standardized target in the left dorsolateral prefrontal cortex | Parsa Tadayon | Fidel Vila-Rodriguez |
| 73 | Building gene regulatory networks of a human gastrulation model using scRNA-seq data | Pattarin Blanchard | Nika Shakiba |
| 74 | Implantation and Assessment of a Ventral Microelectrode Stimulator for Spinal Cord Injury Treatment | Paul Juralowicz | Bio MEMs |
| 75 | Estimating Biomechanical Forces From Video Using Computer Vision and Machine Learning | Pawel Kudzia | SBME Faculty Member |
| 76 | Exploring the therapeutic capacity of mRNA and saRNA LNP formulations | Petya Popova | Anna Blakney |
| 77 | The effects of denosumab on bone mineralization in the treatment of giant cell tumors of the spine | Robyn Birch | Rizhi Wang |
| 78 | A novel in-house virtual surgical planning system for mandibular reconstruction - a clinical case series | Rohan Birk | Eitan Prisman |
| 79 | Engineered, clinically-relevant production of helper (CD4+) T cells from pluripotent stem cells | Ross Jones | Peter Zandstra |

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| 80 | Spatial DNA Barcoding Assisted by Microfluidics for Quantification of Intratumor Heterogeneity | Ruth Yu | Govind Kaigala |
| 81 | Design and Development of a Low-Cost Modular Simulator for Training in the Surgical Management of Jejunoileal Atresia | Ryan Yeung | Tim Salcudean<br>Shahrzad Joharifard<br>Roger Tam |
| 82 | Quantitative visualization of lipid nanoparticle fusion as a function of formulation and process parameters | Sadie Graves | Sabrina Leslie |
| 83 | Variant Effect Prediction using Deep Neural Network in Autoimmune Disease | Sambina Islam Aninta | Carl de Boer |
| 84 | Simultaneous, single-particle measurements of size and loading give new insights into the structure of drug-delivery nanoparticles | Shagun Kothari | Sabrina Leslie |
| 85 | Fully implantable, flexible optical probes for neuromodulation of the spinal cord | Shahriar Shalileh | Dena Shahriari |
| 86 | Spatiotemporal sampling of Pancreatic cancer cells for profiling cellular plasticity in collective migration processes | Sharvari Somayaji | Govind Kaigala |
| 87 | Integrated Metabolic and Macromolecular Profiling to Enhance Quality Control in Human Pluripotent Stem Cell Expansion | Shreyas Rangan | Shakiba Lab |
| 88 | Modeling functional evolutionary trajectories of protein-coding sequences by high-dimensional genotype-fitness landscapes | Sofia Romero | Nozomu Yachie |
| 89 | Sketch-Treat-Etch: Microfluidic Technology for Spatial Investigation into Rare Tumor Cell Populations | Sofia Graham | Govind Kaigala |
| 90 | A multi-kingdom genetic barcoding system for precise target clone isolation | Soh Ishiguro | Nozomu Yachie |
| 91 | LuxNFlow: Direct-Light Projection on a Chip for Dynamic Flow Pattering | Sridaran Rajagopal | Govind Kaigala |
| 92 | What does the emptiness of lipid nanoparticles mean for mRNA therapeutics? | Suiyang Liao | Anna Blakney |

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| 93 | Hic1 in the maintenance of lung CD4+ T cells (TRM) in allergic asthma | Taehyun Kim | Kelly McNagny |
| 94 | Visible Light Crosslinkable GelMA Hydrogels for Injection into Spinal Cord Lesions | Tanya Bennet | Karen Cheung |
| 95 | Development of a High-Throughput Platform for Transcription Factor Characterization | William Cheney | Carl de Boer |
| 96 | Engineering Novel Collective Cancer Migration Models | Yara Nasrallah | Govind Kaigala |
| 97 | Alignment of Magnetic Microstructures in an Injectable Spinal Cord Injury Treatment: Simulation and Generation of Configurable Magnetic Fields | Yas Oloumi Yazdi | Karen Cheung |
| 98 | The effect of suspension culture parameters on the growth and pluripotency of wild type and genetically variant human pluripotent stem cells | Yeganeh Dorri Nokoorani | Nika Shakiba |
| 99 | Beyond Conventional Parametric Modeling: Data-Driven Framework for Estimation and Prediction of Time Activity Curves in Dynamic PET Imaging | Zakariaei Niloufar | Arman Rahmim |
| 100 | Assessing the ability of multiple hydrogels to support in vitro neurite outgrowth in 3D from dorsal root ganglia | Zhuoye Xie | Karen Cheung |