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Acknowledgements

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About Us
Molecular and Systems Pharmacology (MSP) at the Faculty of Pharmaceutical Sciences research focuses on drug discovery and development processes, with expertise in cancer pharmacology, cardiovascular pharmacology, diabetes, drug metabolism, neuropharmacology and pharmacogenomics.

Highlights

New Recruitments
Ly Vu - Assistant Professor (Tenure Track)
Jessica Kalra - Assistant Professor of Teaching (Tenure Track)

Main Areas of Research

Dr. Abby Collier and Dr. Michael Coughtrie Labs
Pharmacology and toxicology of pregnancy, drug metabolism and pharmacokinetics, phase II conjugation enzymes, in vitro and in vivo extrapolation (IVIVE) with physiologically-based pharmacological modelling.

Dr. Guri Giaver and Dr. Corey Nislow Labs
Genetic mutations responsible for variations in drug efficiency, yeasts in space.

Dr. Sarah Hedtrich Lab
Next generation therapies, regeneration of human tissues and disease models.

Dr. Jessica Kalra
Pedagogical Research

Dr. Anil Maharaj Lab
Novel DM/PK maturation models, drug dosing in childhood.

Journal Publications
65

Trainees
35 Active
7 Completed
Main Areas of Research - continued

**Dr. Colin Ross Lab**
Pharmacogenomics for drug safety, gene therapy, therapeutic gene editing.

**Dr. Brian Rodrigues Lab**
Lipoprotein lipase, cardiac metabolism, angiogenesis, cardiomyopathy, diabetes.

**Dr. Thomas J. Velenosi Lab**
Pharmacometabolomics, metabolic biomarkers of drug response and characterization of therapeutic targets in cancer, computational methods for mass spectrometry.

**Dr. Ly Vu Lab**
Molecular mechanisms underlying control of stem cells, pathogenesis of hematological malignancies with a focus on RNA modifications and RNA biology.

**Dr. Karla Williams Lab**
Extracellular vesicles, cancer cell invasion, breast cancer metastasis.

**Dr. Harvey Wong Lab**
Translational modeling and simulation techniques to optimize drug dose, cancer tumor drug resistance.

**Dr. Judy Wong Lab**
Role of telomeres in preventing chromosomal erosion in health and disease, role of G-quadruplexes in genome regulation and in the integrity of DNA/RNA quadruplexes.
Faculty List

Abby Collier, PhD
Professor in Molecular and Systems Pharmacology
Email: abby.collier@ubc.ca  Phone: 604-827-2380

Michael Coughtrie, BSc (Hons), PhD, FCAHS
Professor in Molecular and Systems Pharmacology
Dean, Faculty of Pharmaceutical Sciences
Email: michael.coughtrie@ubc.ca  Phone: 604-827-2178

Guri Giaever, PhD
Associate Professor in Molecular and Systems Pharmacology
Email: g.giaever@ubc.ca  Phone: 604-827-1789

Sarah Hedtrich, PhD
Associate Professor in Molecular and Systems Pharmacology, Nanomedicine, and Chemical Biology
Email: sarah.hedtrich@ubc.ca  Phone: 604-822-2466

Jessica Kalra, PhD
Assistant Professor of Teaching, Bachelor of Pharmaceutical Sciences (BPSc) Degree Program
Email: jessica.kalra@ubc.ca

Anil Mararaj, BBSc (Pharm), PhD
Assistant Professor in Molecular and Systems Pharmacology
Email: anil.maharaj@ubc.ca  Phone: 604-822-2466
Corey Nislow, PhD
Professor in Molecular and Systems Pharmacology
Email: corey.nislow@ubc.ca  Phone: 604-827-1579

Brian Rodrigues, PhD
Professor in Molecular and Systems Pharmacology
Email: brian.rodrigues@ubc.ca  Phone: 604-822-4758

Colin Ross, BSc, MSc, PhD
Associate Professor in Molecular and Systems Pharmacology, Nanomedicine, and Chemical Biology
Email: colin.ross@ubc.ca  Phone: 604-827-2017

Alexander Smith, PhD
Lecturer and Laboratory Instructor, Bachelor of Pharmaceutical Sciences (BPSc) Degree Program
Email: alexander.smith@ubc.ca  Phone: 604-827-2701

Thomas J. Velenosi, PhD
Assistant Professor in Molecular and Systems Pharmacology
Email: thomas.velenosi@ubc.ca

Ly Vu, PhD
Assistant Professor in Molecular and Systems Pharmacology
Email: ly.vu@ubc.ca  Phone: 604-822-5094
Karla Williams, PhD
Assistant Professor in Molecular and Systems Pharmacology
Email: karla.williams@ubc.ca  Phone: 604-822-9915

Harvey Wong, PhD
Associate Professor in Molecular and Systems Pharmacology, Nanomedicine, and Chemical Biology
Email: harvey.wong@ubc.ca  Phone: 604-822-4707

Judy Wong, PhD
Professor in Molecular and Systems Pharmacology
Email: judy.wong@ubc.ca  Phone: 604-827-3314
Trainees List

Postdoctoral Fellows
Active: 9    Completed: 0    Total: 9

Dr. Marjan Barazandeh
Dr. Partho Adhikary
Dr. Fatemeh Mohabatpour
Dr. Neel Mehta
Dr. Maryam Ghashghaei
Dr. Nikki Salmond
Dr. Merlyn Emmanuel
Dr. Sunny Yang
Dr. Nisreen Shumayrikh

PhD Students
Active: 21    Completed: 3    Total: 24

Michael Doerksen
Hayley Price (Graduated)
Yuejian Liu (Graduated)
Mina Khoshnoodi
Hamid Gaikani
Joseph Ogbede
Zheng Tan
Belal Tafech
Gokce Alp
Khady Thombiane
Rui Shang
Chae Syng (Jason) Lee
Jafar Hasbullah
Kristen Gibson
Alice Yu
Tiffany Carlaw
Erika Scott
Kheir Mufti
Spencer Anderson
Jimmy Raack
Tarique Benbow (Graduated)
Sina Halvei
Sumreen Javed (Graduated)
Karan Khanna
Sepidah Soukhtehzari
MSc Students

Active:14   Completed: 4   Total: 18

Brandon Haefling (Graduated)
Juliana de Andrada Bolsoni
Kathryn Nguyen
Leah Mappalakayil
Sahithi Thotakura
Samantha Breaux (Graduated)
Ranjar Ekbatan (Graduated)
Yajie Zhai (Graduated)
Tessa Morin
Tyler Thomson
Alexandra Birkenshaw
Sandy Morrison
Effat Habibi
Yerin Kim
Kendal Ruzicki
Xuewei (Vivi) Chen
Esther Afolayan
Chad Hou

Research Staff

Dickson Lai (Collier Lab)
Behnoush Kermanshahi (Research Associate- Kalra Lab)
Andrea Olaizola (Research Associate- Kalra Lab)
Brenden Morris-Reade (Research Assistant- Kalra Lab)
Bahira Hussein (Tech T5- Rodrigues Lab)
Fudan Miao (Ross Lab)
Michelle Higginson (Ross Lab)
Linhua Zhang (Research associate- Ross Lab)
Haya Shaalan (Research Technician- Vu Lab)
Glenn Edin (Senior Research Technician- Vu Lab)
Marty Yue (Research Technician- Vu Lab)
Aaremis Arsalan (Research Technician-Vu Lab)
Lina el Garawany (Research Technician-Vu Lab)
Dr. Nazarine Fernandez (Research Technician- Williams Lab)
Funding

*Format: Source, Project title, PI

Canadian Institutes of Health Research (CIHR)
DRUG SAFETY and EFFECTIVENESS NETWORK (DSEN) SEARCH (active Surveillance and Evaluation of Adverse Reactions in Canadian Healthcare) & PREVENT (Pharmacogenomics of Adverse Reaction EVEnts) National Team
PI Abby Collier (Co-I Colin Ross)

Office of the Vice President Research and Innovation, UBC
Research Support for the Pharmaceutical Sciences Analytical Suite
PI Abby Collier

Canadian Institutes of Health Research (CIHR)
Validation and commercialization of an innovative analgesic for chronic pain
Project Grant
PI Abby Collier

Genentech Ltd
Improved PBPK Scaling from Preclinical Models to First-in-Human Trials
PI Abby Collier

National Science and Engineering Council of Canada (NSERC)
Post Translational Mechanisms of UGT Function
Discovery Grant
PI Abby Collier

NASA
Cellular response to microgravity
Co-PI Guri Giaever
Other applicants: Corey Nislow and Hammond

GENETIC NETWORKS, LLC
Drug screening
PI Guri Giaever

LEO Foundation
Towards a cure for genodermatoses: Intraepidermal delivery of gene editing tools leveraging smart delivery systems
PI Sarah Hedtrich

New Frontiers in Research Fund- Exploration 2021
Towards a lipidated siRNA therapy for targeting lung cancer.
Lead PI Dr. Ullah Aman, Co-PI Sarah Hedtrich
Canadian Institute of Health Research (CIHR)
Cutaneous adjuvant conditioning to enhance vaccine response
Lead PI Jan Dutz, Co-PI Sarah Hedtrich

National Science and Engineering Council of Canada (NSERC) IE Build
Applied Research for the Canadian Cannabis Industry
Co-I Jessica Kalra, Kelly Sveinson, Ji Yang, Todd Stuckless

Canadian Foundation for Innovation (CFI)
Applied Research for the Canadian Cannabis Industry
Co-I Jessica Kalra, Kelly Sveinson, Ji Yang, Todd Stuckless

British Columbia Knowledge Development Fund (BCKDF)
Applied Research for the Canadian Cannabis Industry
Co-I Jessica Kalra, Kelly Sveinson, Ji Yang, Todd Stuckless

National Science and Engineering Council of Canada (NSERC) ARTI
Equipment and Instrumentation for Tissue Culture Assay Development
PI Jessica Kalra

Thrasher Research Institute
Evaluation of the Effects of Childhood Obesity on Drug Dosing
PI Anil Maharaj

Pediatric Trials Network/ National Institute of Health
Best Pharmaceuticals for Children Act (BPCA) Innovative Trial Designs for Dosing, Safety, and Efficacy in Pediatric Therapeutics
PI Anil Maharaj

Pediatric Trials Network/ National Institute of Health
Best Pharmaceuticals for Children Act (BPCA) Innovative Trial Designs for Dosing, Safety, and Efficacy in Pediatric Therapeutics
PI Anil Maharaj

National Science and Engineering Council of Canada (NSERC) Discovery
Development of an ex-vivo-in-silico framework for predicting maternal and breastfed-infant toxicokinetics
PI Anil Maharaj

MITACS: Amgen Current Project Year
Discovery of antibodies against challenging membrane protein targets: microencapsulation-assisted rare clone selection
PI Corey Nislow
NASA
Fuel to Mars
Co-PI Corey Nislow

NASA
Multi-Generational Genome-Wide Yeast Fitness Profiling Beyond and Below Earth’s van Allen Belts
Co-PI Corey Nislow

Canada Research Chair
Canada Research Chair Tier 1
PI Corey Nislow

Genome Canada
DNA sequencing platform
PI Marra, CO-I Corey Nislow

Canadian Institutes of Health Research (CIHR)
Role of cardiac lipoprotein lipase in diabetic heart disease.
PI Brian Rodrigues

Canadian Institutes of Health Research (CIHR)
Role of VEGFB in the cardiovascular complications of diabetes.
PI Brian Rodrigues

Diabetes Canada
The cardiovascular effects of VEGFB during diabetic cardiomyopathy.
PI Brian Rodrigues

Canadian Institutes of Health Research (CIHR)
Role of cardiac lipoprotein lipase in diabetic heart disease.
PI Brian Rodrigues

Heart and Stroke Foundation of Canada (HSFC)
Role of cardiac lipoprotein lipase in diabetic heart disease.
PI Brian Rodrigues

UBC Research Excellence Cluster
BC Diabetes Research Network Established Cluster
Co-PI Brian Rodrigues, Lead PI Dr. Bruce Verchere

Canadian Institutes of Health Research (CIHR)
Endothelial heparanse regulation of cardiac metabolism.
PI Brian Rodrigues
**National Research Council (NRC) of Canada**
Renewal: AAV Gene Therapy for the Treatment of Lipoprotein Lipase Deficiency - Cell and Gene Therapy Challenge Program
**PI Colin Ross**, Hayden, M.

**UBC Faculty of Medicine: 2021/2022 Precision Health Catalyst Grant Competition**
Uncovering patient-specific genetic factors that can be used to optimize morphine-based pain relief while avoiding harm
**PI Colin Ross**, Catrina Loucks.

**NMIN Round 3 Grand Challenges Full Research Program Application**
Development, optimization and evaluation of novel nanoparticle formulations for extra-hepatic targeted gene therapy
**PI Colin Ross**, Anna Blakney, Sabrina Leslie, Ken Harder, Pieter Cullis
Co-I Bertrand, Nicolas Foster, Leonard

**British Columbia Knowledge Development Fund (BCKDF)**
A Comprehensive Experimental Laboratory for Hematology and Stem Cell Research
**PI Ly Vu**

**Canada Foundation for Innovation (CFI)**
A Comprehensive Experimental Laboratory for Hematology and Stem Cell Research
**PI Ly Vu**

**British Columbia Cancer Center Agency Operating Grant**
Molecular basis of normal and malignant hematopoiesis.
**PI Ly Vu**

**Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant**
Posttranscriptional regulation of hematopoietic stem cell function and cell fate determination during hematopoiesis.
**PI Ly Vu**

**Canadian Institutes of Health Research (CIHR) Operating Grant**
mRNA decay and translational regulation by RNA deadenylation in myeloid leukemia.
**PI Ly Vu**

**American Society of Hematology (ASH) Scholar Award**
Uncovering the Role of CNOT poly(A) deadenylation in Acute Myeloid Leukemia (AML).
**PI Ly Vu**

**CIHR The Japan Agency for Medical Research and Development (AMED) -Japan CEEHRC Teams in Advancing Epigenetic Technologies**
Characterization of the integrative epigenetic and epitranscriptomic landscape of AML.
**PI Ly Vu**, Co-I Akihide Yoshimi
Terry Fox Research Institute New Investigator Award
Uncovering the role of long noncoding RNAs in myeloid leukemia.
PI Ly Vu

Stem Cell Network Early Career Researcher Jump Start Awards
Modulating activity of RNA regulating proteins to preserve longterm regenerative potential of Hematopoietic Stem Cells.
PI Ly Vu

Canadian Institutes of Health Research (CIHR)
Materials and technologies for highly sensitive biomarker analysis of extracellular vesicles toward cancer diagnostics.
PI- Karla Williams and Russ Algar

Canadian Institutes of Health Research (CIHR)
Characterization of invadopodia formation in response to local cues and their role in orchestrating metastasis.
PI Karla William

Natural Sciences and Engineering Research Council of Canada (NSERC)
Extracellular vesicles: biogenesis, composition, and biological function
PI Karla Williams

Canadian Glycomics Network-Networks of Centres of Excellence (NCE)
Extracellular vesicle associated glycans as a novel platform for breast cancer detection.
PI Karla Williams, Co-I Lara Mahal, Peter H. Watson

Susan G. Komen Career Catalyst Research Award
Targeting breast cancer dissemination and developing novel prognostic methods.
PI Karla Williams, Co-I Patricia Stoop and Natalie Baudais

Canadian Glycomics Network
Atypical Glycan Based Liquid Biopsy for Risk Stratification in Early Breast Cancer
PI Karla Williams, Peter Watson (Co-PI)

Cancer Research Society (CRS)
Tumor-Specific Targeting of Telomere with Combination Therapeutics
PI Judy Wong

University of Pennsylvania Orphan Disease Center
Characterization of Telomere Maintenance in Tumor Models of Dyskeratosis Congenita
PI Judy Wong
National Science and Engineering Council of Canada (NSERC)
Structure-Function Relationship Study of Telomerase Reverse Transcriptase’s Non-Canonical Activities
PI Judy Wong

Cancer Research Society (CRS)
Applying Synthetic Dosage Lethality to Develop Therapeutic Strategies for Ovarian Clear Cell Carcinoma
CO-I Judy Wong, PI's Franco Vizeacoumar and Andrew Freyward

Canadian Institutes of Health Research (CIHR)
Identification of therapeutically relevant targets in telomerase overexpressing prostate cancers
CO-I Judy Wong, PI's Franco Vizeacoumar and Andrew Freyward

Canadian Institutes of Health Research (CIHR)
Molecular and Functional Genomic Characterization of G-quadruplexes in Cancer with the Alternate Lengthening of Telomere (ALT) Mechanism
PI Judy Wong, CO-I Peter Stirling
Publications


Seminars

**MSP-NCB Joint Seminars**

In October 2021, Dr. Simon Wisnovsky and Dr. Tom Velenosi shared their lab themes and future research plans with the MSP and NCB research groups.

**MSP Faculty Led Seminars**

The MSP Faculty led seminars 2021-2022 included talks from:

- **Dr. Miki Fujita**
  Research Manager, UBC Bioimaging Facility
  "Cryo-EM and Cryo-Sample Preparation in UBC Bioimaging Facility"

- **Dr. Andy Johnson**
  Head of Flow Cytometry, UBC
  "Introductory Flow Cytometry Seminar"

- **Dr. Richard Moore**
  Group Leader, Sequencing, GSC
  Adjunct Professor, Faculty of Health Sciences, Simon Fraser University
  "Nanopore sequencing at Canada’s Michael Smith Genome Sciences Centre"
Events

MSP Retreat 2022

The MSP retreat was hosted in April 2022 at the Faculty of Pharmaceutical Sciences. MSP faculty and students discussed future directions of the MSP group and enjoyed talks from incoming PIs Dr. Ly Vu, Dr. Tom Velenosi and Dr. Anil Maharaj.

MSP-NCB Beach Day Event

In August 2022, the MSP and NCB enjoyed a research meet-and-greet event at the Spanish Banks Beach in Vancouver. Students and colleagues discussed research themes and had fun on the beach!
UBC Molecular and Systems Pharmacology

Faculty of Pharmaceutical Sciences
2405 Wesbrook Mall
Vancouver, BC Canada V6T 1Z3

https://pharmsci.ubc.ca
https://pharmsci.ubc.ca/research/research-themes/molecular-and-systems-pharmacology