



THE UNIVERSITY OF BRITISH COLUMBIA

Molecular and Systems Pharmacology

Faculty of Pharmaceutical Sciences



# Annual Report

## 2021-2022



## Table of Contents

About Us and Highlights .....	2
Faculty List .....	4
Trainees List .....	7
Funding .....	9
Publications .....	15
Seminars .....	23
Events .....	24

## Acknowledgements

We would like to thank and acknowledge the MSP faculty lead, Dr. Judy Wong (2020 - current); the MSP student leads, Mina Khoshnoodi (Nislow Lab) and Rui Shang (Rodrigues Lab); and Kendal Ruzicki (Williams Lab) for compiling the report.

## 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



### Journal Publications

65



### Trainees

35 Active

7 Completed

## 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.

## 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](mailto: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  
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**Guri Giaever, PhD**  
 Associate Professor in Molecular and Systems Pharmacology  
**Email:** [g.giaever@ubc.ca](mailto: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](mailto:sarah.hedtrich@ubc.ca) **Phone:** 604-822-2466



**Jessica Kalra, PhD**  
 Assistant Professor of Teaching, Bachelor of Pharmaceutical Sciences (BPharm) Degree  
 Program  
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**Anil Mararaj, BBS (Pharm), PhD**  
 Assistant Professor in Molecular and Systems Pharmacology  
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**Corey Nislow, PhD**  
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**Brian Rodrigues, PhD**  
 Professor in Molecular and Systems Pharmacology  
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**Colin Ross, BSc, MSc, PhD**  
 Associate Professor in Molecular and Systems Pharmacology, Nanomedicine, and  
 Chemical Biology  
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**Alexander Smith, PhD**  
 Lecturer and Laboratory Instructor, Bachelor of Pharmaceutical Sciences (BPhSc) Degree  
 Program  
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**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](mailto: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](mailto:harvey.wong@ubc.ca) **Phone:** 604-822-4707



**Judy Wong, PhD**

Professor in Molecular and Systems Pharmacology

**Email:** [judy.wong@ubc.ca](mailto: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)
- Ranjbar 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)
- Aaremish 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 Resesarch 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 heparanase 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

Price HR, Pang N, Kim H, Coughtrie MWH, and **Collier AC**. Protective placental inflammatory and oxidative stress responses are attenuated in the context of twin pregnancy and chorioamnionitis in assisted reproduction. *Journal of Assisted Reproduction and Genetics*. 2022 Jan;39(1):227-238. doi: 10.1007/s10815-021-02371-2 **IF 3.4 Rank Q1 Reproductive Sciences**

Campbell KSJ, **Collier AC**, Irvine M, Brain U, Rurak DW, Oberlander TF and Lim K. Maternal Serotonin Reuptake Inhibitor (SRI) antidepressants have acute drug effects on third-trimester fetal heart rate variability. *Frontiers in Psychiatry*, 16 August 2021 **IF 6.8, Rank Q1 Psychiatry and psychology** <https://doi.org/10.3389/fpsy.2021.680177>.

Takahashi, RH, Forrest W, Smith AD, Badee J, Qiu N, Schmidt S, **Collier AC**, Parrott N, Fowler. Characterization of Hepatic UDP-Glucuronosyl Transferase Enzyme Abundance - Activity Correlations and Population Variability using a Proteomics Approach. *Drug Metabolism and Disposition* 2021 June 29th; 2021 Sep;49(9):760-769. doi: 10.1124/dmd.121.000474 **IF 4.5 Rank Q1 Pharmacology and Pharmacy**

Mueller JW, Collier AC and Gestiera TF Sulfation pathways – there and back again. *Frontiers in Molecular Biosciences*, published online April 22, 2022. **IF 6.3, Rank Q1 General Sciences**

Holzknicht J, Dubrac S, **Hedtrich S**, Galgóczy L, Marx F. Small, Cationic Antifungal Proteins from Filamentous Fungi Inhibit *Candida albicans* Growth in 3D Skin Infection Models. *Microbiol Spectr*. 2022 Jun 29;10(3):e0029922. doi: 10.1128/spectrum.00299-22. Epub 2022 May 2. PMID: 35499318; PMCID: PMC9241769. (Impact factor 7.171)

Graff P, Hönzke S, Joshi AA, Yealland G, Fleige E, Unbehauen M, Schäfer-Korting M, Hocke A, Haag R, **Hedtrich S**. Preclinical Testing of Dendritic Core-Multishell Nanoparticles in Inflammatory Skin Equivalents. *Mol Pharm*. 2022 Jun 6;19(6):1795-1802. doi: 10.1021/acs.molpharmaceut.1c00734. Epub 2022 Mar 10. PMID: 35266720. (Impact factor 4.939)

Babity S, Couture F, Campos EVR, **Hedtrich S**, Hagen R, Fehr D, Bonmarin M, Brambilla D. A Naked Eye-Invisible Ratiometric Fluorescent Microneedle Tattoo for Real-Time Monitoring of Inflammatory Skin Conditions. *Adv Healthc Mater*. 2022 Mar;11(6):e2102070. doi: 10.1002/adhm.202102070. Epub 2021 Dec 23. PMID: 34921529. (Impact factor 9.933)

Gruber A, Joshi AA, Graff P, Cuéllar-Camacho JL, **Hedtrich S**, Klinger D. Influence of Nanogel Amphiphilicity on Dermal Delivery: Balancing Surface Hydrophobicity and Network Rigidity. *Biomacromolecules*. 2022 Jan 10;23(1):112-127. doi: 10.1021/acs.biomac.1c01100. Epub 2021 Dec 7. PMID: 34874701. (Impact factor 6.988)

Liebe H, Liebe F, Sponder G, **Hedtrich S**, Stumpff F. Beyond Ca<sup>2+</sup> signalling: the role of TRPV3 in the transport of NH<sub>4</sub>. *Pflugers Arch.* 2021 Dec;473(12):1859-1884. doi: 10.1007/s00424-021-02616-0. Epub 2021 Oct 19. PMID: 34664138; PMCID: PMC8599221. (Impact factor 3.78)

Calderón M, **Hedtrich S**. The Delivery Challenge of Genome Editing in Human Epithelia. *Adv Healthc Mater.* 2021 Oct;10(19):e2100847. doi: 10.1002/adhm.202100847. Epub 2021 Jun 24. PMID: 34165913. (Impact factor 9.933)

Dommisch H, Stolte KN, Jager J, Vogel K, Müller R, **Hedtrich S**, Unbehauen M, Haag R, Danker K. Characterization of an ester-based core-multishell (CMS) nanocarrier for the topical application at the oral mucosa. *Clin Oral Investig.* 2021 Oct;25(10):5795-5805. doi: 10.1007/s00784-021-03884-x. Epub 2021 Apr 5. PMID: 33821321; PMCID: PMC8443517. (Impact factor 3.573)

Charbaji R, Kar M, Theune LE, Bergueiro J, Eichhorst A, Navarro L, Graff P, Stumpff F, Calderón M, **Hedtrich S**. Design and Testing of Efficient Mucus-Penetrating Nanogels-Pitfalls of Preclinical Testing and Lessons Learned. *Small.* 2021 Jun;17(23):e2007963. doi: 10.1002/smll.202007963. Epub 2021 Mar 14. PMID: 33719187. (Impact factor 13.281)

Ain QU, Campos EVR, Huynh A, Witzigmann D, **Hedtrich S**. Gene Delivery to the Skin - How Far Have We Come? *Trends Biotechnol.* 2021 May;39(5):474-487. doi: 10.1016/j.tibtech.2020.07.012. Epub 2020 Aug 29. PMID: 32873394; PMCID: PMC7456264. (Impact factor 19.536)

Işık D, Joshi AA, Guo X, Rancan F, Klossek A, Vogt A, Rühl E, **Hedtrich S**, Klinger D. Sulfoxide-functionalized nanogels inspired by the skin penetration properties of DMSO. *Biomater Sci.* 2021 Feb 9;9(3):712-725. doi: 10.1039/d0bm01717e. PMID: 33285562. (Impact factor 6.843)

Adhikary PP, UI Ain Q, Hocke AC, **Hedtrich S**. COVID-19 highlights the model dilemma in biomedical research. *Nat Rev Mater.* 2021;6(5):374-376. doi: 10.1038/s41578-021-00305-z. Epub 2021 Mar 17. PMID: 33747552; PMCID: PMC7967778. (Impact factor 66.308)

Adhikary PP, Tan Z, Page BDG, **Hedtrich S**. TSLP as druggable target - a silver-lining for atopic diseases? *Pharmacol Ther.* 2021 Jan;217:107648. doi: 10.1016/j.pharmthera.2020.107648. Epub 2020 Aug 3. PMID: 32758645. (Impact factor 12.31)

**J. Kalra**, J Baker, J. Song, A. Kyle, A, Mitchinton, M Bally. "Inter-Metastatic Heterogeneity of Tumor Marker Expression and Microenvironment Architecture in a Preclinical Cancer Model", *International Journal of Molecular Science*, 2021, June 13: 22(12); IF 5.94

Zhao S, Gockenbach M, Grimstein M, Sachs HC, Mirochnick M, Struble K, Belew Y, Wang J, Capparelli EV, Best BM, Johnson T, Momper JD, **Maharaj AR**. Characterization of Plasma Protein Alterations in Pregnant and Postpartum Individuals Living With HIV to Support Physiologically-Based Pharmacokinetic Model Development. *Front Pediatr*. 2021;9:721059. doi: 10.3389/fped.2021.721059. eCollection 2021. [Journal Impact Factor = 3.418]

Guimarães M, **Maharaj A**, Edginton A, Vertzoni M, Fotaki N. Understanding the Impact of Age-Related Changes in Pediatric GI Solubility by Multivariate Data Analysis. *Pharmaceutics*. 2022 Feb 4;14(2). doi: 10.3390/pharmaceutics14020356. [Journal Impact Factor = 6.321]

Balevic SJ, Weiner D, Clowse MEB, Eudy AM, **Maharaj AR**, Hornik CP, Cohen-Wolkowicz M, Gonzalez D. Hydroxychloroquine PK and exposure-response in pregnancies with lupus: the importance of adherence for neonatal outcomes. *Lupus Sci Med*. 2022 Jan;9(1). doi: 10.1136/lupus-2021-000602. [Journal Impact Factor = 4.235]

Nosrati Z, Esquinas PL, Rodríguez-Rodríguez C, Tran T, **Maharaj A**, Saatchi K, Häfeli UO. Simultaneous SPECT imaging with 123I and 125I - a practical approach to assessing a drug and its carrier at the same time with dual imaging. *Int J Pharm*. 2021 Sep 5;606:120884. doi: 10.1016/j.ijpharm.2021.120884. [Journal Impact Factor =1.15]

**Maharaj AR**, Wu H, Zimmerman KO, Muller WJ, Sullivan JE, Sherwin CMT, Autmizguine J, Rathore MH, Hornik CD, Al-Uzri A, Payne EH, Benjamin DK Jr, Hornik CP. Pharmacokinetics of Ceftazidime in Children and Adolescents with Obesity. *Paediatr Drugs*. 2021 Sep;23(5):499-513. doi: 10.1007/s40272-021-00460-4. [Journal Impact Factor = 3.022]

Mer AS, Heath EM, Madani Tonekaboni SA, Dogan-Artun N, Nair SK, Murison A... **Nislow C** et al. Biological and therapeutic implications of a unique subtype of NPM1 mutated AML. *Nat Commun*. 2021 Feb 16;12(1):1054.

Fekadu A, Oppenheim C, Manyazewal T, **Nislow C**, Woldeamanuel Y, Hailu A, et al. Understanding the key processes of excellence as a prerequisite to establishing academic centres of excellence in Africa. *BMC Med Educ*. 2021 Jan 7;21(1):36.

Shang, R., Lal, N., Lee, C. S., Zhai, Y., Puri, K., Siera, O., Boushel, R., Sultan, I., Räsänen, M., Alitalo, K., Hussein, B., and **Rodrigues, B**. Cardiac-specific VEGFB overexpression reduces lipoprotein lipase activity and improves insulin action in rat heart. *Am J Physiol Endocrinol Metab*. 321: 753-765, 2021 [IF 4.31].

Shang, R., and **Rodrigues B**. Lipoprotein lipase and its delivery of fatty acids to the heart. *Biomolecules*. 11: 1016, 2021 [IF 4.57]. "Lee C.S., Zhai Y., Shang R., Wong T., Mattison A., Cen H., Johnson J.D., Vlodaysky I., Hussein B., Rodrigues B. (2022). Flow-induced secretion of endothelial heparanase regulates cardiac lipoprotein lipase. *J Am Heart Assoc*.11(23): e027958. [IF 6.107]"

Cen, H. H., Hussein, B., Botezelli, J. D., Wang, S., Zhang, A. J., Noursadeghi, N., Jessen, **Rodrigues, B.**, Timmons, J. A., and Johnson, J. D. Human and mouse transcriptomic analyses identify insulin receptor mRNA downregulation in hyperinsulinemia-associated insulin resistance. *FASEB J*. 2022; 36:e22088 [IF 4.97].

Gill EE, Smith ML, Gibson KM, Morishita KA, Lee AHY, Falsafi R, Graham J, Foell D, Benseler SM, **Ross CJ**, Luqmani RA, Cabral DA, Hancock REW, Brown KL. Different Disease Endotypes in Phenotypically Similar Vasculitides Affecting Small-to-Medium Sized Blood Vessels. *Front in Immunol*. 2021;12:638571. doi: 10.3389/fimmu.2021.638571. 2021. PubMed PMID: 33692808. (IF 7.56). Ranked 22 of 200 journals in immunology.

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## 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**

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