

SAMANTHA L. WILSON

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CURRENT ACADEMIC APPOINTMENT

Assistant Professor, Department of Obstetrics and Gynecology, McMaster University

July 2022 -

Postdoctoral Fellow, Princess Margaret Cancer Centre

February 2018 - June 2022

Supervisor: Dr. Michael Hoffman

EDUCATION

Doctor of Philosophy, Medical Genetics, University of British Columbia

January 2013-February 2018

Supervisor: Dr. Wendy Robinson

Dissertation: Genetic and epigenetic profiling of placental insufficiency: Identifying biomarkers of preeclampsia and intrauterine growth restriction

Bachelor of Science, The University of Western Ontario

September 2008-June 2012

Honours Specialization in Genetics

PUBLICATIONS, N=20

underline = I supervised student

Original Research

1. **Wilson, S.L.**, Shen, S.Y., Harmon, L.M., Burgener, J., Triche, T., Bratman, S.V., De Carvalho, D.D., Hoffman, M.M. Synthetic spike-in controls enable sensitive and reproducible cell-free methylome interrogation. *Cell Reports Methods*. **In Press**.
2. Brockway, H.B., **Wilson, S.L.**, Kallapur, S.K., Buhimschi, C.S., Muglia, L.J., Jones, H.N. Characterization of methylation signatures in spontaneous preterm birth. **Submitted**.
3. Lee, Y., Choufani, S., Weksberg, R., **Wilson, S.L.**, Yuan, V., Robinson, W.P., Burt, A., Marsit C., Lu, A., Binder, A., Ritz, B., Bohlin, J., Gjessing, H., Harris, J., Magnus, P., Jugessur, A., Horvath, S. Placental epigenetic clocks: estimating gestational age using placental DNA methylation levels. *Aging*. 11 (12), 4238. 2019.
4. Konwar, C., Price, E.M., Wang, L., **Wilson, S.L.**, Terry, J., Robinson, W.P. DNA methylation profiling of acute chorioamnionitis-associated placentas and fetal membranes: insights into epigenetic variation in spontaneous preterm births. *Epigenetics and Chromatin*. 11 (1), 63. 2018.
5. Leavey, K., **Wilson, S.L.**, Robinson, W.P., Cox, B. Epigenetic Regulation of Placental Gene Expression in Transcriptional Subclasses of Preeclampsia. *Clinical Epigenetics*. 10 (1), 28. 2018.
6. Magee, L.A., Synnes A., von Dadelszen, P., Hutfield A., Chainoiné, J.P., Cote, A.M., Devlin, A., Dorling, J., Gafni, A., Ganzevoort, W., Gruslin, A., Helewa, M., Hutton, E., Koren, G., Lee, S.K., McArthur, D., Rey, E., Robinson, W.P., Roseboom, T., Singer, J., **Wilson S.L.**, Moutquin, J.M., and CHIPS-Child Study consortium. CHIPS-Child: Testing the developmental programming hypothesis in the offspring of the CHIPS Trial. *Pregnancy and Hypertension*. 14, 15-22. 2017.
7. **Wilson, S.L.**, Leavey, K., Cox, B., Robinson, W.P. Mining DNA methylation alteration towards classification of placental pathologies. *Human Molecular Genetics*. 27 (1), 135-146. 2017.
 - This work won the Elsevier Trophoblast Research New Investigator Award at the 2016 International Federation of Placenta Association meeting.
8. Barha, C.K., Salvante, K., Hanna, C.W., **Wilson, S.L.**, Robinson, W.P., Altman, R.M., Nepromnaschy, P. Hypothalamic-pituitary-adrenal axis activity and cellular aging in mothers. *PLOS One*. 12 (5), e0177869. 2016.

9. **Wilson, S.L.**, Liu, Y., Robinson, W.P. Placental telomere length decline with gestational age differs by sex and TERT, DNMT1, and DNMT3A DNA methylation. *Placenta*. 48, 26-33. 2016
 - This work was selected as part of the inaugural *poster walks* session at the American Society of Human Genetics 2015 meeting.
10. Barha, C., Hanna, C.W., Salvante, K., **Wilson, S.L.**, Robinson, W.P., Nepromnaschy, P. Number of Children and Telomere Length in Women: A Prospective, Longitudinal Evaluation. *PLOS One*. 11 (1), e0146424. 2016.
11. **Wilson, S.L.**, Blair, J.D., Hogg, K., Langlois, S., von Dadelszen, P., Robinson, W.P. Placental DNA methylation at term reflects maternal serum levels of INHA, but not PAPP-A or FN1, early in pregnancy. *BMC Medical Genetics*. 16 (1), 111. 2015.

Review articles, proceedings, and letters

1. **Wilson, S.L.** and Wallingford, M. Epigenetic regulation of molecular reproduction in human and animal models. *Molecular Human Reproduction*. 27 (7), gaab041. 2021.
2. **Wilson, S.L.**, Way, G.P., Bittremieux, W., Armache, J-P., Haendel, M., Hoffman, M.M. Sharing biological data: Why, when and how. *Federation of European Biochemical Societies Letters*. 595 (7), 847-863. 2021.
3. **Wilson, S.L.**, Robinson, W.P. Utility of DNA methylation to assess placental health. *Trophoblast Research*. 64, S23-S28. 2017.
4. Manokhina, I., Konwar, C., Del Gobbo, G.F., **Wilson, S.L.**, Robinson, W.P. Placental biomarkers for assessing fetal health. *Human Molecular Genetics*. 26 (R2), R237-R245. 2017.
5. Albrecht, C., Baker, J.C., Blundell, C., Chavez, S.L., Carbone, L., Chamley, L., Hannibal, R.L., Illsley, N., Kurre, P., Laurent, L.C., McKenzie, C., Morales-Prieto, D., Pantham, P., Paquette, A., Powell, K., Price, N., Rao, B.M., Sadovsky, Y., Salomon, C., Tuteja, G., **Wilson, S.**, O'Tierney-Ginn, P.F. IFPA meeting 2016 workshop report 1: Genomic communication, bioinformatics, trophoblast biology and transport systems. *Placenta*. 60, S5-S9. 2017.
6. Manokhina, I., **Wilson, S.L.**, Robinson, W.P. Non-invasive nucleic-acid based approaches to monitor placental health in pregnancy. *AJOG*. 213 (4), S197-S206. 2015.
7. Cohen, A.S.A., **Wilson, S.L.**, Trinh, J., Ye, X.C. Detecting Somatic Mosaicism: Considerations and Clinical Implications. *Clin Genet*. 87 (6), 554-562. 2014.

Book Chapters

1. Robinson, W.P., Penaherrera, M.S., Konwar, C., Yuen, V., **Wilson, S.L.**. Epigenetic Modifications in the Human Placenta. *Human Reproductive and Prenatal Genetics*. Elsevier. 293-311. 2019.

Theses

1. **Wilson, S.L.** Genetic and epigenetic profiling of placental insufficiency: identifying biomarkers of preeclampsia and intrauterine growth restriction. *University of British Columbia*. 2017.

PATENTS

Patent Applications

1. International Patent Application No. PCT/CA2020/051507 SYNTHETIC SPIKE-IN CONTROLS FOR CELL-FREE MEDIP SEQUENCING AND METHODS OF USING SAME. November 6, 2020.

R package: Spiky

2020

Contributor

Spiky is a package designed to use synthetic spike-in control data for cfMeDIP-seq to absolutely quantify molar amount of experimental cell-free DNA. I created the code and worked with programmers, Dr. Tim Triche and Lauren Harmon to create spiky and make it accessible to everyone. Spiky is available on GitHub, and Bioconductor.

<https://github.com/trichelab/spiky>

<https://bioconductor.org/packages/spiky>

FUNDING, N=8**Research Grants, N=2**

1. **Accelerator grant in genome medicine (\$80,000.00CAD)** 2019-2020
McLaughlin Centre, University of Toronto
Genome-wide cell-free DNA methylation enrichment and sequencing for preeclampsia diagnosis
Role: Co-investigator
2. **CIHR project grant (\$1,212,525.00CAD)** 2019-2024
Canadian Institute of Health Research
DNA methylation profiling in cell-free DNA: a non-invasive method to screen for pre-term birth
Role: Co-investigator

Salary Awards, N=6

1. **CIHR Fellowship (\$135,000.00CAD)** 2020-2023
Canadian Institute of Health Research
2. **Molly Towell Perinatal Research Foundation Fellowship (National) (\$60,000.00CAD)** 2019-2021
Molly Towell Perinatal Research Foundation
Declined in 2020 to hold CIHR fellowship
3. **Princess Margaret Postdoctoral Fellowship (\$50,000.00CAD)** 2018-2019
Princess Margaret Cancer Research Centre
4. **UBC Four Year Doctoral Fellowship (\$92,800.00CAD)** 2015-2019
University of British Columbia
Declined in 2018 as PhD was completed
5. **BC Children's Hospital Research Institute Graduate Studentship (\$40,000.00CAD)** 2014-2016
BC Children's Hospital Research Institute
Declined in 2015 to hold the UBC 4 Year Doctoral Fellowship
6. **NSERC Undergraduate Research Student Award (\$4500.00CAD)** 2011
National Sciences of Engineering Research Council

Presentation awards, N=8

1. **Elsevier Placenta New Investigator Award (International)(\$1000.00USD)** 2021
International Federation of Placenta Association
Awarded to top oral presentation.
2. **JW Knox Ritchie Research Award: best poster presentation by a postdoc** 2019
University of Toronto, Dept. of Obstetrics and Gynecology
3. **Medical Genetics Research Day Poster Prize** 2017
University of British Columbia, Department of Medical Genetics
4. **BC Children's Hospital Research Institute Poster Presentation Award** 2017
BC Children's Hospital Research Institute
5. **CIHR Poster Presentation Award Silver** 2017
Canadian Student Health Research Forum
Canadian Institute of Health Research
6. **Elsevier Trophoblast Research New Investigator Award (International) (\$1500.00USD)** 2016
International Federation of Placenta Association
Awarded to the top poster presentation (>200 presenters). Along with the award, was invited as a plenary speaker to IFPA 2017 meeting in Manchester, UK, and invited to write a review article on my work in placental DNA methylation in the Trophoblast Research Journal.
7. **Academic Day Best Oral Presentation** 2016
University of British Columbia, Department of Obstetrics and Gynecology
8. **Medical Genetics Research Day Poster Prize** 2015
University of British Columbia, Department of Medical Genetics

Teaching awards, N=2

1. **Teaching Assistant Award** 2017
University of British Columbia, Department of Medical Genetics
2. **Teaching Assistant Award** 2014
University of British Columbia, Department of Medical Genetics

Travel awards, N=8

1. **Elsevier New Investigator Travel Award (€120.00)** 2021
International Federation of Placenta Association
2. **CIHR, Institute Community Support Travel Award (\$1000.00CAD)** 2019
Institute of Human Development, Child and Youth Health
Canadian Institute of Health Research
3. **CIHR Travel Award (\$1000.00CAD)** 2017
Canadian Institute of Health Research
Nominated as being within the top 5% of doctoral students
4. **Loke Travel Award (\$500.00USD)** 2016
International Federation of Placenta Association
5. **BC Children's Hospital Research Methodology Grant (\$1200.00CAD)** 2016
BC Children's Hospital Research Institute
6. **CEEHRC Travel Award (\$1000.00CAD)** 2016
Canadian Epigenetics, Environment and Health Research Consortium Network

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| 7. BC Children's Hospital Research Institute Travel Grant (\$1200.00CAD)
BC Children's Hospital Research Institute | 2015 |
| 8. Wellcome Trust Epigenomics of Common Diseases Travel Bursary (£100.00)
Wellcome Trust | 2014 |

PRESENTATIONS, N=33

Invited talks, N=9

- | | |
|--|-----------------|
| 1. University of Ottawa: Ottawa Data Champions
Title: Practicalities of preparing data for sharing and reproducibility
Seminar | September 2022 |
| 2. Colorado Center for Personalized Medicine
Title: Towards non-invasive prediction of pregnancy complications using epigenomics
Seminar | March 2022 |
| 3. Columbia University, Department of Obstetrics and Gynecology
Title: Towards non-invasive prediction of pregnancy complications using epigenomics
Seminar | December 2021 |
| 4. University of Florida, Department of Physiology and Functional genomics
Title: Towards non-invasive prediction of pregnancy complications using epigenomics
Seminar | September 2021 |
| 5. PACE consortium annual meeting
Title: A new method to enrich and amplify the DNA methylation signature of cell-free placental DNA from maternal plasma
Virtual meeting | April, 2021 |
| 6. Tufts Medical Center, Mother and Infant Research Institute
Title: Towards non-invasive prediction for screening of pregnancy complications
Seminar | January, 2021 |
| 7. R ladies Toronto
Title: Machine learning approaches to predict preterm birth in R
Toronto, ON, Canada | September, 2019 |
| 8. International Federation of Placental Association 2017 Annual Meeting
Title: Placental molecular profiling in preeclampsia: Utility, reproducibility and biological meaning
Manchester, UK | September, 2017 |
| 9. International Federation of Placental Association 2016 Annual Meeting
Title: Epigenomics and the Placenta
Portland, OR, USA | September, 2016 |

Selected talks, N=11

- | | |
|---|----------------|
| 1. International Federation of Placenta Association 2021 meeting: Oral presentation
Title: A new method to absolutely quantify and enrich for circulating placenta DNA from maternal blood
Virtual meeting | September 2021 |
| 2. American Society of Human Genetics 2020 meeting: Platform oral presentation
Title: Enrichment, sequencing, and absolute quantification of circulating placental DNA in maternal blood, using DNA methylation
Virtual meeting
Top 9% of abstracts of 2186 abstracts that were submitted were chosen for an oral presentation. | October, 2020 |
| 3. Placental-Interface Virtual Seminar Series
Title: A new method to absolutely quantify and enrich for circulating placenta DNA from maternal blood, using | May, 2020 |

DNA methylation
Virtual seminar

4. **Princess Margaret Cancer Enlightening Day** October, 2019
Title: Synthetic spike-in controls to account for biological and technical bias in cfMeDIP-seq
Toronto, ON, Canada
5. **UBC Faculty of Medicine Student Research Day** May, 2017
Title: DNA methylation: Reproducibility, utility and biological meaning
Vancouver, BC, Canada
6. **UBC Dept. of Medical Genetics Research Day** November, 2016
Title: DNA methylation gives insight into different etiologies in early-onset and late-onset preeclampsia and intrauterine growth restriction
Vancouver, BC, Canada
7. **UBC Dept. of OBGYN Academic Day** May, 2016
Title: DNA methylation profiling gives insight into the relationship between early-onset and late-onset Preeclampsia, Intrauterine growth restriction and healthy placentas
Vancouver, BC, Canada
8. **Canadian National Perinatal Research Meeting** February, 2016
Title: DNA methylation profiling gives insight into the relationship between early-onset and late-onset Preeclampsia, Intrauterine growth restriction and healthy placentas
Banff, AB, Canada
9. **American Society of Human Genetics 65th Annual Meeting** October, 2015
Title: Sexual dimorphism in placental telomere length over gestational age
Baltimore, MD, USA
Selected for featured poster talk in the prenatal, perinatal and reproductive genetics category.
10. **Pacific Northwest Genetics exchange** September 2015
Title: Assessing biomarkers of pregnancy complications through placental DNA methylation profiles
Vancouver, BC, Canada
11. **The Tree of Life: Placenta Workshop** September 2014
Title: Identifying biomarkers through placenta DNA methylation profiles: Preliminary Data
Vancouver, BC, Canada

Other seminars, N = 2

1. **Western University, Schulich School of Medicine seminar** September 2021
Title: Towards non-invasive prediction of pregnancy complications using epigenomics
2. **McMaster University, Department of OBGYN seminar** August 2021
Title: Towards non-invasive prediction of pregnancy complications using epigenomics

Poster presentations, N=11

1. **Society of Reproductive Investigation** July 2021
Title: Enrichment and Absolute Quantification of Cell-Free Placenta DNA in Maternal Blood
Virtual Meeting
2. **Canadian National Perinatal Research Meeting** February 2021
Title: Enrichment, sequencing, and absolute quantification of circulating placental DNA in maternal blood, using DNA methylation
Virtual Meeting

3. **Epigenomics of Common Diseases Meeting** November, 2019
 Title: Synthetic spike-in controls to account for biological and technical bias in cfMeDIP-seq
 Cambridge, UK
4. **University of Toronto OBGYN Research day** May, 2019
 Title: Developing predictive models of preterm birth using DNA methylation profiling in cell-free DNA: A study design
 Toronto, ON, Canada
5. **Canadian Student Research Forum** June, 2017
 Title: DNA methylation: Reproducibility, utility and biological meaning
 Winnipeg, MB, Canada
6. **GenomeBC 15th Annual Genomics Forum** May, 2017
 Title: DNA methylation: Reproducibility, utility and biological meaning
 Vancouver, BC, Canada
7. **American Society of Human Genetics 66th Annual Meeting** October, 2016
 Title: DNA methylation gives insight into different etiologies in early-onset and late-onset preeclampsia and intrauterine growth restriction
 Vancouver, BC, Canada
8. **International Federation Placenta Association Annual Meeting** September, 2016
 Title: Unravelling the relationship between early and late-onset preeclampsia. What does the placental DNA methylation profile reveal?
 Portland, OR, USA
9. **BC Children's Hospital Research Institute Research Forum** September, 2016
 Title: Sexual dimorphism in placental telomere length over gestational age
 Vancouver, BC, Canada
10. **UBC Medical Genetics Research Day** November, 2016
 Title: Sexual dimorphism in placental telomere length over gestational age
 Vancouver, BC, Canada
11. **American Society of Human Genetics 63rd Annual Meeting** October, 2013
 Title: DNA methylation profiling reveals distinct subgroups
 Boston, MA, USA

TEACHING

University of Toronto, Department of Molecular Genetics

MMG3003Y: Genomic Methodologies

Guest Lecturer

April and June 2018-June 2021

- Class size: 30
- Gave 2 lectures to graduate students
 - i) DNA methylation microarrays: Everything to consider in an experiment
 - ii) Analyzing DNA methylation experiments and data visualization using ggplot2 in R

University of Toronto, Department of Molecular Genetics

MMG3001Y: Advanced Human Genetics

Guest Lecturer

November 2018-November 2021

- Class size: 30
- Gave 2 lectures to graduate students
 - i) Fundamentals of epigenetics
 - ii) Epigenetics and development

University of British Columbia, Department of Medical Genetics

MEDG419: Developmental Origins of Human Disorders

Teaching Assistant

January 2017-April 2017

- Class size: 20
- Marked student participation, presentations, midterm and final exams

- Lead the biweekly tutorial sessions reviewing class lectures
- Won the Department of Medical Genetics Teaching Assistant Award 2017 for work in this class

University of British Columbia, Department of Medical Genetics
MEDG420: Human Genomics and Medical Genetics

Teaching Assistant
September 2015-December 2015

- Class size: 20
- Marked student participation, presentations, midterm and final exams

University of British Columbia, Department of Medical Genetics
MEDG419: Developmental Origins of Human Disorders

Teaching Assistant
January 2014-April 2014

- Class size: 20
- Marked student participation, presentations, midterm and final exams
- Lead the biweekly tutorial sessions reviewing class lectures in more detail and focusing of material student's were struggling with
- Won the Department of Medical Genetics Teaching Assistant Award 2014 for work in this class

University of British Columbia, Medical School
Topics in Genetics

Problem Based Learning Facilitator
April 2013-April 2016

- Class size: 10-50
- Facilitated group discussions on first and second year medical school genetics curriculum. Class sizes ranged from 10-50 students
- Lead discussions on: Principles of Human Genetics, Calculating Genetic Risks, Chromosomal Abnormalities, and Prenatal Diagnosis

WORK EXPERIENCE

McMaster University, Department of Obstetrics and Gynecology
Assistant Professor

July 2022 -

My lab focuses on understanding pregnancy complications pertaining to placental dysfunction. We use multi-omics data such as, epigenomics, transcriptomics, genomics, and proteomics, along with bioinformatics to understand disease etiology. We also focus on developing non-invasive methods to assess placental health and use machine learning approaches to predict pregnancies at risk of complications prior to the onset of clinical symptoms.

Princess Margaret Cancer Centre
Postdoctoral Research Fellow

February 2018 - June 2022

Developing machine learning approaches to predict disease in the context of both cancer and preterm birth. Both these projects have goals to develop non-invasive biomarkers using DNA methylation profiles in circulating cell free nucleic acids. In cancer, circulating tumour DNA is being studied and in preterm birth, cell free placental DNA is being studied. We are using cell free meDIP-seq approaches to measure DNA methylation at low levels.

London Health Science Centre, Medical Genetics Clinic
Research Assistant (0.8FTE)

September 2011-August 2012

- Developed and maintained database of BRCA1 and BRCA2 variants in local patient population
- Reviewed family histories, made pedigrees, and performed cancer risk assessments on patients
- Observed genetic counselling sessions in cancer genetics, prenatal genetics, and paediatric genetics
- Participated in Medical Genetics rounds and patient review

London Health Science Centre, Medical Diagnostic Laboratory
Research Assistant (0.2FTE)

May 2012-August 2012

- Designed PCR tests for identifying mutations diagnostic of Charcot-Marie-Tooth Syndrome and Hemochromatosis

Norgen Biotek Corp.
Research Assistant

May 2011-August 2011

- Performed DNA and RNA extractions on multiple organisms (plant, bacteria, blood, saliva, and tissue)
- Investigated RNA degradation in plants with different extraction methods and different processing time

CREDENTIALS

CIHR Institute of Gender and Health Core Competency Module for Sex and Gender Biomedical Research	April 2022
Canadian Institutes of Health Research	
SciNet summer school: Introduction to machine learning, Introduction to python, and Python in high performance computing	July 2019
SciNet	
Scientific computing: Introduction to machine learning and Machine learning in python	May 2019
Krembil Centre for Neuroinformatics	
Compute Ontario Summer School on High Performance Computing	June 2018
SciNet and Compute Ontario	
Data Analysis with Python	October 2016
Carpentry Software Workshops	
Epigenomic Data Analysis	June 2016
Canadian Bioinformatics Workshops	
Instructional Skills Workshop	July 2015
University of British Columbia	

SUPERVISION AND MENTORSHIP

Jasrita Singh

McMaster University, Wilson Lab

September 2022 - Present

Biomedical Discovery and Commercialization Graduate Program

Student: Jasrita Singh

- Faculty mentor for the Biomedical Discovery and Commercialization Graduate Program. This involves meeting with the student monthly and helping students navigate their coursework, projects and their community internship.

McMaster University, Wilson Lab

September 2022 - Present

Biology Fourth Year Thesis, Supervisor

Student: Mehroop Randhawa

- Devised the experimental design to perform a meta analysis on gene ontology analyses in reproduction cohorts. Assess how often the same GO terms come up by chance, and what we can do to improve these analyses in the reproduction field.
- Guided student through a computational biology analysis, from preprocessing, experimental design and critical thinking, and communicating her results to other students and scientists

McMaster University, Wilson Lab

September 2022 - Present

Biomedical Discovery and Commercialization Fourth Year Thesis, Supervisor

Student: Ahmed Berih

- Devised the experimental design to assess immune cell proportion in blood of pregnant people with and without a preeclampsia diagnosis.
- Guided student through a computational biology analysis, from preprocessing, experimental design and critical thinking, and communicating his results to other students and scientists

Princess Margaret Cancer Centre, Hoffman Lab

May 2021-May 2022

Amgen Scholars, Summer student co-supervisor

Student: Veronica Alba

- Devised the experimental design to improve the synthetic spike-in controls for cfMeDIP-seq experiments
- Guided student through a computational biology analysis, from preprocessing, experimental design and critical thinking, and communicating her results to other students and scientists

Princess Margaret Cancer Centre, Hoffman Lab

May 2020-June 2022

*University of Toronto, Undergraduate research student co-supervisor**Student: Esther Yoo*

- Devised the experimental design to develop an epigenetic clock for circulating cell-free DNA. Guided student to use epigenetic clock to look at differences in epigenetic aging in different cancers
- Guided student through a computational biology project, from preprocessing, experimental design and critical thinking, machine learning, and communicating her results to other students and scientists

Princess Margaret Cancer Centre, Hoffman Lab

May 2019-December 2019

*McMaster University Co-op student Co-supervisor**Student: Sid Reed*

- Devised the experimental design to investigate differences and similarities between different cancer types and the placenta over development
- Guided student through a computational biology project, from preprocessing to choosing statistical tests to answer our experimental questions

BC Children's Hospital Research Institute, Robinson Lab

May 2016-December 2017

*Summer Student Co-Supervisor**Student: Li Qing Wang*

- Devised the experimental design to investigate variation in CCR5 gene in relation to reduced susceptibility to preeclampsia
- Taught gel electrophoresis and pyrosequencing to student
- Introduced student to bioinformatics and aided in bioinformatic analysis of the results
- Li Qing is now an MD/PhD student at UBC and is completing her PhD in the Robinson lab, having expanded this project to a wider scope. She is preparing a publication on this work

BC Children's Hospital Research Institute, Robinson Lab

July 2014-July 2015

*UBC Directed Studies Student Co-Supervisor**Student: Yao Liu*

- Devised the design experiment to investigate telomere length dynamics in the placenta over gestation and whether telomere length differ between placental insufficiency pathologies and controls
- Measured telomere length using qPCR and taught the technique to student
- Aided student in analysis and write up of his year end report

CONTRIBUTIONS TO SCIENTIFIC COMMUNITY

REVIEW SERVICE

CIHR Doctoral Research Awards Committee

2021-2022

Reviewer, Canadian Institute of Health Research

Reviewed applications for the CIHR doctoral fellowship awards

Student committees and examinations

May 2020

External examiner, University of Adelaide, Adelaide, SA, Australia

Reviewed PhD thesis of Qianhui Wan (Supervisor: Dr. Claire Roberts)

Journal Service

February 2018-Present

Peer review articles submitted to:

- Placenta (N=5)
- Clinical Epigenetics (N=7)
- Molecular Autism (N=1)
- Scientific Reports (N=2)
- Bioinformatics (N=1)

- Gynecological Endocrinology (N=1)
- European Journal of Neuroscience (N=1)
- Epigenetics (N=1)
- Journal of Developmental Origins of Health and Disease (N=1)
- Communication Biology (N=1)

INSTITUTIONAL LEADERSHIP AND COMMITTEES

Placenta central slack organizer

May 2020 - present

312 members

- Set up a slack work space for pregnancy and reproduction researchers to converse, meet people with similar interests, set up collaborations, share new research and ideas, and form collaborations.
- Manage a team of co-organizers and hold biannual meetings on how to improve the slack work space.
- Target audience: pregnancy and reproduction research of all levels.

Graduate Student Representative

September 2016-June 2017

Faculty of Medicine Advisory Committee, University of British Columbia

- Committee met to evaluate funding applications for the Graduate Student Initiative, providing funds for student led projects collaborating across many departments in the Faculty of Medicine
- Committee also started the first Faculty of Medicine research day to promote collaboration and connection between the departments within the Faculty of Medicine

Graduate Student Representative

September 2015-June 2016

Department of Medical Genetics Advisory Committee, University of British Columbia

- Committee met to evaluate many aspects of the Medical Genetics Department including: enrollment, awards, program application and pre-requisites, and implantation of the rotation program.

EVENT ORGANIZER

Virtual Canadian Placenta Meeting Co-organizer

November 2022

- Co-organized the logistics of the event including: setting up online registration, abstract submitting, inviting individuals to the event and moderating.
- Target audience: pregnancy and reproduction research of all levels.

Event Lead, Annual Placenta Workshop

2015 & 2016

BC Children's Hospital Research Institute

- Recruited and organized volunteers
- Organized the logistics of the event, including: schedules, catering, hotels, speaker invitations, airport pickups, registration and set-up, obtaining funding from institutional and private vendors
- Target audience: scientists, clinicians and trainees specializing in the research and management of pregnancy complications

Committee Member, Maternal Fetal Medicine Symposium

July 2015-November 2015

BC Women's Hospital

- Obtained funding for this inaugural symposium to highlight new research in reproductive mental health
- Target audience: clinicians, trainees and basic scientists interested in mental illness pathogenesis and management during pregnancy.

KNOWLEDGE TRANSLATION

MEDIA

Article written about ASHG 2020 presentation

November 2020

GenomeWeb

- Article written about my work using the cell-free methylated DNA immunoprecipitation technique to enrich for cell-free placental DNA. Shows widespread interest in this work and communicates the broad implications to non-scientists.

Science Expert

February 2020

The Science Pawdcast

- *The Science Pawdcast* is an online podcast run by high school chemistry teacher, Jason Zackowski, featuring his twitter science dog, Bunsen the Bernese mountain dog. The podcast aims to make science accessible and engaging to the public. I was interviewed as a science expert in episode 3 of season 2.

OUTREACH

Scientist Volunteer

June 2018-June 2020

Letters to Pre-Scientists

- This program assigns young students, interested in science, to a current scientist. Students and scientists exchange letters for the duration of the school year.
- Target audience: elementary and high school students aged 5-18

Scientist Speaker

March 2018- June 2020

Skype a Scientist

- Used skype to video call high school classes worldwide to talk about my research and discuss careers in research.
- Target audience: high school students aged 14-18

UBC Let's Talk Science

September 2014-June 2016

University of British Columbia

- Taught grade 7 students basic genetics concepts, how genetics is used to solve problems and careers in genetics.
- Lesson plan included DNA extraction from kiwi and blood ABO typing (which we framed as a murder mystery)

Institute Discovery Days Presenter

December 2016

BC Children's Hospital Research Institute

- Along with a clinical physician, I presented a demonstration about pregnancy and the placenta and how it works to high school students. We outlined career options in basic and translational sciences and brought placentas from the previous day's deliveries for the students to see and touch.

District Vancouver Science Fair Judge

February 2014

Langara College

- Judged high school students' scientific posters and chose top students to move on the the Greater Vancouver Science Fair

Greater Vancouver Science Fair Judge and Team Captain

April 2013 & April 2014

University of British Columbia

- Managed a team of judges evaluating high school students' posters in Biology
- Team discussed and chose top student to move on the Provincial Science Fair

CONTRIBUTIONS TO COMMUNITY

Peer Counselor, AMS Speakeasy

September 2013-April 2014

Alma Mater Society, University of British Columbia

- Speakeasy provides emotional support and resources to students at UBC
- Topics trained in: LGBTQ+ issues, stress, anxiety, bereavement, sexual assault, and suicidal thoughts

Crisis Hotline Operator

March 2013-June 2013

Vancouver Rape Relief and Women's Shelter

- I operated crisis calls from women. This entailed listening to the women, grounding their fears, and ensuring that they are safe. Vancouver Rape Relief provides emotional support and a safe comforting environment, as well as practical services including help reporting to the police and accompanying women to hospital
- I also participated in daily activities ongoing in the women's shelter, provided emotional support and physical help (cooking dinner, watching children etc.) while they attend to their own personal needs

Soccer Coach

May 2012-August 2012

Kensal Park Soccer, A League of their own

- Coached children with autism aged 5-17 years. I completed a course on applied behavioral analysis and prepared practice plans based on my children's functional skills and their specific needs

ACADEMIC MEMBERSHIPS**Placental interface seminar series**

2020-Present

Virtual seminar series

R Ladies Toronto

2019-Present

R Ladies Toronto

International Federation of Placenta Association

2016-Present

International Federation of Placenta Association

Canadian Society for Molecular Biosciences Membership

2018-2020

Canadian Society for Molecular Biosciences

Placentomics Consortium

September 2016-Present

University of California, Los Angeles

- The consortium houses DNA methylation data on hundreds of placenta samples which are used in a number of ongoing projects. (Lead: Dr. Karin Michels, UCLA)

Combined Placental Research Group

September 2013-December 2017

BC Children's Hospital Research Institute

- Group lead from 2015-2017
- Group met once a month to discuss current placental research. Individuals present on new research happening within the group.

Illumina 450K/EPIC Working Group

September 2013-April 2017

BC Children's Hospital Research Institute

- Group met once a month to discuss problems and recent research using the Illumina DNA methylation microarrays

Developmental Origins of Health and Disease Journal Club

January 2013-September 2016

University of British Columbia

- Group met once a week to discuss recent research in epigenetics relating to the developmental origins of health and disease hypothesis.

American Society of Human Genetics Membership

2013, 2015-2016, 2020

American Society of Human Genetics

ABSTRACTS, N=23

1. **Wilson, SL.**, Shen, SY., Triche, T., De Carvalho, DD., Hoffman, MM. A new method to absolutely quantify and enrich for circulating placenta DNA from maternal blood. International Federation of Placenta Association, Virtual. August 30 - September 2, 2021.

2. **Wilson, SL.**, Shen, SY., Triche, T., De Carvalho, DD., Hoffman, MM. Enrichment and Absolute Quantification of Cell-Free Placenta DNA in Maternal Blood. Society of Reproductive Investigation, Virtual. July 5 - 9, 2021.
3. Harmon, L., **Wilson, SL.**, Shen, SY., Burgener, J.M., Bratman, S.v., De Carvalho, D.D., Hoffman, M.M., Triche, T. Spiky: standardizing cfMeDIP-seq data with spike-in controls. BioC 2021 conference. August 4, 2021.
4. **Wilson, SL.**, Shen, SY., Triche, T., De Carvalho, DD., Hoffman, MM. Enrichment, sequencing, and absolute quantification of circulating placental DNA in maternal blood, using DNA methylation. Canadian National Perinatal Research Meeting. Virtual. February 8 - 12, 2021.
5. **Wilson, SL.**, Shen, SY., Triche, T., De Carvalho, DD., Hoffman, MM. Enrichment, sequencing, and absolute quantification of circulating placental DNA in maternal blood, using DNA methylation. American Society of Human Genetics, Virtual. October 27-31, 2020.
6. **Wilson, SL.**, Shen, SY., De Carvalho, DD., Hoffman, MM. Synthetic spike-in controls to account for biological and technical bias in MeDIP-seq experiments. Epigenomics of common diseases, Cambridge, UK. November 6-8, 2019.
7. Konwar, C., Price, EM., Del Gobbo, GF., **Wilson, SL.**, Manokhina, I., Terry, J., Robinson, WP. Insights into epigenetic, genetic and miRNA variation associated with acute chorioamnionitis placentas. International Federation of Placenta Associations Annual Meeting, Tokyo, Japan. September 21-24, 2018.
8. **Wilson, SL.**, Leavey, K., Cox, B.J., Robinson, WP. Placental molecular profiling in preeclampsia: Utility, reproducibility and biological meaning. International Federation of Placenta Associations Annual Meeting, Manchester, UK. August 30-September 2, 2017.
9. Konwar, C., Price, EM., Del Gobbo GF., **Wilson, SL.**, Jefferson T., Robinson, WP. Genetic and epigenetic profiling of acute chorioamnionitis associated placentas. International Federation of Placenta Associations Annual Meeting, Manchester, UK. August 30-September 2, 2017.
10. **Wilson, SL.**, Leavey, K., von Dadelzen, P., Cox, B.C., Robinson, WP. Unravelling the relationship between early and late-onset preeclampsia. What does the placental DNA methylation profile reveal? Canadian Student Health Research Forum, Winnipeg, Canada. June 6-9, 2017.
11. **Wilson, SL.**, Leavey, K., Cox, B.J., Robinson, WP. DNA methylation gives insight into different etiologies in early-onset and late-onset preeclampsia and intrauterine growth restriction. American Society of Human Genetics 66th Annual Meeting, Vancouver, Canada. October 18-22, 2016.
12. Magee, L.A., Synnes, A., von Dadelzen, P., Hutfield, A., Chanoine, J.P., Cote, A.M., Devlin, A., Gafni, A., Ganzevoort, W., Gruslin, A., Helewa, M., Hutton, E., Koren, G., Lee, S.K., McArthur, D., Rey, E., Robinson, W.P., Roseboom, T., Singer, J., **Wilson, SL.**, Mountquin, J.M. CHIPS-Child: Testing the developmental programming hypothesis in the offspring of the CHIPS Trial. International Society of the Study of Hypertension in Pregnancy World Congress, Sao Paulo, Brazil. October 23-26, 2016.
13. Robinson, W.P., Liu, Y., **Wilson, SL.** Placental telomere length decline with gestational age differs by sex and TERT, DNMT1 and DNMT3a DNA methylation. IFPA Meeting, Portland, USA. September 13-16, 2016.
14. **Wilson, SL.**, Leavey, K., von Dadelzen, P., Cox, B.J., Robinson, W.P. Unravelling the relationship between early and late-onset preeclampsia. What does the placental DNA methylation profile reveal? IFPA Meeting, Portland, USA. September 13-16, 2016.
15. Leavey, K., **Wilson, SL.**, Bainbridge, S., Robinson, W.P., Cox, B.J. Epigenetic Regulation of Placental Gene Expression in Transcriptional Subclasses of Preeclampsia. IFPA Meeting, Portland, OR, USA. September 13-16, 2016.
16. Barha, C.K., Salvante, K.G., Hanna, C.W., **Wilson, SL.**, Robinson, W.P., Altman, R.M., Nepomnaschy, P.A. Stressful Life Events, the Hypothalamic-Pituitary-Adrenal Axis and Cellular Aging in Women. 2016 Annual Conference of the Human Biology Association. Atlanta, USA. April 13-14, 2016.
17. **Wilson, SL.**, Blair, J.D., Langlois, S., von Dadelzen, P., Robinson, W.P. DNA methylation profiling gives insight into the relationship between early-onset and late-onset Preeclampsia, Intrauterine growth restriction and healthy placentas. Canadian National Perinatal Research Meeting, Banff, Canada. February 10-13, 2016.

18. Barha,CK., Salvante,KG., Hanna,CW.,**Wilson,SL.**,Robinson,WP., Altman,RM., Nepomnaschy,PA. Women's Aging: The Role of the Hypothalamic-Pituitary-Adrenal Axis. Annual Conference of the Canadian Association of Physical Anthropology. Winnipeg,Canada., October 28-31, 2015.
19. **Wilson,SL.**, Liu,Y., Robinson,WP. Sexual dimorphism in placental telomere length over gestational age. American Society of Human Genetics 65th Annual Meeting. Baltimore,USA. October 6-10, 2015.
20. Leavey,K.,**Wilson, SL.**, Bainbridge,S., Robinson,WP, Cox,BJ. An Integrated Transcriptional, Epigenetic, and Clinical Analysis of Preeclamptic Placentas. IFPA Meeting. Brisbane,Australia. September 9-12, 2015.
21. **Wilson, SL.**, Blair,JD., Hogg,K., Langlois,S., von Dadelszen,P., Robinson,WP. The relationship of placental DNA methylation to maternal serum proteins Inhibin- and Pregnancy associated plasma protein A. Epigenomics of common diseases. Cambridge, UK. October 28-31, 2014.
22. **Wilson, SL.**,Blair,JD., von Dadelszen,P., McFadden,DE., Langlois,S., Robinson,WP. DNA methylation profiling reveals distinct subgroups. American Society of Human Genetics 63rd Annual Meeting. Boston,USA. October 22-26, 2013.
23. Blair,JD.,**Wilson, SL.**, Yuen,RYC., von Dadelszen,P., Robinson,WP. Altered DNA methylation in preeclampsia placentas. International Federation of Placentas Association Meeting 2013. Whistler, Canada. September 11-14, 2013.