
Farhana Islam, Ph.D.

EDUCATION

- 2018–2024 **Doctor of Philosophy (Ph.D.), Psychiatric Pharmacogenomics**
Department of Pharmacology & Toxicology, University of Toronto, Toronto, ON
Thesis: Towards Precision Medicine in Psychiatry: Characterizing Genomic and Epigenetic Contributions to Antidepressant and Antipsychotic Response, Adverse Drug Reactions, and Pharmacokinetics
- 2014–2017 **Master of Science (M.Sc.), Neuroscience**
Centre for Neuroscience Studies, Queen's University, Kingston, ON
Thesis: Inhibition of Wnt Signalling Dose-Dependently Impairs the Acquisition and Expression of Amphetamine-Induced Conditioned Place Preference in Rats
- 2009–2013 **Bachelor of Science (Honours) (H.B.Sc.)**
University of Toronto - St. George Campus, Toronto, ON
Neuroscience and Biochemistry double majors, Psychology minor

RELEVANT WORK EXPERIENCES

- 2024–Present **Data Scientist**, Child Health Evaluative Sciences, Hospital for Sick Children & **Data Scientist (Secondment)**, GEMINI Research, Unity Health
- As lead analyst for GEMINI-Pediatrics, designing/spearheading research studies with the goal of generating evidence focused on the care of hospitalized children.
 - Manipulating and handling clinical and healthcare administrative datasets (i.e., CIHI DAD, NACRS, GEMINI) using R, SQL and Python. Identifying statistical approaches to test research hypotheses and assess quality improvement metrics.
 - Building and maintaining cross-institutional research collaborations, managing project timelines/milestones, and presentation of findings to experts in the field.
 - Supervising and training summer students, trainees, and new team members.
- 2024–Present **Sessional Instructional Assistant**, Department of Biology - University of Toronto Mississauga Campus & Department of Biological Sciences - Scarborough campuses
- Designing and leading tutorial and practical lessons for BIO259H5 (Introduction to Biological Data) that explained theory/practice of hypothesis testing and probability to undergraduate students using R. Leading tutorials for BIOC14 (Genes, Behavior, & Environment), grading presentations, and holding office hours.
- 2023–2024 **Research Data Analyst/Statistician**, Trauma/Neurosurgery, St. Michael's Hospital
- Manipulating/handling clinical and Statistics Canada datasets, designing statistical plan, building statistical models, data interpretation and writing manuscripts/grants.

RECENT RESEARCH EXPERIENCES

- 2018–2024 **Doctoral Student**
Mentor: Dr. Daniel Mueller, University of Toronto, Toronto, ON
Pharmacogenetics Lab at the Centre for Addiction and Mental Health, Toronto, ON
- Evaluating and interrogating predictive models of treatment response and side effects to psychotropic medications using clinical and multi-omic data from multi-site clinical trial.
 - 15 total publications resulted from PhD research, secured local and international funding, and collaborated with industry and academic institutions across North America
- 2014–2017 **Masters Student**
Mentor: Dr. Richard J. Beninger, Queen's University, Kingston, ON
Neurotransmitter and Behaviour Lab, Centre for Neuroscience Studies
- Investigation of the role of Wnt signalling in the acquisition and expression of incentive learning using the conditioned place preference behavioural model.
 - Performance of stereotaxic surgery for chronic brain cannulation and microinjections of pharmacological agents prior to behavioural conditioning.
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PEER-REVIEWED PUBLICATIONS

AS PRIMARY AUTHOR

1. **Islam, F**, Lisoway, A, Oh, ES, Fiori, LM, Magarbeh, L, Elsheikh, SSM, Kim, HK, Kloiber, S, Kennedy, JL, Frey, BN, Milev, RV, Soares, C, Parikh, S, Placenza, F, Strother, SC, Hassel, S, Taylor, VH, Leri, F, Blier, P, Uher, R, Farzan, F, Lam, RW, Turecki, G, Foster, JA, Rotzinger, S, Kennedy, SH, Müller, DJ. Integrative genetic variation, DNA methylation, and gene expression analysis of escitalopram and aripiprazole treatment outcomes in depression: a CAN-BIND-1 study. *Pharmacopsychiatry*. 2024 Sep; 57(5):232-244.
2. **Islam, F**, Magarbeh, L, Elsheikh, SSM, Kloiber, S, Espinola, CW, Bhat, V, Frey, BN, Milev, RV, Soares, C, Parikh, S, Placenza, F, Strother, SC, Hassel, S, Taylor, VH, Leri, F, Blier, P, Uher, R, Farzan, F, Lam, RW, Turecki, G, Foster, JA, Rotzinger, S, Kennedy, SH, Müller, DJ. Influence of *CYP2C19*, *CYP2D6*, and *ABCB1* Gene Variants and Serum Levels of Escitalopram and Aripiprazole on Treatment-Emergent Sexual Dysfunction: A CAN-BIND-1 Study. *Canadian Journal of Psychiatry*. 2024 Mar; 69(3):183-195.
3. **Islam F**, Marshe VS, Magarbeh L, Frey BN, Milev RV, Soares CN, Parikh SV, Placenza F, Strother SC, Hassel S, Taylor VH, Leri F, Blier P, Uher R, Farzan F, Lam RW, Turecki G, Foster JA, Rotzinger S, Kennedy SH, Müller DJ. Effects of *CYP2C19* and *CYP2D6* gene variants on escitalopram and aripiprazole treatment outcome and serum levels: results from the CAN-BIND 1 study. *Translational Psychiatry*. 2022 Sep 6; 12(1):366.
4. **Islam F**, Hain D, Lewis D, Law R, Brown LC, Tanner JA, Müller DJ. Pharmacogenomics of Clozapine-induced agranulocytosis: a systematic review and meta-analysis. *Pharmacogenomics Journal*. 2022 Jul; 22(4):230-240.
5. **Islam F**, Men X, Yoshida K, Zai CC, Müller DJ. Pharmacogenetics-Guided Advances in Antipsychotic Treatment. *Clinical Pharmacology & Therapeutics*. 2021 Sep; 110(3):582-588.
6. **Islam F**, Gorbovskaya I, Müller DJ. Pharmacogenetic/Pharmacogenomic Tests for Treatment Prediction in Depression. *Advances in Experimental Medicine and Biology*. 2021; 1305:231-255.
7. **Islam F**, Maciukiewicz M, Freeman N, Huang E, Tiwari A, Mulsant BH, Pollock BG, Remington G, Kennedy JL, Müller DJ, Rajji TK. Contributions of cholinergic receptor muscarinic 1 and CYP1A2 gene variants on the effects of plasma ratio of clozapine/N-desmethylozapine on working memory in schizophrenia. *Journal of Psychopharmacology*. 2021 Jan; 35(1):31-39.
8. **Islam F**, Mulsant BH, Voineskos AN, Rajji TK. Brain-Derived Neurotrophic Factor Expression in Individuals With Schizophrenia and Healthy Aging: Testing the Accelerated Aging Hypothesis of Schizophrenia. *Current Psychiatry Report*. 2017 Jul; 19(7):36.
9. **Islam F**, Xu K, Beninger RJ. Inhibition of Wnt signalling dose-dependently impairs the acquisition and expression of amphetamine-induced conditioned place preference. *Behavioural Brain Research*. 2017 May 30; 326:217-225.

AS CO-AUTHOR

10. Adams E, Lavoie-Gagnon H, **Islam F**, Humer M, Mou B, Koulis TA, Kim D, Atrchian S. Effects of Palliative Esophageal External Beam Radiation Therapy in Patients with Stent for Esophageal Cancer: A Retrospective Cohort Study. *J Gastrointest Cancer*. 2025 Apr 18;56(1):102.
11. Magarbeh L, Elsheikh S, **Islam F**, Marshe V, Men X, Tavakoli, E, Kronenbuerger, M, Kloiber, S, Frey, BN, Milev, RV, Soares, C, Parikh, S, Placenza, F, Hassel, S, Taylor, VH, Leri, F, Blier, P, Uher, R, Farzan, F, Lam, RW, Turecki, G, Foster, JA, Rotzinger, S, Kennedy, SH, Müller, DJ. Polygenic Risk Score Analysis of Antidepressant Treatment Outcomes: A CAN-BIND-1 Study Report. *Canadian Journal of Psychiatry*. 2025; in press.
12. Elsheikh S, Marshe V, Maciukiewicz M, **Islam F**, Men X, Goncalves V, Felsky D, Kennedy JL, Mulsant BH, Reynolds III C, Lenze EJ, Kennedy JL, Mueller DJ. Genome-Wide Associations of Cognitive Domains and their Correlation with Polygenic Risk Scores for Antidepressant Response in Late-Life Depression. *Alzheimer's & Dementia*. 2024; 20(Suppl. 8):e095772.

13. Elsheikh S, Marshe V, Men X, **Islam F**, Goncalves V, Paré G, Felsky D, Mulsant BH, Reynolds III C, Lenze EJ, Kennedy JL, Mueller DJ. Polygenic score analyses on antidepressant response in Late-life Depression, Results from the IRL-GRey Study. *The Pharmacogenomics Journal*. 2024 Nov 22;24(6):38.
14. Magarbeh L, Hassel C, Choi M, **Islam F**, Marshe VS, Zai CC, Zuberi R, Gammal RS, Men X, Scherf-Clavel M, Enko D, Frey BN, Milev R, Soares CN, Parikh SV, Placenza F, Strother SC, Hassel S, Taylor VH, Leri F, Blier P, Farzan F, Lam RW, Turecki G, Foster JA, Rotzinger S, Kloiber S, Kennedy JL, Kennedy SH, Bousman CA, Müller DJ. ABCB1 Gene Variants and Antidepressant Treatment Outcomes: A Systematic Review and Meta-Analysis Including Results from the CAN-BIND-1 Study. *Clinical Pharmacology & Therapeutics*. 2023 Jul; 114(1):88-117.
15. Marshe VS, Maciukiewicz M, Hauschild AC, **Islam F**, Qin L, Tiwari AK, Sibille E, Blumberger DM, Karp JF, Flint AJ, Turecki G, Lam RW, Milev RV, Frey BN, Rotzinger S, Foster JA, Kennedy SH, Kennedy JL, Mulsant BH, Reynolds CF 3rd, Lenze EJ, Müller DJ. Genome-wide analysis suggests the importance of vascular processes and neuroinflammation in late-life antidepressant response. *Translational Psychiatry*. 2021 Feb 15; 11(1):127.
16. Marshe VS, **Islam F**, Maciukiewicz M, Fiori LM, Yerko V, Yang J, Turecki G, Foster JA, Kennedy SH, Blumberger DM, Karp JF, Kennedy JL, Mulsant BH, Reynolds CF 3rd, Lenze EJ, Müller DJ. Validation study of microRNAs previously associated with antidepressant response in older adults treated for late-life depression with venlafaxine. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*. 2020 Jun 8; 100:109867.
17. Marshe VS, **Islam F**, Maciukiewicz M, Bousman C, Eyre HA, Lavretsky H, Mulsant BH, Reynolds CF 3rd, Lenze EJ, Müller DJ. Pharmacogenetic Implications for Antidepressant Pharmacotherapy in Late-Life Depression: A Systematic Review of the Literature for Response, Pharmacokinetics and Adverse Drug Reactions. *American Journal of Geriatric Psychiatry*. 2020 Jun; 28(6):609-629.

RELATED HONOURS AND AWARDS

2021	Early Career Investigator Award for the 2021 World Congress of Psychiatric Genetics (WCPG) - International Society of Psychiatric Genetics (ISPG)	1,326
2019, 2022	Department of Pharmacology & Toxicology Book Fund Travel Award	3,000
2021, 2020, 2018	Ontario Graduate Scholarship (3x)	45,000
2019, 2017, 2016	University of Toronto Fellowship (3x)	30,000
2019	School of Graduate Studies Research Conference Grant	900
2019	Massey College's Catherall Travel Bursary	800
2018	Muslim Award for Excellence - Naseem Altaf Malik Humanitarian Scholarship	2,500
2017, 2018	Massey College Junior Fellowship (2x)	-
2017	Pharmacology Graduate Student Award	5,000
2017	Frist-Jus Annual Memorial Award in Neuropsychopharmacology	5,000
2014, 2015	Clifton Foundation Scholarship (2x)	30,000
2014, 2015	Queen's Graduate Award (2x)	10,000

TEACHING EXPERIENCES

2021–2024	Teaching Assistant, Biostatistics I (CHL5201Y), <i>Dalla Lana School of Public Health, University of Toronto</i> <ul style="list-style-type: none"> Designed and led tutorials teaching biostatistics concepts and data analysis using R to graduate students and clinicians.
2020-2023	Teaching Assistant, Personalized Medicine (PHM360H), <i>Department of Pharmacy, University of Toronto</i> <ul style="list-style-type: none"> Guided groups of pharmacy through their case studies relating to pharmacogenetics concepts and its applications within pharmacy.
2017-2023	Teaching Assistant, Pharmacology and Toxicology in Society (PCL389H), <i>Department of Pharmacology and Toxicology, University of Toronto</i>

- Received formal training in grading reflections and providing assistance in leading a community-engaged course. Graded student reflections on their placements, class debates, and final posters.

Fall 2021	Teaching Assistant, Biometrics (BIO360H) , <i>Department of Biology, University of Toronto Mississauga</i> <ul style="list-style-type: none"> • Graded student reports on their statistical analyses and critical reviews of scientific papers.
2014-2017	Teaching Assistant, Abnormal Psychology (PSYC 235) and Social Psychology (PSYC 241) , <i>Department of Psychology, Queen's University</i> <ul style="list-style-type: none"> • Designed and led tutorials and group discussions using Adobe Connect and OnQ interface, evaluated assignments, midterms and exams, and moderated online forum discussions.

PROFESSIONAL DEVELOPMENT

June 2022	Psychiatric Neuroinformatics , Krembil Centre for Neuroinformatics (KCNI) Summer Academy, Toronto, Canada.
September 2020	Machine Learning , Canadian Bioinformatics Workshops, Virtual.
August 2018	Towards Pharmacogenomics in Clinic , U-PGx Summer School, Bonn, Germany.

SERVICE & OUTREACH

2024 – Present	Second Vice President – Unit 3 , CUPE 3902
2022 – Present	Appointed Member , University of Toronto Tribunal
2022 – 2023 & 2018 – 2019	Appointed Member (2 terms) , University Affairs Board - Office of the Governing Council, <i>University of Toronto</i>
2022 – 2023	Elected Member , Board of Directors, University of Toronto Graduate Students' Union
2021 – 2023	Committee Member , PGx Psychiatry Special Interest Group, <i>Pharmacogenomics Research Network (PGRN)</i>
2020 – 2023	Committee Member , Equity, Diversity and Inclusion (EDI) Committee, <i>Canadian College of Neuropsychopharmacology (CCNP)</i>
2020 – 2024	Graduate Ambassador for Department of Pharmacology & Toxicology , <i>Faculty of Medicine, University of Toronto</i>
2016 – 2020	President (elected) and previously Vice-President (2016-2018), Race and Ethnicity Caucus, <i>University of Toronto Graduate Students' Union</i>
2017 – 2019	Junior Fellow , <i>Massey College</i>
2018	Protégée of City Councillor Lucy Troisi of Ward 28 , <i>City of Toronto</i>
2017	Mentee of Senator Salma Ataullahjan , Women in House, <i>University of Toronto</i>

RELATED SKILLS AND INTERESTS

- Statistical analyses using R, with developing expertise in Python.
- Web design using HTML, CSS, and JavaScript.
- Medical communications, including peer-review of scientific articles, grants, and scholarships.
- Leadership positions, in particular, promoting equity, diversity, and inclusion.

FIRST-AUTHOR PRESENTATIONS

INVITED PRESENTATIONS

March 2023	<i>Contributions of CYP2C19 and CYP2D6 Gene Variants to Antidepressant Pharmacokinetics, Treatment Response, and Adverse Drug Reactions: A CANBIND-1 Report.</i> Harvard Medical School/Massachusetts General Hospital, Precision Psychiatry Seminar.
March 2023	<i>Towards Precision Medicine in Psychiatry: Characterizing Genetic Contributions to Antidepressant and Antipsychotic Pharmacokinetics, Treatment Response and Adverse Drug Reactions</i> Research Trainee Seminar Series, Centre for Addiction and Mental Health.

July 2016 *A role for Wnt Signalling in the cellular mechanisms underlying incentive learning.*
Behavioural Neuroscience Summer Seminar Series, Queen's University.

INVITED CONFERENCE TALKS

October 2021 *Association of CYP2C19 and CYP2D6 genotypes and plasma levels of escitalopram and aripiprazole with treatment outcome in the CAN-BIND-1 sample.*
Moving Depression Pharmacogenetics Forward-Using Scientific Discoveries to Inform Clinical Decisions Symposium at the World Congress of Psychiatry Genetics (WCPG), Virtual.

CONFERENCE POSTERS

October 2023 *Contributions of CYP2D6 and CYP2C19 Gene Variants to Antidepressant Outcome and Pharmacokinetics: Current Evidence, Expert Recommendations and a CANBIND-1 Report.*
Canadian Psychiatric Association (CPA), Vancouver, British Columbia.

September 2022 *Effects of CYP2C19, CYP2D6, and ABCB1 Gene Variants on Escitalopram and Aripiprazole Treatment-Related Sexual Side Effects: Results From the CAN-BIND-1 Study.*
World Congress of Psychiatric Genetics (WCPG), Florence, Italy.

April 2021 *Genetic Determinants of Clozapine-Induced Agranulocytosis: A Systematic Review and Meta-Analysis.*
76th Annual Meeting of the Society of Biological Psychiatry (SOBP), Virtual.

October 2020 *Contributions of Cholinergic Receptor Muscarinic 1 (CHRM1) and CYP1A2 Gene Variants on the Effects of Plasma Ratio of Clozapine/N-Desmethylozapine on Working Memory in Schizophrenia.*
World Congress of Psychiatry Genetics (WCPG), Virtual.

April 2020 *Contributions of Cholinergic Receptor Muscarinic 1 (CHRM1) and CYP1A2 Gene Variants on the Effects of Plasma Ratio of Clozapine/N-Desmethylozapine on Working Memory in Schizophrenia.*
75th Annual Meeting of the Society of Biological Psychiatry (SOBP), New York City, NY.
Conference cancelled.

October 2019 *Association of CYP2C19 and CYP2D6 genotypes and plasma levels of escitalopram and aripiprazole with treatment outcome in the CAN-BIND-1 sample.*
Pharmacogenetic Research Network Meeting at the American Society for Human Genetics Annual Meeting, Houston, Texas.

June 2019 *Effects of CYP1A2 and Cholinergic Receptor Muscarinic 1 (CHRM1) Gene Polymorphisms on Plasma Ratio of Clozapine/N-desmethylozapine and Working Memory Performance in Schizophrenia.*
Canadian College of Neuropsychopharmacology (CCNP) 2019 Annual Meeting, Montreal, Quebec.

June 2019 *Effects of CYP2C19 and CYP2D6 gene polymorphisms and methylation on plasma levels of escitalopram and aripiprazole and treatment outcome in the CAN-BIND-1 sample.*
Clinical Pharmacogenetics Implementation Consortium (CPIC®) Meeting, Memphis, Tennessee.

June 2019 *Association of CYP2C19 and CYP2D6 genotypes and plasma levels of escitalopram and aripiprazole with treatment outcome in the CAN-BIND-1 sample.*
World Federation of Societies of Biological Psychiatry (WFSBP) 14th World Congress of Biological Psychiatry, Vancouver, British Columbia.

May 2019 *Impact of CYP2C19 and CYP2D6 Genotypes on Clinical Outcomes and Side Effects in Patients Receiving Escitalopram and Aripiprazole for Major Depression: Results From the CAN-BIND Cohort.*
74th Annual Meeting of the Society of Biological Psychiatry (SOBP), Chicago, Illinois.

November 2016 *Inhibition of Wnt signalling dose-dependently impairs the acquisition and expression of amphetamine-induced conditioned place preference.*
Society for Neuroscience (SfN), San Diego, California.