

Suraj Bansal

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EDUCATION

McMaster University, Hamilton ON

Expected: May 2025

Bachelor of Health Sciences (Honours) Candidate (GPA: 3.95/4.00) | *Certificates:* Health Innovation Bootcamp

Relevant Coursework: Clinical Biochemistry, Drug Discovery and Biotechnology, Neural Networks and Machine Learning, Immunology, Cellular and Molecular Biology, Anatomy and Physiology, Epigenetics, Clinical Epidemiology and Biostatistics

Honors: Dean's List (2021-22, 2022-23) | *Awards:* Faculty of Health Sciences Achievement Award (\$1,000)

PROFESSIONAL EXPERIENCE

Princess Margaret Cancer Centre, UHN: John Dick Lab, *Student Researcher* | Toronto, ON

Sep. 2020 - Present

- Led 17 external computational analyses to inform functional drug studies with collaborators across 11 labs in 5 institutions
- Spearheaded a literature screen to identify and re-analyze 95 preclinical RNA-sequencing studies using gene expression deconvolution to quantify interpatient heterogeneity in drug response and predict clinical responses to treatment in AML.
- Performed single-cell transcriptomic analysis of the tumor micro-environment in MC38 mouse models of colorectal cancer treated with immune checkpoint blockade, in partnership with clinician-scientists at the German Cancer Research Centre.
- Led the development of a cloud-powered bioinformatics pipeline for automated transcriptomic meta-analysis (ranging from unsupervised cell clustering to survival analysis) of 20 bulk- and single-cell RNA-sequencing datasets to streamline exhaustive drug target characterization in AML (currently used in 7 external collaborations across 6 labs).

Awards: T-CAIREM AI in Medicine Summer Scholarship (2022), UofT Molecular Genetics Summer Research Program (2021, 2022, 2023), University Health Network Summer Research Program (2021, 2022, 2023), BioTalent Student Subsidy (2022, 2023)

Hamilton Social Medicine Response Team (HAMsMART), *Research Student* | Hamilton, ON

Sep. 2022 - Present

- Liaised with physician and peer investigators to mobilize two harm reduction programs (safer opioid supply, HIV prevention clinic) for hundreds of people experiencing homelessness or treatment-refractory opioid use disorder in Hamilton
- Conducted patient recruitment and chart review for a primary care-embedded safer supply program for prescribing pharmaceutical-grade opioid alternatives to people with treatment-refractory opioid use disorder
- Contributed to study recruitment, reflexive thematic analysis, statistical analysis, and knowledge translation for a mixed methods study evaluating the health of 20 people service restricted from emergency homeless shelters; manuscript in prep

Center for Addiction and Mental Health (CAMH), *National Youth Advisor* | Toronto, ON

Aug. 2022 - Present

- Longitudinally advised the development of various mental health and substance use policies, systems, and services
- Liaised with peer-investigators at University of Manitoba to co-create a trauma-informed patient and public engagement evaluation tool to evaluate the quality and integrity of patient and public engagement in health research across Canada

St. Michael's Hospital, Division of Gastroenterology, *Research Assistant* | Toronto, ON

Jun. 2019 - Aug. 2019

- Assisted with endoscopic training for University of Toronto residents as EndoVR simulation expert and standardized patient
- Performed data collection for medical education research studying the effects of gamification on student learning

RESEARCH PUBLICATIONS

Published Manuscripts

Andy G.X. Zeng, Suraj Bansal (2nd), ... John E. Dick. A cellular hierarchy framework for understanding heterogeneity and predicting drug response in Acute Myeloid Leukemia. (In Press). *Nature Medicine*. May 2022. DOI:10.1038/s41591-022-01819-x.

Suraj Bansal, Matthew Ahn. The efficacy of nanoparticle-based CT imaging techniques in identifying pro-inflammatory macrophages in atherosclerosis. (In Press). *The Meducator Health Sciences Journal*. April 2022. DOI:10.35493/medu.41.14.

Published Abstracts

Robert J. Vanner, ... Suraj Bansal (4th), ... John E. Dick. TET2-mutations reshape tumour infiltrating leukocytes to promote immunotherapy response. (In Press). *Molecular Oncology*. June 2023. DOI: 10.1002/1878-0261.13469.

Suraj Bansal, Andy G.X. Zeng, ... John E. Dick. ATLAS-AML: an automated bioinformatics pipeline for target characterization in Acute Myeloid Leukemia. *Experimental Hematology*. August 2023. DOI: 10.1016/j.exphem.2023.06.130.

Grace Egan, ... Suraj Bansal (4th), ... Aaron D. Schimmer. XPO2 Is Essential for a Subset of AML Cells and Is a Biomarker for Poor Response and Survival in Pediatric and AYA AML. November 2023. *Blood*. DOI:10.1182/blood-2023-180968.

Amanda Tajik, ... Suraj Bansal (17th), ... Kristin Hope. Identifying stress granules as determinants of leukemia stem cell maintenance and stress adaptation. November 2023. *Blood*. DOI:10.1182/blood-2023-180919.

Robert Vanner, ... Suraj Bansal (4th), ... John E. Dick. Somatic TET2 Mutations Prime the Immune System for Response to Immune Checkpoint Blockade. November 2023. *Blood*. DOI:10.1182/blood-2023-177740.

Manuscripts Under Review

Suraj Bansal, Stephanie Di Pelino, ... Claire Bodkin. Nowhere to Go: A parallel convergent mixed methods study examining the health of people who experience emergency shelter service restrictions. *BMC Public Health*

Andy G.X. Zeng, ... Suraj Bansal (5th), ... John E. Dick. Precise single-cell transcriptomic mapping of normal and leukemic cell states reveals unconventional lineage priming in acute myeloid leukemia. *Blood*. (Preprint on bioRxiv; DOI: 10.1101/2023.12.26.573390)

RESEARCH PUBLICATIONS

Oral Presentations

Suraj Bansal, Gessie Stearns, ... Claire Bodkin. A Statistical Analysis of Mortality in People Experiencing Homelessness in Hamilton. *The Ontario Public Health Convention*.

Suraj Bansal, Andy G.X. Zeng, ... John E. Dick. ATLAS-AML: an automated bioinformatics pipeline for target characterization in Acute Myeloid Leukemia. *International Society for Computational Biology Student Council Symposium*.

Suraj Bansal, Andy G.X. Zeng, ... John E. Dick. A cloud-based computational target characterization pipeline to advance precision medicine in Acute Myeloid Leukemia. *University of Toronto T-CAIREM AI in Medicine Summer Research Conference*.

Suraj Bansal, Andy G.X. Zeng, ... John E. Dick. ATLAS-AML: an automated bioinformatics pipeline for target characterization in Acute Myeloid Leukemia. *University of Toronto Temerty Faculty of Medicine Research Showcase*.

Suraj Bansal, Jeffrey Sun. Developing a National Council of Undergraduate Academia. *Student Journal Forum*.

Poster Presentations

Suraj Bansal, Andy G.X. Zeng, ... John E. Dick. ATLAS-AML: An automated bioinformatics pipeline for target characterization in Acute Myeloid Leukemia. *International Society for Experimental Hematology 52nd Annual Scientific Meeting*.

Suraj Bansal, Andy G.X. Zeng, ... John E. Dick. An exhaustive machine learning analysis identifies novel therapy targets in TP53-mutated Acute Myeloid Leukemia. *Till & McCulloh Meeting*.

Suraj Bansal, Andy G.X. Zeng, ... John E. Dick. A cloud-based computational target characterization framework to advance precision medicine in Acute Myeloid Leukemia. *University of Toronto Molecular Genetics Undergraduate Summer Research Day*.

Suraj Bansal, Stephanie Di Pelino, ... Claire Bodkin. Nowhere To Go: A convergent mixed methods study of the health of people who experience emergency homeless shelter service restrictions. *McMaster University Faculty of Health Sciences Poster Day*.

Suraj Bansal, Andy G.X. Zeng, John E. Dick. A cellular hierarchy framework for guiding preclinical drug studies in acute myeloid leukemia. *University of Toronto Molecular Genetics Undergraduate Summer Research Day*.

Manuscripts in Prep

Suraj Bansal, Andy G.X. Zeng, ... John E. Dick. ATLAS-AML: an automated bioinformatics pipeline for drug target discovery and characterization in Acute Myeloid Leukemia.

Suraj Bansal, Gessie Stearns, ... Claire Bodkin. A statistical analysis of mortality in people experiencing homelessness in Hamilton.

Isabel N.X. Lim, Suraj Bansal (2nd), ... Stephanie X. Xie. Differential sensitivity of leukemia stem cells to sphingolipid modulation and in combination with Venetoclax.

Robert Vanner, Suraj Bansal (2nd), ... John E. Dick. Somatic TET2 mutations prime the immune system for response to immune checkpoint blockade.

Joana Araújo, ... Suraj Bansal (4th), ... John E. Dick. Targeted disruption of human FLT3 eradicates leukemic stem cells without harming healthy hematopoietic stem cells.

David Kealy, ... Suraj Bansal (5th), ... Katherine S. Bridge. Hypoxia-Inducible Factor-1 is pathologically activated by phosphorylation of PIM1 in JAK2V617F myeloproliferative neoplasms, initiating a non-canonical hypoxic response that drives disease progression.

LEADERSHIP AND VOLUNTEERING EXPERIENCE

National Council of Undergraduate Academia, Founding Chairman | Canada *Feb. 2023 - Present*

- Liaised with 15 student-run Undergraduate research journals to launch a national platform for promoting inter-journal collaboration and participating in themed discussions (e.g. optimizing editorial workflows) at bimonthly meetings.
- Wrote resource booklets (e.g. DOI registration) for new journals; worked closely with UCalgary to establish their journal

McMaster Junior Health Sciences Journal, Founding Editor-in-Chief | Hamilton, ON *Jan. 2023 - Present*

- Founded Canada's first peer-reviewed journal for publishing scientific reviews written by high school students in Hamilton
- Recruited 25 graduate students at McMaster to form a mentorship program for authors underrepresented in STEM

The Meducator Journal, Editor-in-Chief | Hamilton, ON *Sep. 2021 - Present*

- Managed a \$10,000 budget and oversaw 7 subteams consisting of 90 members to lead bi-annual publication efforts
- Initiated and led Canada's first collaborative undergraduate publication with McGill Science Undergraduate Journal
- Grew an academic writing mentorship program (50 students) with professor-run workshops and end-stage publication

McMaster University President's Advisory Committee (PACBIC), R3 Member | Hamilton, ON *Sep. 2022 - Present*

- Contributing to the Race, Racialization and Racism Working Group (R3) to identify and address issues affecting BIPOC communities within the University, and the broader McMaster community to advise the development of anti-racism policy

Keeping Six—Hamilton Harm Reduction Action League, Volunteer | Hamilton, ON *Sep. 2022 - Present*

- Provided weekly street outreach to 20+ homeless people by engaging in 1:1 conversation, distributing healthcare, harm reduction, and hygiene supplies, and connecting people to local housing and employment resources
- Assisted with patient intake and shadowed physician-patient consultations for the Hamilton safer opioid supply clinic

York Region District School Board Student Senate, Prime Minister | York Region, ON *Sep. 2018 - Jun. 2021*

- Managed a \$30,000 portfolio and led 10 executives in launching a bi-annual mental health conference and monthly meetings attended by 500+ students from 33 YRDSB secondary schools (increased attendance by 1,500% across 3 years)
- Launched weekly symposiums on improving education delivery and student wellbeing during COVID-19 (300 attendees)

LEADERSHIP AND VOLUNTEERING EXPERIENCE

- Richmond Hill Mayor's Youth Action Committee, *Director of Logistics*** | Richmond Hill, ON *Sep. 2016 - Jun. 2021*
- Managed a \$10,000 budget and coordinated 35 members to organize 5 annual community building events (e.g. youth leadership conference, arts showcase); grew event attendance by 350% across 5 years
 - Advised the development of city-led youth recreation programs and the annual municipal official plan policy update
- Frontline Connect Canada, *Technology Lead*** | Canada *Apr. 2020 - Dec. 2020*
- Collaborated with clinicians, and Conquer COVID-19 to source 275 donated tablets and SIM cards to enable virtual communication during COVID-19 in 4 hospital systems and 63 long-term care facilities (featured in CBC news)
- TEDxYouth Toronto, *Youth Ambassador Co-Chair*** | Toronto, ON *May. 2018 - Nov. 2019*
- Managed a \$15,000 sponsorship portfolio (RBC, Western Ivey, NBA Canada) and sourced world-renowned TEDx speakers
 - Implemented coordinated marketing strategies, procuring 1,000+ conference applications (increased from 500)
 - Led 12 Youth Ambassadors in launching the inaugural TEDxYouth Summer Conference (100 attendees)

PROJECTS

- The Hamilton Homelessness Mortality Project, *Project Co-Lead*** | Hamilton, ON *Sep. 2022 - Present*
- Conducted a quarterly data collection and statistical analysis of mortality of people experiencing homelessness in Hamilton; featured in 16 provincial and national news articles (e.g. Globe and Mail, CBC News, Global News, Hamilton Spectator)
- Ryde AI, *Project Lead and Co-Founder*** | Toronto, ON *Mar. 2020 - Dec. 2020*
- Built an open-source mobile application to connect vehicle hardware with cloud-powered self-driving features (e.g. automated lane centering, adaptive cruise control) using Bluetooth technology
 - Hired and led 3 engineers to place as finalists for investment competitions at Khosla Ventures, Amazon, and Stanford
- Kidogo, *Project Consultant*** | Nairobi, KE *Feb. 2020 - Jun. 2020*
- Led a 4-person team to deliver a recommendation to C-Suite on identifying and training local "mamapreneurs" to pilot sack farming micro-businesses to increase female entrepreneur profits by 43% and reduce childhood malnutrition in Nairobi
- Sidewalk Labs (Google) Toronto Waterfront Project, *Innovation Consultant*** | Toronto, ON *Oct. 2019 - Jan. 2020*
- Led a 4-person team to build a mobile application to reduce household expenditures by 27% through a sharing economy digital infrastructure; presented our recommendation to Sidewalk Labs C-suite; placed 1st of 80 proposals.

SELECT HONOURS AND AWARDS

Recipient (1 of 1), The Bachelor of Health Sciences Program Scholarship (\$2,500.00)	2023
Semi-Finalist (1 of 40), Canada Youth Impact Challenge (\$1,000.00)	2023
Finalist (1 of 5), Hackworks Innovation Challenge on Homelessness	2023
Recipient (1 of 20), UofT T-CAIREM AI in Medicine Summer Research Studentship (\$7,200.00)	2022
Recipient (1 of 1), York Region Portraits of Giving Young Adult Honoree	2022
Recipient (1 of 1), Ontario Public Schools' Association Jack A. MacDonald Award of Merit (\$500.00)	2021
Recipient (1 of 1), Ontario Student Voice Award: Entrepreneurship Category (\$1,000.00)	2021
Recipient (1 of 1), Richmond Hill Volunteer Youth Achievement Award	2021
Recipient, 5-Year Ontario Volunteer Service Award	2021
Recipient, Youth Ontario Volunteer Service Award	2021
Recipient (1 of 50), RBC Scholarship Program (\$2,500.00)	2021
Recipient (1 of 5), Benson Kearley IFG Students Making an Impact Scholarship (\$2,000.00)	2021
Recipient (1 of 5), Meridian's Commitment to Communities Student Award (\$500.00)	2021
First Place, Sidewalk Labs (Google) Consulting Competition	2020
First Place, SHAD Design Entrepreneurship Challenge, University of British Columbia	2019

SKILLS AND INTERESTS

Languages and Libraries: Python, R, Javascript, SQL, Keras, Tensorflow, ScanPy, Seurat, RShiny, Pandas, Scikit-learn
Interests and Hobbies: Machine Learning, Self-Driving Cars, Café-Hopping, Food Culture, Squash, Hiking, Guitar