

# 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: Anatomy and Physiology, Cellular Biology, Biochemistry, Immunology, Epidemiology and Biostatistics

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

## RESEARCH EXPERIENCE

The Dick Lab, Princess Margaret Cancer Centre, Student Researcher | Toronto, ON

Sep. 2020 - Present

- Developing a cloud-powered bioinformatics pipeline that performs bulk and single-cell transcriptomic meta-analysis (ranging from unsupervised cell clustering to survival analysis) on 15+ blood development and leukemia datasets to enable rapid target characterization and precision medicine in AML (currently used in 5 external collaborations across various labs).
  - Identified 95 preclinical RNA-sequencing datasets and performed gene expression deconvolution before and after drug treatment to quantify changes in leukemia cellular hierarchy composition and predict clinical responses to treatment
  - Building a R-based web application to automate transcriptomic meta-analyses for individual genes and prognostic gene expression scores in a cohort of 358 MPN patients at Princess Margaret Hospital (ClinicalTrials.gov Identifier: NCT02760238).
  - Performed single-cell transcriptomic analysis of the tumor micro-environment in MC38 mouse models of colorectal cancer treated with immune checkpoint blockade
  - Investigated resistance of leukemia stem cells to sphingolipid inhibition and in combination with Venetoclax
  - Performed bioinformatics analysis in bulk and single-cell RNA-sequencing cohorts to elucidate the functional role and therapeutic viability for the exportin XPO2 and its interactome in pediatric AML.
  - Leading a transcriptomic meta-analysis of 25+ drug targets in clinical trials to quantify their therapeutic viability in AML
- Awards: T-CAIREM AI in Medicine Summer Studentship (2022), UofT Molecular Genetics Undergraduate Summer Research Program (2021, 2022, 2023), University Health Network Summer Training and Research (STAR) Program (2021, 2022, 2023)

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

Sep. 2022 - Present

- Conducting patient recruitment and chart reviews for a primary care-embedded safer supply program for prescribing pharmaceutical grade opioid alternatives to people with treatment-refractory opioid use disorder
- Performing qualitative analysis and chart audits for a convergent mixed methods study on health outcomes of people experiencing emergency homeless shelter service restrictions
- Performed chart reviews and qualitative data analysis for the Hamilton Outreach HIV Treatment and Prevention Clinic
- Volunteering and shadowing at a physician-led safer supply clinic to distribute harm reduction supplies, and pharmaceutical grade opioid alternatives to homeless people at risk of mortality from the contaminated illicit opioid supply

St. Michael's Hospital, Division of Gastroenterology, Research Volunteer | 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 their medical education research studying the effects of gamification on student learning

## RESEARCH PUBLICATIONS

### Published Manuscripts

Zeng, A.G.X., Bansal, S., Jin, L., Mitchell, A., Chen, W.C., Abbas, H.A., Chan-Seng-Yue, M., Voisin, V., van Galen, P., Tierens, A., Cheok, M., Preudhomme, C., Dombret, H., Daver, N., Futreal, P.A., Minden M.D., Kennedy, J.A., Wang, J.C.Y., Dick, J.E. 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.

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

### Manuscripts Under Review

Lim, I.N.X., Bansal, S., Boulanger, M., Xie, S.X. Differential sensitivity of leukemia stem cells to sphingolipid modulation and in combination with venetoclax. *Molecular Pharmacology*.

### Published Abstracts

Vanner, R.J., Zeng, A.G.X., Chan-Seng-Yue, M., Bansal, S., Genta, S., Sanz-Garcia E., Siu, L.L., Trumpp, A., Dick, J.E. TET2-mutations reshape tumour infiltrating leukocytes to promote immunotherapy response. (In Press). *Molecular Oncology*. June 2023. DOI: 10.1002/1878-0261.13469.

### Accepted Abstracts

Bansal, S., Zeng, A.G.X., Mitchell, A., Dick, J.E. ATLAS-AML: an automated bioinformatics pipeline for target characterization in Acute Myeloid Leukemia. *Experimental Hematology*.

Lim, I.N.X., Boulanger, M., Bansal, S., Gupta, K., Nagree, M.S., Dick, J.E., Xie, S.X. Differential sensitivity of leukemia stem cells to sphingolipid modulation and in combination with venetoclax. *Molecular Pharmacology*.

### Oral Presentations

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

## RESEARCH PUBLICATIONS

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### Oral Presentations

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

Bansal, S., Zeng, A.G.X., Mitchell, A., Lim, I.N.X., Nagree, M.S., Xie, S., Dick, J.E. A cloud-based computational target characterization pipeline to advance precision medicine in Acute Myeloid Leukemia. *T-CAIREM AI in Medicine Summer Research Conference*.

Bansal, S., Sun, J., Developing a National Council for Undergraduate Academia (NCoUA). *Canadian Student Journal Forum*.

### Poster Presentations

Bansal, S., Zeng, A.G.X., Mitchell, A., Lim, I.N.X., Nagree, M.S., Xie, S., Dick, J.E. A cloud-based computational target characterization framework to advance precision medicine in Acute Myeloid Leukemia. *University of Toronto Department of Molecular Genetics Undergraduate Summer Research Conference*.

Bansal, S., Zeng, A.G.X., Mitchell, A., Dick, J.E. An intuitive cloud-based bioinformatics pipeline for transcriptomic meta analysis in blood development and leukemia. *University of Toronto Department of Medical Biophysics Undergraduate Research Day*.

C, Bodkin., Chan, K., Kouyoumdjian, K., Lamarche, L., Lennox, R., O'Shea, T., Wiwcharuk, G., Mancini, O., Di Pelino, S., Liu, R., Pitkis, A., Lee, A., Bansal, S. 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*.

### Abstracts Under Review

Egan, G., Hurren, R., Thomas, G.E., Sarathy, C., Zeng, A.G.X., Bansal, S., Khan, D.H., Yan, Y., Feng, Y., St-Germain, J., Raught, B., Dick, J.E., Schimmer, A.D. The exportin, XPO2, is a novel therapeutic target in pediatric and AYA AML. *Cancer Research*.

### Manuscripts in Preparation

Bansal, S., Zeng, A.G.X., Mitchell, A., Dick, J.E. ATLAS-AML: an automated bioinformatics pipeline for target characterization in Acute Myeloid Leukemia.

Medeiros, J.J.F., Zeng, A.G.X., Chan-Seng-Yue, M., Woo, T., McLeod, J.L., Bansal, S., Arruda, A., Tsui, H., Goraya B., Claudio, J.O., Ho, J.M., Kennedy, J.A., Maze, D., Sibai, H., Minden, M.D., Wang, J.C.Y., Dick, J.E., Gupta, V. Stem cell-derived gene expression scores predict survival and leukemic transformation in myelofibrosis.

C, Bodkin., Chan, K., Kouyoumdjian, K., Lamarche, L., Lennox, R., O'Shea, T., Wiwcharuk, G., Mancini, O., Di Pelino, S., Liu, R., Pitkis, A., Lee, A., Bansal, S. Nowhere To Go: A convergent mixed methods study of the health of people who experience emergency homeless shelter service restrictions.

Turner, S., Lennox, R., Lamarche, L., Inglis, G., Busche, K., Bodkin, C., O'Shea, T., Atri, A., Wilton, D., Bansal, S., Lemieux, C. Primary care-embedded safer supply program: A pilot program for people with treatment-refractory opioid use disorder.

## LEADERSHIP AND VOLUNTEERING EXPERIENCE

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National Council of Undergraduate Academia, *Founder and Chairman* | Canada

Feb. 2023 - Present

- Launched a national council for the editor-in-chiefs of undergraduate-led Canadian journals to convene bi-monthly to participate in themed discussions (e.g. incentivizing journal submissions, optimizing editorial workflows, etc.)
- Delivered an oral presentation on inter-journal collaboration to all Canadian journals at the 2023 Student Journal Forum

The Meducator, *Editor-in-Chief* | Hamilton, ON

Sep. 2021 - Present

- Facilitating bi-annual publication cycles for McMaster's open-access, peer-reviewed Undergraduate Health Sciences Journal
- Coordinated 20 editors in reviewing submissions, writing 10+ staff-written pieces, facilitating a double-blinded peer-review process, registering DOI's, and leading all publication efforts (1500+ issues; 65,000 online visitors yearly)
- Launched Canada's first collaborative journal between undergraduate science journals at McMaster and McGill
- Co-developing a national database for undergraduate academia and local conference for student-led research at McMaster
- Mentored 4 students through preparing and publishing review articles via the Meducator writing mentorship program

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
- Coordinated Lunch and Learn symposiums to highlight shared experiences of racialized staff, faculty, and students on themed discussions (e.g. cultural appropriation, islamophobia, anti-black racism).

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

Sep. 2022 - Present

- Consulted the development of numerous research and policy development projects and youth-friendly education resources
- Co-created a trauma-informed patient and public engagement tool (TI-PEET) with researchers at the University of Manitoba to evaluate the quality and integrity of patient and public engagement in health research across Canada.

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)
- Built FACESofYRDSB, an anonymous online platform to showcase racial discrimination stories from BIPOC students
- Launched weekly mental health symposiums on the impacts of COVID-19 on adolescent mental health and wellbeing

TEDxYouth Toronto, *Student 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

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Deaths in the Hamilton Homeless Population, *Core Project Member* | Hamilton, ON Sep 2022 - Present

- Conducted an ongoing data collection and statistical analysis of mortality of people experiencing homelessness in Hamilton; featured in CBC News, Globe and Mail, Hamilton Spectator, Toronto Star, and Global News

Ryde AI, *Project Lead and Co-Founder* | Toronto, ON Apr. 2020 - Nov. 2020

- Built a mobile application to interface cloud-based software with on-board diagnostics with Bluetooth to automate driving assist features (e.g. adaptive cruise control, automated lane centering, forward collision warning, lane departure warnings)

Sidewalk Labs (Google), *Project Consultant* | Toronto, ON Nov. 2019 - Feb. 2020

- Created an innovation plan and end-to-end mobile application to reduce household expenditures for Toronto's eastern waterfront residents through a sharing economy digital infrastructure that monetizes personal assets
- Selected from 50 recommendations to present our proposal to C-level executives at Sidewalk Labs headquarters

## SELECT HONOURS AND AWARDS

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Finalist (1 of 5), Canada Design for Change Challenge	2023
Recipient (1 of 20), T-CAIREM AI in Medicine Summer Research Studentship	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 (1 of 1), Richmond Hill Volunteer Youth Achievement 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
Recipient, McMaster University Faculty of Health Sciences Achievement Award (\$1,000.00)	2021
Recipient, Richmond Hill Community Recognition Certificate	2021
Finalist, Zappos (Amazon) Venture Challenge	2020
Semi-Finalist, Spark Teen Accelerator Challenge	2020
First Place, Sidewalk Labs (Google) Consulting Competition	2020
First Place, SHAD Design Entrepreneurship Challenge, University of British Columbia	2019

## SKILLS & INTERESTS

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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, Acoustic Guitar