

Jaskaran Singh

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🌐 jaskaran-singh

Education

- October 2021 - Present 📖 **Ph.D. in Biology, Institut national de la recherche scientifique, Quebec, Canada**
1. Investigating the link between cerebellar pathology and the loss of c9orf72 function in a zebrafish ALS model.
 2. Investigating the role of TLR3 in neuromuscular disorders.
- Note: Initially started remotely in May 2021 due to COVID-19 restrictions.*
- 2015 – 2020 📖 **Integrated BS-MS (Biology Majors), Indian Institute of Science Education and Research, Mohali**

Scholarships

- 2023- 2024 📖 **Pierre Auger Morissette Capacity Building Award in ALS Research**
Awarded by Brain Canada Foundation (CAD 7500)
- 2015 – 2020 📖 **Innovation in Science Pursuit for Inspired Research (INSPIRE) Scholarship**
Awarded to top one percentile students pursuing higher education in science in India by the Department of Science and Technology (DST), India

Research Experience

- August 2019 — July 2020 📖 **Master's thesis project in "Understanding molecular mechanisms underlying zebrafish brain regeneration"**
Guide: *Dr. Rajesh Ramachandran (Associate Professor, Dept. of Biological Sciences, IISER Mohali)*
- May 2019 — July 2019 📖 **Summer project in "Neuronal regeneration in zebrafish brain"**
Guide: *Dr. Rajesh Ramachandran (Associate Professor, Dept. of Biological Sciences, IISER Mohali)*
- May 2018 — July 2018 📖 **Summer project in "Regeneration of various tissues in zebrafish"**
Guide: *Dr. Rajesh Ramachandran (Associate Professor, Dept. of Biological Sciences, IISER Mohali)*
- May 2017 — July 2017 📖 **Summer project in:**
1. Designed an experiment and wrote a program in MATLAB to find X, Y, and Z coordinates of a moving body using Kinect Sensor
2. Learning the EEG recording technique and getting familiar with the instrumentation.
Guide: *Prof Aditya Murthy (Chairperson : Center for Neuroscience, Indian Institute of Science, Bangalore)*
- May 2016 — July 2016 📖 **Summer project on "Drosophila melanogaster — Methods, Protocols and Genetics"**
Guide: *Dr. Lolitika Mandal (Associate Professor, Dept. of Biological Sciences, IISER Mohali)*

Research Publications

- 1 **Singh, Jaskaran**, Y. E. Pan, and S. A. Patten, "Nmj analyser: A novel method to quantify neuromuscular junction morphology in zebrafish," *Bioinformatics*, vol. 39, no. 12, btad720, 2023. [DOI: 10.1093/bioinformatics/btad720](https://doi.org/10.1093/bioinformatics/btad720).
- 2 **Singh, Jaskaran** and S. A. Patten, "Modeling neuromuscular diseases in zebrafish," *Frontiers in Molecular Neuroscience*, vol. 15, p. 1054573, 2022. [DOI: 10.3389/fnmol.2022.1054573](https://doi.org/10.3389/fnmol.2022.1054573).
- 3 M. Breuer, M. Rummler, **Singh, Jaskaran**, S. Maher, P. Jamadagni, C. Zaouter, N. Pilon, B. M. Willie, and S. A. Patten, "Chd7 regulates craniofacial cartilage development via controlling htr2b expression," *Journal of Bone and Mineral Research*, 2024. [DOI: 10.1093/jbmr/zjae024](https://doi.org/10.1093/jbmr/zjae024).


Conference Abstracts

- 1 **Singh, Jaskaran**, L. Lescouzeres, and K. Patten, "Investigating link between cerebellar pathology and loss of c9orf72 in zebrafish als model," in *2024 ALS Canada Research Forum*, Toronto, Canada, 2024.
- 2 **Singh, Jaskaran** and K. Patten, "Nmj analyser: A novel method to quantify neuromuscular junction morphology in zebrafish," in *Regroupement interdisciplinaire de formation d'applications utilisant des lasers intenses (RIFALI)*, Montreal, Canada, 2024.
- 3 **Singh, Jaskaran**, L. Lescouzeres, and K. Patten, "Investigating link between cerebellar pathology and loss of c9orf72 in zebrafish als model," in *16th Zebrafish Disease Model Conference*, Durham, USA, 2023.
- 4 **Singh, Jaskaran** and K. Patten, "Elucidating the role of toll-like receptor 3 in motor neuron disorders," in *16th Zebrafish Disease Model Conference*, Durham, USA, 2023.
- 5 **Singh, Jaskaran**, Y. E. Pan, J. Li, and K. Patten, "C9orf72 knockdown zebrafish als model exhibits cerebellar pathology and motor defects," in *Symposium-Center of Excellence in Research on Orphan Diseases - Fondation Courtois*, Montreal, Canada, 2022.
- 6 **Singh, Jaskaran**, Y. E. Pan, J. Li, and K. Patten, "Link between cerebellar pathology and loss of c9orf72 in zebrafish als model," in *17th International Zebrafish Conference*, Montreal, Canada, 2022.
- 7 M. Breuer, M. Rummler, P. Jamadagni, **Singh, J.**, C. Zaouter, B. Willie, and K. Patten, "Craniofacial dysmorphism mediated by serotonin receptor htr2b in a zebrafish model of charge syndrome," in *17th International Zebrafish Conference*, Montreal, Canada, 2022.






Skills

Languages	<div></div> <div>Strong reading, writing and speaking competencies for English, Punjabi, Hindi.</div>
Coding	<div></div> <div>Python, Macro, R, MATLAB</div> <div>Developed a program to analyze zebrafish neuromuscular junction morphology</div> <div>Developed a program to analyze the swim angle of free-swimming adult zebrafish</div>
Cell and Molecular Techniques	<div></div> <div>Cell culture; High resolution melting (HRM); Crispr-Cas9 Fo knockout; ATAC-seq, Western Blotting; H&E staining; HiC; RT-PCR; qPCR; Gel electrophoresis; Plasmid and genomic DNA isolation; RNA extraction; Alcian blue staining; Immunohistochemistry; Immunocytochemistry</div>
Animal Techniques	<div></div> <div>Microinjection; Touch escape response; Zebrafish stab brain injury; Zebrafish Nostril injury (brain); Brain, heart, and retina dissection (zebrafish); Zebrafish heart amputation; DanioVision; Brain injection (zebrafish); Electroporation; Cryosectioning</div>
Microscopy	<div></div> <div>Epiflourescence, Brightfield and Confocal microscopy.</div>

Accomplishments

- 2024  **Selected to attend NMD4C's Basic Research Summer School**
Organised by Neuromuscular Disease Network for Canada (May 27th-28th, 2024)
- 2023  **Scientific Image Competition**
Won Congrès Armand-Frappier 2023 scientific image competition (3rd Prize)
- 2020  **National Eligibility Test (NET)**
Secured All India Rank: 62 for assistant professorship (Council of Scientific and Industrial Research, India)
- 2016  **MOOC on "Ecosystems Approach and Systems Thinking"**
Scored 92% in MOOC organized by UNEP-Concordia University
-  **Participated in Young Scientist's Conclave organized as a part of India International Science Festival**
- 2015  **Qualified a highly competitive All India Pre-Medical Test (AIPMT) national level medical entrance exam**
-  **Qualified a highly competitive Punjab Medical Entrance Test (PMET) state-level medical entrance exam**
- 2013  **Science Fair**
Potential of energy usage from methane reserves in Antarctic icecaps
Won first prize in district level and participated in state level, January 2014
- 2012  **English Debate Competition, 2012**
Won 3rd prize in state-level debate competition conducted in memory of Sardar Mehma Singh Grewal

Teaching Experience

- 2023  **Training and supervising a summer intern-Daniel Hany (Bachelors, McGill, Montreal, Canada)**
-  **Trained and supervised a summer intern-Raphael Vallee (Bachelors, UdeM, Montreal, Canada)**
-  **Mentor, 'Apprentis chercheurs' Program, INRS**
 - June 2023
 - August 2023
- 2022  **Mentor, 'Apprentis chercheurs' Program, INRS**
 - June 2022
 - August 2022
- 2020  **Teaching assistant in biology lab at IISER Mohali**

Science Communication/Outreach





Volunteer Work

1. Volunteered at 17th International Zebrafish Conference, Montreal, Canada, 2022
2. Volunteered at Scientific Foundation Day, IISER Mohali, 2018

Scientific societies

1. Member of International Zebrafish Society
2. Member of Neuromuscular Disease Network for Canada (NMD4C)
3. Member of Indian Society of Cell Biology (2016)

Contributions to Society

- 2019–2016  Organized free food event (Langar) for underprivileged people in Mohali, India
- 2019  Wrote and acted in a short film exploring the sensitive issues of transgender inequality and caste discrimination in India
- 2018  Organized a public lecture at IISER Mohali on the day of Vaisakhi to educate people about the abandonment of caste and treating all people as equal
- 2017–2015  Organized blood donation campaigns at IISER Mohali

References

Dr. Kessen Patten, *Professor, INRS-AFSB, Laval, Canada*

Email: kessen.patten@inrs.ca

Dr. Rajesh Ramachandran, *Associate Professor, Department of Biological Sciences, IISER Mohali*

Email: rajeshra@iisermohali.ac.in