

# Jaskaran Singh

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## 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

- 2024- 2025    📖 **Olivier Goy Rising Star Trainee Award in ALS Research**  
Awarded by Brain Canada Foundation (CAD 10000)
- 2024- 2025    📖 **Doctoral Scholarship**  
Awarded by Fondation Armand-Frappier (CAD 10000)
- 2024    📖 **Doctoral Scholarship**  
Awarded by CERMO-FC (CAD 4500)
- 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

## Awards

- 2024    📖 **Travel grant to attend International Zebrafish Conference (Kyoto, Japan)**  
Awarded by International Brain Research Organisation (CAD 2200)
- 2024    📖 **Travel grant to attend International Zebrafish Conference (Kyoto, Japan)**  
Awarded by Fondation Armand-Frappier (CAD 500)

## 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)

## Research Experience (continued)

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 *Symposium-Center of Excellence in Research on Orphan Diseases - Fondation Courtois*, Montreal, Canada, 2024.
- 2 **Singh, Jaskaran**, L. Lescouzeres, and K. Patten, “Investigating link between cerebellar pathology and loss of c9orf72 in zebrafish ALS model,” in *International Zebrafish Conference*, Kyoto, Japan, 2024.
- 3 **Singh, Jaskaran**, L. Lescouzeres, and K. Patten, “Investigating link between cerebellar pathology and loss of c9orf72 in zebrafish ALS model,” in *Canadian Zebrafish Research Community*, Montreal, Canada, 2024.
- 4 **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.
- 5 **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.
- 6 **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.
- 7 **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.
- 8 **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.
- 9 **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.

- 10 M. Breuer, M. Rummmler, 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	Strong reading, writing and speaking competencies for English, Punjabi, Hindi.
Coding	Python, Macro, R, MATLAB, HTML, CSS <i>Developed a program to analyze zebrafish neuromuscular junction morphology</i> <i>Developed a program to analyze the swim angle of free-swimming adult zebrafish</i> <i>Created my website using HTML and CSS : <a href="https://jaskaranneuro.github.io/">https://jaskaranneuro.github.io/</a></i>
Cell and Molecular Techniques	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
Animal Techniques	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
Microscopy	Epifluorescence, Brightfield and Confocal microscopy.

## 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

- 2024 **Training and supervising a summer intern-Daniel Hany (Bachelors, McGill, Montreal, Canada)**
- 2023 **Trained and supervised a summer intern-Raphael Vallee (Bachelors, UdeM, Montreal, Canada)**

## Teaching Experience (continued)

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2024     **Mentor, 'Apprentis chercheurs' Program, INRS**

- June 2024
- August 2024

2023     **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

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### 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

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- 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

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**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