

# Ishita Hiremath

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## EDUCATION

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<b>McGill University, Canada</b>	<b>Montreal, Canada</b>
Doctoral Student	Aug 2024 - Aug 2022
Biology and Biomedical Engineering	
Supervisor: <i>Dr. Caroline E. Wagner</i> (Bio Eng)	Biofluids and Global Health Lab
<b>McGill University, Canada</b>	<b>Montreal, Canada</b>
Masters of Engineering (Thesis)	Aug 2022 - Aug 2024
Biology and Biomedical Engineering	* <sup>2</sup> GPA: 3.72/4
Supervisor: <i>Dr. Caroline E. Wagner</i> (Bio Eng)	Biofluids and Global Health Lab
<b>Birla Institute of Technology, Mesra</b>	<b>Ranchi, India</b>
Bachelor of Technology, Bioengineering and Biotechnology	Aug 2018 - May 2022
CGPA: 8.33/10 *McGill Standards: 3.9/4	Ranked 2 <sup>nd</sup> in the Class of 2022

## AWARDS/HONORS

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- [MEDA Doctoral Award \(42,000 CAD/Yr\)](#) August 2024
- [MITACS Graduate Fellowship \(15,000 CAD\)](#) August 2022
- Indian Academy of Sciences-Indian National Academy of Sciences National Academy of Sciences Fellowship August 2021
- MITACS Globalink Research Intern May 2021
- Awarded a Specialization course in Bio-Computing, Birla Institute of Technology, Mesra May 2020
- Trophy for the highest rank in City May 2018  
12<sup>th</sup> grade Biology (97%), English (95%)

## RESEARCH EXPERIENCE

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<b>Biofluids and Global Health Lab, McGill University</b>	<b>Montreal, Canada</b>
<i>Doctoral Student</i>	Aug 2024 – Aug 2028
<b>Biofluids and Global Health Lab, McGill University</b>	<b>Montreal, Canada</b>
<i>Master's Thesis Student</i>	Aug 2022 – Aug 2024
<ul style="list-style-type: none"><li>- Developing a Respiratory Viruses mobility profile library to elucidate virus transport mechanisms in Reconstituted Mucin Gels.</li><li>- Collaborating on the development of SARS-CoV-2 and Influenza virus-like particle systems using HEK293T cells for viral mobility profiling, under the guidance of a <a href="#">Hanrahan lab, McGill University</a>.</li><li>- Simulating viral particles binding and transport in Viscoelastic biofluids to study early-stage host infection dynamics.</li><li>- Engineering a microfluidic chip to study the impact of mucosal barrier on cell susceptibility to respiratory viral infections.</li><li>- Authoring a review to consolidate the interactions between respiratory viruses and mucus.</li><li>- Mentored <b>three undergraduates</b> during summer 2023&amp; 2024 and fall 2023 for their <a href="#">SURE intern</a> projects and B. Eng thesis projects (resp).</li></ul>	

**NanoBio Lab, Birla Institute of Technology****Ranchi, India***Bio-engineering Undergraduate Thesis*

Jan 2022 – May 2022

- Synthesized, optimized, and characterized a pH-responsive hydrogel scaffold, incorporating Chitosan/ $\kappa$ -carrageenan, designed to perform optimally at acidic and facilitate enhanced oxygen and cell infiltration.
- Assisted in formulating and submitting a grant proposal to the *Defense Research and Development Organization* (DRDO), India, aiming to develop innovative, smart pH-responsive scaffolds for enhanced wound healing.

**Sintim Research Group, Purdue University****West Lafayette, Indiana, USA***Undergraduate Research Student*

Sept 2021 – Jan 2022

- Conducted a detailed review on Bromodomains to understand their structure and inhibitory mechanisms/motifs.
- Computed and critiqued novel inhibitory molecules to target BRD4 via scaffold hopping and fragment fusion techniques.

**Bio-Nanotechnology Lab, Indian Academy of Sciences****SRM AP, India***National Fellowship*

Aug 2021 - Oct 2021

- Investigated the influence of nanoparticle shape on binding efficiency and cellular interactions on various chemotherapeutic and antimicrobial moieties.
- Optimized reaction conditions for nanoparticle synthesis, surface-functionalization, and the quantitative drug binding onto various shapes of nanoparticles to interpret its cellular interactions.

**Calmettes Lab, Université INRS – Laval****Québec, Canada***MITACS Globalink Research Intern '21*

May 2021 - Aug 2021

- Analyzed protein sequences from the unknown HP0304 secretome of *Helicobacter pylori* to classify their virulence contributing putative functions.
- Identified homologs of HP0304 and proposed protocols to confirm their functions.

**Cancer Pharmacology Lab, National University of Singapore (NUS)****Singapore***Research Intern*

Aug 2020 - Apr 2021

- Authored review article on Wnt pathway regulators and how mutations, deletions and amplifications in regulators play a role in the development of several cancers.
- Investigated safety concerns about Wnt inhibitors that are currently in preclinical and clinical trials.

**Structural Biology and Protein Engineering Lab, Indian Institute of Technology (IIT) Roorkee, India***SPARK Summer Research Intern*

May 2020 - Aug 2021

- Computed Class-D  $\beta$ -Lactamase enzyme structure along with its inhibitory molecules using various in-silico and structural bioinformatics tools.
- Targeted the  $\beta$  Lactam Ring in the enzyme to model the inhibitory molecules and docked the modelled protein with Oxacillin, Penicillin to study its maximum binding affinity and other interactions.

**PUBLICATIONS & PRESENTATIONS**

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**Peer reviewed publications:**

1. **Hiremath, I. S., Goel, A., Warriar, S., Kumar, A. P., Sethi, G., & Garg, M. (2021).** The multidimensional role of the Wnt/ $\beta$ -catenin signaling pathway in human malignancies. **Journal of Cellular Physiology**, 1– 40. <https://doi.org/10.1002/jcp.30561>

## Presentation in National and International Conferences:

1. ‘Investigating the Effects of Viscoelasticity and Binding on Viral Transport through Mucus’ [9th Annual Meeting of the Biophysical Society of Canada](#) – **10min Oral Presentation;**  
**Ishita Hiremath**, Leonardo Martin-Alarcon , Caroline E Wagner (May 2023)
2. ‘Investigating the Effects of Viscoelasticity and Binding on Viral Transport through Mucus’ [2024 BBMESS Research Day](#) – **Poster Presentation;**  
**Ishita Hiremath**, Leonardo Martin-Alarcon , Caroline E Wagner (May 2023)
3. ‘Modeling the Effects of Viscoelasticity and Binding on Viral Transport through Mucus’ [Canadian Chemical Engineering Conference](#) – **20min Oral Presentation;**  
**Ishita Hiremath**, Caroline E Wagner (Nov 2023)
4. ‘Virus-like Particles Transport Through Mucin Gels’ **SURE 2023 Poster Presentation**  
Michelle Levy, **Ishita Hiremath**, Caroline E Wagner (Aug 2023)
5. ‘Modeling the Effects of Viscoelasticity and Binding on Viral Transport through Mucus’ **7th Biological and Biomedical Engineering Symposium** – Poster Presentation  
**Ishita Hiremath**, Caroline E Wagner (May 2023)
6. Functional Analysis and Enzymatic Assay Development for HP0304 in Helicobacter pylori’  
**Birla Institute of Technology Summer Symposium** – **15min Oral Presentation;**  
**Ishita Hiremath**, Charles Calmettes (2021)
7. ‘Application of Foldscope Microscope’ by **Department of Biotechnology, Government of India**  
**Ishita Hiremath**, Dinesh Prasad (Oct 2018)

## LEADERSHIP EXPERIENCE

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### **McGill University**

**Montreal, Canada**

*Teaching Assistantship – 150 hours*

*Winter Sem: Jan 2024 - May 2024*

- Tutored 10 undergraduates for their coursework and final projects on **BIEN 414: Fundamentals and Rheology of Biological Fluids**.
- Conducted a 2-hour tutorial session each week including marking, demonstrating, and tutoring.

*Teaching Assistantship – 180 hours*

*Fall Sem: Aug 2023 - Dec 2023*

- Tutored 70 undergraduates for their coursework on **BIEN 314: Transport Phenomena in Biological Systems 1**
- Conducted a 3-hour tutorial session each week (fluid mechanics and heat transfer) including marking, demonstrating, and tutoring.

### **Reckitt Benckiser Group.**

**Gurgaon, India**

*Digital R&D Intern*

*Jan 2022 - May 2022*

- Launched a global Liquid Vaporizer (LV) pest database with key RB formulations, products and claims.
- Devised a data repository for LV, Aerosol products, (1000+ products) and integrated it onto the Entomology Science Platform alongside Brazil Team.

### **Vidyanagar Township, JSW Steel Ltd.**

**Karnataka, India**

*COVID-19 Relief Volunteer*

*May 2021 - Jun 2021*

- Developed, coordinated and delegated a team of undergraduate students in my town during the peaked 2<sup>nd</sup> wave to address the technical issues faced by the COVID-19 relief authorities regarding patient’s data management.

- Analyzed, validated, and compiled data regarding COVID-19 patients to develop real time data accessibility to both the authorities and the hospitals to track primary and secondary contacts.
- Improved the then-working systems and saved up 10-12 hours per day, making it more efficient to use.

**Society of Biotechnologists, Birla Institute of Technology Mesra**

**Ranchi, India**

*Events Director*

May 2021 - May 2022

- Mentored 30+ undergraduates of BIT Mesra with progressing their career in Bioengineering and in regular coursework.
- Delivered and moderated a panel discussion on 'International Research Internships and Experiences' as a speaker to over 65 undergraduate and graduate students.

**SKILLS**

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Mammalian Cell Culturing, Confocal Microscopy, FTIR Spectroscopy, UV-Vis Spectroscopy, X-Ray Diffraction, Dynamic Light Scattering, Zetasizer- Zeta Potential, Optical Microscopy, PyMOL, Auto-Dock (Molecular docking), Programming (MATLAB, C), Inverted Microscope, Multiple Particle Tracking (MPT)