Ishita Hiremath

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EDUCATION

McGill University, Canada — **Montreal, Canada**

Masters of Engineering (Thesis) — Aug 2022 - Aug 2024

Biology and Biomedical Engineering — *[2]GPA: 3.72/4

Supervisor: *Dr. Caroline E. Wagner* (Bio Eng) — Biofluids and Global Health Lab

Birla Institute of Technology, Mesra — **Ranchi, India**

Bachelor of Technology, Bioengineering and Biotechnology — Aug 2018 - May 2022

CGPA: 8.33/10 *McGill Standards: 3.9/4 — Ranked 2nd in the Class of 2022

AWARDS/HONORS

- MITACS Graduate Fellowship (**15,000 CAD**) — August 2022
- Indian Academy of Sciences-Indian National Academy of Sciences — August 2021
  National Academy of Sciences Fellowship
- 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
  12th grade Biology (97%), English (95%)

RESEARCH EXPERIENCE

Biofluids and Global Health Lab, McGill University — **Montreal, Canada**

Master's Thesis Student — Aug 2022 – Present

- Developing a Respiratory Viruses mobility profile library to elucidate virus transport mechanisms in Reconstituted Mucin Gels.
- Simulating viral particles binding and transport in Viscoelastic biofluids to study early-stage host infection dynamics.
- Engineering an *in-vitro* Mucin layered cellular model to study the impact of mucus on infection kinetics.
- Drafting a comprehensive review to consolidate the interactions between respiratory viruses and mucus.
- Mentored undergraduates during summer and fall 2023(ongoing) for their summer and B. Eng thesis projects (resp).

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/ κ-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.

*[2] According to BBME Program Requirements

- 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 nano particle 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 β-Lactamase enzyme structure along with its inhibitory molecules using various in-silico and structural bioinformatics tools.
- Targeted the β 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

Peer reviewed publications:

1. **Hiremath, I**. S., Goel, A., Warrier, S., Kumar, A. P., Sethi, G., & Garg, M. (2021). The multidimensional role of the Wnt/β-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. '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)

2. 'Virus-like Particles Transport Through Mucin Gels' SURE 2023 Poster Presentation
   Michelle Levy, **Ishita Hiremath**, Caroline E Wagner (Aug 2023)

3. '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)

4. 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)

5. 'Application of Foldscope Microscope' by **Department of Biotechnology, Government of India**
   Ishita Hiremath, Dinesh Prasad (Oct 2018)

LEADERSHIP EXPERIENCE

McGill University **Montreal, Canada**

Teaching Assistantship – 150 hours *Winter Sem:* Jan 2024 - May 2024

- Will tutor 10 undergraduates for their coursework and final projects on *BIEN 414: Fundamentals and Rheology of Biological Fluids*.
- Will conduct 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 2nd 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.
- Improvised 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

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)