

Yiyang Hu

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EDUCATION

McMaster University

B.Eng./B.H.Sc., iBioMed (Biomedical Eng.), Materials Eng. Specialization

Expected May 2029

CGPA: 3.8/4

TECHNICAL SKILLS

CAD & Hardware: Autodesk Inventor, Autodesk Fusion, AutoCAD, CrystalMaker suite, Pipe-Flo, Raspberry Pi

Programming & Modeling: Python, MATLAB (SimBiology), LaTeX, Typescript

Materials Characterization & Testing: Universal Testing Machine (UTM) analysis, Hardness Testers, Sample Preparation, Grain analysis

Biomedical & Molecular Techniques: Aseptic Technique, PCR, Gel Electrophoresis, SDS-PAGE, Protein Analysis Techniques, Cell culture

EXPERIENCE

Administrative Assistant

McCanny Secondary School

June 2025 - Aug 2026

Toronto, ON

- Analyzed academic performance for 100+ students to identify trends for intervention and academic tracking
- Compiled findings into actionable reports for teachers, students, and families each term
- Produced detailed, individualized report cards each term, reducing turnaround time by 23 percent
- Managed email correspondence, ensuring timely communication with families and staff

Teaching Assistant and Course Instructor

McCanny Secondary School

June. 2024 - Aug 2025

Toronto, ON

- Facilitated learning for classes of 20+ students, including English-language learners and remote learners
- Built individualized learning plans, course material, and performance reports for each student using Microsoft Office
- Increased online student participation by over 50 percent through integration of online engagement tools

PROJECTS

Personal Small-Scale Metal Foundry

Apr 2025 – Present

- Designed, built, and operated a propane-fired metal foundry using refractory materials with safety in mind
- Fabricated custom sand molds to cast alloy parts, achieving consistent dimensional quality across production runs
- Selected refractory materials and safety practices informed by published materials research, targeting up to an 85 percent reduction in airborne fibre exposure during construction and operation
- Improved furnace insulation performance through iterative material selection, targeting a 2–5x increase in insulation service life based on published materials data

E.coli Copper Biosensor Assembly and Characterization

Sep 2025 — Nov 2025

- Executed high-precision laboratory techniques in aseptic conditions to engineer copper-sensitive biosensors
- Analyzed 5+ plasmid modifications via PCR, gel electrophoresis, spectrophotometry and SDS-PAGE
- Maintained comprehensive laboratory records and digital logs, ensuring reproducibility and strict compliance with Biosafety Level 1 standards
- Analyzed protein expression data, generated calibration curves for 15+ concentrations, and documented results into detailed technical reports via MS Word & Excel

Tetrathionate-Responsive Probiotic Circuit for Inflammatory Bowel Disease

Jan 2025 – May 2025

- Designed a synthetic biology circuit in *E. coli* Nissle 1917 to detect tetrathionate and trigger antioxidant AhpC expression, targeting reduction of reactive oxygen species (ROS) in inflammatory bowel disease
- Built and simulated a MATLAB SimBiology ODE model across a 1,000-fold range of tetrathionate concentrations (1e-6–1e-3 M) and a 100-fold range of enzyme kinetics, predicting full H₂O₂ depletion within 20 seconds at high tetrathionate levels
- Engineered an 8-part genetic circuit design (promoters, ribosome binding sites, coding sequences, terminators) in Benchling using Gibson Assembly workflows, and outlined molecular validation protocols including PCR, bacterial transformation, and fluorescence-based characterization
- Collaborated with a 5-person team to synthesize primary literature into a novel synthetic biology therapeutic design proposal