

ALIYA SALLAM

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RESEARCH INTERESTS

- Advancing tissue engineering and nanomedicine to tackle diseases like diabetes and cancer
- Developing biosensors for early disease detection and comprehensive health monitoring
- Innovating medical technologies to bridge the gap in women's healthcare

EDUCATION

Candidate for M.A.Sc. Chemical Engineering

Sept 2025 – Present

University of Waterloo, Waterloo, ON

- **CGPA:** 96%

B.A.Sc. Nanotechnology Engineering, Honours, Co-operative Program

Sept 2019 – Apr 2024

University of Waterloo, Waterloo, ON

- **Degree Honours:** With Distinction, Dean's Honour List
- **CGPA:** 90%
- **Capstone Design Project:** Point-of-Care Device for Reproductive Hormone Sensing

EXPERIENCE

Nanoscale Measurements Assistant

Jan – Aug 2023

National Research Council Canada, Ottawa, ON

- Optimized nanoplastic synthesis using top-down laser ablation to develop a certified reference material (CRM) and characterized properties of nanoplastic particles using AFM, DLS, and FTIR
- Verified and validated 11 different procedures for synthesizing carbon quantum dots and determined the success of the procedures based on characterization of particle fluorescence, absorbance, zeta-potential, NMR & FTIR spectra and TEM images
- Investigated the cytotoxicity and biocompatibility of carbon quantum dots in HepG2 cells using MTT and neutral red toxicity assays
- Communicated research findings to team through engaging presentations and detailed reports

R&D Associate

Jan – Apr 2022

FluidAI Medical (formerly NERv Technology), Waterloo, ON

- Integrated a flow sensor for sensing biofluids into a smart-monitoring medical device and optimized calibration models and circuit design, resulting in a 5% increase in sensor accuracy
- Developed Python scripts to analyze sensor data and applied results to enhance sensor design
- Upgraded design of fluid channel to include new flow sensor using Fusion 360 and 3D printing
- Performed verification and validation of medical device and followed ISO 13485 standard in daily tasks and documentation

Biomedical Engineering Intern

Sept – Nov 2021

Chipcare Corporation, Toronto, ON

- Performed optimization studies for a medical point-of-care diagnostic device, including thermocycler temperature testing, cartridge fluidics testing, and sample filtration tests
- Inspected microfluidic cartridges for quality assurance and communicated issues to supplier

- Developed and implemented test plans, protocols, and reports while following good documentation practices and ISO 13485 standard
- Upgraded Python scripts to improve workflow efficiency and decrease assay time

Research Assistant

May – Aug 2020, Jan – Apr 2021

Tam Lab, University of Waterloo, Waterloo, ON

- Formulated clean cosmetic products using cellulose nanocrystal emulsions, and performed product testing using rheology, particle size analysis, microscopy, and UV-vis spectrophotometry
- Increased product stability and optimized formulation process with Design of Experiments (DOE)
- Engineered a functional food product using a novel probiotic delivery system to help enhance human microbiome health
- Delivered clear and concise presentations summarizing results to supervisor and coworkers

PUBLICATIONS AND POSTERS

Pegoraro, A., Chen, M., Sakib, S., Jakubek, Z., Maan, Z., Prezgot, D., **Sallam, A.**, Corriveau, D., Vandenberg, M., Zou, S. (in press). Nanoplastic Reference Materials for Biological and Methodological Assessment. *Microplastics and Nanoplastics*.

Sallam, A., Chenananporn, P., Ren, C., Yim, E. (2025, November 9-12). *A Robust Droplet Microfluidics Platform for Encapsulation of Spheroids in Hydrogel Microparticles* [Poster presentation]. TERMIS-AM, Detroit, MI, USA.

Sallam, A. & Kennedy, D. (2024, February 21-23). *Validation of Protocols for the Synthesis of Carbon Quantum Dots* [Poster presentation]. Quantum Days, Calgary, AB, Canada.

- Received student award from NRC for outstanding contribution

AWARDS AND HONOURS

NSERC CGRS-M	2026
WIN Nanofellowship	2025
Dean of Engineering Master's Excellence Award	2025
Engineering Dean's Entrance Award	2025
Dean's Honour List	2024
George Dufault Award for Excellence in Communication	2024
Nanotechnology Engineering Design Symposium Award	2024
Canadian Engineering Competition Innovative Design 1 st Place Award	2024
Ontario Engineering Competition Innovative Design 2 nd Place Award	2024
SFF OEC Innovative Design Award	2024
Quantum Days Poster Presentation Award	2024
Engineer of the Future Fund: Cowan Prize	2023
Engineer of the Future Fund	2023
NSERC Undergraduate Student Research Award	2020
University of Waterloo President's Scholarship of Distinction	2020

PROJECTS

Hera Analytics: Point-of-Care Device for Reproductive Hormone Sensing

Sept 2022 – Apr 2024

Capstone Design Project, University of Waterloo

- Designed and fabricated a molecularly imprinted polymer (MIP) electrochemical biosensor for measuring female hormone levels in saliva, providing a point-of-care device to aid women in understanding reproductive health

- Led the design and testing of electrical biosensing components using Arduino and a portable potentiostat, and optimized sensor sensitivity and selectivity via square wave voltammetry electrochemical measurements
- Authored technical reports and presentations throughout design process to document progress
- Pitched design to judges at the Ontario and Canadian Engineering Competitions
- **Awards:** Engineer of the Future Fund, Engineer of the Future: Cowan Prize, SFF OEC Innovative Design Award, Ontario Engineering Competition Innovative Design 2nd Place, Canadian Engineering Competition Innovative Design 1st Place, Nanotechnology Engineering Design Symposium Award