

1. PERSONAL DATA

Mahla Poudineh

Assistant Professor, Director of IDEATION Lab
Department of Electrical and Computer Engineering
University of Waterloo

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[Google Scholar](#)

EMPLOYMENT HISTORY

Assistant Professor 01/2020 – present
University of Waterloo, Department of Electrical and Computer Engineering, Waterloo, ON

Visiting Professor (University Leave, Sabbatical) 09/2023 – 02/2024
Massachusetts Institute of Technology, Koch Institute for Integrative Cancer Research (Host: [Prof. Robert Langer](#)), Boston, MA

Postdoctoral Fellow 04/2018 – 11/2019
Stanford University, School of Medicine, Stanford, CA
Project: Continuous Detection of Glucose and Insulin in Live Animals
Mentor: Prof. H. Tom Soh

Postdoctoral Fellow 02/2017 – 04/2018
University of Toronto, Leslie Dan Faculty of Pharmacy, Toronto, ON
Project: Efficient Neurogenesis of Mesenchymal Stem Cells via Mechanotransduction
Mentor: Prof. Shana Kelley

EDUCATION HISTORY

Ph.D., Electrical Engineering 2012 – 2017
University of Toronto, Toronto, ON
Thesis: On-Chip Manipulation and Sorting of Cancer Cells for Next-Generation Diagnostic Technologies
Advisors: Prof. Edward Sargent and Prof. Shana Kelley

M.Sc., Electrical Engineering 2010 – 2012
University of Tehran, Tehran, Iran

B.Sc., Electrical Engineering, 2006 – 2010
University of Tehran, Tehran, Iran

AWARDS AND HONOURS

Canada Research Chair (Tier 2) in Health Monitoring BioNano Devices (\$600,000 CAD) 2024
- A program recognizing exceptional emerging researchers worldwide for their potential to become leaders in their field

Distinguished Performance Award, Faculty of Engineering, University of Waterloo 2024

Emerging Investigators, Lab on a Chip Journal 2024
- [featured article](#): A platform for rapid miRNA detection

Ontario Ministry of Colleges and Universities Early Researcher Award (\$190,000 CAD) 2023
- A program recognizing exceptional emerging researchers in Ontario

Johnson & Johnson WiSTEM²D Scholars Award in the Technology Category (\$150,000 USD) 2023
- An international award, only one award conferred per category annually

Engineering Research Excellence Award, Faculty of Engineering, University of Waterloo 2023

Research Excellence Award, ECE Department, University of Waterloo 2022

Waterloo Institute of Nanotechnology (WIN) Research Leader 2022

Emerging Investigator, Nanoscale Journal 2022
- [featured article](#): A platform for cervical cancer screening

Rising Star, Advanced Healthcare Materials Journal 2022
- [featured article](#): A platform for continuous glucose monitoring

UCLA CTSI Translational Science Award, Best Poster Winner for Translational Science University of California, Los Angeles	2019
Rogers Scholarship	2013
Publication Award, Iran Nanotechnology Initiative Council	2014
Ranked 39th Among 400,000 Participants in National University Entrance Exam, Iran	2006

GRADUATED THESIS SUPERVISIONS

Degree	Details
PhD1	Pouyan Keshavarz Motamed, to be graduated in Fall 2024, Thesis defense date: 11/2024 Thesis Title: Numerical and Experimental Investigation of Effects of Deformability of Circulating Tumor Cells in Physical Occlusion
PhD2	Hesam Abouali, to be graduated in Winter 2025, Thesis defense date: 01/2025 Thesis Title: Design and Development of a Real-time Monitoring Microfluidic Platform for Multiplexed Biomarker Detection
MSc1	Hanjia Zheng, 2022 Thesis Title: An Optical, Microneedle-based Biosensor Integrating Aptamer Probes for Biomarker Detection in Skin Interstitial Fluid Current Position: PhD student at IDEATION Lab
MSc2	Hamid Aghamohammadi, 2022 Thesis Title: Optimization of a Microfluidic Assay Computationally and Experimentally for Rapid and Sensitive Detection of Toxins in Water Samples Current Position: R&D Engineer at NeoVentures Biotechnology Inc.
MSc3	Subhamoy Biswas, 2024 Thesis Title: Machine Learning-Assisted Continuous Glucose and Ketone Monitoring for Diabetic Ketoacidosis Current Position: PhD student in Oregon Health and Science University
MSc4	Sanjana Srikant, 2024 Thesis Title: Quantum Dot Mediated Bead-Based Assays for Continuous Biomarker Monitoring in Diabetes and Lung Perfusion Systems Current Position: Research Assistant at IDEATION Lab

2. RESEARCH AND SCHOLARSHIP

AREAS OF INTEREST

- Autonomous Systems for Disease Management
- Wearable Bio-Sensing Approaches for Continuous Health Monitoring
- Microfluidic-based Biosensing Approaches
- Controlled Drug Delivery Approaches
- Translating Biomedical Devices for Clinical and Pre-Clinical Use

AWARDED RESEARCH FUNDING (total: ~\$ 6,387,415 CAD (: ~ \$ 4,625,798 USD) since joining Waterloo in 2020)

Given the multidisciplinary nature of her research, Poudineh has established a strong network of collaborators spanning biology, chemistry, pre-clinical models and clinical expertise from Stanford, MIT, Harvard, Rostock University (Germany), McMaster University, and University of Toronto. Her lab has secured over \$4.6 million USD from competitive national and international agencies including NSERC (Discovery Grant and 5 Alliance Grants), 2 CIHR Project Grants, Canadian Space Agency, and Breakthrough T1D (formerly JDRF).

Agency	Title	Role	Amount	Duration	Status
Canada Research Chairs Program	Canada Research Chair (Tier 2) in Health Monitoring BioNano Devices	PI	\$600,000 CAD	11/2024 – 11/2029	Ongoing
Waterloo Trailblazer Fund	Electrochemical Early Detection of Traumatic Brain Injury Using Skin Patches	PI; Co-PIs: E. Shirzadi, J. Honek	\$53,000 CAD	09/2024 – 08/2026	Ongoing
Breakthrough T1D (formerly JDRF)	Validation and Testing of a Novel CGM-CKM Device with Human Patients	PI; Co-PI: R. Lal	~\$305,785 USD	06/2024 – 04/2026	Ongoing
Centre for Bioengineering & Biotechnology (CBB)-Seed Funding	Smart Shunt	PI; Co-PI: J. Liu	\$10,000 CAD	05/2024 – 04/2025	Ongoing
Waterloo Momentum Fund	Closed-Loop Control of Vancomycin Concentration in vivo	PI; Co-PIs: A. Edginton, K. Watt	\$100,000 CAD	04/2024 – 03/2026	Ongoing
CIHR-Project Grant	Smart Ventilation	Co-PI; PI: A. Sage	~\$700,000 CAD	04/2024 – 04/2029	Ongoing
Ontario Ministry of Colleges and Universities	Early Research Award	PI	\$190,000 CAD	03/2024 – 03/2029	Ongoing
Poudineh received the ERA in the first submission.					
Johnson & Johnson	WiSTEM2D Award-Technology Category	PI	\$150,000 USD	01/2023 – 12/2025	Ongoing
NSERC Alliance Grant (Mission); Industry Partner: Proflange	An Integrated Microfluidic, Metal Oxide Semiconductor Gas Sensor Combined with Machine Learning Optimization for Greenhouse Gas Detection	PI; Co-PI: M. Pope	\$680,600 CAD	03/2023 – 03/2026	Ongoing
Breakthrough T1D (formerly JDRF)	A pH Responsive Hydrogel Microneedle Patch for Continuous Measurement of Ketone Bodies and Glucose	PI; Co-PI: P. Levine, A. Giacca	\$875,000 USD	05/2022 – 04/2026	Ongoing
NSERC Alliance Grant; Industry Partner: AIH Tech. Inc.	An Integrated Microfluidic and Photonic Platform for Real-time Biomarker Quantification	Co-PI; PI: D. Ban	\$462,000 CAD	05/2022 – 05/2025	Ongoing
CIHR-Project Grant	Moving Beyond Blood Glucose with Continuous Multiplexed Hormone Measurement	PI; Co-PI: J. Schertzer	\$956, 250 CAD	10/2021 – 09/2026	Ongoing
The success rate for this round of CIHR was <16% and Poudineh's application ranked in the top 97th percentile in the Diabetes, Obesity, Lipid & Lipoprotein Disorders committee. CIHR grants are usually secured by senior faculty members.					
NSERC Discovery Grant	Next-Generation Enabling Technologies Towards Precision and Personalized Medicine	PI	\$180,500 CAD	04/2020 – 04/2026	Ongoing
Poudineh received the NSERC funding in the first year of her appointment (Other junior faculty members usually receive in their second year).					

Agency	Title	Role	Amount	Duration	Status
NSERC – Lab2Market	Integrated Microfluidic Electrochemical Assay for Cervical Cancer Detection at Point-of-Care Testing	PI	\$20,000 CAD	09/2022 – 12/2022	Completed
Graham Seed Funding	A New Transdermal Patch to Continuously and Without Pain Track and Treat Diabetes	PI	\$25,000 CAD	02/2023 – 02/2024	Completed
Deep Space Healthcare Challenge- Canadian Space Agency	Heart-Tracker: A Wearable Platform for Real-Time Monitoring of Cardiac Makers in Interstitial Fluid	Co-PI; Co-PIs: L. Soleyman, Y. Shayan	\$30,000 CAD	05/2022 – 12/2022	Completed
NSERC Alliance Grant; Industry Partner: BlueLion Labs	A Microfluidic Assay for Rapid and Multiplexed Detection of Toxins in Water Samples	PI	\$30,000 CAD	07/2021 – 07/2022	Completed
Mitacs Accelerate; Industry Partner: Health Message Technology	Developing an Aptamer, Graphene Based Electrochemical Biosensor for Early Detection of Alzheimer	PI	\$60,000 CAD	05/2021 – 04/2023	Completed
Centre for Bioengineering & Biotechnology (CBB)-Seed Funding	A Wearable, Microneedle Aptamer-Based Biosensor for Continuous Tracking of Insulin and Glucose	PI; Co-Applicants: J. Liu, P. Levine	\$10,000 CAD	05/2021 – 04/2022	Completed
NSERC Alliance Grant; Industry Partner: Affinite Instruments	A Microfluidics-Based Approach for Multiplexed Detection of Biomarkers in Unprocessed Blood Using a Surface Plasmon Resonance Sensor	PI	\$80,769 CAD	01/2021 – 01/2023	Completed
NSERC Alliance Grant; Industry Partner: Mediphage	Purification of SARS-CoV-2 VLPs Using a Microfluidic Technique for Downstream COVID-19 Vaccine Production	PI	\$50,000 CAD	06/2020 – 06/2021	Completed
Canada Foundation for Innovation/ Ontario Research Fund (CFI/ORF)-JELF	Integrated Device-Driven Approaches for Automated, Real-Time Tracking	PI	\$320,000 CAD	04/2020 – 12/2022	Completed

Poudineh received the CFI-JELF funding in the first year of her appointment (Other junior faculty members usually receive in their second year).

MOST SIGNIFICANT CONTRIBUTIONS

Poudineh's IDEATION Lab employs cutting-edge engineering solutions to tackle critical challenges in the fields of life science and is gaining renown for **advancing two key technologies: microfluidics and wearable microneedles**. The lab has developed microfluidic platforms to uncover crucial biological insights pertaining to diabetes and cancer, while its hydrogel microneedle (HMN) devices introduce a **first-of-its-kind** platform for the development of polymeric, flexible wearable sensors suitable for minimally invasive monitoring of patients' health conditions in an out-patient settings. The latter research directions were initiated by Poudineh upon joining Waterloo. Her significant contributions over the past five years can be summarized in three following categories:

1- Conductive Hydrogel Microneedle Electrodes.

Poudineh's group is developing novel wearable platforms that use, for the first time, flexible, hydrogel microneedle (HMN) electrodes for continuous, real-time measurement of patient health status. Their electrodes utilize state-of-the-art conductive and flexible yet mechanically strong polymers to tackle the problems associated with rigid microneedle (MN) biosensors, including lack of compatibility with skin. The team used their HMN electrodes for

developing the first HMN-based pH meter (published in *Small* (J14)) and the **first** HMN-continuous glucose monitoring (CGM) device (published in *Advanced Healthcare Materials* (J13)). Additionally, they employed their HMN electrodes for developing a new continuous ketone monitoring (CKM) device which measures ketone bodies. They tested the performance of the HMN electrodes for in vivo measurement using a rat model of diabetes showed that fluctuation in ketone and glucose levels upon insulin injection can be tracked using the HMN-CGM-CKM device (published in *Advanced Materials* (J2)). The team also validated the HMN-CGM-CKM performance in healthy pigs for baseline glucose and ketone measurement. **This project secured ~ \$1.2 million USD in funding from Breakthrough T1D (formerly JDRF), a prominent international organization dedicated to advancing diabetes research.** Their next step involves evaluating the capability of the system in monitoring the levels of ketones and glucose in healthy individuals and patients with T1D (in collaboration with Dr. Lal, Stanford).

2- Aptamer Integrated Hydrogel Microneedle Assays

By combining the HMN patches for fluid extraction with a flexible aptamer biosensor, Poudineh and her team developed a robust, universal, and wearable technology, named Wearable Aptalyzer, to continuously measure **any biomarkers of interest**. Specifically, they applied the Wearable Aptalyzer to modernize therapeutic drug monitoring (TDM) of drugs with a narrow therapeutic window, including vancomycin and gentamycin, two commonly used antibiotics for severe infectious disease treatment (published in *Advanced Science* (J1)). The Wearable Aptalyzer was also utilized for monitoring glucose and lactate levels by integrating their aptamer probes published in *Advanced Materials* (J3)). In future, the team aims to employ Wearable Aptalyzer along with automatic dosage adjustment to develop a closed-loop control system for VAN administration. They have also identified the functional groups in these polymers and bind them with aptamer molecules or DNA probes for a variety of sensing applications (published in *ACS Sensors* (J15) and *Angewandte Chemie* (J11)).

3- Continuous Monitoring Technologies for High-Resolution and Universal Tracking

Technologies that can continuously measure circulating biomolecules would have a transformative impact towards the vision of precision medicine. During her PDF training at Stanford, Poudineh led the development of a platform, called real-time enzyme-linked immunosorbent assay or RT-ELISA, for continuous, and real-time monitoring of any biomarkers of interest. RT-ELISA is the first technique to provide continuous and simultaneous measurement of protein biomarkers with high sensitivity and sub-second temporal resolution (published in *Nature Biomedical Engineering* (J19)). In her group, Poudineh and her team developed a second-generation RT-ELISA by using quantum dots as the fluorescence reporters. Specifically, the use of quantum dots improved the assay sensitivity and multiplexed capabilities. The new RT-ELISA is called quantum dot integrated RT-ELISA or QIRT-ELISA. **This project led to approximately \$1 million CAD CIHR funding which aims to unravel the role of diabetes hormones and biomarkers in diabetes manifestation and progression.** Poudineh's CIHR application ranked in the top 97th percentile in the Diabetes, Obesity, Lipid & Lipoprotein Disorders panel. In collaboration with Schertzer group at McMaster, they have so far demonstrated continuous in vivo monitoring of insulin and glucagon (under review in *Advanced Science* (S2)). They are now aiming to include C-peptide and glucose, allowing for a comprehensive evaluation of diabetes biomarkers. QIRT-ELISA is a general platform and could be readily modified to measure other circulating analytes in vivo by swapping the affinity reagents. Particularly, in collaboration with Toronto Lung Transplant program, Poudineh and her collaborators aim to apply QIRT-ELISA for continuous monitoring of ventilator-induced lung injury biomarkers in ex vivo lung perfusion systems with the goal of enhancing lung transplant success. This project has been supported by ~ \$700K CAD in funding from CIHR where Poudineh is a Co-PI along with Sage (University of Toronto) and Keshavje (world-renowned thoracic surgeon-scientist at University Health Network).

PUBLICATIONS

Poudineh has authored more than 30 articles featured in top-tier journals, such as *Nature Biomedical Engineering* (IF: 29.2), *Advanced Materials* (IF: 29.4), *Small* (IF: 13.4), *Angewandte Chemie* (IF: 16.6), and *ACS Sensors* (IF: 8.9). ^ refers to the trainees supervised by Poudineh; * refers to the authors who contributed equally; The corresponding author(s) is underlined.

Articles Submitted

S1. Hesam Abouali[^], Seiedali Hosseini[^], Sanjana Srikant[^], and Mahla Poudineh, "Continuous High-Throughput Plasma Separation for Blood Biomarker Sensing Using a Hydrodynamic Microfluidic Device," *Small*, submitted 10/2024.

- S2. Hesam Abouali^{*}, Sanjana Srikant^{*}, Md. Fahim Al Fattah^{*}, Nicole G. Barra, Darryl Chan, Dayan Ban, Jonathan D. Schertzer, and **Mahla Poudineh**, “Real-Time Multiplexed Measurement of Blood Insulin and Glucagon Using a Quantum Dot Integrated Assay,” *Advance Science*, submitted 09/2024.
- S3. Natalie Fudge^{*}, Fatemeh Keyvani^{*}, Joshua Khatri[^], and **Mahla Poudineh**, “Agarose-gel Coating for Improving the Polydopamine-based pH Sensor Stability in Continuous pH Measurements,” *Sensors & Diagnostics*, submitted 09/2024.
- S4. Pouyan Keshavarz Motamed[^], Mohammad Kohandel, **Mahla Poudineh**, and Nima Maftoon, “Predicting physical occlusion site of circulating tumor cells traveling in microvasculature,” *Proceedings of the National Academy of Sciences of the United States of America*, submitted 10/2024.
- S5. Md. Fahim Al Fattah, Asif Khan, Sanjana Srikant[^], Hesam Abouali[^], Md. Rasidul Islam, Aixi Pan, Mohsen Azadnia, Md Soyaeb Hasan, Mahmoud Almadhoun, Hany Aziz, **Mahla Poudineh**, Vivek Maheshwari, and Dayan Ban, “Perovskite Photodetector Integrated with Microfluidics for Low-level Fluorescence Detection: Towards Self-powered Biomarker Sensing,” *ACS Applied Electronic Materials*, submitted 09/2024.

Refereed Journal Articles

- J1. Fatemeh Keyvani^{*}, Peyman GhavamiNejad^{*}, Mahmoud Ayman Saleh^{*}, Mohammad Soltani[^], Yusheng. Zhao, Pierre Chelle, Hanjia Zheng[^], Fasih A. Rahman, Sara Mahshid, Joe Quadrilatero, Praveen Rao, Andrea Edginton, and **Mahla Poudineh**, “Integrated Electrochemical Aptamer Biosensing and Colorimetric pH Monitoring via Hydrogel Microneedle Assays for Assessing Antibiotic Treatment,” *Advanced Science*, in press.
- J2. Irfani Ausri^{*}, Sadegh Sadeghzadeh^{*}, Subhamoy Biswas[^], Hanjia Zheng[^], Peyman GhavamiNejad[^], Michelle Huynh[^], Fatemeh Keyvani[^], Erfan Shirzadi[^], Fasih A. Rahman, Joe Quadrilatero, Amin GhavamiNejad, and **Mahla Poudineh**, “Multifunctional Dopamine-Based Hydrogel Microneedle Electrode for Continuous Ketone Sensing,” *Advanced Materials*, 2024, 36, 32, 2402009. [Featured as the frontispiece cover.](#)
- J3. Fatemeh Bakhshandeh^{*}, Hanjia Zheng^{*}, Nicole G. Barra, Sadegh Sadeghzadeh[^], Irfani Ausri[^], Payel Sen, Fatemeh Keyvani[^], Fasih A. Rahman[^], Joe Quadrilatero, Juewen Liu, Jonathan D. Schertzer, Leyla Soleymani, and **Mahla Poudineh**, “Wearable Aptalyzer Integrates Microneedle-Based Sample Collection with Aptamer-Based Electrochemical Sensing for In Vivo Monitoring of Glucose and Lactate in Live Animals,” *Advanced Materials*, 2024, 36, 35, 2313743. [Featured as the frontispiece cover](#)
- J4. Hesam Abouali^{*}, Michelle Przedborski^{*}, Mohammad Kohandel, and **Mahla Poudineh**, “Investigating Nano-Sized Tumor-Derived Extracellular Vesicles in Enhancing Anti-PD-1 Immunotherapy,” *Nanoscale*, 2024, 16, 19062–19073.
- J5. Hanjia Zheng[^], Fatemeh Keyvani[^], Dragos Mantaila[^], and **Mahla Poudineh**, “Rapid miRNA Detection from Skin Interstitial Fluid Using a Hydrogel Microneedle Assay Integrated with DNA Probe and Graphene Oxide,” *Lab on a Chip*, Invited Article, 2024.
- J6. **Mahla Poudineh**, “Microneedle Assays for Continuous Health Monitoring: Challenges and Solutions,” *ACS Sensors*, Invited Perspective, 2024, 9, 2, 535–542.
- J7. Erfan Shirzadi^{*}, Michelle Huynh^{*}, Peyman GhavamiNejad^{*}, Hanjia Zheng[^], Agosh Saini[^], Fatemeh Bakhshandeh, Fatemeh Keyvani[^], Dragos Mantaila[^], Fasih A. Rahman, Joe Quadrilatero, Leyla Soleymani, and **Mahla Poudineh**, “A PEDOT:PSS-Based Composite Hydrogel as a Versatile Electrode for Wearable Microneedle Sensing Platforms,” *Advanced Sensor Research*, Invited Article, 2024, 3, 3, 2300122.
- J8. Fahim Al Fattah^{*}, Hesam Abouali^{*}, Seiedali Hosseini, Jian Yin, Asif Abdullah Khan, Hamid Aghamohammadi[^], **Mahla Poudineh**, and Dayan Ban, “An Optofluidic System for Monitoring Fluorescently Activated Protein Biomarkers,” *Analysis & Sensing*, 2024, 4, 2, e202300064.
- J9. Pouyan Keshavarz Motamed[^], Hesam Abouali[^], **Mahla Poudineh**, and Nima Maftoon, “Experimental Measurement and Numerical Modelling of Deformation Behavior of Breast Cancer Cells Passing through Constricted Microfluidic Channels,” *Microsystems & Nanoengineering*, 2024, 10, 7.

- J10. Nandini Debnath[^], Ludo Live, and **Mahla Poudineh**, “A Microfluidic Plasma Separation Device Combined with Surface Plasmon Resonance for Biomarker Detection in Unprocessed Blood,” *Lab on a Chip*, 2023, 23, 572-579.
- J11. Fatemeh Keyvani[^], Hanjia Zheng[^], Md Rejvi Kaysir[^], Dragos Mantaila[^], Fahim A. Rahman, Joe Quadrilatero, Dayan Ban, and **Mahla Poudineh**, “A Hydrogel Microneedle Assay Combined with Nucleic Acid Probes for On-site Detection of Small Molecules, Proteins, and Ribonucleic Acids,” *Angewandte Chemie International Edition*, 2023, 62, e202301624.
- J12. Hamid Aghamohammadi[^], Katie Thomas, Jason Deglint, Alex Wong, and **Mahla Poudineh**, “A Bead-Based, Competitive Assay Integrated with Microfluidics for Multiplexed Toxin Detection,” *Lab on a Chip*, 23, 3245-3257, 2023.
- J13. Peyman GhavamiNejad^{^*}, Amin GhavamiNejad^{*}, Hanjia Zheng[^], Karan Dhingra[^], Melisa Samarikhalaj[^], and **Mahla Poudineh**, “A Conductive Hydrogel Microneedle-Based Assay for Real-time, Continuous, and Enzyme-less Glucose Measurement in Live Animals,” *Advanced Healthcare Materials*, 2022, 12, 1, 2202362. [Featured in Rising Star Series of Advanced Healthcare Materials.](#)
- J14. Sarah A. Odinotski[^], Karan Dhingra[^], Amin GhavamiNejad, Hanjia Zheng[^], Peyman GhavamiNejad[^], and **Mahla Poudineh**, “A Conductive Hydrogel-Based Microneedle Platform for Real-Time pH Measurement in Live Animals,” *Small*, 2022, 18, 45.
- J15. Hanjia Zheng^{^*}, Amin GhavamiNejad^{*}, Peyman GhavamiNejad[^], Melisa Samarikhalaj[^], Adria. Giacca, and **Mahla Poudineh**, “A Hydrogel Microneedle-Assisted Assay Integrating Aptamer Probes and Fluorescence Detection for Reagentless Biomarker Quantification,” *ACS Sensors*, 2022, 8, 2388-2399. [Featured as supplementary cover art.](#)
- J16. Fatemeh Keyvani^{^*}, Nandini Debnath^{^*}, Mahmoud Ayman Saleh[^], and **Mahla Poudineh**, “An Integrated Microfluidic Electrochemical Assay for Cervical Cancer Detection at Point-of-Care,” *Nanoscale*, 2022, 14, 6761 - 6770. [Featured in Emerging Investigator Series in Nanoscale & on front cover.](#)
- J17. Hamid Aghamohammadi[^], Seiedali Hosseini[^], Sanjana Srikant[^], Alex Wong, and **Mahla Poudineh**, “A Computational and Experimental Model to Study Immunobead-based Assays in Microfluidic Mixing Platforms,” *Analytical Chemistry*, 2022, 94, 4, 2087–2098.
- J18. Hesam Abouali[^], Seiedali Hosseini[^], Emma Purcell, Sunitha Negrath, and **Mahla Poudineh**, “Recent Advances in Device Engineering and Computational Analysis for Characterization of Cell-Released Cancer Biomarkers,” *Cancers*, 2022, 14, 288.
- J19. Nafiseh Moghimi, Seiedali Hosseini[^], **Mahla Poudineh**, and **Mohammad Kohandel**, “Recent Advances on Cancer-on-Chip Models: Development of 3D Tumors and Tumor Microenvironment,” *Bioprinting*, 2022, 28, e00238.
- J20. **Seied Ali Hosseini Farahabadi**, Milad Entezami, Hesam Abouali[^], Hadi Amarloo, **Mahla Poudineh**, and Safieddin Safavi-Naeini, “Sub-Terahertz Silicon-Based On-Chip Absorption Spectroscopy Using Thin-Film Model for Biological Applications,” *Scientific Reports*, 2022, 12, 17747.
- J21. **Mahla Poudineh**^{*}, Caitlin L. Maikawa^{*}, Eric Yue Ma, Jin Pan, Dan Mamerow, Yang Han, Sam W Baker, Ahmad Beirami, Alex Yoshikawa, Michael Eisenstein, Seung. Kim, Jelena Vuckovic, **Eric A. Appel**, and **H. Tom Soh**, “A Fluorescence Sandwich Immunoassay for the Real-Time Continuous Detection of Glucose and Insulin in Live Animals,” *Nature Biomedical Engineering*, 2021, 5, 53–63.
- J22. Brenda L. K. Coles^{*}, Mahmoud Labib^{*}, **Mahla Poudineh**, Brenden T. Innes, Justin Belair-Hickey, Surath Gomis, Zongjie Wang, Gary D. Bader, Edward H. Sargent, **Shana O. Kelley**, and **Derek Van der Kooy**, “A Microfluidic Platform Enables Comprehensive Gene Expression Profiling of Mouse Retinal Stem Cells,” *Lab on a chip*, 2021, 21, 4464-4476.
- J23. Zongjie Wang, Libing Zhang, Mahmoud Labib, Haijie Chen, Mingyang Wei, **Mahla Poudineh**, Brenda J. Green, Bill Duong, Jagotamoy Das, Sharif Ahmed, **Edward H. Sargent**, and **Shana O. Kelley**, “Peptide-

- Functionalized Nanostructured Microarchitectures Enable Rapid Mechanotransductive Differentiation,” *ACS Applied Materials and Interfaces*, 2019, 11, 41030-41037.
- J24. **Mahla Poudineh**, Edward H. Sargent, Klaus Pantel, and Shana O. Kelley, “Profiling Circulating Tumour Cells and Other Biomarkers of Invasive Cancers,” *Nature Biomedical Engineering*, Invited Review, 2018, 2.
- J25. Mahmoud. Labib, Reza M. Mohamadi, **Mahla Poudineh**, Sharif Ahmed, Ivaylo Ivanov, Ching-Lung Huang, Maral Moosavi, Edward H. Sargent, and Shana O. Kelley, “Single Cell mRNA Cytometry via Sequence-Specific Nanoparticle Clustering and Trapping,” *Nature Chemistry*, 2018, 10, 489-495.
- J26. **Mahla Poudineh***, Zongjoe Wang*, Mahmoud Labib, Moloud. Ahmadi, Libing Zhang, Jagotamoy Das, Sharif Ahmed, Stephane Angers, and Shana O. Kelley, “Three-Dimensional Nanostructured Architectures Enable Efficient Neural Differentiation of Mesenchymal Stem Cells via Mechanotransduction,” *Nano Letters*, 2018, 18, 7188-7193.
- J27. Leyla Kermanshah, **Mahla Poudineh**, Sharif Ahmed, L. N. Matthew Nguyen, Sanjana Srikant, Rhema Makonnen, Shana O. Kelley, “Dynamic CTC Phenotypes in Metastatic Prostate Cancer Models Visualized Using Magnetic Ranking Cytometry”, *Lab on a Chip*, 2018,18, 2055-2064.
- J28. Guangli Wang, Jagotamoy Das, Sharif Ahmed, Carine R. Nemr, Libing Zhang, **Mahla Poudineh**, Edward H. Sargent, and Shana O. Kelley, “Curvature-Mediated Surface Accessibility Enables Ultrasensitive Electrochemical Human Methyltransferase Analysis,” *ACS Sensors*, 2018, 3, 1765–1772.
- J29. **Mahla Poudineh**, Peter M. Aldridge, Sharif Ahmed, Brenda J. Green, Leyla Kermanshah, Vivian Nguyen, Carmen Tu, Reza M. Mohamadi, Robert K. Nam, Aaron Hansen, Srikala S. Sridhar, Antonio Finelli, Neil E. Fleshner, Anthony M. Joshua, Edward H. Sargent, and Shana O. Kelley, “Tracking the Dynamics of Circulating Tumor Cell Phenotypes Using Nanoparticle-mediated Magnetic Ranking,” *Nature Nanotechnology*, 2017, 12, 274-282.
- J30. **Mahla Poudineh**, Mahmoud Labib, Sharif Ahmed, L. N. Matthew Nguyen, L. Kermanshah, Reza M. Mohamadi, Edward H. Sargent, and Shana O. Kelley, “Profiling Functional and Biochemical Phenotypes of Circulating Tumor Cells Using a Two-Dimensional Sorting Device,” *Angewandte Chemie International Edition*, 2017, 56, 163-168.
- J31. **Mahla Poudineh**, Edward H. Sargent, and Shana O. Kelley, “Amplified Micro-Magnetic Field Gradients Enable High-Resolution Profiling of Rare Cell Subpopulations,” *ACS Applied Material and Interface*, 2017, 9, 25683–2569.
- J32. Yi-Ge Zhou, Reza M. Mohamadi, **Mahla Poudineh**, Leyla Kermanshah, Sharif Ahmed, Tina Saberi Safaei, Jessica Stojic, Robert K. Nam, Edward H. Sargent, and Shana O. Kelley, “Interrogating Circulating Microsomes and Exosomes Using Metal Nanoparticles,” *Small*, 2016, 12, 727-732.
- J33. Andrew T. Sage, Justin D. Besant, Laili. Mahmoudian, **Mahla Poudineh**, Xiaohui Bai, Ricardo Zamel, Michael Hsin, Edward H. Sargent, Marcelo Cypel, Mingyao Liu, Shaf Keshavjee, and Shana O. Kelley, “Fractal Circuit Sensors Enable Rapid Quantification of Biomarkers for Donor Lung Assessment for Transplantation,” *Science Advances*, 2015, 1, e1500417.
- J34. **Mahla Poudineh**, Reza M. Mohamadi, Andrew Sage, Laili Mahmoudian**, Edward H. Sargent, and Shana O. Kelley, “Three-Dimensional, Sharp-Tipped Electrodes Concentrate Applied Fields to Enable Direct Electrical Release of Intact Biomarkers from Cells,” *Lab on a Chip*, 2014, 14, 1785-1790.
- J35. Ying Wan, Yi-Ge Zhou, **Mahla Poudineh**, Tina Saberi Safaei, Reza M. Mohamadi, Edward H. Sargent, and Shana O. Kelley, “Highly Specific Electrochemical Analysis of Cancer Cells using Multi-Nanoparticle Labeling,” *Angewandte Chemie*, 2014, 53, 13361-13365.
- J36. Yi-Ge Zhou, Ying Wan, Andrew Sage, **Mahla Poudineh**, and Shana O. Kelley, “Effect of Microelectrode Structure on Electrocatalysis at Nucleic Acid-Modified Sensors,” *Langmuir*, 2014, 30, 14322-14328.
- J37. Brian Lam, Richard D. Holmes, Jagotamoy Das, **Mahla Poudineh**, Andrew Sage, Edward H. Sargent, and Shana O. Kelley, “Optimized Templates for Bottom-Up Growth of High-Performance Integrated Biomolecular Detectors,” *Lab on a Chip*, 2013, 13, 2569-2575.

- J38. **Mahla Poudineh**, Zeynab Sanaee, Azam Gholizadeh, Samaneh Soleimani-Amiri, and Shams Mohajerzadeh, “Highly Ordered Sub 50 nm Silicon Nanowire Formation Using a High Precision Top-Down Process,” *IEEE Transactions on Nanotechnology*, 2013, 12, 712-718.
- J39. Zeynab Sanaee, **Mahla Poudineh**, Mohammad Abdolahad, and Shams Mohajerzadeh, “High Aspect Ratio Micro- and Nano-Machining of Silicon Using Time-multiplexed Reactive Ion Etching,” *Journal of micromachining and microengineering*, 2011, 21, 125012.

Referred Conference Presentations

The presenter is underlined.

- C1. Subhamoy Biswas[^], Pouyan Keshavarz Motamed[^], Peyman GhavamiNejad[^], Irfani R. Ausri[^], Ali Etemad, **Mahla Poudineh**, “Learning the Sensing Delay for Personalized Continuous Diabetes Monitoring,” *ICLR Workshop on Learning from Time Series for Health*, Poster Presentation, Vienna, Austrian, 2024.
- C2. Abdollah Pil-Ali, Sahar Adnani, Pranav Gavirneni, Seokjee Shin, Bahareh. Sadeghimakki, **Mahla Poudineh**, William Wong, and Karim. S. Karim, “Self-Aligned Fabrication of High-Aspect Ratio High-Resolution X-Ray Gratings,” SPIE Medical Imaging, San Diego, CA, 2022.
- C3. Abdollah Pil-Ali, Mohammad Soltani, Sahar Adnani, Muhammed Kayaharman, **Mahla Poudineh**, Bo Cui, and Karim S. Karim, “Improving Adhesion Quality of SU-8 to Gold Thin Film for Absorption Grating Fabrication in X-Ray Phase-Contrast Imaging,” SPIE Medical Imaging, San Diego, CA, 2022.
- C4. Hesam Abouali[^], Seiedali Hosseini[^], Sanjana Srikant[^], and **Mahla Poudineh**, “A High Yield, High Purity Blood Plasma Generator Enabling Cancer Biomarker Analysis,” IEEE Nanotechnology Materials and Devices Conference, Oral presentation (virtual), Vancouver, BC, 2021.

Conference Presentations (Abstract-based)

The presenter is underlined.

- C1. Fatemeh Keyvani[^] and **Mahla Poudineh**, “Wearable Microneedle Biosensor for Real-Time I-Situ Antibiotic Monitoring,” Gordon Research Conference-Bioanalytical Sensors, Oral presentation, New Port, RI, 2024.
- C2. Hesam Abouali[^], Seiedali Hosseini[^], and **Mahla Poudineh**, “A High-Efficiency Microfluidic Platform for Continuous Blood Plasma Separation” 31st Annual Conference of the CFD Society of Canada, Oral presentation, Toronto, ON, 2024.
- C3. Fatemeh Keyvani[^], Hanjia Zheng[^], Md Rejvi Kaysir[^], Dragos Mantaila, and **Mahla Poudineh**, “A Universal Hydrogel Microneedle for on-Site Detection of Small Molecules, Proteins, and Ribonucleic Acids,” Electrochemical Society, Oral Presentation, Boston, MA, 2023.
- C4. Hesam Abouali[^], Sanjana Srikant[^], Nicole G. Barra, Jonathan D. Schertzer, and **Mahla Poudineh**, “Design and Development of a Real-time Monitoring Microfluidic Platform for Multiplexed Insulin and Glucagon Detection,” Gordon Research Conference-Physics and Chemistry of Microfluidics, poster Presentation, Tuscany, Italy, 2023.
- C5. Peyman GhavamiNejad[^], Amin GhavamiNejad, and **Mahla Poudineh**, “A Minimally-Invasive Hydrogel-Based Microneedle Sensor for Non-Enzymatic Monitoring of Glucose,” Diabetes Canada Conference, Poster presentation, Calgary, AB, 2022.
- C6. Hanjia Zheng[^] and **Mahla Poudineh**, “Hydrogel Microneedle-Assisted Assay Integrating Aptamer Probes and Fluorescence Detection for Reagentless Biomarker Quantification,” Network for Sustainable Nanotechnology (N4SNano), Oral presentation, Waterloo, ON, 2022.
- C7. Fatemeh Keyvani[^], Nandini Debnath[^], and **Mahla Poudineh**, “Integrated Microfluidic Electrochemical Biosensor for Cervical Cancer Detection at Point of Care Testing,” Network for Sustainable Nanotechnology (N4SNano), Oral presentation, Waterloo, ON, 2022.

- C8. Hanjia Zheng[^] and **Mahla Poudineh**, “Hydrogel Microneedle-Assisted Assay Integrating Aptamer Probes and Fluorescence Detection for Reagentless Biomarker Quantification,” Canadian Society for Chemical Engineering, Oral presentation, Vancouver, BC, 2022.
- C9. Peyman GhavamiNejad[^], Karan Dhingra[^], Amin GhavamiNejad, and **Mahla Poudineh**, “A Hydrogel Microneedle-Based Biosensor for Continuous, Real-Time, and Enzyme-Less Glucose Measurement,” MicroTAS Conference, Poster presentation (virtual), Palm Spring, CA, 2021.
- C10. Hanjia Zheng[^], Amin GhavamiNejad, and **Mahla Poudineh**, “A Hydrogel Microneedle-Based Biosensor Integrating Aptamer Probes and Fluorescence Detection for Biomarker Quantification,” MicroTAS Conference, Poster presentation (virtual), Palm Spring, CA, 2021.
- C11. **Mahla Poudineh**, Mahmoud Labib, Zongjie Wang, Edward H. Sargent, Shana O. Kelley, and H. Tom Soh, “Next-Generation Enabling Technologies for Diagnosing Disease and Monitoring Therapy,” Micro- and Nanotechnologies for Medicine Workshop, Poster presentation, Los Angeles, CA, 2019.
- C12. **Mahla Poudineh**, Zongjoe Wang, Mahmoud Labib, Moloud Ahmadi, Libing Zhang, Jagotamoy Das, Sharif Ahmed, Stephane. Angers, and Shana O. Kelley, “Nanostructured Architectures Enable Efficient Differentiation of Mesenchymal Stem Cells Towards Neurogenesis Lineages,” Lab-on-a-Chip and Microfluidics World Congress, Poster presentation, San Diego, CA, 2018.
- C13. **Mahla Poudineh**, Mahmoud Labib, Edward. H. Sargent, and Shana O. Kelley, “Two-Dimensional Profiling of Cancer Cell Subpopulations” MicroTAS Conference, Poster presentation, Savannah, GA, 2017.
- C14. **Mahla Poudineh**, Peter M. Aldridge, Sharif Ahmed, Carmen Tu, Reza M. Mohamadi, Edward H. Sargent, and Shana O. Kelley, “Phenotypic Profiling of Circulating Tumor Cells Using Magnetic Ranking Cytometry” Next Generation Dx Summit Conference, Poster presentation, Washington, DC, 2016.
- C15. **Mahla Poudineh**, Peter M. Aldridge, Sharif Ahmed, Leyla Kermanshah, Carmen Tu, Reza M. Mohamadi, Edward H. Sargent, and Shana O. Kelley, “Tracking the Dynamics of Circulating Tumor Cell Phenotypes Using Nanoparticle-mediated Magnetic Ranking” Ontario on a Chip Conference, Oral presentation, Toronto, ON, 2016.
- C16. **Mahla Poudineh**, Sharif Ahmed, Leyla Kermanshah, Peter M. Aldridge, Reza M. Mohamadi, Edward H. Sargent, and Shana O. Kelley, “Amplified Micro-magnetic Field Gradients Enable High Resolution Profiling of Circulating Tumor Cell Subpopulations” Gordon Research Conference, Poster presentation, Mount Snow West Dover, VT, 2015.
- C17. **Mahla Poudineh**, Reza M. Mohamadi, Andrew T. Sage, Laili Mahmoudian, Edward H. Sargent, and Shana O. Kelley, “Three-Dimensional, Sharp-Tipped Electrodes Concentrate Applied Fields to Enable Direct Electrical Release of Intact Biomarkers from Cells,” Ontario on a Chip Conference, Poster presentation, Toronto, ON, 2014.
- C18. **Mahla Poudineh**, Reza M. Mohamadi, Andrew T. Sage, Laili Mahmoudian, Edward. H. Sargent, and Shana O. Kelley, “Rapid Continuous Electrical Lysis of Bacteria on Structured Electrodes Preserves RNA Integrity.” MicroTAS Conference, Poster presentation, San Antonio, TX, 2014.
- C19. **Mahla Poudineh**, Zeynab Sanaee, Samaneh Soleimani-Amiri, Azam Gholizadeh, and Shams. Mohajerzadeh, “An Effective Top-down Process for Fabrication of Silicon Nano-rods,” MRS Fall Meeting, 2012.
- C20. Zeynab Sanaee, **Mahla Poudineh**, Maryam Mehran, and Shams Mohajerzadeh, “High Aspect Ratio Deep Si Etching of Micro/Nano Scale Features with SF₆ /H₂/ O₂ Plasma, in a Low Plasma Density Reactive Ion Etching System,” Nanotech, Vol. 2, p 325-328, 2011.
- C21. Zeynab Sanaee, **Mahla Poudineh**, Maryam Mehran, and Shams Mohajerzadeh, “Development of a Novel Technique for Silicon Vertical Etching in Micro/Nano Scale with SF₆/H₂/O₂ Plasma and in Low Plasma Density,” ICEE, Poster presentation, Iran, 2011.
- C22. Zeynab Sanaee, Soheil Azimi, **Mahla Poudineh**, Shams Mohajerzadeh, and Amin Sandoughsaz, “Ultra-high Aspect Ratio High Speed Silicon Nanowire and Three-dimensional Formation Using a Hydrogen-assisted Deep Reactive Ion Etching,” AVS, Poster presentation, USA, 2011.

- C23. Zeynab Sanaee, **Mahla Poudineh**, and Shams Mohajerzadeh, “Fabrication of Silicon Nano-needles Suitable for Biological Applications,” E-MRS Fall Meeting, Poster presentation, 2012.
- C24. Zeynab Sanaee, **Mahla Poudineh**, and Shams Mohajerzadeh, “High Precision, High-Rate Silicon Etching Process for Nano-fabrication,” MME, Poster presentation, 2012.

KEYNOTE

- K1. “Advanced Sensing Technologies for Healthcare Automation,” 31st Annual Conference of the CFD Society of Canada, Toronto , ON, Canada, 05/2024.

INVITED TALKS AND SEMINARS

- T1. “Advanced Sensing Technologies for Healthcare Automation,” IEEE International Conference on Nano/Molecular Medicine & Engineering, Honolulu, HI, 12/2024.
- T2. “Aptec Health,” Accelerating Clinical Trial Consortium, Quebec city, QC, 10/2024.
- T3. “NanoBiomaterial Inspired Technologies for Healthcare Automation,” Society for Biomaterials (SFB) Fall meeting, Boston, MA, 09/2024.
- T4. “Multifunctional Dopamine-Based Hydrogel Microneedle Electrode for Ketone Sensing and In Situ Enzyme-Enabled Crosslinking,” American Chemistry Society (ACS) Fall meeting, Denver, Co, 08/2024.
- T5. “Advanced Sensing Technologies for Healthcare Automation,” Gordon Research Conference-Bioanalytical Sensors, New Port, RI, 06/2024.
- T6. “Advanced Sensing Technologies for Healthcare Automation,” Canadian Society for Chemistry (CSC), Winnipeg, MB, Canada, 06/2024.
- T7. “Advanced Sensing Technologies for Healthcare Automation,” Future Directions of Advanced Materials Workshop, McMaster University, Hamilton, ON, 05/2024 (virtual).
- T8. “Advanced Sensing Technologies for Healthcare Automation,” New York University, New York, NY, USA, 03/2024.
- T9. “Advanced Sensing Technologies for Healthcare Automation,” University of Massachusetts, Amherst, MA, 02/2024.
- T10. “Advanced Polymeric Patches as Flexible Electrodes,” MIT (Program in Polymers and Soft Matter (PPSM) Seminar Series), Boston, MA, 02/2024.
- T11. “Advanced Sensing Technologies for Healthcare Automation,” MIT (Microsystems Technology Laboratories Seminar Series), Boston, MA, USA, 02/2024.
- T12. “Advanced Sensing Technologies for Healthcare Automation,” Northwestern University, Evanston, IL, USA, 02/2024.
- T13. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” Langer group Seminar Series, Boston, MA, USA, 11/2023.
- T14. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” Biomedical Engineering Instrumentation, Boston, MA, USA, 11/2023.
- T15. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” John Hopkins University, Baltimore, MD, USA, 10/2023.
- T16. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” New York University, New York , NY, USA, 09/2023.
- T17. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” Ontario Symposium on Micro and Nanotechnology, Kingston , ON, Canada, 08/2023.
- T18. “Next-Generation Enabling Technologies for Disease Diagnosis and Therapeutic Monitoring,” Electrochemical Society (ECS), Boston, MA, USA, 05/2023.

- T19. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” University of California San Diego, San Diego, CA, USA, 05/2023.
- T20. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” University of South California, Los Angeles, CA, USA, 05/2023.
- T21. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” University of California Los Angeles, Los Angeles, CA, USA, 05/2023.
- T22. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” University of California Berkeley, Berkeley, CA, USA, 05/2023.
- T23. “Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases,” Canadian Society for Chemistry (CSC), Vancouver, BC, Canada, 05/2023.
- T24. “Advanced Technologies for Improving Diabetes Management and Study,” Diabetes Canada, Calgary, AB, Canada, 11/2022.
- T25. “Next-Generation Enabling Technologies for Health Monitoring,” Canadian Society for Chemical Engineering, Vancouver, BC, Canada 10/2022.
- T26. Next-Generation Enabling Technologies for Health Monitoring, Electrochemical Society (ECS), Atlanta, GA, USA, 10/2022.
- T27. “Next-Generation Enabling Technologies for Health Monitoring,” Network for Sustainable Nanotechnology (N4SNano), Waterloo, ON, Canada 08/2022.
- T28. “Next-Generation Enabling Technologies for Health Monitoring,” Nano Series Conference, 06/2022 (virtual).
- T29. “Next-Generation Enabling Technologies for Health Monitoring,” Translational Biomedical Engineering, Canada, 03/2022.
- T30. “Next-Generation Enabling Technologies for Health Monitoring,” Rutgers University, New Jersey, NY, USA, 03/2022 (virtual).
- T31. “Next-Generation Enabling Technologies for Health Monitoring,” Rice University, Houston, Tx, USA, 01/2022 (virtual).
- T32. “Micro-Enabled Technologies for Diabetes Monitoring,” Canadian Society for Chemical Engineering, Canada, 11/2021.
- T33. “Next-Generation Enabling Technologies for Diagnosing Disease and Monitoring Therapy,” Distinguished Lecture Series, ETH Zurich, Switzerland, 05/2021 (virtual).
- T34. “Continuous Detection of Glucose and Insulin in Live Animals,” Stanford Diabetes Research Seminar, USA 05/2021 (virtual).
- T35. “Next-Generation Enabling Technologies for Diagnosing Disease and Monitoring Therapy,” Sharif University of Technology, Tehran, Iran, 12/2020 (virtual).
- T36. “Next-Generation Enabling Technologies for Diagnosing Disease and Monitoring Therapy,” IEEE Iran Section, 12/2020 (virtual).
- T37. “Next-Generation Enabling Technologies for Diagnosing Disease and Monitoring Therapy,” Rochester Institute of Technology, USA, 09/2020 (virtual).
- T38. “Next-Generation Enabling Technologies for Diagnosing Disease and Monitoring Therapy,” Emerging Trends of Bioengineering Technologies webinar series, Tehran, Iran, 08/2020 (virtual).
- T39. “Profiling cells inside and out using magnetic nanoparticles,” Smart Materials for Biological Sensing, Pittcon, Philadelphia, PA, USA, 03/2019.
- T40. “Next-Generation Enabling Technologies for Biomedical Engineering Applications,” Carnegie Mellon University, Pittsburgh, PA, USA, 03/2019.

- T41. “Next-Generation Enabling Technologies for Biomedical Engineering Applications,” University of Alberta, Edmonton, AB, Canada, 06/2018.
- T42. “Next-Generation Enabling Technologies for Biomedical Engineering Applications,” University of Waterloo, Waterloo, ON, Canada, 03/2018.
- T43. “Next-Generation Enabling Technologies for Biomedical Engineering Applications,” Delft University of Technology, Delft, Netherlands, 12/2017.
- T44. “Next-Generation Enabling Technologies for Biomedical Engineering Applications,” Stanford University, Stanford, CA, USA 10/2017.
- T45. “On-Chip Phenotypic Profiling of Circulating Tumor Cells,” York University, Toronto, ON, Canada, 07/2017.
- T46. “On-Chip Phenotypic Profiling of Circulating Tumor Cells,” Ryerson University, Toronto, ON, Canada 05/2017.

PATENTS

^ refers to the trainees supervised by Poudineh.

- P1. Leyla Soleymani, **Mahla Poudineh**, Fatemeh Bakhshandeh, Hanja Zheng[^], and Fatemeh Keyvani[^], “Electrochemical Hydrogel Microneedle Array Biosensors,” Provisional patent application (05/2024).
- P2. **Mahla Poudineh**, Fatemeh Keyvani[^], and Nandini Debnath[^], “Microcapillary Device, Electrochemical Biosensor, and Devices and Methods Thereto,” US patent application (29/04/2022).
- P3. Jason Deglint, **Mahla Poudineh**, Katie Thomas, Hamid Aghamohammadi[^]. Rapid Detection of Multiple Toxins Using a Microfluidic Device. Provisional patent application (01/2022).
- P4. **Mahla Poudineh**, Amin GhavamiNejad, Hanjia Zheng[^], and Fatemeh Keyvani[^], “Hydrogel Microneedles for Biosensing,” US patent application, serial# 17/962,055, filed on 07/10/2022, claiming priority to the US provisional patent application serial# 63/253,781, filed on 08/10/2021. Provisional patent application (7/10/2021).
- P5. **Mahla Poudineh**, Amin GhavamiNejad, Peyman GhavamiNejad[^], and Sarah A. Odinotski[^], “Microneedle Electrodes for Biosensing,” US patent application, serial# 17/963,646, filed on 11/10/2022, claiming priority to the US provisional patent application serial# 63/253,739, filed on 08/10/2021. Provisional patent application (7/10/2021).
- P6. H. Tom Soh, **Mahla Poudineh**, and Jing Pan, “Continuous Real-Time Monitoring of Biomolecules in Live Subjects,” US patent application, WO/2021/146612 (Jan 15, 2021).
- P7. Shana O. Kelly, Edward H. Sargent, **Mahla Poudineh**, Reza M. Mohamadi, and Peter M. Aldridge, Device for Magnetic Profiling of Particles in a Flow, Issued patent, US10809180B2 (20/10/2022), US20180292305A1 (11/10/2018), and WO2017054075A1 (27/09/2016).

3. TEACHING ACTIVITIES

COURSE DEVELOPMENTS

At Waterloo, Poudineh has taught several courses to nanotechnology engineering (NE) undergraduate students and electrical and computer engineering (ECE) graduate students. She received a great acclaim from students with average critique of 4.4 out of 5. In their evaluation, the students mentioned that they learnt valuable knowledge in the field of molecular biology and biosensing.

NE 381: Introduction to Nanoscale Biosystems. This course is offered to level 3 undergraduate students and designed to provide students with an overview of molecular biology required for the engineering of nanobiotechnological applications. In this course, students first learn about the structure and function of DNA, RNA, proteins, lipids as the building blocks of living organism and then will be introduced to different gold standard tools for protein and nucleic acid characterization.

Example comment from students: “She is clearly very passionate about the subject, and it was a nice way to teach this course. She introduced more applications to us, to see how what we have been learning applies in real life.”

NE 487: Nanobiotechnology and Microfluidic System. This course is offered to level 4 undergraduate students and covers the basic principle of design and fabrication methods for biomedical devices which are the basis of modern nanobiotechnology systems. Students are first familiarized with the conventional techniques used in the clinic for disease diagnosis such as ELISA and then with the current state-of-the-art of technologies and lab-on-a-chip devices and biosensors developed to simplify and improve molecular and cellular diagnostic approaches. The NE 487 course is built based on NE 381. Students learn about microfluidic systems which have been developed rapidly in recent years and emerge as a powerful tool in the field of biomedical engineering.

Example comment from students: “Prof. Poudineh, thank you for all your efforts! Your excellent organization made it much less stressful to deal with the online learning setup. You also did a wonderful job answering clarifying questions, and I appreciated how thoughtful you were in responding to us and in commenting on our presentations. I could tell from the get-go that you were invested in us learning not only useful material, but also interesting material, and I really appreciated this! Overall, I thought you did a wonderful job teaching this course!”

ECE 730: Biosensing: Fundamentals and Applications. In this course, an introduction to the field of biosensors and a quantitative view of device design and performance analysis are given. Students are introduced to different biosensing techniques, such as electrical biosensors, electrochemical biosensors, and optical biosensors with an emphasis on biomedical and environmental applications. Poudineh discusses the general principles of sampling and analysis, statistical presentation, and manipulation of data. Students also learn about the current state-of-the-art of wearable, continuous, and real-time biosensors, such as continuous glucose monitoring devices.

Example comments from students: “Mahla is a really great and enthusiast researcher in this field, and she gave us all of the energy to pursue learning about the topics,” and “The best thing about this course is that it is interactive, and students can play role in learning new concepts.”

COURSE TEACHING IN 2022-2024

Undergraduate

Term and year	Course Number	Course Title	SCPQ Q1-3 (Std Dev)	SCPQ Q4-6 (Std Dev)	# Students	% Response
Winter 2024	Sabbatical					
Fall 2023	Sabbatical					
Winter 2023	NE 487/ECE 730	Nanobiotechnology Systems and Microfluidics	4/5 (0.66)	4.18/5 (0.77)	30	30
Fall 2022	NE 381	Introduction to Nanoscale Biosystems	4.3/5 (0.6)	4.3/5 (0.6)	64	48.4
Winter 2022	NE 487/ECE 730	Nanobiotechnology Systems and Microfluidics	4.2/5 (1)	4/5 (1.1)	32	40.6

Graduate

Term and year	Course Number	Course Title	SCPQ Q1-3 (Std Dev)	SCPQ Q4-6 (Std Dev)	# Students	% Response
Winter 2024	Sabbatical					
Fall 2023	Sabbatical					
Winter 2023	ECE 730	Biosensing: Fundamentals and Applications	4.96/5 (0.1)	4.89/5 (0.24)	10	90
Winter 2022	ECE 730	Biosensing: Fundamentals and Applications	4.7/5 (0.4)	4.4/5 (0.8)	15	73.3

COURSE TEACHING IN 2020-2021**Undergraduate**

Term and year	Course Number	Course Title	<u>Critique Q 10</u>	<u>Critique Avg. Q 1-9</u>	# Students	% Response
Fall 2021	NE 381	Introduction to Nanoscale Biosystems	72/100	81.8/100	44	50
Winter 2021	NE 487	Nanobiotechnology Systems and Microfluidics	73/100	81.8/100	21	57.1
Winter 2020	NE 479	Nanobiotechnology Systems and Microfluidics	86/100	94/100	8	62.5

Graduate

Term and year	Course	Course Title	<u>Critique Q 9</u>	<u>Critique Avg. Q 1-8</u>	# Students	% Response
Fall 2020	ECE 730	Biosensing: Fundamentals and Applications	90/100	87.9/100	14	92.9

SUPERVISED TRAINEE

Category	Current	Completed	Total
PDF	4	3	7
PhD student	7	0	7
Master's student (MSc)	1	4	4
Undergraduate student (UG)	5	26	31
Visiting student	0	1	1
Research Assistant	1	2	3
Lab Manager	1	1	2

Trainee	Degree	Period	Thesis Title & Comments & Awards/Scholarship
Mayank Garg	PDF/co-advisor	02/2025 –	
Majed Amini	PDF	01/2025 –	
Roderick MacLachlan	PDF	11/2024 –	
Erfan Shirzadi	PDF	04/2023 –	Award: AMTD Waterloo Global Talent Postdoctoral Fellowships
Sadegh Sadeghzadeh	PhD	01/2023 –	Thesis Title: Developing a Microneedle Assay for Ketone Bodies and Glucose Monitoring. Sadegh's work was recently published in Advanced Materials where Sadegh is co-first author. Sadegh passed his comprehensive background exam. Award: WIN Nanofellowship.
Shadi Vajdi	PhD/co-advisor	01/2023 –	Thesis Title: An Experimental and Computational Approach for Investigating Metabolic Dynamics During Cancer Progression. Shadi transferred from master's in mathematics to PhD in ECE. Shadi passed her comprehensive background exam
Hanjia Zheng	PhD	09/2022 –	Thesis Title: Developing an Aptamer-/Antibody-Based Assay for Continuous Biomarker Sensing. Hanjia finished her master's in Poudineh group and then started her PhD studies under Poudineh's supervision. Her work was recently published in Advanced Materials. Award: WIN Nanofellowship

Trainee	Degree	Period	Thesis Title & Comments & Awards/Scholarship
Pouyan Keshavarz	PhD/co-advisor	11/2021 –	Thesis Title: Development of a Validated Discrete Numerical and Experimental Model to Investigate Physical Occlusion of Cancer Cells in Microcapillaries. Pouyan has published one paper under Poudineh's supervision as the first author in Microsystems and Nanoengineering and is currently wrapping up his second paper. Pouyan will defend his thesis in Fall 2024.
Fatemeh Keyvani	PhD	05/2021 –	Thesis Title: Developing Microneedle and Microfluidic Assays for Early Disease Detection and Therapeutic Monitoring. Fatemeh started as a master's student and then switched to PhD. Fatemeh published one paper as the first author in Nanoscale and one paper in Angewandte chemie, her recent work was accepted for publication in Advanced Science. Fatemeh has passed her proposal exam in 2022 and will defend in Winter 2024. Awards: NSERC Canada Graduate Scholarships — Doctoral program (CGS D), Ontario Graduate Scholarship (OGS) & WIN Nanofellowship
Peyman GhavamiNejad	PhD	01/2021 –	Thesis Title: Functional Hydrogel Microneedle Assays for Sensing and Delivery. Peyman published two papers as the first author: Advanced Healthcare Materials and Advanced Sensor Research, his current work was recently accepted for publication in Advanced Science. Peyman successfully passed his proposal exam in 2022. Peyman will defend his thesis in Winter 2024. Award: WIN Nanofellowship
Hesam Abouali	PhD	09/2020 –	Thesis Title: Design and Development of a Real-Time Monitoring Microfluidic Platform for Multiplexed Biomarker Detection. Hesam presented the results of his work in two conferences. Hesam has published on paper as co-first author in Analysis and Sensing and one paper as second author in Microsystems and Nanoengineering. His recent work is currently under review in ACS Nano. Hesam successfully passed his proposal exam in 2022 and will defend in Fall 2024. Award: WIN Nanofellowship
Phoebe Lee	MSc	09/2024 –	Thesis Title: Automated Antibiotic Monitoring and Delivery: VC3 System for Closed-Loop Control of Vancomycin Concentration in vivo.
Sally Yang	UG	01/2024 –	Project: Validating a Dye-Based Assay for Lipid Nanoparticle Release. Award: NSERC Undergraduate Research Award
Belle Shin	UG	05/2024 –	Project: Developing a Ferrofluidic Device for Bead Separation. Award: NSERC Undergraduate Research Award
Natalie Fudge	UG	05/2024 –	Project: Validating Multiplexed Sensors for Incorporating in Smart Brain Shunt. Award: NSERC Undergraduate Research Award
Jianwen Wang	UG	05/2024 –	Project: Developing a Gas Sensor for CO ₂ Detection.
Mara Jenkins	UG	05/2024–	Project: Developing continuous protein monitoring biosensors
Elham Azizi	MSc	04/2023 –	Position: Lab Manager

Trainee	Degree	Period	Thesis Title & Comments & Awards/Scholarship
Irfani Ausri	PDF	06/2022 – 05/2024	Irfani led the development of a novel ketone monitoring patch, and the results of her work was published in Advanced Materials.
Md Rejvi Kaysir	PDF/co-advisor	01/2022 – 12/2022	Current Position: Associate Professor (Khulna University of Engineering & Technology)
Nandini Debnath	PDF	03/2021 – 05/2022	Current Position: R&D Engineer (Applied Nanotools)
Subhamoy Biswas	MSc	09/2022 – 09/2024	Thesis Title: Machine Learning-Assisted Continuous Glucose and Ketone Monitoring for Diabetic Ketoacidosis. Current Position: PhD student in Oregon Health and Science University
Sanjana Srikant	MSc	01/2022 – 09/2024	Thesis Title: Quantum Dot Mediated Bead-Based Assays for Continuous Biomarker Monitoring in Diabetes and Lung Perfusion Systems. Current Position: Research Assistant at IDEATION Lab
Hamid Aghamohammadi	MSc	09/2020 – 09/2022	Thesis Title: Optimization of a Microfluidic Assay Computationally and Experimentally for Rapid and Sensitive Detection of Toxins in Water Samples. Hamid published two manuscripts as the first author related to his master's thesis: one published in Analytical Chemistry and one published in Lab on a Chip. Awards: Waterloo International Master's Award of Excellence (IMAE) Current Position: R&D Engineer (NeoVentures Biotechnology Inc.)
Hanjia Zhang	MSc	09/2020 – 05/2022	Thesis Title: An Optical, Microneedle-Based Biosensor Integrating Aptamer Probes for Biomarker Detection in Skin Interstitial Fluid. Hanjia published a paper as the first author in ACS Sensors related to her master's thesis and presented her work in three conferences.
Bridget MacLean	UG	01/2024 – 05/2024	Project: Developing and Validation of Flow Sensor for Incorporating in Brain Shunt.
Joshua Khatri	UG	09/2023 – 12/2023	Project: Developing a pH Sensor for Incorporating in Brain Shunt. Award: NSERC Undergraduate Research Award
Julia Kehl	UG	09/2023 – 12/2023	Project: Developing Microfluidic Devices for Continuous Monitoring. Award: NSERC Undergraduate Research Award
Justin Mehta	UG	09/2023 – 12/2023	Project: Simulating a Mixer Device Flow Behavior.
Sarah Schneider	UG	09/2023 – 12/2023	Project: Developing Individually Addressable Microneedles.
Jenny Chauhan	UG	09/2023 – 12/2023	Project: Developing Microneedle Assays for Glucose Monitoring
Braeden MacDougall	UG-FYDP	05/2023 – 03/2024	Project: Depression Recognition Empowered by Advanced Molecularly Imprinted Polymer Sensors (DREAM Sensors)
Oliver Aramini	UG-FYDP	05/2023 – 03/2024	Project: Depression Recognition Empowered by Advanced Molecularly Imprinted Polymer Sensors (DREAM Sensors)
Owen Michael Radford Carruthers	UG-FYDO	05/2023 – 03/2024	Project: Depression Recognition Empowered by Advanced Molecularly Imprinted Polymer Sensors (DREAM Sensors)
Alexander Tyden Creaghan	UG-FYDP	05/2023 – 03/2024	Project: Depression Recognition Empowered by Advanced Molecularly Imprinted Polymer Sensors (DREAM Sensors)

Trainee	Degree	Period	Thesis Title & Comments & Awards/Scholarship
Agosh Saini	UG	09/2022 – 04/2023	Project: Developing a Continuous Monitoring System for Validation of Microneedle Biosensors.
Mehal Kushalkar	UG	05/2022 – 12/2022	Project: Studying Biosensing Systems for Measuring Neurotransmitters.
Michelle Dieu Thao Huynh	UG	05/2022 – 04/2023	Project: Developing Conductive Microneedle Electrodes for Biosensing. Michelle published a paper as a first author in Advanced Sensor Research. Award: NSERC Undergraduate Research Award
Megan Dawson	UG-FYDP	01/2022 – 04/2023	Endonostix: An Improvement to the Performance and Scalability of Nomic's nELISA Platform with Applications in Endometriosis Diagnostics.
Hannah Bernstein	UG-FYDP	01/2022 – 04/2023	Endonostix: An Improvement to the Performance and Scalability of Nomic's nELISA Platform with Applications in Endometriosis Diagnostics.
Victoria Ho	UG-FYDP	01/2022 – 04/2023	Endonostix: An Improvement to the Performance and Scalability of Nomic's nELISA Platform with Applications in Endometriosis Diagnostics.
Jeriann Hsiao	UG-FYDP	01/2022 – 04/2023	Endonostix: An Improvement to the Performance and Scalability of Nomic's nELISA Platform with Applications in Endometriosis Diagnostics.
Kiran Naidoo-Edwardso	UG-FYDP	08/2022 – 04/2023	Endonostix: An Improvement to the Performance and Scalability of Nomic's nELISA Platform with Applications in Endometriosis Diagnostics.
Dragos Mantaila	UG	05/2022 – 12/2022	Project: Developing a Microneedle Biosensor for Diverse Biomarker Measurement and a Microfluidic Plasma Separation Device. Dragos published a paper as a co-author. Award: NSERC Undergraduate Research Award
Simone Abdillahi	UG	04/2022 – 08/2022	Project: Validating Insulin and C-peptide Antibodies Using ELISA. Award: NSERC Undergraduate Research Award
Sarah Odinotski	UG-RA-FYDP	04/2021 – 07/2022	Project: Developing a pH Meter Using Hydrogel Microneedle Patches. Sarah is the first author of a paper that was published in Small in 2022 related to her project. Awards: Waterloo Co-op of the Year Award; NSERC Undergraduate Research Award
Sarah Odinotski	UG-FYDP	01/2021 – 04/2022	Project: Developing an Aptamer Electrochemical Biosensor for Measuring the Stress Hormone (Cortisol)
Simon Frew	UG-FYDP	01/2021 – 04/2022	Project: Developing an Aptamer Electrochemical Biosensor for Measuring the Stress Hormone (Cortisol)
Lisa Emaline Devlin	UG-FYDP	01/2021 – 04/2022	Project: Developing an Aptamer Electrochemical Biosensor for Measuring the Stress Hormone (Cortisol)
Jessie Elizabeth Christie	UG-FYDP	01/2021 – 04/2022	Project: Developing an Aptamer Electrochemical Biosensor for Measuring the Stress Hormone (Cortisol)
Lisa Krygsman	UG	01/2020 – 05/2020	Project: Developing a Mixer Microfluidic Device for Cancer Biomarker Detection.
Mahmoud Ayman Saleh	Visiting Student/MSc	07/2021 – 05/2022	Project: Developing a Microneedle Assay for Continuous Therapeutic Monitoring. Mahmoud's paper was recently accepted in publication in Advance Science.
Melisa Khalag	MSc	01/2022 – 03/2023	Position: Lab Manager

4. SERVICE

PhD & MASTER'S THESIS COMMITTEES

- PhD Thesis External Committee Member, Shadman Khan, McMaster University, 2024 (Advisor: Tohid Didar).
- PhD Proposal Committee Member, Razieh Fazaeli, University of Waterloo, 2024 (Advisor: Yuning Li).
- PhD Proposal Committee Member, Euan Gardner, University of Waterloo, 2024 (Advisor: Alfred Yu).
- PhD Thesis Committee Member, Wenhan Hu, University of Waterloo, 2024 (Advisor: Bo Cui).
- Master's Thesis Committee Member, Ethan Piercey, University of Waterloo, 2024 (Advisor: Shirely Tang).
- Master's Thesis Reader, Michael Riad, University of Waterloo, 2024 (Advisor: George Shaker).
- Master's Thesis Committee Member, Sonja Corta, University of Waterloo, 2024 (Advisor: Mohammad Kohandel)
- PhD Thesis Committee Member, Nikhil Venkata Giri, University of Waterloo, 2023 (Advisor: Carolyn Ren).
- PhD Thesis Committee Member, Fatemeh Samaeifar, University of Waterloo, 2023 (Advisor: Hany Aziz).
- PhD Thesis Committee Member, Sahar Adnani, University of Waterloo, 2023 (Advisor: Karim Karim).
- PhD Thesis Committee Member, Md. Masud Rana, University of Waterloo, 2023 (Advisor: Dayan Ban).
- PhD Thesis Committee Member, Pei Li, University of Waterloo, 2023 (Advisor: Shirley Tang).
- PhD Proposal Exam Chair, Olakunle Betiku, University of Waterloo, 2023 (Advisor: Elliot Biro)
- PhD Thesis Committee Member, Atefeh Ghorbani, University of Waterloo, 2022 - 2024 (Advisor: Hany Aziz).
- PhD Thesis Committee Member, Robyn Klassen, University of Waterloo, 2023 (Advisor: Alfred Yu).
- PhD Thesis Committee Member, Irfani Ausri, University of Waterloo, 2022 - 2024 (Advisor: Shirley Tang)
- PhD Thesis Committee Member, Amid Shakeri, McMaster University, 2021 (Advisor: Tohid Didar).
- Master's Thesis Committee Member, Mahmoud Ayman Saleh, American University of Cairo, 2022 (Advisor: Nageh Allam).
- Master's Thesis Committee Member, Sarah Labas, University of Waterloo, 2021 (Advisor: Juewen Liu).
- PhD Background Exam Committee Member, Robyn Klassen, University of Waterloo, 2021 (Advisor: Alfred Yu).
- PhD Proposal Committee Member, Md. Masud Rana, University of Waterloo, 2021 (Advisor: Dayan Ban).
- PhD Background Exam Committee Member, Md Fahim Al Fattah, University of Waterloo, 2021 (Advisor: Dayan Ban).

- PhD Background Exam Committee Member, Anni Pan, University of Waterloo, 2020 (Advisor: Alfred Yu).
- PhD Background Exam Committee Member, Md. Masud Rana, University of Waterloo, 2020 (Advisor: Dayan Ban).
- PhD Background Exam Committee Member, Atefeh Ghorbani, University of Waterloo, 2020 (Advisor: Hany Aziz).
- PhD Background Exam Chair, Michael Riad, University of Waterloo, 2022 (Advisor: George Shaker & Raafat Mansour).
- PhD Background Exam Chair, Behkish Nassirzadeh, University of Waterloo, 2022 (Advisor: Vijay Ganesh).
- PhD Background Exam Chair, Ahmad Sayed, University of Waterloo, 2022 (Advisor: Omar Ramahi & George Shaker).
- PhD Background Exam Chair, Peng Zhang, University of Waterloo, 2020 (Advisor: Ali Safavi-Naeini & Raafat Mansour).
- PhD Background Exam Chair, Wenhan Hu, University of Waterloo, 2020 (Advisor: Bo Cui).
- PhD Background Exam Chair, Seyed Ali Hosseini Farahabadi, University of Waterloo, 2020 (Advisor: Ali Safavi-Naeini).
- PhD Background Exam Chair, Afsaneh Hojjati-Firoozabadi, University of Waterloo, 2020 (Advisor: Ali Safavi-Naeini).
- PhD Background Exam Chair, Milad Entezami, University of Waterloo, 2020 (Advisor: Ali Safavi-Naeini)

OTHER UNIVERSITY SERVICES

- ECE-Nanotechnology Hiring Committee, University of Waterloo, 02/2024 – 04/2024.
- Member, Biomedical Engineering Graduate Program Committee, University of Waterloo, 03/2024 – present.
- Member, Organizing Committee, Network for Sustainable Nanotechnology (N4SNano) Conference, University of Waterloo, 08/2022.
- Co-Organizer, Graduate Studies Theme, ECE Department Retreat, University of Waterloo, 07/2022.
- Member, Biomedical Engineering Undergraduate Program Committee, University of Waterloo (09/2021–present).
- Member, Engineering Faculty Council, University of Waterloo, 01/2022 – 01/2024.

5. PROFESSIONAL ACTIVITIES

- Member of Sponsorship Committee, MicroTAS 2025 Conference, 10/2024 – 10/2025.
- Member of Promotion Committee, MicroTAS 2024 Conference, 10/2023 – 10/2024.
- Canadian Society for Chemistry Member, 05/2020 – present.
- American Chemistry Society Member, 03/2024 – present.
- Editorial Board Members in Nature Publishing Journal (npj) Women’s Health, 06/2023 – present.

- Associate Member, CIHR College of Reviewers, 09/2022 – present.

- Journal Article Review:
 - Science Advances (2023 – present, 2 manuscripts/year)
 - Advanced Healthcare Materials (2021 – present, 6 manuscripts/year)
 - Advanced Functional Materials (2021 – present, 4 manuscripts/year)
 - Small (2021 – present, 6 manuscripts/year)
 - Chemical Engineering Journal (2021 – present, 2 manuscripts/year)
 - ACS Sensors (2020 – present, 6 manuscripts/year)
 - Lab on a Chip (2020 – present, 5 manuscripts/year)
 - Nanoscale (2020 – present, 5 manuscripts/year)
 - Analytical Chemistry (2020 – present, 4 manuscripts/year)

- Grant Review:
 - MITACS (04/2021 – present)
 - NSERC (04/2021 – present)
 - CIHR (07/2022 – present)
 - US-National Institute for Health (12/2022 – 02/2023)
 - Waterloo Internal Funding
 - Graham Seed Funding (12/2023)
 - CBB Seed Funding (12/2022)
 - CIHR-RIF (09/2022)