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### **Areas of Expertise**

Electrokinetics, Microfluidics, Low-cost fabrication, Fluid-flow Modeling, Global Health

### **Education**

<b>Ph.D. in Chemical Engineering</b> Texas A&M University Advisor: Zachary R. Gagnon Thesis: Porous Structures for Enhanced Electrokinetic Point-of-Care Diagnostics	GPA: 4.0	2023
<b>M.S. in Chemical Engineering</b> Bangladesh University of Engineering and Technology Advisor: Mohidus S. Khan Thesis: Diagnosis of kidney conditions using low-cost paper diagnostics	GPA: 3.75	2018
<b>B.S. in Chemical Engineering</b> Bangladesh University of Engineering and Technology	GPA: 3.78	2015

### **Appointments**

<b>University of California, Berkeley</b> Postdoctoral Scholar, Amy Herr lab	2023-Present
<b>Texas A&amp;M University</b> Graduate Research Assistant, Dept. of Chemical Engineering	2018-2023
<b>Bangladesh University of Engineering and Technology</b> Lecturer, Dept. of Chemical Engineering	2015-2018

### **Honors, Fellowships and Awards**

<b>American Electrophoresis Society Blue Fingers Award</b> Recognizes the most outstanding student paper submitted for the AES Annual Conference	2022
<b>Jim and Cathy Holste Graduate Fellowship Award</b> Recognizes outstanding graduate research work from a class of 135 Ph.D. students	2021
<b>NSF I-Corps Fellow</b>	2021
<b>Texas A&amp;M I-Corps Site Fellow</b>	2020
<b>Dean's Merit List for Academic Excellence, BUET</b>	2014-15
<b>1<sup>st</sup> position in Undergraduate Poster Competition, ICChE-BUET</b>	2011

## **Refereeing Activities**

- Reviewer, *Electrophoresis, Nature Food, Journal of Applied Polymer Science*

## **Journal Publications**

(300+ Citations and H-index of 7; Source: Google Scholar, accessed on October 1<sup>st</sup>, 2023)

1. Doria, S.\*, **Islam, M. N.\***, and Gagnon Z., "Leakage Current Induced Pre-Concentration of Charged Reactants", *Talanta*, 2023. <https://doi.org/10.1016/j.talanta.2023.125094> (**\*Joint first authors**).
2. **Islam, M. N.**, Mavrogiannis, N., Gagnon, Z., "Label-free Measurement of Reaction Rate Constants in Solution Using Fluidic Dielectrophoresis", *Sensors and Actuators B: Chemical*, 369, 2022. <https://doi.org/10.1016/j.snb.2022.132305>.
3. **Islam, M. N.**, Doria, S.M., Fu, X., Gagnon, Z. "Piezoresistive Conductive Microfluidic Membranes for Low-Cost On-Chip Pressure and Flow Sensing", *Sensors* 22 (4), 2022. <https://doi.org/10.3390/s22041489>.
4. **Islam, M. N.**, Yost, J., Gagnon, Z., "Rapid Prototyping and Low-Cost Liquid Handling for On-Chip Diagnostics", *Analyst*, 2022. DOI: 10.1039/d1an01676h (**Journal Cover**)
5. **Islam, M. N.**, Ahmed, I., Anik, M. I., Ferdous, S., and Khan, M. S., "Developing Paper Based Diagnostic Technique to Detect Uric Acid in Urine", *Frontiers in chemistry*, 6, 469, 2018. DOI: <https://doi.org/10.3389/fchem.2018.00496>.
6. **Islam, M. N.**, Imtiaz, M. Y., Alam, S. S., Nowshad, F., Shandman, S. A., and Khan, M. S., "Artificial ripening on banana (*Musa Spp.*) samples: Analyzing ripening agents and change in nutritional parameters", *Cogent Food & Agriculture*, 4(1), 2018. DOI:10.1080/23311932.2018.1477232.
7. Nowshad, F., **Islam, M. N.**, and Khan, M. S., "Concentration and formation behavior of naturally occurring formaldehyde in foods", *Agriculture & Food Security*, 7(1), 2018. DOI: 10.1186/s40066-018-0166-4.
8. Nowshad, F., **Islam, M. N.**, and Khan, M. S., "Analysis of the Concentration and Formation Behavior of Naturally Occurring Formaldehyde Content in Food," *International Journal of Food Engineering*, 4(1), pp. 71-75, 2018. DOI: 10.18178/ijfe.4.1.71-75.
9. **Islam, M. N.**, Mursalat, M., Khan, M. S., "A review on the legislative aspect of artificial fruit ripening", *Agriculture & Food Security*, 5(8), 2016. DOI: 10.1186/s40066-016-0057-5.
10. **Islam, M. N.**, Rahman, H. M. S., Mursalat, Rony, M. H., Khan, M. S., "Legislative Aspect of Artificial Fruit Ripening in a Developing Country like Bangladesh", *Chemical Engineering Research Bulletin*, 18(1), 2015. DOI: 10.3329/cebv18i1.26219.
11. Mursalat, M., Rony, A. H., Rahman, H. M. S., **Islam, M. N.**, Khan, M. S., "A Critical Analysis of Artificial Fruit Ripening: Scientific, Legislative and Socio-Economic Aspects", *CHE Thoughts*, 4(1), 2013.

## **Under Review**

1. **Islam, M. N.**, Gagnon, Z., "Dielectrophoretic Trapping in Paper: Paper-based Electric Field Gradients for High-Throughput Particle Trapping".
2. Yost, J., **Islam, M.N.**, Gagnon, Z. "Electrokinetic Nucleic Acid Amplification (E-NAAMP) Using Paper-PDMS Microfluidics and High-Frequency Joule Heating".
3. Mavrogiannis, N., **Islam, M.N.**, Gagnon, Z., "Label-free, non-optical biomolecular detection in unaltered human serum by interfacial electrokinetic transduction: monitoring displacement of electrical liquid interfaces by impedance spectroscopy".

### **Book Chapters**

1. **Islam, M. N.**, Bint-E-Naser, S. F., Khan, M. S., 'Pesticide Food Laws and Regulations', Pesticide Residue in Foods: Sources, Management, and Control, ed: M. S. Khan and M. S. Rahman, Springer International Publishing, 2017.
2. **Islam, M. N.**, Mursalat, M., and Khan, M. S., "A Review on the Legislative Aspect of Artificial Fruit Ripening", Advances in Food Additives, H. Naegeli, C. S. Huh, et al., Scientific Research Publishing, Chapter 3, pp. 45-69, 2016.

### **Patents**

1. **Islam, M. N.** and Gagnon, Z., "Microfluidic Pressure in paper ( $\mu$ PiP) for ultra-low-cost precision micro total analysis systems", US20230256430A1, WO2021222352A1.
2. Khan, M. S., **Islam, M. N.**, Ahmed, I., Anik, M. I., and Ferdous, S., "Low-Cost Paper Diagnostics for the Qualitative and Quantitative Detection of Uric Acid in Urine and other Biofluids", US Provisional Patent, 62672580, 17 May, 2018.
3. Khan, M. S., **Islam, M. N.**, and Mursalat, M., "Low-Cost Paper Diagnostics for the Qualitative and Quantitative Detection of Formaldehyde (Formalin, Primary Aldehyde) in Food, Water and other Biofluids", US Provisional Patent, 62457901, 12 February, 2017

### **Conference Proceedings**

1. **Islam, M. N.**, Yost, J., Gagnon, Z., "Electrokinetically Assisted Paper-Based DNA Concentration for Enhanced qPCR Sensing", Proceedings of the 1st International Electronic Conference on Biosensors, 2020. <https://doi.org/10.3390/IECB2020-07074>
2. Rahman, H. M. S., **Islam, M. N.**, Imtiaz, M Y., Pasha, A. F., Mursalat, M., Alam, S. S., Khan, M. S., "Nutritional Value Analysis of Artificially Ripened Banana (BARI-1 Hybrid Banana, MUSA SPP.)", Proceedings of the International Conference on Chemical Engineering 2014 ICChE2014, 29-30 December, Dhaka, Bangladesh.
3. Nowshad, F., **Islam, M. N.**, Khan, M. S., "Analysis of the Concentration and Formation Behavior of Naturally Occurring Formaldehyde Content in Food", Proceedings of the 4th International Conference on Food Safety and Nutrition, March 13-15, 2017, Prague, Czech Republic.

### **Conference Presentations**

1. **Islam, M. N.**, Jaiswal, B., Nagpal, S., and Gagnon, Z., "Exploring the Insulating Properties of Paper Fibers for Enhanced Electrokinetic Applications in Sample Purification and Liquid Handling", 39th International Symposium on Microscale Separations and Bioanalysis (MSB), May 21-24, 2023, Tallahassee, FL, USA.
2. **Islam, M. N.**, Doria, S., Yost, J., and Gagnon, Z., "Free-Flow Biomolecular Concentration, Separation and Detection Using Conductive-Wall Teichophoresis", 39th International Symposium on Microscale Separations and Bioanalysis (MSB), May 21-24, 2023, Tallahassee, FL, USA.
3. **Islam, M. N.**, Jaiswal, B., and Gagnon, Z., "Dielectrophoretic Pressure in Paper (DPiP): A Novel Insulator-based Dielectrophoretic Technique for Ultra-Low Cost Trapping and Separation", 2022 Annual Meeting of the AES Electrophoresis Society @ SciX, October 2-7, 2022, Cincinnati, OH, USA.
4. **Islam, M. N.** and Gagnon, Z., "Democratizing Microfluidic Innovation and Commercialization Using Microfluidic Pressure in Paper ( $\mu$ PiP) for Scalable Ultra-Low-Cost Manufacturing", Virtual AIChE Annual Meeting, 2020.

5. **Islam, M. N.**, Yost, J., Gagnon, Z., “Electrokinetically Assisted Paper-Based DNA Concentration for Enhanced qPCR Sensing”, 1st International Electronic Conference on Biosensors (Virtual), 2020.
6. **Islam, M. N.** and Gagnon, Z., “Electrokinetic Determination of Solution Phase Kinetic Properties at Microfluidic Liquid Interfaces”, 2019 Annual Meeting of the AES Electrophoresis Society @ SciX, October 13-16, 2019, Palm Springs, CA, USA.
7. **Islam, M. N.**, Mursalat, M., Anik, M. I., Ferdous, M. S., Khan, M. S., “Paper Diagnostics to Detect Formalin in Food”, 4th International Conference on Food Safety and Nutrition, March 13-15, 2017, Prague, Czech Republic.

### **Outreach and Leadership Activities**

- Organized 1st, 2nd and 3rd National Chem-e-Car competition, Bangladesh.
- Represented Bangladesh at the Japan-East Asia Network of Exchange for Students and Youths Program, Tokyo, Japan.
- Represented Bangladesh at the 6th Seoul Workshop on the Peaceful Use of Chemistry for Member States of the Organization for the Prohibition of Chemical Weapons (OPCW) in the Asian Region, Seoul, South Korea.

## ***Professional References***

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