

## Azmain Alamgir

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### EDUCATION

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- Cornell University**, Ithaca, NY June 2024 (anticipated)  
Robert Frederick Smith School of Chemical and Biomolecular Engineering  
*Doctor of Philosophy* in Chemical Engineering
- Northwestern University**, Evanston, IL June 2019  
Robert R. McCormick School of Engineering and Applied Science  
*Bachelor of Science* in Chemical Engineering (with Honors)  
*Minor* in Biotechnology & Biochemical Engineering  
Honors Thesis: "Label-Free Platform for High-Throughput Analysis of Analytes with SAMDI-MS"  
Advisor: Milan Mrksich, Ph.D.

### HONORS AND AWARDS

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- Tau Beta Pi** June 2019  
Tau Beta Pi is the premier national engineering honor society in the country, and one of the most nationally recognized societies. Membership is by invitation and is based on scholastic achievement and exemplary character
- Omega Chi Epsilon** June 2019  
Omega Chi Epsilon is the National Honor Society for Chemical Engineering
- McCormick Summer Research Grant** June 2017, 2018  
Awarded \$4000 grant for a proposal entitled "Photo-immobilization of Small Molecules" to perform research for two consecutive summers at Northwestern University under the supervision of Dr. Milan Mrksich
- Dean's List Honors** 2016-2019  
Awarded 6 of 12 quarters for receiving a grade point average of 3.75 or higher
- Poster Competition Awards**
- 2<sup>nd</sup> Place: 15th Southern School on Computational Chemistry and Materials Science Conference July 2015
  - 2<sup>nd</sup> Place: Mississippi Science and Engineering Fair Region II, Jackson State University March 2015
  - 2<sup>nd</sup> Place: Annual Meeting of Mississippi Academy of Science February 2015
- Precollege Academic Awards** 2015  
National Merit Finalist, National AP Scholar, United States Presidential Scholar Candidate

### LEADERSHIP EXPERIENCE

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- American Institute of Chemical Engineers (AIChE)** April 2018 – April 2019  
*Vice President*
- Serve as liaison between roughly 40 chemical engineering undergraduate students, faculty, and AIChE executive board
  - Spearheaded professional development initiative through industry panel, resume review, and networking events
  - Organized on-campus science demos for roughly 30 disadvantaged and underrepresented high school students from Chicago
  - Implemented new mentorship program between upperclassmen and underclassmen chemical engineering students, leading to a nearly 50% increase in freshman participation rate in AIChE sponsored events
- Searle Center for Advanced Learning & Teaching** September 2016 – June 2019  
*Senior Peer Facilitator*
- Lead weekly two-hour workshop in courses including multivariable calculus, differential equations, and organic chemistry for groups of roughly 10 students
  - Guide students through worksheets on current course topics and answer questions regarding course material
  - Record student attendance from workshop every week and participate in leadership-building activities

### RESEARCH EXPERIENCE

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**Northwestern University**, Evanston, IL  
*Research Assistant (Advisor: Milan Mrksich)*

September 2016-June 2019

- Collaborated on 2+ year project exploring use of SAMDI-MS for the development of photochemical surfaces for non-selective immobilization and characterization of small molecules
- Involved in synthesis of photochemical probes via peptide synthesis, preparation of SAM's-gold surfaces, and characterization of surface reactions using MALDI-TOF-MS
- Explored application of developed method to characterize activity of cytochrome p450 enzyme and monitor Suzuki-Miyaura coupling reaction
- Presented research findings in second author publication in *Journal of the American Chemical Society*

**Jackson State University**, Jackson, MS

July 2016 - August 2016

*Undergraduate Summer Research Assistant (Advisor: Dr. Paresh Ray)*

- Synthesized highly functionalized carbonaceous materials, hydrochar and biochar, by means of hydrothermal carbonization
- Characterized carbon materials using UV-vis, Fluorescence and Raman Spectra spectroscopy
- Presented research findings in poster and oral presentation at regional scientific conference and listed as co-author in publication in *ACS Omega*

**Jackson State University**, Jackson, MS

2014-2015

*High School Research Assistant (Advisor: Dr. Jerzy Leszczynski)*

- Involved in computational studies for optimizing geometries and calculating binding energies of host-guest complexes using density functional theory
- Synthesized urea-based receptors for sensing of halides and oxoanions and evaluated binding interactions by NMR and colorimetric titrations
- Presented research findings in poster and oral presentation at regional scientific conference

## SKILLS

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### Laboratory

- Gas Chromatography, High Performance Liquid Chromatography, Thin-Layer Chromatography, Solid-Phase Peptide Synthesis, Spectroscopy (Fluorescence, NMR, IR, Raman, MALDI-TOF-MS, UV-vis)

### Technical

- Aspen HYSYS, ChemDraw, Gaussion09, LaTeX, MATLAB, MestreNova, Microsoft Office (Word, PowerPoint, Excel), HTML, CSS, JavaScript

## PUBLICATIONS

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- 1 Helal, K. Y.; Alamgir, A.; Mrksich, M. "Traceless-Immobilization of Analytes for Analysis by SAMDI Mass Spectrometry." *J. Am. Chem. Soc.* **2018**, *40*, 8060–8063.
- 2 Gao, Y.; Pramanik, A.; Begum, S.; Sweet, C.; Jones, S.; Alamgir, A.; Ray, P. C. "Multifunctional biochar for highly efficient capture, identification, and removal of toxic metals and superbugs from water samples." *ACS Omega*, **2017**, *2*, 7730–7738.

## PRESENTATIONS

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- 1 Alamgir, A.; Helal, K.; Mrksich, M. "Label-Free Platform for High-Throughput Analysis of Analytes with SAMDI-MS," *Northwestern Undergraduate Research & Arts Exposition*. May 29, **2019**, Evanston, IL.
- 2 Alamgir, A.; Begum, S.; Pramanik, A.; Ray, P. C. "New hydrochar and biochar materials and their studies for photophysical properties by hydrothermal carbonization method," *Fourteenth International Symposium on Recent Advances in Environmental Health Research*. September 10-13, **2017**, Jackson, MS.
- 3 Alamgir, A.; Begum, S.; Pramanik, A.; Ray, P. C. "Synthesis of hydrochar and biochar materials for photophysical properties studies by hydrothermal carbonization method," *Thirteenth International Symposium on Recent Advances in Environmental Health Research*. September 11-14, **2016**, Jackson, MS.
- 4 Alamgir, A.; Jing Wang, J.; Jerzy Leszczynski, J.; Hossain, M. A. "Theoretical studies of urea and thiourea based tripodal receptors for anion binding," *Annual Meeting of Mississippi Academy of Science*. February 25-27, **2015**, Hattiesburg, MS.
- 5 Alamgir, A. Wang, J.; Leszczynski, J.; Hossain, M. A. "Theoretical studies of a sulfonamide-based molecular cleft for halides," *15th Southern School on Computational Chemistry and Materials Science Conference*. July 23-24, **2015**, Jackson, MS.

- 6 Alamgir, A; Jing Wang, J.; Jerzy Leszczynski, J. Hossain, M. A. "Computational and experimental studies of dipodal urea/thiourea receptors for anions," *The 66<sup>th</sup> Southeastern Regional Meeting of the American Chemical Society*. October 16-19, **2014**, Nashville, TN.
- 7 Alamgir, A.; Wang, J. ; Leszczynski, J.; Hossain, M. A. "Theoretical Studies of Dipodal Urea and Thiourea Receptors for Oxoanions," *14th Southern School on Computational Chemistry and Materials Science Conference*. July 14, **2014**, Jackson, MS.