

Sofia Mariapaz Abello



smabello@ncsu.edu

Linked-In QR code

EDUCATION

North Carolina State University, Raleigh, NC	May 2028
Ph.D. - Chemical Engineering	GPA 3.00
North Carolina State University, Raleigh, NC	May 2023
Bachelor of Science in Chemical Engineering - Nanoscience Concentration	GPA 3.77

RESEARCH EXPERIENCE

Graduate Student Researcher, Dr. Genzer CHE Group, NCSU Nov'23 – Present

- Produce bilayer sandwich polymer films with/without compatibilizing agents.
- Develop experimental protocols for bicomponent polymer fibers (sheath-core, side-by-side).
- Characterize impacts of processing conditions and compatibilizing agent parameters on compatibilization efficiency through tensile/adhesion tests.
- Training courses, professional development, and funding from **the Nonwovens Institute**.
- **Technical Skills/Equipment:** ADCB test, Tensile testing, heat press to produce/laminate polymer films.

Undergraduate Student Researcher, Dr. Budhathoki TECS Group, NCSU May'22 – Aug'23

- Functionalized carbon nanotube-based optical nano-biosensors with an FDA-approved polymer for the detection of disease biomarkers.
- Designed and conducted an optimization process through polymer modification(s) to push the limits of the nano-biosensor's sensitivity and brightness.
- Helped in other projects within the group for maximum efficiency including taking the lead on conducting the projects necessary for grant proposal as well as assisting in manuscript(s) writing.
- Presented at the 2022 undergraduate research symposium and in weekly research meetings.
- **Technical Skills/Equipment:** Ultrasonicator, NS minitracer spectrometer, fume hood, microcentrifuge, vacuum filtration, reflux apparatus experimental polymer modification [sulfonation], Epoxidation & crosslinking cotton seed oils for hydrophobic coatings.

Undergraduate Student Researcher, Dr. Augustyn MSE Group, NCSU May '21-'23

- Conducted & optimized thin-film electrochemical depositions of transition metal oxides.
- Ran statistical analysis on film morphology characteristics from laser profilometry data.
- Presented at the 2021 undergraduate research symposium and in weekly research meetings.
- **Technical Skills/Equipment:** Aqueous & Non-Aqueous Electrochemistry, fume hood use/training, semi-microbalance, sonicator, Biologic EC Lab [Potentiostat use], Origin, Gwyddion SPM software for CLSM data analysis, slurry preparations – manually or via Thinky planetary centrifugal mixer.

Research Methods I & II (Independent Research Study) Gastonia, NC Aug 2017-19

- Conducted literature research on using *C.elegans* as models for addictive behavior.
- Designed & conducted experiment to observe growth of two strains of *C.elegans* under positive and negative control conditions with drug of choice – caffeine.

- Collected data and ran statistical analysis on results to present in the school poster session.
- **Technical Skills/Equipment:** Fundamental collegiate-level biology/chemistry lab benchwork & glassware use, fume hood use, pipetting, microcentrifuge, autoclave-sterilization processes, handling E.coli, working with hazardous chemicals/powders, nanopore DNA sequencing device.

PUBLICATIONS

- “Carbon Nanotubes for Optical Detection of Quaternary Ammonium Compounds in Complex Media”, Hannah M. Dewey, Jaron Jones, Sydney Lucas, Shelby Hall, Nigar Sultana, Sofia Mariapaz Abello, and Januka Budhathoki-Uprety*, ACS Applied Nano Materials. August 2023.
- “Influence of Finite Diffusion on Cation Insertion-Coupled Electron Transfer Kinetics in Thin Film Electrodes”, Matthew Chagnot, Sofia Abello, Ruocun Wang, Jahan Dawlaty, Joaquín Rodríguez-López, Chao Zhang, & Veronica Augustyn*, Journal of The Electrochemical Society. January 2024.
- “Development of Optical Nanosensors for Detection of Potassium Ion and Assessment of their Biocompatibility with Corneal Epithelial Cells" H. Dewey, N. Mahmood, S. Abello, N. Sultana, J. Jones, J. Gluck, J. Budhathoki-Uprety. ACS Omega. June 2024.

PRESENTATIONS

1. RISE- Research, Innovation & Science for Engineered Fabrics Conference, “Strategies to control adhesion behavior in nonwoven mats.” Poster, Raleigh, NC October 1st, 2024
2. Southeastern Regional Meeting, American Chemical Society: “Polymer modifications to optimize nanosensor output for analyte detection.” Poster, Durham, NC October 25th, 2023.
3. NC State Undergraduate Research & Creativity Symposium: “Polymer modifications to optimize nanosensor output for analyte detection.” Poster, Raleigh, NC April 26th, 2023.
4. NC State Undergraduate Research & Creativity Symposium: “Development of optical nano-biosensors for detection of electrolytes” Poster, Raleigh, NC July 27th, 2022.
5. NC State Undergraduate Research & Creativity Symposium: “Optimization of the Electrophoretic Deposition of Nb₂O₅ Films for Electrochemical Energy Storage” Poster, Raleigh, NC, 2021.

TRAINING CERTIFICATIONS

1. **Spunbond Technology Short Course – The Nonwovens Institute [March 19-21, 2024]**
2. NC State Data Security Training, OIT, [7/5/20, 12/2/20, 2/1/22, 1/27/23]
3. Working & Returning Safely to Campus During COVID-19, EHPS, [7/5/20, 2/1/21]
4. Safety Orientation Checklist, EHPS, [6/2/21]
5. Laboratory Chemical Waste Management Training, EHPS [6/2/21, 5/22/22, 4/23/23]
6. Diversity, Equity, and Inclusion for Students, OIED, [6/8/21]
7. Laser Safety Training, EHPS, [11/9/21]
8. AIF Safety Training, COE, [3/10/23]
9. Chemical Hygiene Plan [9/6/23]

PREVIOUS WORK EXPERIENCE

Supplemental Instruction Leader, Academic Success Center, NCSU June '21-March 23

- Subjects: Organic Chemistry I & II
- Create lesson plans and study sessions for a collaborative/inclusive groupwork environment.

1:1 Appointment/Small Group Tutor, Academic Success Center, NCSU May '20-21

- Subjects: General Math & Chemistry courses

Independent Contractor - Tutor, Varsity Tutors LLC - Online Platform Nov '21-Jan '23

- Priority Subjects: Organic Chemistry I & II, Qualified for total of 17 subjects.
- Promote a personalized tutoring experience for all clients and build strong, lasting connections.

PAST AWARDS & HONORS

- NC State Undergraduate Research & Creativity Symposium Presentation Award Spring 2023
- 2022 MIT ACCESS Program Participant
- AIChE Member of NCSU Chapter
- Tau Beta Pi Engineering Honors Society
- Achieved CRLA Level 3- Master Certified Tutor [*internationally recognized tutor certification*]
- Active member of NCSU Scholars program Aug 2019-23
- American Chemical Society Scholar
- Women in Science and Engineering, NCSU Program Member
- 1st Place Selection in Freshman Engineering Design Day Competition, NCSU Sep-Dec 2019
- National Society of Leadership and Success Member
- Annual Academic Excellence in Science Award(s) May 2015-17
- Mu Alpha Theta National High School Math Honors Society
- Science National Honors Society
- National Society of High School Scholar
- International Thespian Society Member