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Dariush Aligholizadeh

Education

Aug 2020 | **B.S. in Biochemistry/Molecular Biology and Computer Science Double Major**
May 2024 University of Maryland, Baltimore County (UMBC), GPA: 3.84/4.00, Member: Honors College Baltimore, MD; Relevant Coursework: Neurobiology, Human Physiology, Advanced Organic Synthetic Methods, Biomedicinal Chemistry, Mathematical Biology, Neuroengineering, Biochemistry 1 & 2, Systems Biology, Cell Biology, Molecular & General Genetics, Organic Chemistry 1 & 2, Linear Algebra, Discrete Mathematics, Data Structures, Advanced C/C++ OOP, Statistics w/ Applications in Biology

Sept 2016 | **High School Diploma**
May 2020 Towson High School, GPA: 3.89/4.00, Rank: 14/326 (top 10%), SAT: 1450 (99^{th} percentile) Towson, MD

Publications

co-third author (co-first student authorship) Synthesis and Characterization of Magnetoplasmonic Air-Stable Au@FeCo, Jan 2023. Devadas, Mary; Smolyaninova, Vera; Krushinski, Lynn; Aligholizadeh, Dariush; Langford, Kameron; Korzi, William; Miller, Cody; Kadasala, Naveen; Zhukovskyi, Maksym; Hondrogiannis, Ellen. *DOI: 10.1021/acs.langmuir.2c02965*

(pre-print) Joint first author Cobalt-doping of the Au_{25} bi-icosahedron nanocluster to synthesize the novel $Au_{24}Co(PPh_3)_{10}(PET)_5Cl_2$, Feb 2023. Raufman, Benjamin; Aligholizadeh, Dariush; Stevens, Nathaniel; Devadas, Mary.

(pre-print) Biosynthesis of Undulated Gold Nanoplatelets using extracts of the Cercis Canadensis flower, Feb 2023. Aligholizadeh, Dariush; Turner, Wilson; Bechdel, Landon; Langford, Kameron; Zhukovskyi, Maksym; Devadas, Mary.

(pre-print) Portable Liquid-Phase Surface Enhanced Raman Spectroscopy Detection of DMMP and DMCP utilizing Branched Gold Nanostars, Dec 2022. Tewala, Youssef; Aligholizadeh, Dariush; Hondrogiannis, Nicole; Devadas, Mary.

(in peer-review) FeCo Nanoparticles for SERS Detection of Gunshot Residue Analytes on a Portable Raman Spectrometer, Dec 2022. Harper, Megan; Aligholizadeh, Dariush; Krushinski, Lynn; Hondrogiannis, Ellen; Devadas, Mary.

Scholarships & Grants

UMBC Merit Scholarship, Fall 2020 – Spring 2024, $4500 per semester
NIH Intramural Research Training Grant, Summer 2021, $9000
Louis-Stokes Alliance for Minority Participation Research Grant, Summer 2021, $3000
Rice University Gulf Coast Undergraduate Research Symposium Travel Grant, Fall 2021, $1500
ACS Travel Grant, Spring 2022, $500
UMBC Research Travel Grant, Fall 2021, $500
JSTI Mentor & Poster Judge, Summer 2022, $100
MHEC-CPIP Research Assistant Grant, 2021-2022 & 2022-2023, $5000 total
UMBC Undergrad. Research Award; UMBC Review STEM Editor, 2021-2022, $1000

Awards & Honors

UMBC President's List, Fall 2020, Fall 2021
MHEC-CPIP Nanoscience Research Outreach Program Best Mentor Award, Jul 2022
NIH Cancer Research Training Award, Summer 2021

Royal Microscopy Society International SEM Imaging Contest Top 8 (500+ entries), June 2021
UMBC Dean's List, Spring 2021, Spring 2022
USABO National Semifinalist (top 7% of 10,000 competitors), May 2020
Baltimore County Music Festival Highest Score Received, Cello & Piano Duet, Feb 2020

Research Experience

May 2019 | Present **Undergraduate Researcher/Lab Manager**, Mentor: Dr. Mary Devadas
Towson University
Inorganic Chemistry and Nanoscience Lab.
- Co-third authored a published paper (Langmuir journal) on Au doped FeCo ferrofluids
- First authoring paper on dendritic silver nanoplate synthesis and gold nanoplates
- Second authoring paper on detection of nerve agents and Raman spectral analysis with FeCo
- Accepted to and flown out all expenses paid to Rice University to present at the Gulf Coast Undergraduate Research Symposium (GCURS)
- Presented at multiple national and regional conferences, including ACS National and Regional
- Awarded the LSAMP Undergraduate Research Grant for the Summer 2021 session
- Highly experienced with Scanning Electron Microscopy (SEM/STEM), UV-Vis Spectrophotometry, FT-IR, FT-Raman Spectrometry, Fluorescence Spectrophotometry, NMR, and Flame AAS
- Trained junior members of the lab on the above instruments
- Won international placing in the RMS 2021 competition with Electron Microscopy images

June 2021 | Aug 2021 **Summer Research Intern**, Mentor: Dr. Alan Rein
National Institute of Health, National Cancer Institute
Retroviral Assembly Lab
- Trained in techniques for both general biological analyses, and specific viral analyses
- Awarded the Cancer Research Training Award for the Summer 2021 session (2% acceptance)
- Trained on Western Blot, Isothermal Titration Calorimetry, 2D NOESY NMR, Microscale Thermophoresis, switchSENSE

May 2020 | Present **Bioinformatics Assistant**, Mentor: Dr. Timothy Hamerly
Remote/Online
Infectious Diseases Lab
- Independently develop software and programs for specific lab
- Solely developed database for quick Human ortholog lookup
- Created chromatography graphing program, allows quick scanning/analysis of lateral flow assay strips

Aug 2019 | Jul 2020 **Research Assistant**, Mentor: Dr. Piotr Walczak
University of Maryland, Baltimore & Johns Hopkins School of Medicine.
Neuroradiology Lab.
- Worked on targeting of HIF1 protein and understanding its role in glioblastoma multiforme
- Worked with ImageJ and other data analysis tools
- Helped build convolutional neural network for cancer cell classification
- Trained on and worked with CryoStat, compact MRI

Oct 2020 | Feb 2021 **Undergraduate Research Assistant**, Mentor: Dr. Govind Rao
University of Maryland, Baltimore-County
Center for Advanced Sensor Technology Lab (CAST).
- Researching ELISA technique for cheaper and more accurate antigen/biomarker detection

Scientific Presentations

* Indicates that I was the presenter

American Chemistry Society (ACS) National Conference Spring 2023, Virtual, Mar 2023. Aligholizadeh, Dariush*; Turner, Wilson; Devadas, Mary. "High-yield plasma-dependent fabrication of efficient surface-enhanced Raman scattering undulated Au nanoplates". (poster)

American Chemistry Society (ACS) National Conference Spring 2023, Virtual, Mar 2023. Adegbuyi, Adelolapo; Kouneski, Samantha; Aligholizadeh, Dariush; Ehrlica, Elana; Devadas, Mary. "Synthesis and characterization of water-soluble gold nanoparticles conjugated with Cul-5 DNA for breast cancer therapy" (poster)

American Chemistry Society (ACS) National Conference Spring 2023, Virtual, Mar 2023. Qureshi, Zaid; Aligholizadeh, Dariush; McDuffie, Everette; Devadas, Mary. "Synthesis and characterization of iron-doped bi-icosahedral Au_{25} nanoclusters". (poster)

American Chemistry Society (ACS) National Conference Spring 2023, Virtual, Mar 2023. Johnson, Mansoor; Tewala, Youssef; Aligholizadeh, Dariush; Hondrogiannis, Ellen; Devadas, Mary. "Gold nanostars for the Raman spectroscopic detection of gunpowder residue agents". (poster)

American Chemistry Society (ACS) National Conference Spring 2023, Virtual, Mar 2023. Connolly, Catherine; Topka, Samantha; Aligholizadeh, Dariush; McDuffie, Everette; Devadas, Mary. "Synthesis and characterization of novel mercury-doped and cadmium-doped Au_{25} bi-icosahedron nanoclusters". (poster)

American Chemistry Society (ACS) National Conference Spring 2022, In-Person, San Diego, CA, Mar 2022. Aligholizadeh, Dariush*; Devadas, Mary. "Manipulation of the Metal Crystal Lattice to Synthesize Anisotropic Nanoparticles". (lecture)

American Chemistry Society (ACS) National Conference Spring 2022, Virtual, Mar 2022. Tewala, Youssef; Aligholizadeh, Dariush; Ivanov, Hristo; Hondrogiannis, Nicole; Devadas, Mary. "Liquid phase SERS detection of DMMP and DMCP utilizing gold nanostars". (lecture)

American Chemistry Society (ACS) National Conference Spring 2022, Virtual, Mar 2022. Raufman, Benjamin; Stevens, Nathaniel; Aligholizadeh, Dariush; Devadas, Mary. "Novel cobalt-doped bi-icosahedron Au25-xCox clusters". (lecture)

Rice University Gulf Coast Undergraduate Research Symposium (GCURS), In-Person, Houston, TX, October 2021. Aligholizadeh, Dariush*; Devadas, Mary. "Shape-directed Synthesis of Anisotropic Gold & Silver Nanostructures by Manipulating the Crystal Lattice". (lecture)

NIH Summer Conference, Virtual, August 2021. Aligholizadeh, Dariush*; Rink, Constance; Datta, Siddharta; Kroupa, Tomas; Rein, Alan. "Salt-resistant binding of Gag to HIV-1 RNA Ψ-packaging signal". (poster)

LSAMP End-of-Summer Presentation, Virtual, August 2021. Aligholizadeh, Dariush*; Tewala, Youssef; Devadas, Mary. "Shape-directed Syntheses of Anisotropic Nanostructures" (poster)

ACS National Inorganic Chemistry Conference, Virtual, April 2021. Aligholizadeh, Dariush*; Krushinski, Lynn; Hondrogiannis, Nicole; Devadas, Mary. "Optimizing in-situ longevity of Silver Nanoplates" (lecture)

UMBC Undergraduate Research & Creative Achievement Symposium, Baltimore, MD, Jan 2021. Aligholizadeh, Dariush*; Krushinski, Lynn; Hondrogiannis, Nicole; Devadas, Mary. "Optimizing in-situ longevity of Silver Nanoplates" (lecture)

Binghamton University Undergraduate Research Conference, Virtual, Oct 2021. Raufman, Benjamin; Stevens, Nathaniel; Aligholizadeh, Dariush; Devadas, Mary; "Synthesis and characterization of the bi-icosahedral Au25-Cox nanocluster" (lecture)

Binghamton University Undergraduate Research Conference, Virtual, Oct 2021. Tewala, Youssef; Aligholizadeh, Dariush; Devadas, Mary; "Liquid Phase Surface Enhanced Raman Spectroscopy Detection of DMMP and DMCP utilizing Branched Gold Nanostars" (lecture)

Towson Undergraduate Research Conference, Towson, MD, Sept 2020. Aligholizadeh, Dariush*; Devadas, Mary. "Gold and Silver Nanoplates: Green Syntheses" (lecture)

UMBC Undergraduate Research Symposium, Baltimore, MD, Oct 2019. Aligholizadeh, Dariush*; Brown, Pierce; Langford, Kameron; Devadas, Mary. "Advances in Silver Nanoplate Synthesis: Effect of Variance of Trisodium Citrate" (poster)

Scientific Outreach

Oak Ridge Institute for Science and Education (ORISE) Joint Science and Technology Institute (JSTI) Mentor & Poster Judge, Jul & Aug 2022

○ Assisted six groups of four to six children in the creation and design of professional scientific posters at the culmination of their Department of Energy funded summer internship

○ Selected to judge posters that were presented as part of the JSTI summer poster presentations for STEM outreach

MHEC-CPIP Funded Nanoscience Research Outreach Program, Summer 2022, Spring 2023

○ Designated as outreach group leader for underrepresented minority students from Oxon Hill and Flowers High School during a 4-week science outreach program that culminated in a scientific presentation given by the students

○ Have led the MHEC funded outreach group for two years and have been commended on my dedication to teaching the junior students about a future in research sciences

○ Nominated for and awarded the Best Peer Mentor award

Baltimore County Public Schools Science Outreach Group Leader, May 2021

○ Was an outreach group leader for a virtual Nanoscience workshop designed for High School Students

Towson High School Science Outreach Group Leader, Jan 2020 & Jan 2021

○ Conducted outreach hosting the local High School in our Towson University lab and showing them our day-to-day tasks

○ Demonstrated a chemical synthesis of Gold Nanoparticles and taught about the synthesis mechanism

○ Helped interested teenagers see the applications of chemistry and become interested in research

Work Experience

July 2021 – Present | **UMBC Review Lead STEM Editor/Reviewer**

University of Maryland, Baltimore-County

○ Interviewed and accepted for a position as executive STEM editor for the college-wide research journal

○ Communicate with Professors, Undergraduates, and review publications for inclusion in the 2022 version of the UMBC Review, published Jun 2022 in print and virtual editions

June 2021 – Present | **Research Lab Packing Coordinator**

Towson University

○ Accepted as a Contingent staff member for packing and transferring Towson University research labs to the New Science Complex

○ Worked alongside faculty and staff to ensure safe inventory and transferring of chemicals, personal materials, and glassware

June 2018 – Nov 2019 | **Head Math Instructor**

Kumon Math & Reading Center, Cockeysville, MD

○ Led other math instructors and demonstrated excellent mathematical knowledge and communication skills

○ Graded and tutored children ages 5 – 12 in mathematical skills ranging from basic algebra to advanced calculus II

Leadership Experience

Jan 2022 – Present | **Undergraduate Teaching Assistant – Cell Biology**

University of Maryland, Baltimore-County

○ Volunteer position as undergraduate teaching assistant for a 300-level course in advanced cellular biology

○ Held exam review sessions for the class of 150+ students, have led a solo recitation section with 20-35 students for the past two semesters and have helped junior Teaching Assistants better understand the role and grading requirements

Jan 2021 – Present | **Devadas Nanoscience Lab Manager**

Towson University

○ Assist P.I. in laboratory management tasks

○ Mentoring junior lab members and teaching them how to use lab equipment

○ Ensure safety protocols and create standard operating procedures

Feb 2021 – Present | **Devadas Nanoscience Lead Electron Microscope Operator**

Towson University

○ Sole operator of the Electron Microscope from March 2021 to Sep 2021, imaging undergraduate students' samples and assisting in multiple projects

○ Mentoring graduate students and teaching them how to use the electron microscope

○ Photography recognized in international competition (RMS 2021 Microscopy Shortlist Top 8)

Volunteer Experience

Jul 2022 – Present | **Letters to a Prescientist Mentor**

Remote.

○ Volunteered as a letter writer to young middle school and high school students looking to explore a future in science

○ Been in the program for two cycles of students and have sent letters back in forth in communication with my pen-pal prescientist

Jun 2022 | **Petey Green Project Youth Services Center Tutor**

Aug 2022 Youth Services Center, Washington D.C.

- Volunteered as a tutor helping incarcerated youth further their education towards a G.E.D.
- Independently taught groups of 3-5 students in subjects such as High School English, Math, Biology, and life skills such as filing taxes or filling out birth certificates

July 2021 | **Baltimore City Math Coach (Reach Together Program @ UMBC)**

Jan 2022 Cherry Hill Elementary/Middle School & Arundel Elementary School, Baltimore, MD

- Volunteered and independent Math Coach working with 3 groups (7^{th} grade, 5^{th} grade, and 2^{nd} grade) helping underrepresented and impoverished communities enrich their Math education
- Worked alone on developing lesson plans and guiding students with ranging proficiencies in English in their journey through Math
- Specifically chosen to work with students performing 2-3 years below their appropriate education level