

Jada R. Hoyle-Gardner, Ph.D.

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Education

Post-doctoral Research Fellow

Rollins School of Public Health, Emory University

Title: The Application of Molecular Tools to Study the Effects of Household Air Pollution on Maternal and Infant Health

Doctor of Philosophy, Environmental Sciences (biomolecular sciences)

Florida A&M University, Tallahassee, FL

Thesis Title: Uranium Removal from Polluted Soil using *Bacillus Species* and Investigation of Mechanism through Proteomics Studies

Bachelor of Science, Chemistry

Spelman College, Atlanta, GA

Thesis Title: Investigation of the Effects of Lanosterol on the Aggregation of BL-Crystallin

Grants & Fellowships

IRACDA Fellowships in Research and Science Training (FIRST) (K12GM000680)

Role: Post-doctoral Fellow

NIEHS Graduate and Postdoctoral Training in Environmental Health Sciences and Technology (T32ES012870)

Role: Research Fellow Trainee/Postdoctoral Fellow

Chemistry and Biochemistry Scholars Program

Role: Research Assistant

Experience

POSTDOCTORAL RESEARCH FELLOW; EMORY UNIVERSITY, (NOVEMBER 2021-PRESENT)

- Understanding how food preparation practices effect infant microbiome and maternal metabolome in rural Guatemalan infants and their mothers.
- Build empirical evidence connecting the involved biological pathways from air pollution exposure to changes in biological mechanisms in pregnant women.
- Quantify metabolomics datasets from exposed breastmilk samples using R studio software.
- Organize data to communicate/present in weekly meetings.

Mentor: Sheela Sinharoy, Ph.D

PH.D. CANDIDATE; FLORIDA A&M UNIVERSITY, SCHOOL OF THE ENVIRONMENT (AUGUST 2017- DECEMBER 2021)

- Analyzed total uranium concentration in samples using ICP-OES (induced coupled plasma optical emission spectroscopy).

- Investigated the effects of biosorption conditions on uranium uptake into *Bacillus* sp. for best bioremediation application.
- Prepared protein samples for LC/MSMS analysis (liquid chromatography with tandem mass spectrometry) for determining proteomic mechanism(s) responsible for remediation behavior.
- Evaluated top upregulated and downregulated proteins expressed in uranium exposed *Bacillus* sp. samples using Scaffold software.
- Composed a first-author manuscript and contributing author manuscripts for publication.
- Managed laboratory and served as the graduate mentor to research interns.

Research Mentors: Victor Ibeanusi Ph.D. and Ashvini Chauhan., Ph.D.

INTERN, RESEARCH ASSISTANT; SPACE BIOSCIENCES DIVISION, NASA AMES RESEARCH CENTER, SILICON VALLEY, CA (JANUARY 2021-MAY 2021)

- Understanding how *Bacillus subtilis* can use acetate as an energy source under carbon-less environments in space.
- Extensive literature review on the basics on in-space manufacturing and using *B. subtilis* as a microbe of interest.
- Built a metabolic base model matching typical *B. subtilis* growth dynamics that allowed for enzyme modifications to mimic carbon-less environments.
- Created weekly reports to present data to interdisciplinary lab colleagues.

Research Mentor: Jonathan Galazka Ph.D.

INTERN, RESEARCH ASSISTANT; ENVIRONMENTAL SCIENCES DIVISION, OAK RIDGE NATIONAL LABORATORY (ORNL), OAK RIDGE, TN (MAY 2018-AUGUST 2018)

- Study of the mechanism behind the movement/production of methylmercury in sediment and streams in Oak Ridge, TN.
- Gathered and prepared soil samples for mercury content.
- Facilitated kinetic experiments which included monitoring mercury fate and transport in soil, analyzing mercury using the Lumex instrument, and determining the shift in mercury concentration over time.
- Led kinetic experiments to see how mercury is absorbed on the solid and aqueous phase.
- Engaged with other scientists on campus to assist in roundtable discussions on weekly discoveries.

Research Mentor: Scott Brooks., Ph.D

INTERN, RESEARCH ASSISTANT ☐ CHEMISTRY DEPARTMENT, GEORGIA STATE UNIVERSITY, ATLANTA, GA (MAY 2016-AUGUST 2016)

- Fully funded (Award #126274) REU summer research program
- Worked alongside an interdisciplinary group to investigate a controllable way to produce H₂S for pharmaceutical application.
- Investigated the rate of production for stable H₂S donors during products.
- Ran quality control on products by utilizing HPLC (high-performance liquid chromatography) for resulting compound detection and analysis.
- Explored the possibility of new H₂S donors to be used in cancer drug delivery research.

Research Mentor: Binghe Wang, Ph.D.

NSF STEM UNDERGRADUATE RESEARCH EDUCATOR (SURE); SPELMAN COLLEGE, ATLANTA, GA (MAY 2015-MAY 2016)

- Examined how a student's gender affected their response and participation in a STEM based classroom
- Evaluated which classroom set up and activity (i.e. group projects, individual games, weekly tests) best helped students retain what they learned
- Worked alongside other SURE fellows to promote an interactive and interdisciplinary classroom
- lesson plan in Atlanta Public Schools

Research Mentors: Viveka Borum, Ph.D. and Shannon Sung, Ph.D.

UNDERGRADUATE RESEARCH ASSISTANT ; CHEMISTRY AND BIOCHEMISTRY DEPARTMENT, SPELMAN COLLEGE, ATLANTA, GA (JANUARY 2014-MAY 2017)

- Studied the effects of various concentrations of CaCl_2 to control and irradiated α -Crystallin.
- Investigated the application of a possible chemical (lanosterol) shown to slow down or stop the effects of cataracts.
- Coordinate fluorescence studies (steady-state fluorescence and ANS-binding fluorescence) under UV radiation to analyze the resulting α -Crystallin structure.
- Used UV-Visible absorbance spectroscopy to quantify the extent of aggregation (turbidity) of α -crystallin before, during, and after heat-induced aggregation.

Research Mentor: Lisa Hibbard, Ph.D.

Peer-Reviewed Publications

- 1) **Hoyle-Gardner, J.**, Badisa, VLD, Li, R., Ibeanusi, V., and B. Mwashote. 2022. Uranium biosorption from aqueous solution by metal-resistant strain *Bacillus* MRS-1 bacterium. *Journal of Environmental and Public Health*. (*under review*)
- 2) **Hoyle-Gardner, J.**, Badisa, VLD, Mwashote, B., Rakesh, S., and V. Ibeanusi. 2022. Non-indigenous bacterium response for adaption to uranium exposure through shotgun proteomic analysis. *Applied Microbiology and Biotechnology*. (*under review*)
- 3) **Hoyle-Gardner, J.**, Badisa, VLD, Ibeanusi, V., Jones, W., Gaines, T., Lowenthal, H., Tucker, L. and B. Mwashote. 2021. Lead metal biosorption and isotherms studies by metal resistant *Bacillus* strain MRS-2 bacterium. *Journal of Basic Microbiology*. 1-12.
- 4) **Hoyle-Gardner, J.**, Badisa, VLD, Ibeanusi, V., Mwashote, B., Jones, W., and A. Brown. 2020. Application of Innovative Bioremediation Technique using Bacteria for Sustainable Environmental Restoration of Soils from Heavy Metals Pollution: A Review. *Journal of Bioremediation & Biodegradation*. 11:3.
- 5) Chen, G., Li, R., Ibeanusi, V., **Hoyle-Gardner, J.**, Crandall, C., Seaman, J., and A. Anandhi. 2019. Bacterial-Facilitated Uranium Transport in the Presence of Phytate at Savannah River Site. *Chemosphere*. 223, 351 - 357. doi.org/10.1016/j.chemosphere.2019.02.064.
- 6) Ibeanusi, V., Pathak, A., Chauhan, A., **Hoyle-Gardner, J.**, Cooper, T., Turker, L., Howard, H., Obinegbo, O., and J. Seaman. 2018. Genome-Centric Evaluation of *Bacillus* sp. strain – ATCC55673 and Response to Uranium Biomineralization. *Significances Bioeng. Biosci.* 2(3). doi: 10.31031/SBB.2018.02.000539.

Scientific Presentations

- **Jada Hoyle-Gardner**; Victor Ibeanusi, Ashvini Chauhan, Charles Jagoe, Gang Chen, Runwei Li, and Veera Badisa. "Uranium Removal From Contaminated Environments Using *Bacillus* Species." Colgate's Smile with Science Symposium. 2022.

- Jada Hoyle-Gardner; Victor Ibeanusi, Veera Badisa, Gang Chen, and Ashvini Chauhan. "Application of Microbes for Bioremediation of Contaminated Environments." Colgate's Smile with Science Symposium. 2022.
- Jada Hoyle-Gardner. "Bacteria: Friendly Neighborhood Cleaner." Dow Diamond Symposium 2020.
- Jada Hoyle-Gardner; Victor Ibeanusi, Veera Badisa, Benjamin Mwashote, and John Seaman. "Reveal of Uranium Bioremediation Mechanisms by Bacillus Species through Proteomics Studies." Waste Management (WM) Symposium 2020; Phoenix, AZ.
- Jada Hoyle-Gardner; Victor Ibeanusi, Veera Badisa, Gang Chen, Ashvini Chauhan, Benjamin Mwashote, and John C. Seaman. "Investigation of Pathways to Predict Bioremediation of Uranium at Nuclear Sites." NOBCCHE 46th Annual National Conference; St. Louis, MO.
- Jada Hoyle-Gardner; Victor Ibeanusi, Haley Howard, Ashvini Chauhan, Rajneesh Jaswal, Charles Jagoe, John C. Seaman, Ben Mwashote. "Analysis of Growth Dynamics and Protein Expressions of Microbial Mediated Biomineralization of Uranium Contaminated Soils at Savannah River Site, Aiken, SC." NOBCCHE 45th Annual National Conference 2018; Orlando, FL.
- Jada Hoyle-Gardner; Victor Ibeanusi, Haley Howard, Ashvini Chauhan, Rajneesh Jaswal, Charles Jagoe, John C. Seaman "Analysis of Growth Dynamics and Protein Expressions of Microbial-Mediated Biomineralization of Uranium Contaminated Soils at Savannah River Site, Aiken, SC" 19th International Conference on Heavy Metals in the Environment; University of Georgia; 2018 July; Athens, GA.
- Jada Hoyle-Gardner; Aria Williams; Dr. Lisa B. Hibbard. "Investigation of the Effects of Lanosterol on the Aggregation of BL-Crystallin." Spelman College Research Day at Spelman College; 2017 April; Atlanta, GA.
- Jada Hoyle-Gardner; Patience Mukashyaka; Dr. Lisa B. Hibbard. "UV Radiation and CaCl₂ Effects on the Chaperone Behavior of α -Crystallin." Emory University-Laney Graduate School STEM Research and Career Symposium at Emory Conference Center; 2016 September; Atlanta, GA.
- Jada Hoyle-Gardner; Bingchen Yu, Dr. Binghe Wang. "Hydrogen Sulfide (H₂S)- The Third Gasotransmitter." NSF REU Program Poster Session at Georgia State University; 2016 July; Atlanta, GA.

Teaching Experience

Teaching Assistant (January 2018-December 2021)

Sources and Control of Environmental Pollution Course Section Number: EVR 5260

4 Credit Hours

Lead Instructor: Michael Abazinge, Ph.D.

Responsibilities

- Co-organized lecture materials for students prior to class
- Facilitated tutoring sessions when needed
- Created and graded midterm and final tests

Program of Excellence in STEM (PE-STEM) Project (May 2020-May 2022)

Tallahassee, FL

Responsibilities

- A US Department of Education Funded Grant Program (under Minority Science and Engineering Improvement Program (MSEIP)) year-round STEM academy for high schoolers to engage in STEM based lessons and group projects alongside undergraduate and graduate FAMU students.

- Developed and led instructional activities for high school students interested in STEM majors
- Assisted Program Directors in program operation, implementation, and planning

Teaching Assistant (January 2018-December 2021)

Introduction to Environmental Science Course Section Number: EVR 4007

4 Credit Hours

Lead Instructor: Michael Abazinge,

Responsibilities

- Facilitated classroom lectures biweekly
- Organized group study sessions
- Created and graded midterm and final tests

Morehouse College Teaching Assistant (May 2017-August 2017)

Summer Upward Bound Math and Science Program, Morehouse College, GA

Responsibilities

- Organized chemistry lessons and activities for high school students during and after classes
- Prepared quizzes and tests
- Led classroom hands on experiments when needed
- Coordinated one-on-one tutoring sessions for students after classes

Teaching Assistant (August 2015-May 2017)

General Chemistry I,II Lab; Organic Chemistry I Course

Section(s): CHE 111/112; CHE 231

3 and 4 Credit Hours

Responsibilities

- Helped prepare the laboratory prior to class.
- Graded weekly pre-lab quizzes and lab reports
- Aided students when needed during lab procedures

STEM Undergraduate Research Educator (SURE) Summer Intern (May 2015-August 2015)

Grady High School, GA

Responsibilities

- Curated classroom chemistry and biology-based activities to engage students.
- Facilitating weekly “student suggestion” forms to determine feedback from the classroom.
- Assisted students with completion any summer coursework needed for promotion to the next grade level.
- Aided lead teacher in grading homework and tests.

Upward Bound Summer Assistant (May 2014-August 2014)

Summer Upward Bound Math and Science Program, NJIT, Newark, NJ

Responsibilities

- In addition to RA duties, tutored students in select STEM courses and organized games and activities to engage the assigned group.
- Monitored any academic or personal changes with students during the program.

Honors

Colgate Smile with Science Symposium Presenter (2022)

First Place (Showcase & Research Contest), Alpha Kappa Mu Honor Society 2021 Convention (2021)

2020 David Cooper Scholarship Recipient (Florida Section - Air and Waste Management Association)

DOW 2020 Diamond Symposium Attendee (2020)

NOBCCChE (The National Organization for the Professional Advancement of Black Chemists and Chemical Engineers) Colgate-Palmolive Poster Session Award Recipient (2019)

FAMU School of Graduate Studies and Research Travel Grant (2019)

NOBCCChE Advancing Science Conference Grant (ASCG) (2018, 2019, 2022)

Department of Energy Office of Environmental Management MSIPP (Minority Serving Institutions Partnership Program) Grant Funding Recipient (2017-2022)

ACS (American Chemical Society) Certification (2017)

Spelman College's Departmental Service Award (2017)

First Place, Spelman College's Annual Research Day (2017)

First Place, Spelman College's Annual Research Day (2014)

Affiliations and Professional Societies

American Public Health Association

Emory University's Postdoctoral Council for Diversity (EU-PCD)

Alpha Kappa Mu Honor Society (AKM)

Sigma Xi, The Scientific Research Honor Society (Associate Membership)

Alpha Chi Sigma Professional Fraternity

National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE)

American Chemical Society (ACS)

Trainings, Licenses, & Certifications

Inclusive STEM Teaching

Responsible Conduct of Research for Postdocs, Medical Research Fellows and Early Career Researchers

Infectious Disease Transmission Models for Decision-Makers (Coursera)

Columbia University's Microbiome Data Analytics Boot Camp: Planning, Generating, and Analyzing 16S rRNA Gene Sequencing Surveys

NIH Resilience Training Program (RTP)

Leadership Certificate Program Leadership Certificate Program (Emory University School of Medicine)

Human Subject Research Track (RCR) (CITI Program)

Essential Epidemiologic Tools for Public Health Practice Essential Epidemiologic Tools for Public Health Practice (Coursera)

Mentoring Experience

CuriOdyssey STEMCorps Program Mentor (2022-Present)

- This connects a trained team of educators, mentors, caregivers and community partners to support youth from underrepresented communities and empower them to pursue opportunities to engage in Science, Technology, Engineering and Math (STEM) learning.

Spelman College/Braven Program Mentor (Summer 2022)

- The Spelman/Braven Mentoring Program is a professional mentorship for recent Spelman College graduates to help them secure an opportunity and cultivate the skills needed to excel.

Greater Opportunities Advancing Leadership and Science (GOALS) Guest Speaker (Summer 2021)

- Facilitated a discussion to with the attendees of the 2021 GOALS Girls and Youth Leadership Institute at the Intrepid Sea, Air & Space Museum. This personal dialogue included information about working as an environmental scientist (school, personal experiences), along with a Q & A session.

School of the Environment, CORE Laboratory Mentor (2018-2021)

- Aide selected undergraduates in becoming comfortable with laboratory techniques and safety. Also, helped them complete presentations for various symposiums.

HBCU Virtual College Tour Speaker (Spring 2021)

- Presented to middle and high schoolers on the importance of attending an HBCU. Specifically spoke on the transition from high school to college, along with adapting to STEM classes.

FAMU Dreamers, Inc (January 2019-August 2020)

- Met with local elementary and middle school students biweekly to introduce age level.

Undergraduate Laboratory Mentor (2016-2017)

- Mentored undergraduate students in laboratory protocols and giving scientific talks for planned conferences.

Community Outreach

Research Symposium Judge (August 2022)

- Judged several posters from a host of other undergraduate programs across at Georgia State University (Atlanta, Ga) (included The CASA Georgia State, the MARC program, HIP, Beckman, and more) and provided any professional feedback when necessary.

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