

Anuradha Goswami, PhD

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RESEARCH INTEREST

Water and wastewater treatment, Advanced Oxidation Process, environmental microbiology and genomics, environmental dimensions of antimicrobial resistance (AMR), microbial fuel cell, evolutionary engineering, environmental quality assessment and sustainability.

EDUCATION

Ph.D., Water and Environmental Engineering, Glasgow Caledonian University, Glasgow, UK. 2020

M.Tech. Environmental Science and Engineering, Birla Institute of Technology, Mesra, India. 2015

B.Tech. Genetic Engineering, SRM University, Chennai, India. 2012

PROFESSIONAL MEMBERSHIP

Post-Doctoral Research Member, Association of Environmental Engineering and Science Professors.

Ambassador, AMR Insights: Antimicrobial resistance, AMR Insights B.V. Amsterdam / The Netherlands

RESEARCH VISION

My training in environmental engineering and informatics techniques will facilitate the assessment of contamination of emerging concerns, role of environmental stressors (pollution) in selecting for antimicrobial resistance (AMR) and applying oxidation processes and microbial fuel cell technology to devise a hybrid water and wastewater treatment method- working toward one health approach and a circular economy. In long term, I aim to facilitate a stewardship program based on my scientific evidence to translate sanitation and hygiene practices, AMR awareness, through community engagement and collaboration with stakeholders to conceptualize a policy on the environmental dimension of AMR.

TEACHING PHILOSOPHY HIGHLIGHTS

- Follow diversity, equity, and inclusion principle in and outside the class.
- Students' affirmation to practice effective communication, substantial collaboration, and active learning tasks involving creativity and critical thinking- "4Cs Magic Mantras".
- Challenge students with a task in a class and practice a think-pair-share teaching strategy.
- Practice response strategy to understand students' interpretation of the topic taught and discussed.

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow, The University of Alabama at Birmingham (UAB), 2020- Present. Work on environmental microbiology and genomics projects.

Credential Course Instructor, UAB Honors Science and Technology Program, 2022 – Present

Visiting Scientist, UAB, 2020. Teach UAB honors students majoring in different disciplines.

Visiting Research Scholar, Zweckverband Bodensee, Lake Constance Water Supply, Company headquarters-Stuttgart, Germany, 2017. Worked on Ozonation application at an industrial scale.

Senior Research Fellow, Water Technology Centre, Indian Agricultural Research Institute, Delhi, India. 2015- 2016. Worked on Phytoremediation to sequester heavy metals from water.

Research Trainee, Min-Mec Consultancy Pvt. Ltd., New Delhi, India, 2015. Trained in water characterization and microbiology skills.

GRANTS AND AWARDS

- **Career Enhancement Award** by the Office of Postdoctoral Education, UAB, Birmingham, USA “Environmental Pollution: A concerning link in water ecosystem selecting for Antimicrobial Resistance Gene”. \$1,500 as a Principal Investigator for 2022-2023.
- **Young Scientist Award** from MSD Educational Trust, India “Understand evolutionary mechanism to select for antimicrobial resistance (AMR)”. \$6,000 as a Principal Investigator for 2022-2023.
- **Winner, Most Community Minded Award**, 2022, awarded by Office of Postdoctoral Education, UAB.
- **Nominee**, UAB President’s Diversity Champion Award 2023.
- **Finalist**, 3 Minute Thesis Competition, 2019, awarded by Glasgow Caledonian University (GCU).
- Travel and accommodation grants from the GCU Research budget to visit conferences in Zagreb, Croatia and Edinburgh, UK, during the PhD program.
- Best poster presentation, 1st Postgraduate Conference, 2018 Glasgow Caledonian University.
- **GATE Scholar- National Graduate Aptitude Test in Engineering (GATE) Scholarship** awarded by the Central Government of India for the Master of Technology after qualifying for the GATE examination.

GRANT UNDER REVISION

NIH K99/R00 Pathway to Independence Award as a Principal Investigator, under revision by NIEHS.

UNSUCCESSFUL GRANTS: Written and reviewed research ideas for my potential future grants

- 2022, Signals in the Soil (SitS), NSF on the microbial fuel cell. Grant applied as a Co-investigator. **PANEL RECOMMENDATION: Competitive**
- 2021, Alabama Center of Excellence (ALCoE) on wetland bioremediation. Grant applied as a Co-investigator. **PANEL RECOMMENDATION: Competitive**

MULTI-DISCIPLINARY SCIENTIFIC CONTRIBUTIONS

Citations 37 (ResearchGate), 35 (Google Scholar) as of Jan 15th, 2023; h-index 4

Environmental Engineering: Designing water treatment

Peer Reviewed Journal

Goswami, A., Jiang, J-Q, Petri M, Treatability of five micro-pollutants using modified Fenton reaction catalyzed by zero-valent iron powder (Fe(0)), Journal of Environmental Chemical Engineering, 2021, 9(1):105393. DOI: 10.1016/j.jece.2021.105393 [**Impact Factor: 7.9**]

Goswami, A., Jiang, J-Q, Comparative performance of catalytic Fenton oxidation with zero-valent iron (Fe (0)) In comparison with ferrous sulphate for the removal of micropollutants, Applied Sciences, 2019, 9(11), 2181. DOI: 10.3390/app9112181 [**Feature Paper; Impact Factor: 2.8**]

Goswami, A., Jiang, J-Q, Petri M, Non-Parametric Regression Analysis of Diuron and Gabapentin Degradation in Lake Constance Water by Ozonation and Their Toxicity Assessment, Water, 2019, 11(4), 852. DOI: 10.3390/w11040852 [Impact Factor: 3.5]

Goswami, A., Jiang J-Q, Simultaneous quantification of Gabapentin, Sulfamethoxazole, Terbutryn, Terbutylazine and Diuron by UV-Vis spectrophotometer, Biointerface Research in Applied Chemistry, 2018, 8 (1), 3111.

Conferences:

Goswami, A., Jiang, J-Q, Zero valent iron catalytic Fenton oxidation in the treatment of micro pollutant – evidence of synergetic effect. Poster presentation, 16th IWA Leading Edge Conference on Water and Wastewater Technologies, June 2019, Edinburgh, UK.

Goswami, A., Jiang, J-Q, Modified Fenton oxidation process employing iron powder for the treatment of water and wastewater containing pharmaceuticals. Paper presented, 9th Biennial Seminar on Water Resources and Environmental, 2018 Edinburgh, UK.

Goswami, A., Jiang, J-Q., Petri M, Comparative performance of catalytic oxidation with ferrous sulphate and iron powder to treat Terbutryn and Diuron in drinking water. Paper presented IWA 10th Eastern European Young Water Professionals Conference, 2018 Zagreb, Croatia.

Goswami, A., Jiang, J-Q, Degradation of Diuron and Gabapentin by Ozonation in Drinking Water Treatment, Poster presentation, 1st Postgraduate Conference, Glasgow Caledonian University, 2018, Glasgow, UK.

Goswami, A., Kumar, N, Assessment of Fenton Oxidation as Pre-Treatment Option for Municipal Landfill Leachate, Poster presentation, Water and Health- Managing Water Quality, India Water Week-2016, New Delhi, India

Environment quality assessment: Antimicrobial Resistance (AMR) Genes in the environment

Peer Reviewed Journal

Goswami, A., Adkins-Jablonsky, S.J., Barreto Filho, M.M., Schilling, M.D., Dawson. A., Heiser, S., O'Connor, A., Walker, M., Roberts, Q., Morris, J.J., Heavy metal pollution impacts soil bacterial community structure and antimicrobial resistance at the Birmingham 35th Avenue Superfund Site, bioRxiv 2022.04.12.488090. DOI: 10.1101/2022.04.12.488090. **Revision submitted to Microbiology Spectrum. [Impact Factor: 9.0]**

Conferences:

Goswami, A., Fowler, B.R., Adkins-Jablonsky, S., Morris, J.J., Revisiting potential antimicrobial resistance (AMR) emerging sources: Landfill survey, AEESP Research and Education Conference, St. Louis, June 28-30, 2022.

Goswami, A., Morris, J.J., Assessing incidence of antibiotics resistance genes at polluted versus non-polluted sites using bioinformatics tools, Advancing Data Technologies to corner AMR, Online, May 23, 2022.

Goswami, A., Morris, J.J., The likelihood of landfill site as a source point of the incidence of antibiotic resistance genes (ARG): A Case study in Birmingham, Alabama, UAB Postdoc Research Day 2021, Birmingham, AL.

Jablonsky, S.A., **Goswami, A.**, Morris, J.J., Roberts, Q., Aksycn, R., Gregory, S., Aler, K., Dawson, A., Bennett, B. Assessment of antibiotics resistance metagenome in heavy metal polluted sites in North Birmingham, AL, 2021 Florida and Southeastern Branch American Society for Microbiology. March 25th-26th, 2021.

Evolutionary Microbiology

Conferences:

Goswami, A., Entwistle, E., Morris, J.J., Social Networking in marine bacteria leads to reductive evolution through loss of function: Black Queen Hypothesis, The Joint Aquatic Sciences Meeting (JASM), Grand Rapids, Michigan, May 14th-20th, 2022. **(Manuscript to be submitted to The ISME Journal is under preparation)**

Goswami, A., Morris, J.J., 16S Data Processing for microbial profiling: Insight Black Queen Hypothesis, 42nd Annual South-eastern Phycological Colloquy, November 2020, Birmingham, AL.

TEACHING EXPERIENCE

SP2022 STH 395-56 Honors Proposal Preparation (IDEA Survey Score 4.3/5); FA2022 STH 395-56 Honors Proposal Preparation (IDEA Survey Score 4.4/5); SP2023 STH 395-56 Honors Proposal Preparation

Course Summary: Proposal preparation is a UAB Honors course in junior and senior years. I have designed a course structure which educates the student about research proposal expectations by institutions such as NSF and NIH. They are also taught to prepare a written proposal for honors thesis research. The students must network in UAB to build their committee for the proposal and, later, the UAB Honors thesis defense.

SP2022 STH 400-36 Honors Thesis Preparation (IDEA Survey Score 4.8/5); FA2022 STH 400-64 Honors Thesis Preparation (IDEA Survey Score 4.9/5); SP 2023 STH 400-37 Honors Thesis Preparation; SP2023 STH 400-45 Honors Thesis Preparation

Course Summary: I mentor students in preparing a thesis for their honors thesis research and a scientific publication reporting the research. I have designed a course module syllabus and class schedule and trained students on scientific writing and presentation. The course involves peer review sessions for students to evaluate the research plan and presentations of fellow students. Students are expected to demonstrate skill as an editor of the written work of others and a researcher to conduct and write their thesis. Students' progress is evaluated after defending their thesis before their committee. I serve as a committee member for some of my students.

FA2022 STH 299-2D Interdisciplinary Seminar Clinical Innovation (IDEA Survey Score 4.1/5)

Course Summary: Sophomore students from interdisciplinary fields are enrolled on this course. I have modified the existing course. The course requires students to build a business model on real clinical problems. I have made a common theme: Antibiotic Resistance for students to work in teams to build a business solution. Finally, I have drafted the course report writing guidelines, which students must use for the final submissions.

SP2023 STH 201-AU Research Approaches: EGR

Course Summary: This course is designed for engineering major students to attain laboratory skills in engineering. They must choose their topic of interest and learn to build a project. I lecture on this course for the first time in Spring 2023 and have developed the syllabus, quizzes, course requirements, and objectives.

SU2023 BY 271-OV Biology of Microorganisms

Course Summary: This course is designed for major biology undergraduate and graduate students to understand the cell physiology and genetic and molecular mechanisms of microorganisms.

UNIVERSITY SERVICES

- Executive Board Member, Peer Group Co-Chair, Office of Postdoctoral Education, UAB.
- Collaborating with UAB Informatics to organize and deliver workshops on basic R programming and QIIME analysis.
- Judge, Fall Undergraduate Research Expo 2021 and Summer and Spring Undergraduate Research Expo 2022, UAB.
- Moderated UAB Biology department visit to Five Miles Creek Water Reclamation Facility, Birmingham, AL, in Spring 2022.
- Organization and leadership excellence, Elected Chair in the Research in Sustainable Environments (RiSE)- 2nd and 4th Postgraduate Conference, Glasgow (2018 and 2019) and worked with Glasgow Caledonian University (GCU), Glasgow to coordinate conferences.
- Served Graduate school, GCU, as a Ph.D. Research Student Leader for a one-year term (2018-2019).

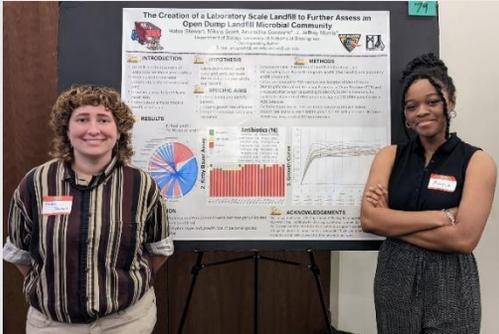
STEM OUTREACH

- I have been actively involved in outreach events and have volunteering experiences at Glasgow Science Festival and teaching at a high school as a UK STEM Ambassador from 2017-2019.
- Promoting Women in Science, Diversity and Equity by mentoring undergraduate students from diverse cultures

MENTORING EXPERIENCE

STUDENT NAME	TRAINING PERIOD	PROGRESS
Bela Fowler	October 2021 – March 2022	Presented a poster at the Alabama Academy of Science (AAS) in 2022
Halee Stewart	February 2022- Present	Presented a poster at AAS, and UAB Summer Research Expo in 2022
Mikyala Scott	Capstone Research, Summer Internship, 2022	Presented a poster for UAB Summer Research Expo, 2022
Isabella Parkhurst	August 2022- Present	Conducting a research thesis under me
Vivian Adams	September 2022- Present	Currently, she is getting trained in research safety and microbiology research skills.

FEW OF THE PROUD MOMENTS WITH UAB



Halee Stewart (Left) and Mikyla Scott, capstone research (Right), undergraduate students- **my mentees presented their research at the UAB research expo.**



The clinical Innovation class applied an interdisciplinary approach to propose a business model to combat the Antibiotic resistance challenge. Their report is under revision by UAB Honors and will be submitted for peer-review publication. The cohort of 11 students will include all co-author as first authors.



Featured in the UAB Biology **Fall2022 Diversity, Equity & Inclusion** newsletter.



Organized UAB Biology trip to a water reclamation facility in Birmingham, AL