Swati Agrawal

Assistant Professor at University of Mary Washington
Fredericksburg, VA, US

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Biography

Dr. Agrawal's research focuses on protozoan pathogens that cause serious diseases like African sleeping sickness, Chagas disease, Leishmaniasis and Toxoplasmosis. Her work in molecular pathogenesis uses molecular techniques like CRISPR-cas9 to identify and characterize new determinants of pathogenicity in these parasites. She is also interested in studying bacteriophages as possible cure for the rising antibiotic resistance problems in food borne pathogen Bacillus cereus and Bacillus anthracis. This work is an expansion of original research work that freshman Biology student participate in her Phage Hunters course as part of Howard Hughes medical institute initiative to provide new and engaging research experiences to undergraduate classrooms. Freshman biology student engage in two semesters of authentic research isolating and characterizing novel bacteriophages that can be used in phage therapy. She has developed classroom interventions aimed at improving biomolecular visual literacy in students. These active learning tools use Augmented reality to illustrate three dimensional structures of proteins and nucleic acids helping students better understand and retain structure and function concepts in Cell biology, biochemistry and molecular biology. Her ongoing research focuses on creating accurate and compelling molecular and cellular visualizations that will support research, learning and scientific communication.

Areas of Expertise

Molecular Biology (CRISPR-cas9 gene editing), Microscopy (Fluorescence, Scanning and Transmission Electron Microscopy), Biochemistry, Bioinformatics, Biomolecular Visualization (PyMOL, MolStar, Augmented Reality and Virtual Reality)

Event Appearances

Lecture: Phage Therapy
Undergraduate STEM Research Society

Lecture: CRISPR-cas9 Gene-editing Technology
Life after Covid

Lecture: Improving Visual Literacy Using PyMOL, Augmented Reality
6th Catalyst Conversation

Education

Washington College, Chestertown, MD
Visiting Assistant Professor

University of Michigan, Ann Arbor
Postdoctoral Fellowship

University of Georgia, Athens
Ph.D. Cell Biology

North Maharashtra University
M.S. Microbiology

Babasaheb Ambedkar University
B.S. Microbiology

Accomplishments

2022-2023 Jepson Fellowship
for research on Characterization of cell death pathways in Kineoplastid parasites to create a new tool kit for understanding apoptosis pathway in C. fasticulata parasites

Supplemental Faculty Development Award
UMW CAS, for attending the annual conference for ASBMB and NCUR

External Grant Application Award
for writing the ABLE grant

Association for Biology Lab Educators Roberta William Teaching Grant
for developing a research-intensive course in Molecular Parasitology

American Society for Cell Biology PALM Fellowship
for developing novel classroom tools improving biomolecular visualization

Brazilian Federal Foundation Travel and Research Grant
for support and Evaluation of Graduate education to visit Universidade Federal de Uberlandia, Uberlandia, Brazil

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