Arlington, VA 22204

René KM Xavier, Ph.D.

rene.km.xavier@icloud.com

Dr. Xavier is a DARPA Innovation Fellow with a Ph.D. in Integrative Biology and 12 years of project management experience. She specializes in molecular and synthetic biology, biomanufacturing, and bioinformatics, and is passionate about sustainability, conservation, and science education. As a U.S. Navy veteran, Dr. Xavier has strong troubleshooting, communication, and organizational skills.

Education

Florida Atlantic University Harbor Branch Oceanographic Institute – Boca Raton and Ft. Pierce, FL

Ph.D. in Integrative Biology **May 2023**
Dissertation: A Metagenomic Approach to the Biosynthesis of Marine Natural Products
Master of Science in Integrative Biology **Oct 2019**

Department of Energy Joint Genome Institute – Walnut Creek, CA
Certificate of Training, Microbial Genomics and Metagenomics Workshop **Mar 2019**

University of Washington – Seattle, WA
Bachelor of Science in Molecular, Cellular, Developmental Biology **Sep 2011**
Minor in Marine Biology

Cascadia Community College – Bothell, WA
Associate of Science, Faculty Honors **May 2009**

Naval Nuclear Power Training Command – Charleston, SC and Ballston Spa, NY **Apr 2002-Oct 2003**

Publications

ORCID iD: https://orcid.org/0000-0003-2381-8449

Xavier, R. K. M. and Mincer, Tracy, J. (2024). Characterizing the microbiome and virome of the Indian River Lagoon during dysbiosis. *Fronteirs in Marine Science* **In Review**

Uppal, S., Metz, J. L., Xavier, R. K. M., Nepal, K. K., Xu, D., Wang, G., & Kwan, J. C. (2022). Uncovering Lasonolide A Biosynthesis Using Genome-Resolved Metagenomics. *MBio*, *13*(5) **Oct 2022**

Florida Ocean Alliance. (2021). *Florida Ocean News.* www.floridaoceanalliance.org **Mar-Sep 2021**

Xavier, R. K. M., Xu, D., McCarthy, P. J., Yang, S., & Wang, G. (2021). Genome Sequence of Streptomyces sp. Strain HB-N217, Isolated from the Marine Sponge *Forcepia* sp. *Microbiology Resource Announcements*, *10*(8). https://doi.org/10.1128/MRA.01410-20 **Feb 2021**

Chen, Y., Metz, J., Miller-Xavier, R. K., & Wang, G. (2020). Unlocking a new target for streptomycetes strain improvement. *Synthetic and Systems Biotechnology*, *5*(1), 33–34. https://doi.org/10.1016/j.synbio.2020.02.001 **Oct 2020**

Work and Research Experience

DARPA Innovation Fellow – Defense Advanced Research Projects Agency, Arlington, VA **Jun 2023-Present**
Defense Sciences Office, Ana Saplan, M.S.

Manage an innovative portfolio of 9 performers whose aim is to rapidly generate high-quality datasets to annotate unknown gene function with high-confidence. Led a multidisciplinary team in the development of cutting-edge technologies with potential for military and civilian applications. My responsibilities included collaborating with top researchers and industry experts, identifying emerging technologies, and fostering a culture of innovation within the organization. I spearheaded projects that pushed the boundaries of what is possible, leveraging advanced research to address complex challenges and drive technological breakthroughs. My work as a DARPA Innovation Fellow exemplified my ability to translate visionary ideas into tangible solutions with real-world impact.
Hold Secret government security clearance.

Graduate Research Assistant – FAU HBOI, Ft. Pierce, FL **Sep 2021-**
Department of Biological Sciences, Tracy Mincer, Ph.D. **Dec 2022**

Performed metagenomic analysis of marine environments to discover novel marine natural products. Mined complex microbial communities producing secondary metabolites using metagenomics and metatranscriptomics. Discovered potential biomarkers for Harmful Algal Blooms in Florida's Indian River Lagoon. Explored the microbiome and metabolic potential of *Leiodermatium* sponge symbionts. **Jul 2018-Dec 2020**

Graduate Research Assistant – Florida Ocean Alliance, Remote **Jan-Sep 2021**

- Published quarterly newsletter *Florida Ocean News* and developed new Squarespace website.
- Collaborated with a 26-member Board of Directors for media content.
- Communicated to a diverse audience the latest local, state, and federal ocean news and its impact on Florida's Blue Economy, ocean and coastal resilience, and human and natural infrastructure.

Graduate Teaching Assistant – FAU, Boca Raton and Ft. Pierce, FL **Aug 2017-**

- Taught General Microbiology (Fall) and Marine Microbiology Molecular Biology (Spr). **May 2019**

Production Engineer – Valent BioSciences Corporation, Osage, IA **Dec 2013-**

- Subject Matter Expert on DeltaV distributed control system, continuous sterilization, and large-scale microbial fermentation. **Jun 2016**
- Led root cause investigations using 6σ DMAIC process to improve production processes.
- Wrote standard operating procedures and batch records for new equipment and processes.
- Developed training program for the 35-person operations department.

Fulbright Fellowship – Academy of Sciences of the Czech Republic, Prague, CZ **Sep 2012-**
Institute of Experimental Botany, Viktor Žárský, Ph.D. and Martin Potocký, Ph.D. **Jun 2013**

- Researched regulation of reactive oxygen species in polarized cell growth by demonstrating a protein interaction between NADPH oxidase and Rop GTPases in growing pollen tubes of *Nicotiana tobacum* using Yeast 2 Hybrid screening, GST pull-down, and fluorescent proteins.
- Genetically cloned, expressed, and purified recombinant proteins. Transformed pollen with DNA utilizing the Biolistic Particle Delivery System. Operated confocal microscope to perform Fluorescence Resonance Energy Transfer.

Internship – Emerald BioStructures, Bainbridge Island, WA **May 2012-**

- Purified various proteins by affinity chromatography utilizing the AKTA system. **Aug 2012**

Internship – Charles University, Faculty of Science, Prague, Czech Republic **Jun 2010-**
Department of Experimental Plant Biology, Viktor Žárský, Ph.D. **Sep 2010**

- Studied the molecular switch of exocytosis: protein interactions between NADPH oxidase and Rop GTPases within *Arabidopsis thaliana.*

Lab Aide and Undergraduate Researcher – Fred Hutchinson Cancer Research Center, Seattle, WA **Jan 2009-**
Basic Sciences Division, Mark Groudine, M.D., Ph.D. and Hector Rincon, Ph.D. **Sep 2011**

- Investigated the protein code regulation of UpSET, a *Drosophila melanogaster* homolog of mammalian MLL5 (a leukemia oncogene), by mining transcription factor libraries.

Nuclear Electrician's Mate Second Class Petty Officer, E-5 – United States Navy **Nov 2003-**
USS Harry S Truman, Reactor Electrical Division **Nov 2007**

- Worked with a team of 30 personnel to operate a nuclear power plant safely and efficiently.
- Organized and directed the Reactor Electrical training program, which obtained above-average scores during the Operational Reactor Safety Exam.

Technical Skills

Bioinformatics	R, BASH, Linux, Python3, GitHub, Anvi'o, Kbase, DNA/RNAseq, NCBI BLAST, gene alignments, phylogenetic & phylogenomic trees, (q)PCR primer design, FAIR data management, *de novo* assembly methods, metagenomic quality control, taxonomy and functional analysis, big data analysis
Microbiology Techniques	cell-size fractionization, direct & indirect staining, gram staining, cell culture
Molecular Biology & Synthetic Biology Techniques	protein expression, SDS-PAGE, protein immunoblot (Western Blot), Yeast Two-Hybrid (Y2H), Glutathione S-transferase (GST) pull-down, molecular cloning, DNA/RNA extraction from tissue and purification, reverse-transcriptase polymerase chain reaction (RT-PCR), quantitative-PCR (qPCR), restriction enzyme digestion, gel electrophoresis, bacteria transformation, *in vitro* transcription/translation (IVT)
Biochemistry Techniques	small-scale protein purification using chromatography (Ion Exclusion, Size Exclusion) and beads (Ni^{+2}, GST), indirect immunofluorescence
Microscopy	light microscope, confocal microscope LSM-510 Duo, hemocytometer

Public Speaking

Discovering Unknome Function Hybrid Workshop – Defense Sciences Office, Boston, MA **Dec 2023**
Presentation: *Discovering Unknome Function Advanced Research Concept*

Indian River Lagoon Symposium – Harbor Branch Oceanographic Institute, Ft. Pierce, FL **Feb 2023**
Poster: *The Microbiome and Virome of the Indian River Lagoon: For Better or For Worse*

FAU Marine Science Friday – Harbor Branch Oceanographic Institute, Ft. Pierce, FL **Nov 2022**
Public Lecture: *Exploring Marine Microbiomes and Viromes using Shotgun Metagenomics*

Indian River Lagoon Symposium – Harbor Branch Oceanographic Institute, Ft. Pierce, FL **Apr 2022**
Presentation: *The Microbial Diversity of the IRL from a Metagenomic Perspective*

Marine Natural Products Gordon Research Seminar – Ventura, CA **Mar 2022**
Poster: *A Comparative Metagenomic Analysis of* Leiodermatium *Sponges*

Florida Association of Environmental Professionals Annual Conference – Virtual on Remo **Sep 2021**
Lecture: *Indian River Lagoon Microbial Community*

HBOI Marine Science Friday – Virtual on Zoom **Mar 2021**
Public Lecture: *Marine Natural Products: From the Seafloor to the Medicine Cabinet*

FAU Marine Science Seminar – Virtual on WebEx **Sep 2020**
Lecture: *Shotgun Metagenomics of Marine Environments*

Indian River Lagoon Symposium – Harbor Branch Oceanographic Institute, Ft. Pierce, FL **Feb 2020**
Poster: *A Shotgun Perspective of the Microbial Diversity in the Indian River Lagoon*

HBOI Science Seminar – Ft. Pierce, FL **May 2019**
Lecture: *A Metagenomic Approach to Biosynthesis of Marine Natural Products*

Graduate Profession Student Association (GPSA) Research Day – Boca Raton, FL **Apr 2019**
Poster: *A Metagenomic Approach to Predicting Toxin Biosynthesis in Harmful Algal Blooms*

Ocean Discovery Visitor's Center – Ft. Pierce, FL **Mar 2019**
Public Lecture: *Pulling Back the Curtain on Biosynthesis of Marine Natural Products*

Indian River Lagoon Symposium – Harbor Branch Oceanographic Institute, Ft. Pierce, FL **Feb 2019**
Poster: *Pulling Back the Curtain on Biosynthesis in Harmful Algal Blooms*

Fellowships/Honors/Awards

DARPA Innovation Fellowship, DARPA, Arlington, VA	**Jun 2023-Present**
Indian River Lagoon Graduate Research Fellowship, FAU HBOI, Ft. Pierce, FL	**Jan 2019-2022**
Graduate Diversity Fellowship, FAU, Ft. Pierce, FL	**Jun 2019**
First Place in Cellular Biology at GPSA Research Day, FAU, Boca Raton, FL	**Apr 2019**
Presidential Fellowship, FAU, Ft. Pierce, FL	**2017-2019**
Three Minute Thesis (3MT) People's Choice Heat 7 Champion, FAU HBOI, Ft. Pierce, FL	**Oct 2018**
Fulbright Fellowship, Academy of Sciences of the Czech Republic, Prague, CZ	**Sep 2012-Jun 2013**
Faculty Honors, Cascadia Community College, Bothell, WA	**Jun 2009**
Presidential Honors, Cascadia Community College, Bothell, WA	**Mar-Sep 2008**
Honorable Discharge from the United States Navy—EM(N)2 (SW)	**Nov 2007**

Clubs, Memberships, Volunteering, & Hobbies

Veterans of Foreign Wars	**2014-Present**
FAU Veteran Owls	**2017-2023**
NCBI Codeathon—Petabyte-Scale Sequence Search Metagenomics Benchmarking Codeathon	**Sep 2021**
Florida Beach Cleanups—International Coastal Cleanup, Treasure Coast Waterway Cleanup	**2018-2021**
SCUBA Diving—Professional Association of Diving Instructors (PADI) Rescue SCUBA Diver	**Sep 2017**
Naturalist—Abrolhos National Marine Park, Bahia, Brazil	**Aug 2013**

Languages

English (native), Portuguese (intermediate), Spanish (beginner), Czech (beginner)