

Mariana Rius

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EDUCATION

Stony Brook University, School of Marine and Atmospheric Sciences
Doctor of Philosophy, Biological Oceanography
College of Charleston, Department of Biology
Bachelor of Science, Marine Biology
Minors, Chemistry & Spanish

Stony Brook, NY
August 2014 – January 2021
Charleston, SC
August 2009 - May 2012

DOCTORAL AND POSTDOCTORAL RESEARCH

Stony Brook University, School of Marine and Atmospheric Sciences, Department of Ecology and Evolution, Principal Investigators: Dr. Jackie Collier and Dr. Joshua Rest, *Stony Brook, NY*

February 2021 - August 2021. Differential gene expression (RNAseq) in pigmented (wildtype) and genetically modified carotenoid-less *Aurantiochytrium limacinum* (heterotrophic marine protist, Stramenopile) strains under nutrient and oxidative stress growth conditions.

August 2014 - January 2021. Determining the evolutionary origins through phylogenetics of thraustochytrid carotenoid biosynthesis; Developing and applying a transformation system for the inactivation of carotenoid biosynthesis in *Aurantiochytrium limacinum*.

RELEVANT SKILLS

Languages: Native fluency in Spanish and English; Beginner French and Italian

Bioinformatics/ Programming: Proficiency in R/Rstudio, Unix/BASH, RNAseq data analysis, phylogenetics, MobaXTerm, High Performance Computing Clusters (module, slurm), AWS Console, beginner python

Computer Skills: Proficiency in Microsoft Word, PowerPoint, Excel, Outlook, BioEdit, Mega, Dendroscope, Notung, Inkscape, ZEN 3.0, i-control, Endnote, Google Drive, Slack, Zoom, protocols.io, beginner LaTeX

Technical Lab Bench Skills: primer design, Infusion cloning, *E. coli* transformation including plasmid extraction and cryopreservation, genomic DNA extraction, RNA extraction, nucleic acid quantification (NanoDrop), PCR and colony PCR (*E. coli* and *A. limacinum*), gel electrophoresis, gel extraction, restriction digest, microplate growth assays including nutrient optimization, antibiotic inhibition, and growth with oxidative stressors, thraustochytrid culture (liquid and solid media) and transformation by electroporation, fluorescence microscopy, spectrophotometry, Nile red and propidium iodide staining

PUBLICATIONS

Rius, M., Rest, J.S., Filloramo, G.V., Novák Vanclová, A.M.G., Archibald, J.M., Collier, J.L. (2021). A novel origin of eukaryotic carotenoid production in a diverse group of heterotrophic protists. (in preparation)

Rius, M. (2021). *Evolutionary origins, regulation, and function of carotenoid biosynthesis in the marine heterotrophic eukaryote, Aurantiochytrium limacinum* (Publication No. 28315974) [Doctoral dissertation, Stony Brook University]. ProQuest Dissertations Publishing.

Faktorová, D., et al. (2020). Genetic tool development in marine protists: emerging model organisms for experimental cell biology. *Nat Methods* 17, 481–494.

Rius, M., Collier, J.L. (2019). Electroporation of *Aurantiochytrium limacinum* (ATCC MYA-1381). protocols.io <https://dx.doi.org/10.17504/protocols.io.8xyhxpw>.

Rius, M. (2018). Zoospore Isolation of *Aurantiochytrium limacinum*. protocols.io <https://dx.doi.org/10.17504/protocols.io.u73ezqn>.

George A., Zand D.J., Hufnagel R.B., Sharma R., Sergeev Y.V., Legare J.M., Rice G.M., Scott Schwoerer J.A., **Rius M.**, Tetri L. Gamm D.M., Bharti K., Brooks B.P. (2016). Biallelic Mutations in MITF Cause Coloboma, Osteopetrosis, Microphthalmia, Macrocephaly, Albinism, and Deafness. *Am J Hum Genet.* Dec 1;99(6):1388-1394.

MENTORING EXPERIENCE

Department of Chemistry, Stony Brook University, *Stony Brook, NY*

May 2019 - August 2021. Michael Horowitz, Masters Student: Are carotenoids involved in the oxidative stress response of *Aurantiochytrium limacinum*?

Department of Ecology and Evolution, Stony Brook University, *Stony Brook, NY*

November 2018 - May 2020. Xegfred Lou Quidet, Undergraduate Student: The effects of hydrogen peroxide on the growth of *Aurantiochytrium limacinum*.

November 2018 - May 2019. Bingyuan Zhu, Undergraduate Student: The relationship between cell density and optical density (OD) of *Aurantiochytrium limacinum*.

June - September 2019. Elizabeth Yaboni, Summer High School Student: An investigation of the biological purpose of carotenogenesis and a method for assessing viability in *Aurantiochytrium limacinum*

Simons Summer Research Program, Stony Brook University, *Stony Brook, NY*

June - August 2018. Sarah Kelso, Simons Summer High School Student: Inactivation of the carotenoid synthesis gene in a non-photosynthetic marine protist

June - August 2018. Kylan Bao, Simons Summer High School Student: Inactivation of a proteorhodopsin-like gene in *Aurantiochytrium limacinum* by double homologous recombination

School of Marine and Atmospheric Sciences, Stony Brook University, *Stony Brook, NY*

May - August 2015. Kevin Crawford, Undergraduate Student: Effects of varying media glucose:nitrogen ratio on growth of *Aurantiochytrium limacinum*

TEACHING EXPERIENCE

Stony Brook University, *Stony Brook, NY*

Guest Lecturer - Bioinformatics and Computational Biology (BIO 312), College of Arts and Sciences
Phylogenetics as a Research Application, September 30, 2019

Guest Lecturer - Oceanography (MAR 104), School of Marine and Atmospheric Sciences
Marine Primary Producers, November 8, 2016
Ocean Acidification, December 6, 2016

Instructor - Fundamentals of Scientific Inquiry in Biological Sciences IIA (BIO 205)
Undergraduate Biology, College of Arts and Sciences, January 2015 - May 2015

Teaching Assistant - Marine Mammals (MAR 370)
School of Marine and Atmospheric Sciences, August 2014 - Dec 2014

College of Charleston, *Charleston, SC*

Instructor (Peer Teacher) - Spanish 202 Conversation (SPAN202-C)
Department of Hispanic Studies January 2011 – May 2012

High Schools

Guest Lecturer - AP Spanish, Port Jefferson High School, *Port Jefferson, NY*
Acidificación del Océano, December 12, 2016

Guest Lecturer - The Frost School, *Rockville, MD*
Molecular and Marine Biology, November 23, 2016

LEADERSHIP AND OUTREACH

The Carpentries (<https://carpentries.org/>)

Certified Instructor, Instructor Training Participant

Stony Brook University, Women in Science and Engineering

Leadership Workshop Series Participant

Stony Brook University, Graduate Writing Programs

Dissertation/ Thesis Writing Boot Camp Program Leader

Online

June – July 2021

Stony Brook, NY

March 2021 - April 2021

Stony Brook, NY

Feb 2021 - May 2021

Stony Brook University, Collier and Rest Labs

Phylogenetics Pipeline Tutorial Leader

Growthcurver R package Workshop Leader

Organizer and Moderator of the 2019 Summer Research Symposium

Stony Brook, NY

June 2020

April 2020

August 2019

Protocols.io

EBSCO Webinar Panelist, Supporting Open Research Workflows and Digital Collaboration

protocols.io

May 4, 2020

Ambassador, Ambassador Program

December 2018 - Present

Long Island Aquarium

Meet an Oceanographer - Microorganisms

Riverhead, NY

May 20, 2017

Stony Brook University, Center for Inclusive Education

Panelist Speaker for Graduate School Preview Day

Stony Brook, NY

August 18, 2017

Panelist Speaker for Graduate School Preview Day

November 17, 2016

Diversity Recruitment Team at SACNAS 2016, Long Beach, CA

October 2016

Diversity Recruitment Team at SACNAS 2015, Washington D.C.

October 2015

Mental Health Association, Families Foremost Support Center

Volunteer Adult Education Tutor

Rockville, MD

September 2013 – June 2014

College of Charleston, Counseling and Substance Abuse Services

Volunteer Peer Counselor

Charleston, SC

August 2010 – May 2012

PROFESSIONAL DEVELOPMENT

Stony Brook University, The Graduate School

Ph.D. Career Ladder Program Participant

Stony Brook, NY

May 2020 - August 2020

SUNY Research Foundation

Mentoring Program Participant - Protégé

Albany, NY

Sept 2019 - June 2020

FELLOWSHIPS AND AWARDS

Stony Brook University, Center for Inclusive Education

Turner Summer Research Grant (\$5000)

Stony Brook, NY

2020

Turner Conference Travel Award (\$1200)

2016

Turner Conference Travel Award (\$695)

2015

Dr. W. Burghardt Turner Fellowship (\$50,000)

2014