VANESSA I. GUERRA, PhD

Scientist
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Molecular geneticist and bioinformatician with 10+ years of experience in reproductive and genomics research. Author of 6 manuscripts for peer-reviewed journals including 2 first-author papers.

EDUCATION

Ph.D. in Biological Sciences, Simon Fraser University 2020
Thesis title: Evolution of mating systems and reproductive genes in sea stars

M.S. in Biology, San Francisco State University 2014
Concentration in Ecology, Evolution, and Conservation Biology
Thesis title: Population variation at a self-incompatibility locus in a marine invasive species

B.S. in Biology, Humboldt State University 2010

EXPERIENCE

Life and Environmental Sciences, University of California Merced (Merced, CA) 2021 – Present
Postdoctoral Scholar
Leading a multi-species genomic analyses to better understand their susceptibility to environmental change.

Simon Fraser University & Smithsonian (Burnaby, BC and Washington, DC) 2015 – 2020
Research Assistant | Visiting Research Fellow
Analyzed reproductive genes evolution using genome and transcriptome analysis (assemblies, SNP calling, annotation, differential expression, and selection analysis)

Wake Forest University 2014 – 2015
Laboratory Manager
Developed next generation sequencing (NGS) protocols and led NGS workshops. Trained undergraduate and graduate students in molecular biology.

San Francisco State University 2010 – 2014
Graduate Student
Described genetic variation in a reproductive gene (cloning, Sanger sequencing, primer optimization, genome analysis)

Smithsonian Environmental Research Center 2009 – 2010
Intern
Identified marine invertebrates and algae. Performed data analysis.

PUBLICATIONS

- Hart, M.W (2021). "Cloning and selfing affect population genetic variation in simulations of outcrossing, sexual sea stars." Biological Bulletin *in review*.
- Guerra, V.I., Haynes, G., Byrne M., Hart, M.W. (2020). "Selection on genes associated with the evolution of divergent life histories: Gamete recognition or something else?" *Accepted in Evolution and Development*
- Hart, M.W., Guerra, V.I., Byrne, M., & Puritz, J. (2020). "Genomic data improve coalescent inference across a range of demographic parameters and life-histories". *Molecular Ecology in review*
- Guerra, V.I., Haynes, G., Byrne, M., Yasuda, N., Adachi S., Nakamura, M., Nakachi, S., and Hart, M.W. "Nonspecific expression of fertilization genes in the crown-of-thorns *Acanthaster* cf. *solaris*: Unexpected evidence of hermaphroditism in a coral reef predator." *Molecular Ecology* 29, no. 2 (2020): 363-379
- Hart M.W., Stover D.A., Guerra V.I., Mozaffari S.V., Ober C., Mugal C.F., Kaj I. "Positive selection on human gamete-recognition genes". *PeerJ* 6 (2018): e4259
- Hart M.W., Guerra V.I. "Finding genes and lineages under selection in speciation". *Molecular Ecology* 26, no. 14 (2017): 3587-3590

TECHNICAL SKILLS

Molecular: NGS library construction; Sanger sequencing; cloning; primer design; molecular protocol adaptations

Bioinformatics: Perl programming; Unix; R programming; workflow design; image analysis; population genetics analysis; phylogenetic analysis; git/version control; NGS toolkits

OUTREACH

- Volunteer tutor, Latino Student Fund 2020
- Co-founder, SFU-Omics Group, Simon Fraser University 2017 – 2019

GRANTS & FELLOWSHIPS

- Simon Fraser University: Graduate Fellowship 2018, 2020
- The Society for Integrative and Comparative Biology, Best practices for using NGS-based datasets (NSF-funded): Participation Grant 2018 – 2019
- University of Washington, Friday Harbor Laboratory: Robert L. Fernald Endowed Scholarship & Larry McEdward Memorial Fund 2017
- Simon Fraser University: Hogg Memorial Grad Scholarship 2017
- Simon Fraser University: Glen Geen Scholarship in Marine Biology 2016
- Red de Genética de la Conservación: Instructional and Travel Grant 2012
- San Francisco State University: Instructionally Related Research Award 2012
- Smithsonian Tropical Research Institute and Pan-American Advanced Studies Institute (NSF-funded): Instructional and Travel Grant 2011
- San Francisco State University (NSF-funded): Training in Ecology and Evolution Fellowship 2010 – 2012

TEACHING EXPERIENCE

- Marine Genomics, University of California, Davis. Lectured Unix classes 2021
- Evolutionary Genomics Laboratory Consultant, Simon Fraser University. Led laboratory exercises for genome and transcriptome analysis (Unix, cluster use, assemblies, SNP calling, trees, differential expression) 2018
- Software Carpentries Instructor, Simon Fraser University. Lectured Unix, GitHub, and R classes 2018
- Pop. Genetics TA, Simon Fraser University. Prepared and led tutorials and lectures 2015
- Microbiology Open Lab. Supervisor, San Francisco State University. Supervised wet lab practices 2011-2013

SPECIALIZED COURSES

- The Society for Integrative and Comparative Biology: "Best practices for using NGS-based datasets to determine statistically robust evidence of positive selection and convergent evolution" workshop 2018 – 2019
- Duke University Marine Laboratory: Benchwork training for NGS techniques 2014
- San Francisco State University: Genome Evolution, Genome Annotation, Molecular Methods 2010

LANGUAGE SKILLS

Bilingual in English and Spanish