Jacob Warner

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ScientistJake **@ScientistJake** **2-BitBio.com**

As both a molecular biologist and bio-informaticien I design and carry out research projects that unite my loves of marine developmental biology and data-science. As a lifetime learner and educator, I hope to continue to get students involved in both bench work and coding to prepare them for careers in the next-generation of biological research.

Academic appointments

2014 – Current **Post-doctoral fellow**

Laboratory of Eric Röttinger, Institute for Research on Cancer and Aging of Nice (IRCAN).
Funded by post-doctoral fellowship awarded by the Cancer Research Association (Association pour recherche sur le cancer, ARC).
Project: Comparison of embryonic and regenerative gene regulatory networks in the sea anemone *Nematostella vectensis.*

2013 – 2014 **Interim Post-doc**

Laboratory of David McClay, Department of Biology, Duke University.
Project: Left-right asymmetry in the sea urchin embryo.

2006 **Research Assistant**

Laboratory of Jeffrey Marks, Department of Pathology, Duke University.
Project: Gene expression and personalized chemotherapy in breast cancer.

Education

2013 **PhD Genetics and Genomics, Duke University, Durham, NC**

With certificates in college teaching and cell and molecular biology.
Dissertation Title: "Mechanistic Diversification of the Hedgehog Signaling Pathway: Insights into Left-Right Asymmetry and Transduction by Motile Cilia in the Sea Urchin"
Thesis advisor: David R. McClay

2006 **BS Biology, High Point University, High Point, NC**

Majors: Biology, French. Minor: Chemistry
Distinctions: Magna cum laude. Presidential scholar athlete. French Honor Society.

Publications

2018 **Warner JF**, Guerlais V, Amiel AR, Johnston J, Nedoncelle K, Rottinger ER. NvERTx: A gene expression database to compare Embryogenesis and Regeneration in the sea anemone Nematostella vectensis. Preprint: BioxRv 2018. doi.org/10.1101/242370

2016 **Warner JF**, Miranda EL, McClay DR. Contribution of hedgehog signaling to the establishment of left-right asymmetry in the sea urchin. Dev Biol. 2016 Mar 15;411(2):314-24. doi: 10.1016/j.ydbio.2016.02.008. Epub 2016 Feb 9. PubMed PMID: 26872875; PubMed Central PMCID: PMC4790456.

2015 Amiel AR, Johnston HT, Nedoncelle K, **Warner JF**, Ferreira S, Röttinger E. Characterization of Morphological and Cellular Events Underlying Oral Regeneration in the Sea Anemone, Nematostella vectensis. Int J Mol Sci. 2015 Dec 1;16(12):28449-71. doi: 10.3390/ijms161226100. PubMed PMID: 26633371; PubMed Central PMCID: PMC4691047.

2014 **Warner JF**, and McClay DR. Left–right asymmetry in the sea urchin. genesis, 2014: 52: 481–487. doi:10.1002/dvg.22752

2014 **Warner JF**, McClay DR. Perturbations to the hedgehog pathway in sea urchin embryos. Methods Mol Biol. 2014;1128:211-21. doi: 10.1007/978-1-62703-974-1_14. PubMed PMID: 24567217.

2014 **Warner JF**, McCarthy AM, Morris RL, McClay DR. Hedgehog signaling requires motile cilia in the sea urchin. Mol Biol Evol. 2014 Jan;31(1):18-22. doi: 10.1093/molbev/mst176. Epub 2013 Oct 11. PubMed PMID: 24124205; PubMed Central PMCID: PMC3879447.

2012 **Warner JF**, Lyons DC, McClay DR. Left-right asymmetry in the sea urchin embryo: BMP and the asymmetrical origins of the adult. PLoS Biol. 2012;10(10):e1001404. doi: 10.1371/journal.pbio.1001404. Epub 2012 Oct 9. PubMed PMID: 23055829; PubMed Central PMCID: PMC3467244.

2009 Walton KD, **Warner J**, Hertzler PH, McClay DR. Hedgehog signaling patterns mesoderm in the sea urchin. Dev Biol. 2009 Jul 1;331(1):26-37. doi: 10.1016/j.ydbio.2009.04.018. Epub 2009 Apr 23. PubMed PMID: 19393640; PubMed Central PMCID: PMC2702090.

Student Advisees

2017 **Vincent Guerlais; Master's Student (M2)**

Vincent Guerlais was a master's student in the bio-informatics program at University of Nice. While in the lab for 6 months, we developed an RNAseq workflow for Nematostella and published the results as a data website (ircan.unice.fr/ER/ER_plotter/home). We expect this work to be published in a peer-reviewed journal by 2018.

2015 **Yvain Desplat; Visiting Undergraduate Intern**

Yvain, then an undergraduate student from SKEMA business school spent a summer in the lab at University of Nice. He completed a project on Wnt signaling during regeneration that we expect to be published in 2018.

2012 **Helen Zou; Independent Undergraduate Research**

Helen was an undergraduate student at Duke University performing a semester long independent study project as part of a systems biology research program.

2011 **Ali McCarthy; Visiting Undergraduate Intern**

Ali, then an undergraduate student at Wheaton College, worked in the lab for a month at Duke University as part of a collaboration with Robert Morris. Her work was published (before her graduation) in Warner et al 2014.

2010 **Sarah Lachance; Visiting Undergraduate Intern**

Sarah, then an undergraduate at Guilford College spent a semester working in the lab at Duke University. She was highly productive and her internship allowed her to complete her BS with the Honors in Research distinction.

Funding Awards and Distinctions

2016 **Hilde Mangold Post-doctoral symposium selected talk, Society for Developmental Biology annual meeting.**

With travel award supplied by Developmental Dynamics

2014 **Cancer Research Association (ARC) post-doctoral fellowship**

Highly competitive (15 awarded per year in France) three year fellowship from the Association pour Recherche sur Cancer (Cancer Research Association, ARC).

Other Training

2015 **Biological Interpretation of Next Generation Sequencing Course**

European Bioinformatics Institute (EMBL-EBI), Hinxton ,UK. One week course focused on computational approaches to analyzing RNAseq, CHIPseq and genomic data. Primarily using R and Linux tools.

2012 **College Teaching Certificate**

Duke University, Durham, NC. Completed coursework: BIO 705s Teaching College Biology, GS755 College Teaching and Course Design. Attended Symposia and participated in teaching practicals.

2011 – 2012 **Preparing Future Faculty Program**

Duke University, Durham, NC. Worked with a faculty mentor at Guilford College (Michele Malotky) where I designed and gave lectures after which I was critiqued. Performed five 'site visits' at teaching colleges in the triangle region of NC: Meredith Col., Elon Col., Durham Technical Community Col., North Carolina Central Col., and Guilford Col. At these visits we met with and interviewed faculty, attended education discussions etc.

2006 **Teaching English as a Foreign Language Certificate**

EBC International, Madrid, Spain. Four-week intensive TEFL CERTIFICATION course. Learned principles of teaching philosophy, building lesson plans, designing curricula, administering lessons, using group work effectively and advanced English grammar.

2005 **French Language Certificate**

Sorbonne, Paris, France. Semester-long French language program. Part of the study abroad program of University of North Carolina Wilmington, NC

Teaching Experience

2013 Fall **Teaching Assistant: Biology 329D, Animal Physiology, Duke U.**

Taught a 1 hour/ week section that complimented the weekly lectures. I used this time to develop a course long problem solving strategy class as this was a senior level course. Each week, I used active learning that began as working strategies to succeed in a 'problem-oriented course'. This evolved into approaching problems on the MCAT exam (since Anim. Phys. is a large component of this). Held office hours, wrote exam questions and graded assignments.

2013 Spring **Teaching Assistant: Biology 220, Cell and Developmental Biology, Duke U.**

Taught a 1 hour/ week section that complimented the weekly lectures. I was free to utilize this time anyway that I saw fit, and used it to deploy the active teaching strategies I learned in the Preparing Future Faculty program and Certificate College Teaching program. Held office hours, wrote exam questions, and graded assignments.

2013 Spring **Team Teacher: Biotechnology, Durham Community College**

Taught the microbiology section (3, four hour sessions) of a modular Biotechnology course. The course was overseen by an advisor but lesson planning and execution was up to the instructors. I designed a group project as a laboratory, lecture hybrid. This course was the most diverse in terms of student aptitude and I learned how to manage highly heterogeneous class. I did this by using group work to allow the more advanced students to bring the slower students along as the project moved forward.

2012 Fall **Teaching Assistant: Biology 329D, Animal Physiology, Duke U.**

See 2013 Fall above.

2012 Spring **Guest Lecturer: Biology of Human Disease , Guilford College, Greensboro, NC**

Designed and taught a lecture and lab section of the Biology of Human Disease course. I designed a mock differential diagnosis where the students studied charts of malaria victims and blood smears from a malaria lab at duke to diagnose the malaria strain of the 'patient'. Was observed and evaluated by Dr. Michele Malotky at Guilford College.

2011 Spring **Teaching Assistant: Biology 101, Molecular Biology, Duke U.**

Taught a 2.5 hour lab section one day per week. By teaching a difficult subject to entry-level students, I greatly improved my teaching abilities. Specifically, I learned how to iterate and use analogies to help students understand abstract concepts. This improvement in my abilities was reflected in the overall, very positive student reviews from this class. Held office hours, wrote exam questions, and graded assignments.

2010 Nov **Guest Lecturer: Developmental Biology, High Point University, High Point, NC**

Designed and taught a lab section on sea urchin embryology to the developmental biology course at High Point University.

2010 Nov **Teaching Assistant: Gene Regulatory Networks Course, Woods Hole MBL, MA**

Administered the laboratory section of this 2-week short course. Taught students various methods in molecular biology. Learned how to teach my scientific superiors (all students were PhDs), most notably how to assess a persons ability.

2006 - 2007 **English as a Foreign Language: Linguacenter Madrid, Spain.**

Over 600 classroom hours (24 class hours/ week). Designed and administered five curriculums. Designed daily lesson plans. Class sizes ranged 4 – 16 students. Skill levels ranged from novice to advanced. Fell in love with teaching.

Major Collaborations

2012 **Robert L Morris and Ali M McCarthy, Wheaton College, MA.**

Mentored Ms. McCarthy, a student of Dr. Morris, at Duke University for 8 weeks in the summer. During this time I helped her adapt a protocol developed by Dr. Morris to perform TEM on sea urchin cilia. This work was published in Warner et al. 2014.

Outreach

2016 - Current **Pokemodels!**

Developed an open access educational outreach card game based on a popular video game series. More info found at https://pokemods.github.io/

2016 - 2017 **Fête de la Science**

Université de Nice, Nice France. Science outreach day at the University of Nice is open to the public. Different groups set up stands to show off their science to the public. I ran a stand,"PokeModels", to highlight research using model organisms.

2009 - 2013 **North Carolina State Science Fair Judge**

Raleigh, NC. Judged biology related submissions to the NC state science fair and interviewed students.

2008 - 2011 **NC DNA Day Ambassador**

NC. Traveled to underprivileged high schools in NC and taught several class sections on an area of genetics with an emphasis on careers in science.

Web Apps

StellaTx : https://er-lab.shinyapps.io/NvERTx_4/
A web based gene expression tool written using the Shiny R web framework.

NvERTx : http://ircan.unice.fr/ER/ER_plotter/home
Python adaptation of StellaTx written using the Django python web framework

F1-stats : F1.2-bitbio.com
A formula-1 statistics visualization site written using the Shiny R web framework.

Presentations

2017 **Talk: Origins of Metazoa meeting.**

Paris, France. Title: Regeneration is a re-deployment of the embryonic gene regulatory network.

2016 **Talk: Society for Developmental Biology annual meeting.**

Boston, MA. Talk Selected for the Hilde Mangold Post-doctoral symposium. Title: Regeneration is a partial redeployment of the embryonic gene regulatory network.

2013	**Poster: Scoiety for Developmental Biology annual meeting** Cancun, Mexico. Title: Hedgehog signaling is dependent upon motile cilia in the sea urchin.
2012	**Talk: Developmental Biology of the Sea Urchin meeting** Woods Hole, MA. Title: Hedgehog signaling is dependent upon motile cilia in the sea urchin.
2011	**Poster: American Society for Cell Biology annual meeting** Denver, CO. Title: Hedgehog signaling is dependent on ciliary trafficking proteins in the sea urchin.
2011	**Talk: Developmental Biology of the Sea Urchin meeting** Woods Hole, MA. Title: Hedgehog signaling and ciliary trafficking proteins in the sea urchin.
2010	**Poster: Duke Systems Biology Symposium** Durham, NC. Title: Left-Right asymmetry and hedgehog signaling in the sea urchin.
2009	**Poster: Developmental Biology of the Sea Urchin meeting** Woods Hole, MA. Title: Hedgehog signaling patterns mesoderm in the sea urchin embryo.
2009	**Invited speaker: High Point University** High Point, NC. Title: Hedgehog signaling in the sea urchin embryo

Other Skills

Languages:	French, fluent in reading writing and speaking. Spanish, not horrible in speaking, semi-decent in reading.
Leadership:	Co-founded a local fraternity (currently chartered by Pi Kappa Phi) while at High Point University