



Research interests

Current Research Projects

- The Role of Fluid Dynamics in Jellyfish Morphogenesis
with John Dabiri, Caltech
- Biomechanics of Muscular Pumps
with John Dabiri, Caltech & Kevin Kit Parker, Harvard
 - » Muscle activation and coordination in the jellyfish *Aurelia aurita*
 - » Bioinspired engineering of muscular pumps *in vitro*

Graduate education and research positions

California Institute of Technology (Pasadena, CA, USA)

- Ph.D Candidate, Division of Biology

Sep 2007 - current

Yale School of Medicine (New Haven, CT, USA)

- Research Associate with Gordon Shepherd & James Mazer, Dept. of Neurobiology
 - » Computational Modeling: Energy consumption of neural processing
 - » Bioengineering: Engineering of novel viral strains for neuroanatomical tracing
 - » Image processing: Feature extraction from natural scenes

Sep 2005 - Sep 2007

University of Heidelberg (Heidelberg, Germany)

- MSc in Molecular Biotechnology, Bioinformatics Track
- Research Assistant with Rainer Friedrich, Max-Planck-Institute for Medical Research, Heidelberg
 - » Computational Modeling: Neural network model of odor processing

Oct 2004 - Jun 2007

Undergraduate and secondary education

University of Heidelberg (Heidelberg, Germany)

- BS in Molecular Biotechnology; Bioinformatics Track
- Research Assistant at the German Cancer Research Center (DKFZ), Heidelberg

Oct 2001 - Aug 2004

University of Montpellier (Montpellier, France)

- Guest student at University Institute of Health Engineering (IUP, Ingénierie de la Santé)

Sep 2002 - Apr 2003

Industrial Vocational School (Backnang & Waiblingen, Germany)

- Basic formation in Electrical Engineering and Wood Engineering

Sep 1999 - Sep 2001

Alexander-von-Humboldt-Gymnasium (Wittmund, Germany)

- Completed German secondary degree (Abitur)

Jun 1999

Clontarff Beach State High School (Redcliff, Brisbane, Australia)

- High school exchange student with STS Foundation

Jul 1996 - Jun 1997

Neuroscience Instructor at YESS/LEAD summer program, Caltech

- Creation and teaching of 3-week neuroscience curriculum for high school students

2009, 2010, 2011

Summer Research at MBL, Woods Hole MA

- Graduate-level research course "Neural Systems & Behavior"
- Post-course fellowship for independent research on jellyfish neuromuscular control

Jun 2008 - Aug 2008

Traineeship at Merck KGaA and ABSystems (Darmstadt, Germany)

- Implementation of laboratory management software and hardware interface

Jul 2005 - Sep 2005

California Institute of Technology: Moore Fellowship for Graduate Studies

2008-2012

German National Merit Foundation: Full scholarship for bachelor and master studies

2001-2007

German Academic Exchange Service (DAAD): Stipend for research in US

2005-2007

Selected Awards

Scientific publications

- **Nawroth JC**, Feitl KE, Colin SP, Costello JH, Dabiri JO. "Phenotypic plasticity in juvenile jellyfish facilitates effective animal-fluid interaction" *Biology Letters* 2010 June 23, 6(3): 389-393.
- Du J, Riedel-Kruse IH, **Nawroth JC**, Roukes ML, Laurent GL, Masmanidis SC. "High-Resolution Three-Dimensional Extracellular Recording of Neuronal Activity With Microfabricated Electrode Arrays" *J Neurophysiol.* 2009 Mar;101(3):1671-8.
- **Nawroth JC**, Greer CA, Chen WR, Laughlin SB, Shepherd GM. "An energy budget for the olfactory glomerulus" *J Neurosci.* 2007 Sep 5;27(36):9790-800; **Cover of J Neurosci.** 2007 3 Oct 2007; 27 (40)

Scientific abstracts

- Society for Integrative & Comparative Biology (SICB) Meeting 2010: **Nawroth JC**, Dabiri JO. "Adaptive phenotypic plasticity in juvenile Scyphomedusae facilitates effective animal-fluid interaction"
- Hertie PENS Winter School 2009 "Structure and Function of Neural Circuits": **Nawroth JC**, Ripplinger CM, Feinberg AW, Dabiri JO, Parker K. "Optical mapping of electrical impulse propagation in the striated muscle of live jellyfish"
- CSHL Meeting 2008 "Neuronal Circuits": **Nawroth JC**, Pala A, Phillips ME, Kim DH, Shepherd GM and Willhite DC. "Modified Trans-synaptic Tracing Viruses Reveal Novel Connectivity in the Rat Olfactory Bulb"
- Society for Neuroscience Annual Meeting 2007: **Nawroth JC**, Greer CA, Chen WR, Laughlin SB, Shepherd GM. "An Energy budget of a defined cortical structure: the olfactory glomerulus"
- Society for Neuroscience Annual Meeting 2007: Chang AY, **Nawroth JC**, Shon LY, Migliore M, Shepherd GM, Willhite DC. "Specificity of mitral and tufted cell lateral connectivity in the olfactory bulb"