

Personal information

Dr. Victoria P. Connaughton
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Education

- Ph.D., Marine Studies, University of Delaware 1994
- B.S., Biology (cum laude), Bucknell University 1989

- Fundamental Issues in Vision Research Course, Marine Biological Lab, Woods Hole, MA 1994
- Zebrafish Course, Marine Biological Lab, Woods Hole, MA 1998

Employment History

- Research Assistant, University of Delaware 9/1989-3/1994
- Postdoctoral fellow, Department of Neurobiology and Anatomy, University of Texas at Houston Medical School 3/1994-12/1996
- Postdoctoral fellow, Laboratory of Neurophysiology, National Institute of Neurological Diseases and Stroke, NIH 1/1997-8/1999
- Biology Lecturer (part-time), Washington College 1/1999-5/1999
- Assistant Professor of Biology, American University 9/1999-5/2006
- Associate Professor (with tenure), American University 5/2006-Present

Honors and Awards

Academic

National and International

- National Eye Institute Fellowship 1994
- Grass Foundation Fellowship 1995
- Thomas H. Maren Fellowship 1996
- National Research Service Award (F32) 1996-1998
- Intramural Research Training Award 1999
- Stanford and Joan Alexander Lecturer, UT-Houston 2008

American University

- Mellon Fund Award AY99-00, 00-01, 02-03, 03-04
- GEFAP Award (awarded each semester) Fall 2000-present
- Biology Dept. Teaching Award (awarded each semester) Spring 2000-present
- Junior Faculty Teaching Release Spring 2003
- Senate Research Award AY00-01, AY03-04

Other

- University of Delaware Graduate Student Woman of Excellence Award 1992
- University of Delaware Student Travel Award 1993
- American Fisheries Society Student Travel Award 1993

Publications **denotes student co-author

Book Chapters

- Connaughton, VP 1997. Glutamate and glutamate receptors in the vertebrate retina 24pgs). In Kolb, H., Fernandez, E., and Nelson, R. *Webvision: The Neural Organization of the Vertebrate Retina*. <http://webvision.med.utah.edu>
- Nelson, R and VP Connaughton. 2003. Bipolar cell pathways in the vertebrate retina 27pgs). In Kolb, H., Fernandez, E., and Nelson, R. *Webvision: The Neural Organization of the Vertebrate Retina*. <http://webvision.med.utah.edu>.
- Connaughton, VP 2005. The Vertebrate Retina, pp. 99-127, In *Glutamate Receptors in Peripheral Tissues*, S. Gill & O. Pulido (eds). Springer-Verlag. 420pp.
- Farsaii, M** and VP Connaughton. 2005. All Amacrine Cells (19pgs). In Kolb, H., Fernandez, E., and Nelson, R. *Webvision: The Neural Organization of the Vertebrate Retina*. <http://webvision.med.utah.edu>.

Articles

Refereed articles

- Carter, J, GJ Marrow, and V Pryor. 1990. Aspects of the ecology and reproduction of Nassau grouper, *Epinephelus striatus*, off the coast of Belize, Central America. *Proceedings of the Gulf and Caribbean Fisheries Institute*. 43: 65-111.
- Pryor, VK and CE Epifanio. 1993. Prey selection by larval weakfish (*Cynoscion regalis*): the effects of prey size, speed, and abundance. *Marine Biology*. 116(1): 31-37.
- Connaughton, VP and CE Epifanio. 1993. The influence of previous experience on the feeding habits of larval weakfish (*Cynoscion regalis*). *Marine Ecology Progress Series*. 101: 237-241.
- Connaughton, VP, CE Epifanio, and R Thomas. 1994. Effects of varying irradiance levels on feeding in larval weakfish (*Cynoscion regalis*). *Journal of Experimental Marine Biology and Ecology*. 180: 151-163.
- Epifanio, CE, MA Lobanoff, VP Connaughton, and JM Welch. 1994. Growth and development of Atlantic mud crab larvae fed natural zooplankton prey. *Journal of Experimental Marine Biology and Ecology*. 180: 165-174.
- Connaughton, VP, A Schuur, NM Targett, and CE Epifanio. 1994. Chemical suppression of feeding in larval weakfish (*Cynoscion regalis*) by trochophores of the serpulid polychaete *Hydroides dianthus*. *Journal of Chemical Ecology*. 102(7): 1763-1771.
- Connaughton, VP and G Maguire. 1998. Differential expression of voltage-gated K⁺ and Ca²⁺ channels in bipolar cells in the zebrafish retinal slice. *European Journal of Neuroscience*. 10: 1350-1362.
- Maguire, G, VP Connaughton, A Prat, G Jackson, and H Cantiello. 1998. Actin cytoskeleton regulates ion channel activity in retinal neurons. *Neuroreport*. 9(4): 665-670.
- Connaughton, VP and JE Dowling. 1998. Comparative morphology of distal neurons in developing and adult zebrafish retinas. *Vision Research*. 38: 13-18.
- Connaughton, VP, TN Behar, W-LS Liu, and S Massey. 1999. Immunocytochemical localization of excitatory and inhibitory neurotransmitters in the zebrafish retina. *Visual Neuroscience*. 16: 483-490.
- Connaughton, VP and R Nelson. 2000. Axonal stratification patterns and glutamate-gated conductance mechanisms in zebrafish retinal bipolar cells. *Journal of Physiology*. 524: 135-146.

- Connaughton, VP, K Dyer, NS Nadi, and TN Behar. 2001. The expression of GAD₆₇ isoforms in zebrafish retinal tissue changes over the light/dark cycle. *Journal of Neurocytology*. 30(4): 303-312.
- Nelson, R, AM Bender, and VP Connaughton. 2003. Stimulation of Sodium Pump Restores Membrane Potential to Neurons Excited by Glutamate in Zebrafish Distal Retina. *Journal of Physiology*. 549: 787-800.
- Connaughton, VP, D Graham, and R Nelson. 2004. Identification and morphological classification of horizontal, bipolar, and amacrine cells within the zebrafish retina using the DiOlistic technique. *Journal of Comparative Neurology*. 477: 371-385.
- Tarboush, RA**, SE MacAvoy, SA Macko, and VP Connaughton. 2006. Catabolic replacement of tissue contributes to the turnover of stable isotopes in a fast-growing tropical fish. *Canadian Journal of Zoology*. 84 (10): 1453-1460.
- Parker, B** and VP Connaughton. 2007. The effect of nicotine levels on growth and development in larval zebrafish. *Zebrafish*. 4(1): 59-68.
- Gleeson, ME, VP Connaughton, and L Arneson. 2007. Induction of hyperglycemia in zebrafish, *Danio rerio*, leads to morphological changes in the retina. *Acta Diabetologia*. 44: 157-163.
- Weber, DN, VP Connaughton, JA Dellinger, D, Klemer, A Udvadia, and MJ Carvan III. 2008. Selenomethionine reduces visual deficits due to developmental methylmercury exposures. *Physiology and Behavior*. 93: 250-260.
- Connaughton, VP, A Bender, and R Nelson. 2008. Electrophysiological evidence of GABA_A and GABA_C receptors on zebrafish bipolar cells. *Visual Neuroscience*. 25(2): 139-154.
- Nelson, R, AM Bender, and VP Connaughton. 2008. Transporter-mediated GABA responses in horizontal and bipolar cells of zebrafish retina. *Visual Neuroscience*. 25(2): 155-166.
- Chapman, GB, R Tarboush, and VP Connaughton. 2009. A light and transmission electron microscope study of the distribution and ultrastructural features of the peripheral nerve processes in the non-retinal layers of the zebrafish eye. *Cell and Tissue Research*. In press.

Invited articles

- Connaughton, VP 1997. Glutamate-gated currents in zebrafish, *Danio rerio*, retinal bipolar cells. *Bulletin of the Mount Desert Island Biological Laboratory*. 36: 43.
- Connaughton, VP 2001. Organization of ON- and OFF-pathways in the zebrafish retina: neurotransmitter localization, electrophysiological responses of bipolar cells, and patterns of axon terminal stratification. *Progress in Brain Research*. 131: 161-176.
- Nelson, R, AT Janis, TN Behar, and VP Connaughton. 2001. Physiological responses associated with kainate receptor immunoreactivity in dissociated zebrafish retinal neurons: a voltage-probe study. *Progress in Brain Research*. 131: 255-265.
- Connaughton, VP 2003. Zebrafish retinal slice preparation. *Methods in Cell Science Special Issue: Zebrafish as a model system in neurobiology*. 25: 49-58.

Abstracts in conference proceedings (refereed)

- Maguire, G, VP Connaughton, A Prat, GR Jackson, and HF Cantiello. 1994. Actin filaments regulate ion channels in identified retinal neurons. *Society for Neuroscience Abstracts*. 20 (part 2): 1522.

- Maguire, G, V Connaughton, A Prat, R Jackson, and H Cantiello. 1995. The actin-based cytoskeleton regulates voltage-gated potassium channel activity in retinal bipolar neurons. *Society for Neuroscience Abstracts*. 21(2): 1035.
- Connaughton, VP and G Maguire. 1995. Whole-cell currents in identified retinal neurons in the zebrafish (*Brachydanio rerio*) retinal slice. *Investigative Ophthalmology and Visual Science*. 36(4): ARVO abstract S930.
- Connaughton, VP and JE Dowling. 1996. Morphology of distal neurons isolated from the zebrafish (*Danio rerio*) retina. *Investigative Ophthalmology and Visual Science*. 37(3): ARVO abstract S630.
- Connaughton, VP and G Maguire. 1997. Voltage- and some glutamate-gated currents in zebrafish bipolar neurons. *Investigative Ophthalmology and Visual Science*. 38(4): ARVO abstract S618.
- Connaughton, VP and R Nelson. 1998. Glutamate-gated currents and glutamate receptors on zebrafish retinal bipolar cells. *Investigative Ophthalmology and Visual Science*. 39(4): ARVO abstract S982.
- AT Janis, TN Behar, VP Connaughton, and R Nelson. 1999. Kainate receptors and Glutamate responses of zebrafish retinal neurons. *Society for Neuroscience Abstracts*. 25(2): 1430.
- Nelson, R and VP Connaughton. 1999. Voltage probe measurements of glutamate responses in acutely dissociated zebrafish retinal neurons. *Investigative Ophthalmology and Visual Science*. 40(4): ARVO abstract S242.
- Connaughton, VP, B Allwardt, and JE Dowling. 1999. Defective glutamate receptors in bipolar cells of zebrafish *noa* mutants. *Investigative Ophthalmology and Visual Science*. 40(4): ARVO abstract S441.
- Connaughton, VP, AM Bender and R Nelson. 2000. GABA-evoked responses in zebrafish retinal bipolar cells. *Investigative Ophthalmology and Visual Science*. 41: ARVO abstract S621.
- Nelson, R, Bender, AM, and VP Connaughton. 2000. AMPA excitation restores membrane potential to tonically depolarized retinal horizontal cells. *Society for Neuroscience Abstracts*. 26(1): 1327.
- Connaughton, VP and ML Miller. 2001. Na⁺/K⁺ ATPase is localized to neuronal cell bodies in the zebrafish retina. *Investigative Ophthalmology and Visual Science*. 42: ARVO abstract S671.
- Nelson, R, Bender, AM, and VP Connaughton. 2001. Na⁺/K⁺ ATPase adds long-term hyperpolarizing components to glutamate responses of zebrafish retinal neurons. *Investigative Ophthalmology and Visual Science*. 42: ARVO abstract S668.
- Tarboush, R**, S MacAvoy, S Macko, and VP Connaughton. 2002. Turnover of stable isotopes due to growth and metabolism in zebrafish, *Danio rerio*. *Eos. Trans. AGU*, 83(19), Spring Meet. Suppl., Abstract B31A-11.
- Wesolowska, A**, R Nelson, and VP Connaughton. 2002. Glutamate mechanisms involved in the OFF responses of zebrafish retina. *Investigative Ophthalmology and Visual Science*. 43: E-abstract 1826.
- Connaughton, VP, D Graham, R Nelson. 2003. Morphological identification of second and third order neurons in the zebrafish retina. *Investigative Ophthalmology and Visual Science*. 44: E-abstract 4134.
- Connaughton, VP, D Graham, R Nelson. 2003. Diolistic identification of horizontal, amacrine, and bipolar cells in the zebrafish retina. *Society for Neuroscience Abstracts*. E-abstract 265.5.
- Nelson, R and VP Connaughton. 2004. Glutamate transporter drives the b-wave in zebrafish retina. *Investigative Ophthalmology and Visual Science*. 45: E-abstract 815.

- Asare, M**, R Nelson, and VP Connaughton. 2004. Effects of dopamine on glutamate responses in horizontal and bipolar cells isolated from zebrafish retina. *Society for Neuroscience Abstracts*. E-abstract 299.12.
- Connaughton, VP and M Warndorf**. 2005. D1 and D2-like dopamine receptor activity enhance outward K⁺ currents in zebrafish retinal bipolar cells. *Investigative Ophthalmology and Visual Science*. 46: E-abstract 1195.
- Asare, MN**, R Nelson, and VP Connaughton. 2005. Effects of dopamine on glutamate responses in horizontal and bipolar cells isolated from zebrafish retina. *Investigative Ophthalmology and Visual Science*. 46: E-abstract 605.
- Nelson, RF, AM Bender, and VP Connaughton. 2005. GABA responses of horizontal cells in zebrafish retina are transporter-like. *Society for Neuroscience Abstracts*. E-abstract. 976.7.
- Nelson, RF, AM Bender, and VP Connaughton. 2006. Transporter-like GABA excitation of horizontal and bipolar cells in zebrafish distal retina. *Investigative Ophthalmology and Visual Science*. E-abstract 390.
- Arneson, L, M Gleeson**, and VP Connaughton. 2006. Induction of Hyperglycemia and microvascular retinal complications in zebrafish, *Danio rerio*. *Investigative Ophthalmology and Visual Science*. E-abstract 1739.
- Connaughton, VP and R Nelson. 2007. Light responses from presumed horizontal and amacrine cells in zebrafish retina. *Investigative Ophthalmology and Visual Science*. E-abstract 5957
- Tarboush, R**, GB Chapman, and VP Connaughton. 2007. A light and electron microscopy study of the zebrafish distal retina. *Investigative Ophthalmology and Visual Science*. E-abstract: 5945.
- Nelson, RF and Connaughton, VP. 2007. Color coding of light responses of zebrafish retinal horizontal cells. *Society of Neuroscience Abstracts*. E-abstract 319-12.
- Nelson, RF and VP Connaughton. 2008. Morphology of L- and C-type horizontal cells in zebrafish retina. *Investigative Ophthalmology and Visual Science*. E-abstract 5793.
- Connaughton, VP and J. Hsieh. 2008. Morphological classification of amacrine cells in the zebrafish retina. *Investigative Ophthalmology and Visual Science*. E-abstract 5905.
- Cederlund, ML, J. Vendrell, J. O'Connor, V. Connaughton, and BN Kennedy. 2008. *Mab21l2*: A novel role in retinal amacrine neurons. Visual System Development Meeting (August 2008).

Other

- Connaughton, VP 1994. Selective feeding by larval weakfish, *Cynoscion regalis*: the influence of prey characteristics and larval behavior. *Ph.D. Dissertation*.

Databases/citations of work

- Data from my research is located in Viperlib, a web-based library used for educational purposes (www.viperlib.com)
- Connaughton et al., 2001. Expression of GAD₆₇ isoforms and GABA change with adaptational state of retina. *Journal of Neurocytology*. 30(4): 303-312. Indexed within ASFA: Aquatic Sciences and Fisheries Abstracts database
- Connaughton. 2003. Zebrafish retinal slice preparation. *Methods in Cell Science*. 25: 49-58. Indexed within ASFA: Aquatic Sciences and Fisheries Abstracts database

- Connaughton, et al., 2004. Identification and morphological classification of horizontal, bipolar, and amacrine cells within the zebrafish retina using the DiOlistic technique. *Journal of Comparative Neurology*. 477: 371-385. Indexed within ASFA: Aquatic Sciences and Fisheries Abstracts database. Also indexed within CSA Neurosciences Abstracts.

Lectures

Papers presented at professional meetings (refereed)

- Whole-cell currents in identified retinal neurons in the zebrafish (*Brachydanio rerio*) retinal slice. *Association for Research in Vision and Ophthalmology Annual Meeting* (4/1995).
- Morphology of distal neurons isolated from the zebrafish (*Danio rerio*) retina. *Association for Research in Vision and Ophthalmology Annual Meeting* (5/1996).
- Voltage- and some glutamate-gated currents in zebrafish bipolar neurons. *Association for Research in Vision and Ophthalmology Annual Meeting* (5/1997).
- Glutamate-gated currents and glutamate receptors on zebrafish retinal bipolar cells. *Association for Research in Vision and Ophthalmology Annual Meeting* (5/1998).
- Voltage probe measurements of glutamate responses in acutely dissociated zebrafish retinal neurons. *Association for Research in Vision and Ophthalmology Annual Meeting* (5/1999).
- Defective glutamate receptors in bipolar cells of zebrafish *noa* mutants. *Association for Research in Vision and Ophthalmology Annual Meeting*. (5/1999).
- GABA-evoked responses in zebrafish retinal bipolar cells. *Association for Research in Vision and Ophthalmology Annual Meeting* (5/2000).
- Immunocytochemical localization of the Na⁺/K⁺ ATPase in the zebrafish retina. *Association for Research in Vision and Ophthalmology Annual Meeting* (5/2001).
work completed by student
- Glutamate mechanisms involved in the OFF responses of zebrafish retina. *Association for Research in Vision and Ophthalmology Annual Meeting* (5/2002).
work completed by student
- Turnover of stable isotopes due to growth and metabolism in zebrafish, *Danio rerio*. *Annual meeting of the American Geophysical Union* (2002).
work completed by student
- Morphological identification of second and third order neurons in the zebrafish retina. *Association for Research in Vision and Ophthalmology, Annual Meeting* (5/2003).
- Diolistic identification of horizontal, amacrine, and bipolar cells in the zebrafish retina. *Society for Neuroscience Annual Meeting* (11/2003).
- Glutamate transporter drives the b-wave in zebrafish retina *Association for Research in Vision and Ophthalmology, Annual Meeting* (4/2004).
- Effects of dopamine on glutamate responses in horizontal and bipolar cells isolated from zebrafish retina. *Society for Neuroscience, Annual Meeting* (11/2004)
work completed by student

- D1 and D2-like dopamine receptor activity enhance outward K⁺ currents in zebrafish retinal bipolar cells. *Association for Research in Vision and Ophthalmology, Annual Meeting* (5/2005). **work completed by student
- Effects of dopamine on glutamate responses in horizontal and bipolar cells isolated from zebrafish retina. *Association for Research in Vision and Ophthalmology, Annual Meeting* (5/2005). **work completed by student
- Transporter-like GABA excitation of horizontal and bipolar cells in zebrafish distal retina. *Association for Research in Vision and Ophthalmology, Annual Meeting* (5/2006).
- Induction of Hyperglycemia and microvascular retinal complications in zebrafish, *Danio rerio*. *Association for Research in Vision and Ophthalmology, Annual Meeting* (5/2006). ** work completed by student
- Retinal electrophysiology correlates with behavioral responses to visual stimuli in adult zebrafish developmentally exposed to either methylmercury, selenomethionine, or both. *8th International Conference on Mercury as a Global Pollutant* (8/2006).
- Light responses from presumed horizontal and amacrine cells in zebrafish retina. *Association for Research in Vision and Ophthalmology, Annual Meeting* (5/2007).
- A light and electron microscopy study of the zebrafish distal retina. *Association for Research in Vision and Ophthalmology, Annual Meeting* (5/2007). **work completed by student
- Morphology of L- and C-type horizontal cells in zebrafish retina. *Association for Research in Vision and Ophthalmology, Annual Meeting* (5/2008)
- Morphological classification of amacrine cells in the zebrafish retina. *Association for Research in Vision and Ophthalmology, Annual Meeting* (5/2008). **work completed by student

Papers presented at professional meetings (non-refereed)

- The influence of prey size, speed and density on selection by larval weakfish. *American Fisheries Society, Early Life History Meeting* (6/1992).
- The influence of prey characteristics on the feeding preferences of larval weakfish. *American Fisheries Society, Northeast Fish and Wildlife Conference* (4/1993).
- The influence of dietary conditioning on the feeding habits of larval weakfish (*Cynoscion regalis*). *American Fisheries Society, Early Life History Meeting* (5/1993).

Invited lectures

- Selective feeding by larval weakfish (*Cynoscion regalis*): the influence of prey characteristics and larval behavior. *University of Texas Marine Science Institute, Port Aransas, TX* (10/1994).
- Selective feeding by larval weakfish (*Cynoscion regalis*): the influence of prey characteristics and larval behavior. *Marine Biology Seminar Series, the University of Texas Marine Biomedical Institute and Texas A&M University at Galveston* (11/1994).
- Morphology of distal neurons isolated from the retinas of adult and larval zebrafish (*Danio rerio*). *University of Texas at Houston Medical School* (10/1995).

- Voltage-gated currents in zebrafish retinal bipolar neurons. *Laboratory of Neurophysiology, National Institute of Neurological Disorders and Stroke, National Institutes of Health (4/1997).*
- Questions in science: the Ph.D. path. *Senior Seminar Series, Washington College, Chestertown, MD (3/1998).*
- Voltage-probe measurements of glutamate responses from acutely dissociated zebrafish retinal neurons. *Conference on Retinal Neurobiology and Visual Processing, FASEB Summer Research Conference (7/1998).*
- Retinal bipolar cells, Department of Biology, *American University (Fall 1999)*
- Greenberg Seminar, *American University (Spring 2000, Spring 2001)*
- Ecology and Physiology of Fish Vision, *Faculty Forum, American University (Fall 2001)*
- Neurobiological Basis of Memory, *Guest Lecture in LIT-696, American University (Fall 2000, Fall 2001)*
- Experiential Learning in the Classroom, *Panel discussion, Ann Ferren Teaching Conference, American University, (Spring 2003)*
- Signal processing in the zebrafish retina: electrophysiology of retinal bipolar neurons, *Seminar, Cooperative Oxford Laboratory, Maryland Department of Natural Resources (June 2003)*
- Preview Day, College of Arts and Sciences, Faculty Perspectives, Science Faculty (Spring 2002, Fall 2003, Fall 2004, Fall 2005, Spring 2006)
- Career Day, Bethesda-Chevy Chase High School, Bethesda, MD (Spring 2004)
- Teaching out of the box, *Presenter (student-selected), Ann Ferren Teaching Conference, American University (Spring 2005)*
- How the Eye Works: Signal Processing by Retinal Bipolar Cells, *BIO-499 Senior Seminar in Biology, American University (Spring 2007)*
- The eyes have it, *Graduate Open House, American University (Spring 2007)*
- Physiological and morphological characteristics of neurons in the distal zebrafish retina. *41st annual Ophthalmology and Visual Science Meeting, University of Texas Medical School at Houston (June 2008)*

Works in progress/manuscripts in preparation

Research

Sponsored research

Grants received: external

- "Modulation of ion channels by the actin cytoskeleton in isolated teleost horizontal cells". Grass Foundation Fellowship 5/1995-9/1995.
- "Glutamate-gated currents in zebrafish retinal bipolar cells". Thomas H. Maren Fellowship 6/1996-7/1996 (\$2500)
- National Research Service Award (F32). National Eye Institute. 1/1/1996-12/31/1997 (1st year = \$20,700; 2nd year = \$25,600).

- Intramural Research Training Award. National Institute of Neurological Diseases and Stroke, NIH. 1/1/1998-12/31/1999 (\$34,500).
- IPA, National Institute of Neurological Disorders and Stroke, National Institutes of Health. Duration of award: 9/1/2006 – 8/30/2007 (\$78,214).

Grants received: internal

- "Inhibitory synapses underlying retinal circuits". Senate Research Award, American University, Washington, DC. 5/1/2000-4/30/2001 (\$12,500)
- "Development of a larval zebrafish rearing facility". Mellon Fund. Fall 1999. (\$1400)
- "Purchase of ADAM Interactive Anatomy Software". Mellon Fund. Spring 2000 (Co-PI with Brett Williams, Anthropology). (\$2000)
- "Impact of Pollutants on fish larvae". Mellon Fund. Fall 2000. (\$1160)
- Publication/offprint charges. Mellon Fund. Spring 2001 and Spring 2002. (\$300 each)
- "Identification of inhibitory circuits in distal retina". Junior Faculty Teaching Release Program, American University, Washington, DC. Spring 2003.
- Imaging retina neurons. Mellon Fund. Fall 2002. (\$1555)
- "Onset of diabetes in NOD mice", Mellon Research Fund. Co-PI (with Lynne Arneson). Spring 2003. (\$2000).
- "How the eye works: signal processing by retinal bipolar cells", Senate Research Award, American University, Washington, DC. 5/1/2003-4/30/2004 (\$10,000)
- "Fluorescent identification of retinal neurons". Mellon Fund. Spring 2004. (\$1130)
- "Development of new models to study diabetic retinopathy in vertebrates" Mellon Fund. Fall 2004. (\$1300)
- Faculty Software Award. Faculty Committee on Information Services, Faculty Senate. Spring 2005. (\$650)
- "Purchase iWorx data acquisition system" CAS Mellon Faculty Development Fund. Spring 2005. (\$2000)
- Dean's Undergraduate Research Award, College of Arts and Sciences, Summer 2007. (\$500; \$1500 to student)

Proposals submitted: Research

- "Inhibitory circuits in distal retina". Academic Research Enhancement Award (R15). National Eye Institute, National Institutes of Health. Submitted 1/25/2001. (not funded)
- "Timecourse of diabetic retinopathy in NOD mice: the murine model of Type I diabetes", Fight for Sight, The Research Division of Prevent Blindness America. (Co-PI with Dr. Lynne Arneson) Submitted 2/2003. (not funded)
- Membrane biosynthesis in normal and dystrophic retina", R01, National Institutes of Health, subcontract (PI = Dr. David Papermaster, University of Connecticut). Submitted 2/2003. (not funded)
- "Prolonged exposure to abnormal light levels alters zebrafish retinal structure", National Science Foundation. Submitted 8/2003. (not funded)

- “Dopamine modulation of bipolar cell activity in the zebrafish retina”. Whitehall Foundation. Submitted 9/2004. (not funded)
- “Development of zebrafish as a model for complications of hyperglycemia”, Academic Research Enhancement Award (R15), National Institutes of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. (Co-PI with Dr. Lynne Arneson). Submitted 5/25/2005. (not funded)

Proposals submitted: Teaching

- Application to Summer Institute on Undergraduate Biology Education. The National Academies/Howard Hughes Medical Institute. Submitted 4/15/2005. (not funded)
- Designed and drafted the Neuroscience Module (and budget) for proposal entitled, “Modern Biological Research Methods- An Immersion Program for Undergraduate and Precollege Students,” submitted to the Howard Hughes Medical Institute (PI: Dr. David Carlini) as part of the 2006 Undergraduate Science Education Program. Submitted 10/2005. (not funded)

Other research projects

Current student research projects

- Effect of abnormal rearing light levels on retinal morphology and development (Ph.D. dissertation)
- Abnormal light levels and morphological changes in adult retina (M.S. Thesis)
- Amacrine cell morphology (MS Thesis)
- Changes in dopamine levels in light vs. dark-adapted conditions (undergraduate research)
- Factors that effect growth in larval zebrafish (undergraduate research)

*Student presentations from the lab (**denotes student)*

- Paley, A** 2001. Growth and development of zebrafish larvae. Montgomery County High School Science Fair.
2nd place Zoology category
Washington Statistical Society Award
- Green, M** 2001. Effect of different ambient light levels on feeding in zebrafish larvae. Montgomery County High School Science Fair.
3rd place Zoology category
- Owens, S** 2002. Behind the music: a day in the life of a *Paramecium*. Montgomery County High School Science Fair.
2nd place Microbiology category
Special Award (presented by the Society for In Vitro Biology)
- Krusman, TJ** 2002. Do genes and environmental variables cause fluctuating asymmetry in developing zebrafish? Paper presentation, 12th Annual Student Research Conference, American University.
- Graham, D**, R Nelson, and VP Connaughton. 2002. DiOlistic labeling of zebrafish retinal neurons. NIH Student Poster Presentation.
NINDS Exceptional Summer Student Award Winner
- Blumenthal, M** 2003. Prolonged exposure to sub-optimal temperatures alters anatomy in zebrafish, Montgomery County High School Science Fair.
2nd place Zoology category
Washington Statistical Society Award
- Ferguson, C** 2003. Determination of how prey availability influences zebrafish growth. Montgomery County High School Science Fair
1st place Zoology category

Grand prize, Life Sciences Division of the entire Science Fair

- Norton, A**, M Mirsky**. 2004. The effects of nitrate on zebrafish growth, Montgomery County High School Science Fair.
2nd place, Zoology category
US Army Research Office Award
- McCarron, A** 2004. Effect of nitrate levels on the growth and development of young and old *Xenopus* tadpoles, Montgomery County High School Science Fair.
3rd place, Zoology category
- DeLucia, V** 2004. Neurotransmitter distribution in retina. Poster presentation, CAS Student Research Conference, American University.
Winner, Best Student Poster (AM session)
- Krugler, A ** 2004. Glia and their location and effects in the retina. Honors Capstone Conference, American University.
- Parker, B** 2005. The effects of nicotine levels on growth and development in larval zebrafish, Montgomery County Science Fair.
Grand Award, Life Sciences, Senior Division, Intel ISEF Finalist
1st place, Zoology category
Winner, Commissioned Officers Association of the US Public Health Service, Surgeon General Outstanding Student Award Certificate
Winner, Sigma Delta Epsilon Graduate Women in Science Certificate of Recognition
- Gilman, L** 2005. Sodium channels in retinal bipolar cells. Poster presentation, CAS Student Research Conference, American University.
- Krugler, A** 2005. Glia and their location and effects in the retina. Poster presentation, CAS Student Research Conference, American University.
- Manion, J** 2006. The effects of varying food density on the growth and survival of zebrafish. Poster presentation, CAS Student Research Conference, American University.
- Feibel, G** 2008. The effects of hyperglycemia on glial cells in the retina of zebrafish. Poster presentation, CAS Student Research Conference, American University.

Editorial activities

Invited reviewer for grant proposals from:

- Council for the Earth and Life Sciences of the Netherlands Organisation for Scientific Research, Netherlands (2002, 2003)
- National Science Foundation (2006, 2008)
- Medical Research Council, Neuroscience and Mental Health Board, London (2008)

Invited reviewer for manuscripts submitted to:

- *Vision Research* (1998)
- *Journal of Neuroscience* (2001)
- *Visual Neuroscience* (2002)
- *Journal of Neurobiology* (2002)
- *International Journal of Developmental Neuroscience* (2004)
- *Transactions of the American Fisheries Society* (2004)
- *The Biological Bulletin* (2004)
- *Journal of Physiology* (2005, 2006)

- *Journal of Comparative Neurology* (2007, 2008)

Invited reviewer for book chapters published in:

- *Physiology of Fishes*, 2nd edition (edited by David Evans, Ph.D.), Publisher: CRC Press (1996)
- *Animal Physiology from Genes to Organisms*, 1st edition, Publisher: Brooks Cole Publishing (2003); reviewed Chapter 5 (The Nervous System) and Chapter 6 (Sensory Physiology)
- Mader, S. *Human Biology*, 8th edition, Publisher: McGraw Hill (2004); reviewed Chapter 12 (Nervous system) and Chapter 13 (Senses)

Consultant activities

- Consultant, Summer Productions (2002)
Edited videos on the respiratory system, digestive system, musculoskeletal system, and nervous system for The Learning Channel Elementary School (The Discovery Channel)
- Member, Review Panel, Navy Medical In-House Laboratory Independent Research Program Review, Naval Medical Research Center, Silver Spring, MD (Fall 2002)
- Member, International Reviewers Panel of the Medical Science Monitor (Fall 2003 to present)

Teaching responsibilities

Courses taught

AY 1999-2000

Fall 1999

- BIO-496 Vertebrate Anatomy with lab, one section (4ch) 16 students
- BIO-100 Great Experiments in Biology, five sections (3ch) 75 students

Spring 2000

- BIO-505 Introduction to Neurobiology, one section (3ch) 20 students
- BIO-499 Senior Seminar in Biology, one section (3ch) 14 students

Summer 2000

- BIO-200 Structure and Function, one section (3ch) 15 students

AY 2000-2001

Fall 2000

- BIO-435 Vertebrate Physiology with lab, two sections (5ch) 20 students

Spring 2001

- BIO-499 Senior Seminar in Biology, one section (3ch) 12 students
- BIO-200 Structure and Function, two sections (6ch) 56 students

Summer 2001

- BIO-200 Structure and Function, one section (3ch) 20 students

AY 2001-2002

Fall 2001

- Maternity leave

Spring 2002

- BIO-505 Introduction to Neurobiology, one section (3ch) 24 students
- BIO-499 Senior Seminar in Biology, one section (3ch) 16 students
- BIO-200 Structure and Function, one section (3ch) 31 students

AY 2002-2003

Fall 2002

- BIO-200 Structure and Function, one section (3ch) 35 students

- BIO-435 Vertebrate Physiology with lab, two sections (5ch) 15 students
Spring 2003
- Junior Faculty Teaching Release

AY 2003-2004

Fall 2003

- BIO-434 Vertebrate Anatomy with lab, two sections (5ch) 34 students
- BIO-200 Structure and Function, one section (3ch) 25 students
- Greenberg Ph.D. Seminar

Spring 2004

- BIO-200 Structure and Function, two sections (6ch) 76 students
- BIO-505 Introduction to Neurobiology, one section (3ch) 22 students
- Greenberg Ph.D. Seminar

AY 2004-2005

Fall 2004

- BIO-435 Vertebrate Physiology with lab, two sections (5ch) 28 students
- BIO-200 Structure and Function, one section (3ch) 33 students
- Greenberg Ph.D. Seminar

Spring 2005

- BIO-200 Structure and Function, two sections (6ch) 76 students
- Greenberg Ph.D. Seminar

AY2005-2006

Fall 2005

- BIO-110 General Biology I, three sections (3ch) 40 students
- BIO-434 Vertebrate Anatomy with lab, two sections (5ch) 30 students
- Greenberg Ph.D. Seminar

Spring 2006

- BIO-110 General Biology I, three sections (3ch) 30 students
- BIO-499 Senior Seminar in Biology, one section (3ch) 15 students
- BIO-505 Introduction to Neurobiology, one section (3ch) 27 students
- Greenberg Ph.D. Seminar

AY2006-2007

- Sabbatical

AY 2007-2008

Fall 2007

- BIO-434 Vertebrate Anatomy with lab, three sections (6ch) 43 students
- Greenberg Ph.D. Seminar

Spring 2008

- BIO-499 Senior Seminar in Biology, one section (3ch) 22 students
- Greenberg Ph.D. Seminar

AY 2008-2009

Fall 2008

- BIO-435 Vertebrate Physiology with lab, three (6ch) 41 students
- Greenberg Ph.D. Seminar

Spring 2009

- BIO-499 Senior Seminar in Biology, one section (3ch) 28 students
- BIO-677 Current Topics in Biology & Ecology, one section (1ch) 4 students
- Greenberg PhD Seminar

Supervision of theses/dissertations: CURRENT

- Chair, Ph.D. committee (BCAN Program; Psychology) Student: Rania Tarboush
Topic: Effect of abnormal rearing light level on circuitry in retinal bipolar cells
- Chair, M.A. thesis committee (Biology) Student: Roza Guillaume
Topic: The effect of abnormal light levels on circadian gene expression in adult retina
- Chair, M.S. thesis committee (Biology) Student: Natalia Prado-Oviedo
Topic: Role of estrogens in hyperprolactinemia-induced acyclicity in African elephants
- Committee member, M.S. thesis committee (Biology) Student: Kerry Chu
Topic: Examination of optic and olfactory structures in four species of amphipods
- Committee member, M.S. thesis committee (Biology) Student: Suma Satish
Topic: Evolution of opsin gene family in cave and spring populations of *Gammaraeus minus*
- Committee member, M.S. thesis committee (Biology) Student: Sabrina Nolan

Supervision of theses/dissertations: DEFENDED

- Chair, M.S. thesis committee (Biology) Student: Tamara Lyday
Defended July 2001
Title: Effects of rearing light intensity on retinal development
Current position: Medical student, Des Moines Osteopathic School, Des Moines, IA
- Chair, M.A. committee (Biology) Student: Kelly Harrison
Defended April 2002
Title: *cyclops* mutation alters development of the zebrafish visual system
Current position: Research technician, Allergan, Inc; Irvine, CA
- Chair, M.A. committee (Biology) Student: Mahnoosh Farsaii
Defended August 2002
Title: All amacrine cells mediate ON- and OFF-retinal pathways of rod and cone signals in the mammalian retina
Current position: Faculty member, Fairfax Baptist Temple Academy, Fairfax, VA
- Chair, M.S. committee (Biology) Student: Rania Tarboush
Defended December 2002
Title: Turnover of stable isotopes due to growth and metabolism in zebrafish, *Danio rerio*
Current position: PhD. Candidate, Behavioral Neuroscience Program, American University
- Chair, M.S. thesis committee (Biology) Student: Matthew Warndorf
Defended December 2004
Title: Effects of dopamine on bipolar cell activity in the zebrafish, *Danio rerio*, retina
Current position: Medical Student, North Eastern Ohio Universities College of Medicine.

- Chair, M.S. thesis committee (Biology) Student: Mariette Asare
Defended December 2004
Title: The effects of dopamine on isolated retinal cell responses to glutamate
Current position: Medical Student, Howard University, Washington, DC.
- Chair, M.S. thesis committee (Biology) Student: Melissa Porter
Defended March 2007
Title: Gene expression profiling determines the role of caspases in T cell activation and survival
Current position: Senior Research Biologist, National Institute of Arthritis, Musculoskeletal, and Skin Diseases, National Institutes of Health, Bethesda, MD
- Chair, M.A. thesis committee (Biology) Student: Alexandra Krugler
Defended April 2007
Title: The role of Muller cells in normal and diseased retina
Current position: Research Technician/Study Manager, Walter Reed Army Institute of Research, Silver Spring, MD
- Chair, M.S. thesis committee (Biology) Student: Jennifer Hsieh
Defended July 2008
Title: Morphological identification of amacrine cells in the zebrafish retina
- Committee member, M.A. committee (Psychology) Student: Renee Cockerham
Defended May 2000
Title: Can olfactory bulbectomized rats detect odors?
- Committee member, M.A. committee (Psychology) Student: Stephanie Bisulco
Defended April 2002
Title: Olfactory discrimination of fatty acids in rats with lesions of the anterior dorsomedial olfactory bulb
- Committee member, M.S. committee (Biology) Student: Candice Dorsey
Defended August 2002
Title: Fluctuating asymmetry as a bio-indicator for the Florida Manatee
- Committee member, M.S. thesis (Biology) Student: Amy Gardiner
Defended July 2004
Title: The effect of diabetogenic peptides on the conformation of the MHC Class II molecule I-A^{g7} in Type 1 diabetes
- Committee member, Ph.D. committee (Psychology) Student: Greg Busse
Defended August 2004
Title: Alcohol's modulation of cocaine-induced place preferences: serial and concurrent interactions
- Committee member, M.S. thesis committee (Biology) Student: Jessica Lidstrom
Defended July 2005
Title: The effect of PPAR γ agonists on lung cancer and their relationship to the NF-kappa B pathway
- Committee member, M.S. thesis committee (Biology) Student: Maryellen Gleeson
Defended September 2005
Title: Development of an animal model (*Danio rerio*) for hyperglycemia: applications of the model for diabetic retinopathy.
- Committee member, M.S. thesis committee (Biology) Student: Natasha Godard
Defended June 2007
Title: Impact of cumulus cell removal on oocytes' nuclear maturation and development in the domestic cat
- Committee member, M.S. thesis committee (Biology) Student: Erika Trovato
Defended March 2008
Title: Inflammatory response and tumorigenesis in the absence of the *MAP3K8* gene

Independent Studies/Internships supervised

AY 1999-2000

Fall 1999

- BIO 596 Topics in Vertebrate Anatomy (4ch) 1 student

Spring 2000

- BIO 590 Topics in Neurobiology (1ch) 1 student

Summer 2000

- BIO 490 Retinal Immunocytochemistry (3ch) 1 student
- BIO 690 Neuroscience (3ch) 1 student
- BIO 790 MA Literature Research (3ch) 1 student

AY 2000-2001

Spring 2001

- BIO 491 DNA isolation at NIH (3ch) 1 student
- BIO 490 Zebrafish Research (3ch) 1 student
- BIO 490 Oral Health Research at NIH (4ch) 1 student
- BIO 590 Retinal Morphology (5ch) 1 student
- BIO 590 Topics in Developmental Biology (1ch) 4 students
- BIO 690 Retinal Biology (1ch) 1 student
- BIO 690 Cell Culture of Zebrafish (2ch) 1 student

AY 2001-2002

Spring 2002

- BIO-490 Fluctuating asymmetry in zebrafish (3ch) 1 student

Summer 2002

- BIO-690 Developmental Biology (3ch) 1 student
- BIO-490 Teleost asymmetry (3ch) 1 student

AY2003-2004

Fall 2003

- BIO-490 Neurotransmitters in Retina (1ch) 1 student
- BIO-490 Gene expression in the eye (3ch) 1 student
- BIO-490 Physiology (1ch) 1 student
- BIO-691 BioReliance Lab Assay (3ch) 1 student
- PSYCH-698 Larval development (3ch) 1 student

Spring 2004

- BIO-490 Physiology (1ch) 1 student
- BIO-490 Dopamine levels in retina (3ch) 1 student
- BIO-490 Gene Expression in the Eye 2 (1ch) 1 student
- BIO-497 Senior Honors Thesis I (3ch) 1 student

AY 2004-2005

Fall 2004

- BIO-490 Dopamine in retina (1ch) 1 student
- BIO-497 Senior Honors Thesis I (3ch) 1 student
- PSYC-698 Retinal Sectioning (3ch) 1 student

Spring 2005

- BIO-490 Embryonic Development of Zebrafish (3ch) 1 student
- BIO-497 Senior Honors Thesis I (3ch) 1 student
- BIO-498 Senior Honors Thesis II (3ch) 1 student

- BIO-690 Topics in Developmental Biology (1ch) 2 students
- PSYC-698 Retinal Sectioning 2 (3ch) 1 student

AY 2005-2006

Fall 2005

- BIO-490 EMTB Certification (5ch) 2 students
- PSYC-698 Immunohistochemistry II (3ch) 1 student

Spring 2006

- BIO-490 Conditioned place preference in zebrafish (3ch) 1 student
- BIO-490 Neuroscience (1ch) 1 student
- HNRS-490 Autism Speaks (3ch) 1 student
- BIO-498 Senior Honors Thesis II (3ch) 1 student
- PSYC-698 Neurotransmitter distribution (3ch) 1 student

AY 2006-2007

Sabbatical

AY 2007-2008

- BIO-490 Treatment/diagnosis of Epilepsy (1ch) 1 student

AY 2008-2009

Fall 2008

- BIO-497 Senior Honors Thesis I (3ch) 2 students
- BIO-498 Senior Honors Thesis II (3ch) 1 student
- BIO-490 Environmental effects on zebrafish (1ch) 1 student
- BIO-690 Developmental neurobiology (3ch) 1 student
- PSYC-698 Ultrastructure of the retina (1ch) 1 student

Undergraduate Advisor, Interdisciplinary Major

- Fall 1999-Spring 2002 Major: Neuroscience Student: Nathan DeCarolis

Involvement in Student Life Outside the Classroom

- Faculty advisor M.V.P.P (Most Valuable Poet Paramedics) Fall 2000-Present
- Moderator, AU Student Research Conference Paper session entitled "Frontier of the Body" Spring 2001
- Judge, AU Student Research Conference (Biology posters) Spring 2004
- Sponsor, Student Research Conference Projects Spring 2001
 - Enzyme activity of the digestive system. Poster presentation by B. Becoskie, A. Wesolowska, and D. Zotos.
 - The function of the cardiovascular system of *Rana pipiens*. Poster presentation by A. Scribner, K. Schneider, and D. Sequeira.
 - Muscle Contraction Physiology. Poster presentation by A. Banno, M. Onishi, and C.-M. Wang.
 - Neurophysiological functioning in the peripheral nervous system. Poster presentation by S. Sedaghat, R. Pickens, and K. Zaiens.
 - Neurotransmitter distribution in retina. Spring 2004

- Poster presentation by V. DeLuccia
Winner, Best Student Poster (AM session)
- Sodium channels in retinal bipolar cells. Spring 2005
Poster presented by L. Gilman
- Glia and their location and effects in the retina Spring 2005
Poster presented by A. Krugler
- Effects of varying food density on growth Spring 2006
and survival in zebrafish
Poster Presentation by J. Manion
- Effects of hyperglycemia on glial cells in the Spring 2008
retina of zebrafish
Poster presentation by G. Feibel

Curriculum development

Development of new courses at AU

- Vertebrate Anatomy (BIO 434) lecture and laboratory
I developed all 15 laboratories for this course in addition to all lecture material.
- Introduction to Neurobiology (BIO 505) lecture
I developed all materials pertinent to this course.

Substantial revision of existing course at AU

- Vertebrate Physiology (BIO 435) lecture and laboratory
I developed all 14 original laboratories for this course in addition to all lecture material. During Fall 2003, laptop computers and simulation software were added to this curriculum. For Fall 2006, this course will be further updated due to the recent purchase of state-of-the-art data acquisition equipment and software (funded by the Mellon Fund and a Faculty Software Award).
- General Biology I (BIO-110) lecture
Team leader updating and modifying existing course during AY 05-06

Departmental and University Service/Activities

Biology Department

Current Departmental service

- Chair, Department of Biology AY 07-08, AY 08-09

Previous Departmental service

- Rank and Tenure Committee AY 04-05, 06-07, Spring 2000
- Undergraduate Studies Committee (Biology) AY 05-06
- Chair, Graduate Studies Committee (Biology) Spring 2000-Fall 2005
- Middle States Assessment Committee Fall 2001-Spring 2003
Biology Graduate and Undergraduate Programs
- Director, Upper-Level Laboratory Resources AY 00-01
- Library Liaison AY 00-01
- Search Committee: Cell Biologist AY 00-01
- Search Committee: Biology Chair AY 99-00
- Search Committee: Molecular Geneticist Spring 2000
- Search Committee: Cell/Developmental Biologist (Temp) Summer 2000

College of Arts and Sciences

Current College service

- Search Committee: Physics Chair AY 08-09
- EPC Committee, at large member AY 07-08
- Sigma Xi, Scientific Research Society
Secretary, AU Chapter Fall 2001-present
Vice-President, AU Chapter AY 02-03, 03-04, 04-05
AY 05-06
- Premedical Evaluation Committee, member Fall 1999-present

Previous College service

- Science Rank and Tenure Committee, Biology Rep AY 05-06
- Psychology Search Committee, Biopsychologist/
Behavioral Neuroscientist position, Dean's rep AY 05-06
- EPC Committee, At-large member Fall 1999-Spring 2006
- EPC Steering Committee
Vice-Chair AY 00-01, 02-04, 04-06
AY 05-06
- Academic Integrity Code Panel member Spring 2000-Spring 2006
- Faculty evaluator, AEL program Spring 2003-Spring 2006
- Sloane PSM Committee AY 02-03
- Math/Stat Chair Search Committee, outside member AY 00-01
- Philosophy/Religion Chair Search Committee, EPC rep AY 02-03
- Committee, Doctoral Dissertation Fellowship Awardees AY 02-03
- Psychology Chair Review Committee, EPC rep AY 03-04
- CAP Chair Search Committee, EPC rep AY 04-05
- Faculty Marshall, CAS Graduation May 2005
- Reader, CAS Graduation May 2006

University

Current University service

- Search Committee: Vice Provost for Graduate Studies & Research AY 08-09
- Faculty Development Committee AY 08-09
- Animal Care and Use Committee Spring 1999-present
- University Safety Project Team Fall 2001-present

Previous University service

- University Senate, EPC representative, Instructional
Budget and Benefit Programs Committee
(Benefits Advisory Project Team) AY 03-04, 04-05, 05-06
- University Senate, At-large member AY 00-01, 01-02
- Interviewer, McNair Postbaccalaureate Program Spring 2002

Memberships and Professional Activities

- Association for Research in Vision and Ophthalmology
- Sigma Xi
- Mount Desert Island Biological Laboratory, Associate Member
- Phi Sigma
- Institute of Diving
- Delta Gamma Fraternity
- Alpha Phi Omega Service Fraternity

Community and Civic Activities

- Parent-Teacher Association Member
Four Seasons Elementary School Fall 2004-present
- Volunteer/Classroom Aid
Four Seasons Elementary School Spring 2005
- Parent Action Team, Daily Discoveries Child Care 2001-2003
- Who's Who in Sciences, Higher Education 2003-present
- Organizer, campus liaison for the Chesapeake Bay Bowl, a National competition among high school seniors in the sciences held at AU Spring 2004
- Mentor, Science Fair Participants, Bethesda-Chevy Chase High School 2000-2006