

CURRICULUM VITAE
Peter D. Brodfuehrer, Ph.D.

Position

Professor of Biology
Neuroscience minor – Head and Adviser for Biology

Work Address

Department of Biology
Bryn Mawr College
101 N. Merion Ave.
Bryn Mawr, PA 19010
610-526-5095

Education

B.A. in Biology, State University of New York at Buffalo, Buffalo, New York, May 1980.
Ph.D. in Biology, University of Virginia, Charlottesville, Virginia, January 1986.
Thesis Advisor: W. Otto Friesen, University of Virginia, Charlottesville, VA
Thesis Topic: Control of Swimming Activity in the Medicinal Leech by the Head Brain

Research Interests

- Neuronal basis of behavior and behavioral choice
- Science Education
- Computational Neuroscience

Job Experience

Research

5/79 - 8/79 College Summer Research Program, Roswell Park Memorial Hospital, Buffalo, New York.
9/79 - 8/80 Honors Research Program, Department of Biology, State University of New York at Buffalo, Buffalo, New York.
5/81 - 8/81 Neural Systems and Behavior Course, Marine Biological Laboratory, Woods Hole, Massachusetts.
1/81 - 8/85 Research assistant in the laboratory of W. Otto Friesen, Department of Biology, University of Virginia, Charlottesville, Virginia.
10/86 Basic Immunocytochemical Techniques in Tissue and Whole-mounts, Marine Biological Laboratory, Woods Hole, Massachusetts.
11/85 - 12/88 Postdoctoral fellow/associate in the laboratory of Ronald R. Hoy, Section of Neurobiology and Behavior, Cornell University, Ithaca, New York.
1/89 - 7/90 Postdoctoral associate in the laboratory of Avis H. Cohen, Section of Neurobiology and Behavior, Cornell University, Ithaca, New York.
8/90 - 8/97 Assistant Professor, Department of Biology, Bryn Mawr College, Bryn Mawr, PA 19010.
8/97 - 7/98 Visiting Scientist, Department of Biology, University of California at San Diego, La Jolla, CA 92023.

- 9/97 –8/03 Associate Professor, Department of Biology, Bryn Mawr College, Bryn Mawr, PA 19010.
- 1/04 – 5/04 Visiting Scientist, United States Environmental Protection Agency, Neurotoxicology Division. Research Triangle Park, NC 27711.
- 5/04 Visiting Scientist, Department of Biology, University of California at San Diego, La Jolla, CA 92023.
- 9/03 – present Professor, Department of Biology, Bryn Mawr College, Bryn Mawr, PA 19010.
- 8/11 – 12/11 Visiting Scientist in Laboratory of Dr. Robert Greenberg, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, PA 19104
- 5/15 – 6/15 Visiting Scientist in Laboratory of Dr. Orit Shefi, Faculty of Engineering
Bar-Ilan Institute of Nanotechnology and Advanced Materials, Bar-Ilan University, Ramat-Gan, Israel

Teaching (outside of Bryn Mawr College)

- 8/80 - 12/80 Teaching assistant: Introductory biology laboratory, Department of Biology, University of Virginia, Charlottesville, Virginia.
- 1/82 - 5/82 Teaching assistant: Neurobiology laboratory, Department of Biology, University of Virginia, Charlottesville, Virginia.
- 8/85 - 12/85 Lecturer: Neuroethology course (Biological Sciences 424), Section of Neurobiology and Behavior, Cornell University, Ithaca, New York.
- 8/88 - 12/88 Lecturer: Principles of Neurophysiology (Biological Sciences 491), Section of Neurobiology and Behavior, Cornell University, Ithaca, New York.
- 8/95 Faculty: Leech Neurobiology and Development course. Marine Biological Station, Woods Hole, MA. (August 12 - August 19).
- 8/96 Lecturer and instructor: Neuroethology in Jerusalem, Hebrew University, Jerusalem, Israel. (August 11 - August 30).
- 6/00 Faculty: Neural Systems and Behavior Course, Marine Biological Laboratory, Woods Hole, MA.

Professional Development

Molecular Biology Summer Workshop sponsored by Smith College and New England BioLabs, Smith College, Northampton, MA, July 11-23, 2011.

PREP workshop Mathematical Biology: Beyond Calculus, Sweet Briar College, VA, June 13-18, 2011.

Bioinformatics Workshop from the National Center for Biotechnology Information at the National Library of Medicine – National Institutes of Health, Bryn Mawr College. June 8&9, 2005

Problem-Based Learning: From Ideas to Solutions through Communication. University of Delaware Institute for Transforming Undergraduate Education, June 15-17, 2005.

Administrative Positions

- 9/99 – 5/06 Chair of Biology, Bryn Mawr College
9/96 - 5/02 Program Chair, Neural and Behavioral Sciences
9/03 – present Minor in Neuroscience (formally Neural and Behavioral Sciences Concentration) Adviser for Biology
9/08 – 5/09 Director of the Center for Science in Society
9/13 – present Head of Minor in Neuroscience
9/15 – 5/15 Chair Faculty Curriculum Committee
5/14 – present Direction STEM Posse Program and Summer Immersion Program
8/15 – present Faculty Fellow for LILAC

Publications

Peer reviewed research articles

Brodfehrer, P.D. and Fournier, C.R. (1983) Reflexes evoked by the femoral and coxal chordotonal organs in the cockroach, *Periplaneta americana*. *Comp. Biochem. Physiol.* 74A:169-174.

Brodfehrer, P.D. and Friesen, W.O. (1984) A sensory system initiating swimming activity in the medicinal leech. *J. exp. Biol.* 108:341-355.

Friesen, W.O. and **Brodfehrer, P.D.** (1984) Identification of neurons in the leech through local manipulations. *J. Exp. Biol.* 113:455-460.

Brodfehrer, P.D. and Friesen, W.O. (1986) From stimulation to undulation: A neuronal pathway for the control of swimming in the leech. *Science* 234:1002-1004.

Brodfehrer, P.D. and Friesen, W.O. (1986) Initiation of swimming activity by trigger neurons in the leech subesophageal ganglion. I. Output connections of Tr1 and Tr2. *J. Comp. Physiol. A* 159:489-502.

Brodfehrer, P.D. and Friesen, W.O. (1986) Initiation of swimming activity by trigger neurons in the leech subesophageal ganglion. II. Role of segmental swim-initiating interneurons. *J. Comp. Physiol. A* 159:503-510.

Brodfehrer, P.D. and Friesen, W.O. (1986) Initiation of swimming activity by trigger neurons in the leech subesophageal ganglion. III. Sensory input to Tr1 and Tr2. *J. Comp. Physiol. A* 159:511-519.

Brodfehrer, P.D. and Friesen, W.O. (1986) Control of leech swimming activity by cephalic ganglia. *J. Neurobiol.* 17:697-705.

Brodfehrer, P.D. and Hoy, R.R. (1988) Effect of auditory deafferentation on the synaptic connectivity of a pair of identified interneurons in adult field crickets. *J. Neurobiol.* 19:17-38.

May, M. L., **Brodfehrer, P.D.** and Hoy, R.R. (1988) Kinematic and aerodynamic aspects of ultrasound-induced negative phonotaxis in flying australian field crickets (*Teleogryllus oceanicus*). *J. Comp. Physiol. A* 164:243-249.

Brodfehrer, P.D. and Hoy, R.R. (1989) Integration of ultrasound and flight inputs on descending neurons in the cricket brain. *J. exp. Biol.* 145: 157-171.

Hoy, R., Nolen, T. and **Brodfehrer, P.** (1989) The neuroethology of acoustic startle and escape in flying insects. In: Principles of Sensory Coding and Processing. *J. exp. Biol.* 146:287-306.

Brodfehrer, P.D. and Hoy, R.R. (1990) Ultrasound sensitive neurons in the cricket brain. *J. Comp. Physiol. A* 166:651-662.

Brodfehrer, P.D. and Cohen, A.H. (1990) Initiation of swimming activity in the medicinal leech by glutamate, quisqualate, and kainate. *J. exp. Biol.* 154:567-572.

Brodfehrer, P.D. and Cohen, A.H. (1992) Glutamate-like immunoreactivity in the leech central nervous system. *Histochemistry.* 97(6):511-516.

Brodfehrer, P.D., Kogelnik, A.M., Friesen W.O. and Cohen, A.H. (1993) Effect of the tail ganglion on swimming activity in the leech. *Behav. Neural Biol.* 59:162-166.

Brodfehrer, P.D. and Burns, A. (1995) Factors influencing the decision to swim in the medicinal leech. *Neuro. of Learning and Mem.* 63:192-199.

Brodfehrer, P.D., Parker, H.J., Burns, A. and Berg, M. (1995) Control of the segmental swim generating mechanism by an identified pair of interneurons in the leech head ganglion. *J. Neurophysiol.* 73:983-992.

Thorogood, M.S.E. and **Brodfehrer, P.D.** (1995) The role of glutamate in swim initiation in the medicinal leech. *Invert. Neurosci.* 1:223-233.

Brodfehrer, P.D., Debski, E.A., O'Gara, B.A. and Friesen, W.O. (1995) Neuronal control of swimming. *J. Neurobio.* 27:403-418.

Thorogood, M.S., Almeida, V.W. and **Brodfehrer, P.D.** (1999) Localization of glutamate receptor 5/6/7 - like and glutamate transporter-like immunoreactivity in the leech central nervous system. *J. Comp. Neurol.* 405:334-344.

Cacciatore, T.W., **Brodfehrer, P.D.**, Gonzalez, J.E., Adams, S.R., Tsien, R.Y., Kristan, W.B.Jr., and Kleinfeld, D. (1999) Identification of neural circuits by imaging coherent changes in membrane potential with FRET-based dyes. *Neuron* 23:449-459.

Cellucci, C.J., **Brodfehrer, P.D.**, Acera-Pozzi, R., Dobrovolny, H., Engler, E., Thompson, R., Los, J. and Albano, A.M. (2000) Linear and nonlinear measures predict swimming in the leech. *Phys. Rev. E* 62, 4826-4834.

Brodfehrer, P.D. and Thorogood, M.S.E. (2001). Identified Neurons and the Initiation of Leech Swimming. *Prog Neurobio.* 63(4):371-381.

Albano, A. M., **Brodfehrer, P. D.**, Tapyrik, L., and Sundera, S. (2006) Linear and nonlinear properties of prestimulus ventral cord signals distinguish swimming response of the leech to intracellular stimulation. *International Journal of Bifurcation and Chaos* 16:145-155.

Brodfehrer, P.D., Tapyrik, L., Convery, M., Zekavat, G., and Pietras, N. (2006) Modification of Behavioral Responsiveness Following Foraging for Artificial Blood in the Medicinal Leech. *J. Comp. Physiol. A.* 192:817-825.

Brodfehrer, P.D., McCormick, K., Garybeal, C., Tapyrik, L., and Albano, A.M. (2008) Initiation of Swimming or Crawling by a Trigger Interneuron in the Medicinal Leech. *Invert Neurosci.* 8:31-39.

Meacham, C.A., **Brodfehrer, P.D.**, Watkins, J.A., and Shafer, T.J. (2008) Developmentally-regulated sodium channel subunits are differentially sensitive to α -cyano containing pyrethroids. *Toxicology and Applied Pharmacology.* 231(3);273-281.

Albano, A.M., **Brodfehrer, P.D.**, Cellucci, C.J., Tigno, X.T., and Rapp, P.E. (2009) Time Series Analysis, or the Quest for Quantitative Measures of Time Dependent Behavior. *Philippine Science Letters*, 1:18-30.

Mullins OJ, **Brodfehrer P D**, Jusufović S, Hackett JH, Friesen WO (2012) Specialized cephalic regions and sensory inputs that control locomotion in leeches. *J. Comp. Physiol. A* 198:97–108.

Technical Notes, Gene Sequences, and Laboratory Exercises

Brodfehrer, P.D. and Parker, H.J. (1994) Neurophysiological Burst Analysis. In: SuperScope II Applications. GW Instruments, Somerville, MA.

Sweeney, L.M., **Brodfehrer, P.D.** and Raughley, B. (2004) An Introductory Biology Laboratory that Uses Enzyme Histochemistry to Teach Students about Skeletal Muscle Fiber Types. *Adv. Physiol. Educ.* 28: 23-28.

Brodfehrer, P.D. glutamate receptor 1, partial [*Hirudo verbana*], GenBank: AGL96589.1

Abstracts / Posters

Brodfehrer, P.D. and Fournier, C.R. (1981) Chordotonal reflexes in periplaneta americana. (1981) Am. Zool. Abstr. Vol. 21, pp. 1012.

Brodfuehrer, P.D. and Friesen, W.O. (1982) Activation of vibration receptors initiates swimming in a semi-intact leech preparation. Neurosci. Abstr. Vol. 8, pp. 529.

Brodfuehrer, P.D. and Friesen, W.O. (1983) Responses of vibration receptors in the medicinal leech to near-field stimulation. Neurosci. Abstr. Vol. 9, pp. 324.

Brodfuehrer, P.D. and Friesen, W.O. (1984) Swim initiation by neurons in the leech brain occurs by independent pathways. Neurosci. Abstr. Vol. 10, pp. 148.

Brodfuehrer, P.D. and Hoy, R.R. (1987) Effect of auditory deafferentation on the synaptic connectivity of identified interneurons in adult crickets. Neurosci. Abstr. Vol. 13, pp. 1144.

May, M. L. and **Brodfuehrer, P.D.** (1987) Changes in wing parameters in Teleogryllus oceanicus due to ultrasonic stimuli. Neurosci. Abstr. Vol. 13, pp. 398.

May, M.L., Land, B.R., **Brodfuehrer, P.D.** and Hoy, R.R. (1988) A three-dimensional model of the ultrasound-induced negative phonotactic response in the australian field cricket (Teleogryllus oceanicus). Neurosci. Abstr. Vol. 14, pp. 311.

Brodfuehrer, P.D., May, M.L. and Hoy, R.R. (1988). Ultrasonic neurons in the brain of crickets. Neurosci. Abstr. Vol. 14, pp. 311.

Brodfuehrer, P.D. and Cohen, A.H. (1990) Localization of glutamate-like immunoreactivity in the leech central nervous system. Neurosci. Abstr. Vol. 16, pp. 306.

Johnson, B.R., May, M.L. and **Brodfuehrer, P.D.** (1990) Intracellular recording from brain cells in the land snail: A student laboratory exercise for examining neuronal excitability. Physiologist 33:A-40.

Johnson, B.R., May, M.L. and **Brodfuehrer, P.D.** (1991) Current events: A student laboratory exercise for examining ionic currents under voltage clamp in snail neurons. Neurosci. Abstr. Vol. 17, pp. 516.

Brodfuehrer, P.D. (1992) Suppression of activity in an identified interneuron predicts the initiation of leech swimming. Third International Congress of Neuroethology. Abstract # 244.

Brodfuehrer, P.D., Burns, A and Berg, M. (1993) Regulation of segmental swim-initiating interneurons by a pair of identified interneurons in the leech head ganglion. Neurosci. Abstr. Vol. 19, pp. 1600.

Grobstein, P., **Brodfuehrer, P.**, and Oristaglio, J. (1993) The free-will problem: motor choice and intrinsic variability in frog and leech. Neurosci. Abstr. Vol. 19, pp. 1617.

Thorogood, M.S. and **Brodfehrer, P.D.** (1993) Non-NMDA antagonists affect the ability of trigger neurons to excite gating neurons in the swim motor circuitry of the medicinal leech. Neurosci. Abstr. Vol. 19, pp. 1600.

Brodfehrer, P.D. and Burns, A. (1993) To swim or not to swim: control of swimming by neurons in the head ganglion of the medicinal leech. Physiologist 36:A-24.

Brodfehrer, P.D. (1995) Inhibitory Regulation of Swimming. Published by NIH as a supplement for a meeting on AREA grant.

Thorogood, M.S., J. Hyer, and **Brodfehrer, P.D.** (1995) Differential Neurotransmitter release by mechanosensory cells in Hirudo medicinalis. Neurosci. Abstr. Vol. 21, pp. 406.

Melson, S.L. and **Brodfehrer, P.D.** (1996) The role of glutamate in leech swimming. Published by the National Council on Undergraduate Research for a meeting on student research.

Thorogood, M.S., Melson, S.L. and **Brodfehrer, P.D.** (1996) Glutamate's role in the expression of leech swimming: Gating cell activation of the oscillator. Neurosci. Abstr. Vol. 22, pp. 1376.

Thorogood, M.S., Almeida, V.W. and **Brodfehrer, P.D.** (1997) Localization of GLT-1 and GLUR 5/6/7 in the CNS of Hirudo medicinalis. Neurosci. Abstr. Vol. 23, pp.1234.

Cacciatore, T.W., **Brodfehrer, P.D.**, Gonzalez, J.E., Tsien, R.Y, Kristan, W.B., Jr., and Kleinfeld, D. (1998) Neurons that are active in phase with swimming in leech, and their connectivity, are revealed by optical techniques. Fifth International Congress of Neuroethology.

Cacciatore, T.W., **Brodfehrer, P.D.**, Gonzalez, J.E., Tsien, R.Y, Kristan, W.B., Jr., and Kleinfeld, D. (1998) Neurons that are active in phase with swimming in leech, and their connectivity, are revealed by optical techniques. Neurosci. Abstr. Vol. 232, pp. 1890.

Brodfehrer, P.D., Cellucci, C.J., Acera-Pozzi, R., Albano, A.M. (1998) A computational approach to understanding the neuronal control of leech swimming. Leech Meeting. Aug. 22, 1998. Marine Biological Laboratory, Woods Hole, MA.

Brodfehrer, P.D., Cellucci, C. J., Acera-Pozzi, R. and Albano, A.M. (1998) Spatiotemporal Coding of Leech Swimming. The Sixth Annual Dynamical Neuroscience Satellite Symposium. Nov. 6-7, 1998. Los Angeles, CA.

Brodfehrer, P.D., Albano, A.M, and Tapyrik-Perichon, L. (2002) Extracellular analysis of the decision to swim in the medicinal leech. East Coast Nerve Net meeting, April 5-7,. Marine Biological Laboratory, Woods Hole, MA.

Jones, R.F. and **Brodfehrer, P.D.**, (2002) Intracellular calcium level and long-term excitation in leech neurons. The 13th Annual Saint Joseph's University Sigma Xi Student Research Symposium. pp. 49.

Kumar, N. and **Brodfehrer, P.D.**, (2002) Initiation of swimming by leech excitatory peptide. The 13th Annual Saint Joseph's University Sigma Xi Student Research Symposium. pp. 53.

Zukas, A.M. and **Brodfehrer, P.D.**, (2002) Neuronal control of the termination of leech swimming. The 13th Annual Saint Joseph's University Sigma Xi Student Research Symposium. pp. 120.

Brodfehrer, P.D., Sweeney, L., and Raughley, B. Analysis of skeletal muscle fiber types using enzyme histochemistry. Association for Biology Laboratory Education. University of Nevada, Las Vegas, June 3-7, 2003.

Brodfehrer, P.D., and Tapyrik, L. E. (2003). Trigger Neurons Control Leech Swimming via Activation of a Distributed Network. Neurosci. Abstr.

Albano, A. M., **Brodfehrer, P. D.**, Tapyrik L., and Sunder S. (2003) Variance and spatial mutual information patterns distinguish swimming response of the leech to intracellular stimulation. Shanghai International Symposium on Nonlinear Science and Applications November 9-13, 2003

Graybeal, C., McCormick, K., and **Brodfehrer, P.D.** (2003) To Swim or not to Swim: A Multifunctional neuron in the leech. 6th Annual Undergraduate Research Symposium in the Chemical and Biological Sciences. University of Maryland, Baltimore Campus November 1, 2003

Pietras, N. and **Brodfehrer, P.D.** (2003) The Effect of Chemical Cues in Artificial Blood on Behavioral Choice in the Medicinal Leech. 6th Annual Undergraduate Research Symposium in the Chemical and Biological Sciences. University of Maryland, Baltimore Campus November 1, 2003.

Brodfehrer, P.D., Meacham, C.A., Bale, A.S., and Safer, T.J. (2004) Comparison of Na_v1.2 and Na_v1.3 Sensitivity to Disruption by the Pyrethroid Insecticides Deltamethrin and Tetramethrin, Neurosci. Abstr. Program No. 398.9.

Zekavat, G., Convery, M., and **Brodfehrer, P.D.** (2004) The Effect of the Perception of Blood on Leech Behavioral Responsiveness. 7th Annual Undergraduate Research Symposium in the Chemical and Biological Sciences. University of Maryland, Baltimore Campus, October 16, 2004

Meacham CA, **Brodfehrer PD**, Bale AS, Watkins JA, Crofton KM, Shafer TJ. (2005) Adult and juvenile rat sodium channel (Na_v1.2 and Na_v1.3) sensitivity to the pyrethroid

insecticide deltamethrin. 22nd International Neurotoxicology Conference September 11-14, 2005.

McCormick, K., and **Brodfehrer, P.D.** (2005) Initiation of Swimming or Crawling by a Trigger Interneuron in the Medicinal Leech. East Coast Nerve Net meeting, April 1-3, Marine Biological Laboratory, Woods Hole, MA.

Bryant, A., Still, E. and **Brodfehrer, P.D.** (2007) Role of Non-NMDA Receptors in Sustaining Swimming in the Leech. East Coast Nerve Net meeting, April 2007, Marine Biological Laboratory, Woods Hole, MA.

Bryant, A., Still, E. and **Brodfehrer, P.D.** (2007) Role of Non-NMDA Receptors in Sustaining Leech Swimming. Eighth International Congress of Neuroethology, Vancouver, Canada, July 1007.

Brodfehrer, P.D., Tapyrik, L., McCormick, K., and Graybeal, C. (2007) Multifunctional Trigger Interneuron in the Medicinal Leech. Eighth International Congress of Neuroethology, Vancouver, Canada, July 1007.

Brodfehrer, P.D., Bryant, A. and Brady, R. (2008) Mechanisms Underlying Swim Maintenance in the Leech. Neurosci. Abstr.

McKeever, D. Powers, S.E., and **Brodfehrer, P.D.** (2009) Transmitters and Receptors Associated with Prolonged Excitation in Leech Neurons. East Coast Nerve Net meeting, April 2009, Marine Biological Laboratory, Woods Hole, MA.

Ver Hoeve, E., and **Brodfehrer, P.D.** (2010) Re-Evaluation of the Swim Generating Network in the Leech. Proceedings of the First Annual Lehigh Valley Society of Neuroscience Undergraduate Research Conference, Moravian College, Bethlehem, PA.

Brodfehrer, P.D., and Ver Hoeve, E. S. (2010) Role of cell 208 in the leech swim oscillator network. Neurosci. Abstr.

Baumann, B., Petre, J., George-Hallgren, A., Olecki, E., Davis, T.L., and **Brodfehrer, P.D.** The Identification of AMPA Receptor in *Hirudo medicinalis*. Proceedings of the Second Annual Lehigh Valley Society of Neuroscience Undergraduate Research Conference, LaFayette College, Easton, PA.

Baumann, B., Davis, T.L., and **Brodfehrer, P.D.** (2011) Molecular identification of AMPA receptor in *Hirudo medicinalis*. Neurosci. Abstr.

Non-NMDA receptor subunit characterization in *Hirudo verbena*. Dearolf, M, Mobus, E., **Brodfehrer, P.D.** (2013) 16th Annual Undergraduate Research Symposium in the Chemical and Biological Sciences. University of Maryland, Baltimore Campus. October, 2013.

Defining the Quantitative Skills of Incoming Biology Students. Paul J. Overvoorde, P.J., Stanhope, L., Zieffler, A., Ziegler, L., Le, L., Vines, M., Preest, M., Belitsky, J., Haque, T., **Brodfehrer, P.D.**, Davis, G.K., Umbanhowar Jr. C., McFadden, C. HHMI 2015
Constellation Studio A: "Promoting Persistence and Success: Adapting Promising Practices and Promoting Institutional Change." June 2015.

Lessons so far: STEM Poses, the Q Project and Blended Learning at Bryn Mawr College. Davis, G.K., **Brodfehrer, P.D.**, Horner, B. McCormack, E., Spohrer, J. HHMI 2015
Constellation Studio A: "Promoting Persistence and Success: Adapting Promising Practices and Promoting Institutional Change." June 2015.

Membership in Scientific Societies

Faculty for Undergraduate Neuroscience
International Neuroethology Society
Council for Undergraduate Research

Professional Activities

Research Grants

11/85 - 10/87 National Research Service Award from the National Institute of Neurological and Communicative Disorders and Stroke. Project Title: Neuronal Plasticity in the Cricket Auditory System. (**Award = \$32,970**)
4/91 - 3/96 Whitehall Foundation. Project Title: Regulation of Leech Swimming by Inhibitory Neurons in the Head Ganglion. (**Award = \$117,056**)
6/91 - 5/95 Academic Research Enhancement Award from the National Institute of Neurological and Communicative Disorders and Stroke. Project Title: Inhibitory Regulation of Leech Swimming. (**Award = \$97,205**)
3/96 - 2/99 National Science Foundation grant. Project Title: Neural Regulation of Locomotor Behavior. (**Award = \$74,999**)
3/96 - 2/99 REU supplement to my National Science Foundation grant (Summer '96). (**Award = \$4,490**)
5/96 - 4/97 Whitehall Foundation. Project Title: Glutamate as a Neurotransmitter in the Leech. (**Award = \$15,000**)
3/96 - 2/99 REU supplement to my National Science Foundation grant (Summer '97). (**Award = \$3,990**)
8/97 - 7/98 Senior National Research Service Award from the National Institute of Neurological and Communicative Disorders/Stroke. Project Title: Spatio-temporal activity patterns during leech swimming. (**Award = \$36,300**)
3/96 - 2/00 REU supplement to my National Science Foundation grant (Summer '99). (**Award = \$4,810**)
8/00 - 7/02 National Science Foundation - Multi-User Equipment and Instrumentation Resources for Biological Science Grant. Project Title: A Confocal Microscope for Research in Biological Sciences. (**Award = \$165,985**)
8/01 - 7/04 National Science Foundation - ITR Small Grants. Project Title: Computational Analysis of Leech Swimming. (**Award = \$361,782**)

- 9/06 – 8/10 National Science Foundation – Collaborative Research: Neuronal Control of Animal Movements. (**Award = \$159,394**), *includes one-year no cost extension
- 5/07 – 8/07 REU supplement to my National Science Foundation grant. (**Award = \$5,600**)

Institutional Grants

- 6/04 - 5/09 Sherman Fairchild Foundation – Scientific Equipment Program, Phase IX. Program Director. (**Total Award = \$484,438**).
- 9/04 – 8/08 Howard Hughes Medical Institute - Undergraduate Science Education Program. Program Director. (**Total Award = \$1,200,000**).
- 9/08 – 8/12 Howard Hughes Medical Institute - Undergraduate Science Education Program. Program Director. (**Total Award = \$1,200,000**).
- 9/09 – 8/14 National Science Foundation: Department of Undergraduate Education – Noyce Teacher Scholarship Program at Bryn Mawr and Haverford Colleges, Co-Principal Investigator. (**Total Award = \$900,000**).
- 9/12 – 8/16 Howard Hughes Medical Institute - Undergraduate Science Education Program. Program Director. (**Total Award = \$1,000,000**).
- 3/13 – 2/14 Howard Hughes Medical Institute – Collaborative Pilot Grant with Macalester, Oberlin, Lewis & Clark, Harvey Mudd and St Olaf Colleges. Co-Principal Investigator. (**Total Award = \$50,000**).

Bryn Mawr Faculty Development Grants

- 12/11 Bryn Mawr College Faculty Awards & Grants Committee – Project Title: Molecular and Cellular Identification of AMPA Receptors in Leech (**Total Award - \$3000**)
- 4/98 Bryn Mawr College Technology Committee. Project Title: Computer-Based Teaching of Cellular Neurophysiology. (**Total Award = \$745**).
- 2/04 – 8/04 Faculty Research Fund. (**Total Award = \$5000**); travel support for sabbatical
- 9/09 – 5/10 Mellon Tri-College Faculty Forum Grant. Project Title: TriCo Biomathematics Initiative. (**Total Award = \$3000**).
- 9/14 – 8/15 New Directions in Research and Teaching (**Total Award = \$14,050**) Project Title: RNA Interference Analysis of non-NMDA Receptors in Leech Swimming.

Invited Seminars

- 5/89 The University of Minnesota, Department of Physiology.
- 9/89 Participant in the "Neuroethology of the Mauthner System" symposium at the 2nd meeting of the International Society for Neuroethology. West Berlin, Germany.
- 4/91 Villanova University, Department of Biology.
- 4/92 Temple University, Department of Biology.
- 3/93 Swarthmore College, Department of Biology.

- 5/95 Participant in Camden Conference on the Brain for Pre-College Educators, May 20, 1995. University of Rutgers-Camden.
- 12/96 NEC Research Institute, Princeton, NJ.
- 7/99 University of Kaiserslautern, Department of Physiology, Germany.
- 3/01 Invited to serve on 2001 Major Research Instrumentation (MRI) Advisory Panels, National Science Foundation. Declined invitation due to teaching obligations.
- 9/01 Dickinson College, Department of Biology
- 2/03 Member of 2003 NSF Graduate Research Fellowship panel in Neuroscience, Physiology and Microbiology.
- 3/03 Bryn Mawr College Center for Science in Society, A Matter of Time New Discussion Series. "Circadian Rhythms: The Clocks That Time Us".
- 8/03 Neurotoxicology Division of the US Environmental Protection Agency. Research Triangle Park, NC 27711.
- 9/04 First International Meeting on Evolution, Development and Neurobiology of the Leech, Lille, France.
- 11/08 Second Annual Leech Neuroscience Meeting, Washington, DC.
- 3/15 Presenter at Progress through Technology symposium at Jack M.Barrack Hebrew Academy, Bryn Mawr, PA.

Professional Activities

- Ongoing Ad hoc journal article reviewer for - *Journal of Comparative Physiology A*, *Journal of Experimental Biology*, *Comparative Biochemistry and Physiology*, *Journal of Neuroscience*, *Journal of Neurophysiology*, and *Integrative and Comparative Biology*.
- Ongoing Ad hoc external reviewer for government grants.
- 8/95 Lecturer and instructor in the Leech Neurobiology and Development course. Marine Biological Station, Woods Hole, MA.
- 8/96 Lecturer and instructor in the Neuroethology in Jerusalem course, Hebrew University, Jerusalem, Israel.
- 8/98 Symposium organizer. Leech Neurobiology and Development. Marine Biological Station, Woods Hole, MA.
- 3/99 Participant in Grant Writing Workshop for graduate student professional development in the Graduate School of Arts and Sciences, Bryn Mawr College.
- 3/00 Outside reviewer for reappointment of an assistant professor at Harvey Mudd College, Clarmont, CA.
- 6/00 Faculty in Neural Systems and Behavior course. Marine Biological Station, Woods Hole, MA.
- 8/00 Symposium organizer. Leech Neurobiology and Development. Marine Biological Station, Woods Hole, MA.
- 6/01 Invited to participate in the Euro Nerve Net School, Laboratoire De Neurobiologie, Université Bordeaux, France (invitation rescinded because of lack of funding).
- 9/01 Outside reviewer for promotion to assistant professor at Harvey Mudd College, Clarmont, CA.
- 12/01 Outside reviewer for promotion to full professor at Haverford College, Haverford, PA.

- 1/02 Outside reviewer for promotion to associate professor at Haverford College, Haverford, PA.
- 5/02 Participant in the Tri-College Math/Science Teaching Symposium at Bryn Mawr College. Presentation: Lauren Sweeny, & Peter Brodfuehrer Department of Biology, Bryn Mawr College, "Making Introductory Biology Lab Interesting: Histochemical Analysis of Muscle Fiber Type".
- 5/03 Outside reviewer for promotion to associate professor at Barnard College, New York, NY.
- 8/04 Faculty team member to the Project Kaleidoscope Leadership Initiative Institutions.
- 9/04 Participant in PKAL Leadership Initiative workshop at RPI, Troy, NY.
- 11/04 Outside reviewer for promotion to associate professor at Haverford College, Haverford, PA.
- 2/04 Invited to serve on NSF Graduate Research Fellowship panel in Neuroscience, Physiology and Microbiology. On leave - declined invitation.
- 4/04 Participant in workshop on Cultivating Faculty Leadership: The Role of Faculty at a Liberal Arts College at Union College, Schenectady, NY.
- 2/05 Invited to serve on NSF Graduate Research Fellowship panel in Neuroscience, Physiology and Microbiology. Declined invitation due to teaching obligations.
- 9/05 Chair External Review Committee for Department of Neuroscience, Lafayette College, Easton, PA.
- 03/06 Member of the 2006 HHMI Undergraduate Science Education Program Review Panel. Howard Hughes Medical Institute, Chevy Chase, Maryland.
- 05/06 Faculty Panel on Assessment, Math/Science Pedagogy Workshop, Bryn Mawr College.
- 2005-09 Program Director, Sherman Fairchild grant to Bryn Mawr College.
- 2004-08 Program Director, Undergraduate Education Grant to Bryn Mawr College from Howard Hughes Medical Institute.
- 02/06 Presenter in Stories of Teaching and Learning, Sponsored by Center for Science in Society, Bryn Mawr College.
- 05/06 Presenter on "Rethinking Science Education", Science in Society Brown Bag Lunch Series. Bryn Mawr College.
- 5/07 External Review Committee of Swarthmore College's Howard Hughes Medical Institute Undergraduate Education Grant, Swarthmore, PA.
- 5/07 Presenter on "Just in Time Teaching" in symposium on Engaging Millennial Learners in Math and Science Courses sponsored by Math Science Partnership of Greater Philadelphia, Widener University, June 1, 2007.
- 2/08 Invited to serve on NSF Graduate Research Fellowship panel in Neuroscience, Physiology and Microbiology. Declined invitation due to teaching obligations.
- 2008-12 Program Director, Undergraduate Education Grant to Bryn Mawr College from Howard Hughes Medical Institute.
- 1/09 Outside review of iBioSeminars for Howard Hughes Medical Institute.
- 2/09 Invited to serve on NSF Graduate Research Fellowship panel in Neuroscience, Physiology and Microbiology. Declined invitation due to teaching obligations.
- 6/09 Presenter on panel discussing novel approaches to science pedagogy at Mid-Atlantic HHMI meeting.

- 7/09 Outside reviewer for promotion to associate professor at the University of Richmond.
- 11/09 Organizer and host of David Asai's, HHMI Undergraduate Director, site visit to Bryn Mawr.
- 2/10 Invited to serve on NSF Graduate Research Fellowship panel in Neuroscience, Physiology and Microbiology. Declined invitation due to teaching obligations.
- 8/10 Outside reviewer for promotion to associate professor at the St. Olaf College.
- 10/10 Presenter – Workshop on Pre-Service Teacher Preparation, 2010 HHMI Program Directors meeting.
- 6/11 Presenter - **Blended Learning Conference**, Bryn Mawr College.
- 12/11 Presentation on Web Casting - **Blended Learning Conference**, Bryn Mawr College.
- 04/12 Grant reviewer - U.S. Army Corps of Engineers' Engineer Research and Development Center.
- 10/12 Presenter – Session on Diversifying the Professoriate through Future Faculty Development, 2012 HHMI Program Directors meeting.
- 10/12 Co-Facilitator – Facilitated Discussion: Identifying Institutional and Shared Challenges – Competency Based Curricula, 2012 HHMI Program Directors meeting.
- 1/14 NSF Graduate Research Fellowship panel in Neuroscience and Physiology.

Honors and Awards

- 1980 Graduated Summa Cum Laude, State University of New York at Buffalo, Buffalo, New York.
- 1985 Andrew Flemming Award for outstanding graduate research, Department of Biology, University of Virginia, Charlottesville, Virginia.
- 1998 Who's Who in America's Teachers; nominated by Daniel Brum (Haverford '97)
- 2003-04 Awarded salary support through the Elizabeth B. Jackson Biology Fund.
- 5/09 Recipient of the Rosalyn R. Schwartz Teaching Award.
- 05/12 Eleanor Bliss Professor of Biology

Supervised Independent Laboratory Research

- 1990-91 Grace Wong (BMC '91)
- 1991-92 Lori Rogers (BMC '92), Catherine Foster (BMC '92) and Janelle Doyle (BMC '92)
- 1992-93 Melissa Berg (BMC '93) and Jan Kristoff (BMC '93)
- 1994-95 Tamara Rozental (BMC '95), Jennifer Hyer (BMC '95) and Sonya Martin (BMC '95)
- 1995-96 Susanna Melson (BMC '96)
- 1996-97 Vania Almeida (BMC '97), Elizabeth Tinker (BMC '97), Daniel Brum (Haverford '97), Shannon Seymour (BMC '97) and Edward Piskorski (Haverford '97)
- 1998-99 Noreen Khan (BMC '99) and Erin Brown (BMC '99)
- 1999-00 Allison Rosenberg (BMC '00) and Rehema Trimiew (BMC Psychology '00)

2000-01	Alexandra Smith (BMC '01), Jason Bernstein (Haverford '01) and Swapna Kamadana (BMC '01)
2001-02	Alica Zuckas (BMC '02), Rebecca Jones (BMC '02) and Nirupama Kumar (BMC '02)
2002-03	Quraishi, Sabah (BMC '03), Dzani, Kuorkur (BMC '04) and Nickisha Stephenson (Haverford '03), Lauren (BMC '04), Pietras, Nicole (BMC '04) and Ocampo, Robert (Haverford '04)
2003-04	Welsh, Lauren (BMC '04), Pietras, Nicole (BMC '04) and Ocampo, Robert (Haverford '04), Tung Nguyen (Haverford '04) and Tara Rajan (BMC '04)
2004-05	Ghazal Zekavat, (BMC '06), Maureen Convery (BMC '06), and Kathryn McCormick (BMC '05)
2005-06	Ghazal Zekavat (BMC '06) and Maureen Convery (BMC '06)
2006-07	Elizabeth Still (BMC '07), Gillian Confair (BMC '07), and Astra Bryant (BMC '08)
2007-08	Astra Bryant (BMC '08) and Rachel Brady (BMC '09)
2008-09	Dominique McKeever, (BMC '09), Sarah Powers (BMC '09), Heather Foley (BMC '09), and Joo Park (BMC '11).
2009-10	Elizabeth Ver Hoeve (BMC '10), Isabelle Winer (BMC '10) and Camille Petre (BMC '11; spring 2010 only)
2010-11	Bailey Baumann (BMC '11), Camille Petre (BMC '11), Anne George-Hallgren (BMC '11), Elizabeth Olecki (BMC '12; spring semester only) and Rama Kirloskar (BMC '12; spring semester only)
2012-13	Su Oner (BMC'14; fall semester only), Nicole Bowman (BMC'14; spring semester only) and Tiannan Zhan (BMC'14; spring semester only)
2013-14	Su Oner (BMC'14) and Valerie Gartner (BMC'14)
2014-15	Katrina Obieta (BMC'15), Amy Miles (BMC'15), Michelle Dearolf (BMC'15; spring semester only) and Mirna Law (BMC'16; spring semester only)

Summer Undergraduate Research Students

Summer '91	Janelle Doyle (BMC '92) and Margaret O'Neill (Smith College '92).
Summer '92	Melissa Berg '93 and Mariam Koodary (withdrew from BMC)
Summer '94	Jennifer Hyer (BMC '95)
Summer '96	Vania Almeida (BMC '97), Elizabeth Tinker (BMC '97; done in collaboration with Danielle Carr in Mathematics) and Daniel Brum (Haverford '97).
Summer '97	Michelle Bostick (BMC '98)
Summer '99	Elizabeth Windsor (BMC '00) and Jason Bernstein (Haverford '01)
Summer '00	Alexandra Smith (BMC '01) and Aparna Kanneganti (BMC '01)
Summer '01	Alica Zuckas (BMC '01) and Rebecca Jones (BMC '01)
Summer '02	Quraishi, Sabah (BMC '03) and Dzani, Kuorkur (BMC '04)
Summer '03	Carolyn Graybeal (BMC '04), Nicole Pietras, (BMC '04) and Kathryn McCormick (BMC '05)
Summer '04	Maureen Convery (BMC '06), Ghazal Zekavat, (BMC '06) and Kathryn McCormick (BMC '05)
Summer '06	Rebecca Donatelli (BMC '07) and Klaudia Gorska (BMC '08)
Summer '07	Astra Bryant (BMC '08) and Rachel Brady (BMC '09)

- Summer '08 Dominique McKeever (BMC '09)
Summer '09 Elizabeth Hamilton (BMC '13; transferred) and Dakota Fisher-Vance (BMC '11)
Summer '12 Nicole Bowman (BMC'14) and Su Oner (BMC'14)
Summer '13 Michelle Dearolf (BMC'15) and Emily Mobus (BMC'14)
Summer '14 Katrina Obieta (BMC'15), Ishani Das (BMC'15), and Mahia Tiwana (BMC'16)

Faculty Committees / Other Activities

- Member of Committee on Faculty Salaries and Benefits, 1991-1994.
Member of the Health Benefits Review Committee, Fall '92 and Spring '93.
Member of Committee on Academic Computing, Natural Science Representative, 1992-1993.
Member of Undergraduate Curriculum Committee, 1992-1995.
Representative to Bryn Mawr Psychology Department Search Committee, 1992-1993.
Representative to Bryn Mawr Computer Center Search Committee, Summer '93.
Representative to the Two College Committee on Academic Cooperation, Fall '94 and Spring '95.
Member of the selection committee for the Dorothy Nepper Marshall Program, Spring '95
Representative to Bryn Mawr Biology Department Search Committee for a tenure track position in Ecology, 1995-1996.
Member of the Post-Bac admissions committee, 1995-1997.
Member of the Institutional Animal Care and Use Committee, 1996-5//01.
Representative to Haverford Biology Department Search Committee for a tenure track position in Molecular Neurobiology, 1998 - 1999.
Representative to Bryn Mawr Biology Department Search Committee for a tenure track position in Genetics, 1998-1999.
Member of Committee on Academic Computing, Natural Sciences Representative, 1998-2001.
Faculty Representative to the Board of Trustees, 1998 - 2001.
Representative to Bryn Mawr Biology Library Search Committee for a science librarian position, 1999.
Faculty Mentor for Ed Wovchko, Assistant Professor in the Department of Chemistry
Chair of the Search Committee for the Computational Scientist position, 2001-2002.
Hired Dr. Wong
Representative to Steering Committee for Computing in Math/Sciences, 1999-2001.
Panel Member - Preview Day's Faculty Panel, October 2001
Panel Member - Admissions Web Chat, April 3, 2002.
Chair of the Search Committee for the Laboratory Instructor, Summer 2002. Hired Mr. Franklin.
Chair of the Search Committee for the Ecologist position in Biology, 2002-2003. Hired Dr. Williams
Member of the Undergraduate Admissions Committee, 2004-2007.
Chair of the Search Committee for Postdoctoral Fellow in Computational Methods, 2004-2005. Hired

Chair of the Search Committee for Instructor to teach postbaccalaureates *Introductory Biology*, spring 2004. Hired Dr. Wien.

Chair of the Search Committee for the Biochemist / Molecular Biologist position in Biology, 2005-2006. Offered job to top candidate, declined position.

Play a key role in the re-structuring of secretarial support for the Departments of Biology, Geology and Chemistry, 2005-2006.

Biology representative to the Science Node, 2006-2007.

Associate Director of Center for Science and Society, 2007-08.

Hosted classroom visits for prospective students – 4 students attended *Introductory Biology* (Biology 102) in spring 2008

Member of the Katharine Houghton Hepburn Center steering committee, 2007-2009.

Member of the Search Committee for Evolutionary Developmental Biologist position in Biology, fall 2007.

Ad Hoc committee to assist the Provost in evaluating and setting criteria for graduate programs – spring 2008

Ad Hoc committee to discuss revising Parents Weekend – May 2008.

Director of Center for Science and Society, 2008-09.

Member of the Search Committee for Computational Ecologist position in Biology, fall 2008.

Diversity Representative to Geology Search Committee, 2008-09.

Elected Faculty Representative to Search for Chief Development Officer by the Faculty – Fall 2008.

Advised student tour guides on the Biology Department and its major, fall 2008.

Chair of the Search Committee for HHMI Postdoctoral Fellow in Applied Mathematics, 2008-09. Hired Dr. Vandiver.

Chair of the Search Committee for HHMI Postdoctoral Fellow in Science Education, Fall 2008-09. Hired Dr. Glasser.

Member of the Middle States Working Group on Graduate Education. 2009-2010.

Hosted classroom visits for prospective students – 5 students attended *Introductory Biology* (Biology 102) in spring 2009.

Hosted classroom visits for alumnae – 3 alumnae attended *Introductory Biology* (Biology 102) in spring 2009.

Elected Faculty Representative to the Board by the Faculty – fall 2009.

Presenter at Grantsmanship Workshop hosted by Provost's Office - February 3, 2010.

Faculty member of Looking Forward *ad hoc* committee – fall 2010.

Informal presentation to Resources on HHMI funding – November 8, 2010.

Member of the Physics Search Committee – 2010-2011.

Co-chair of the Biology Search Committee – 2010-2011.

Co-Organizer of Symposium on Science Careers at Liberal Arts Institutions, April 15, 2011 at Haverford College.

Science Posse Steering Committee – 2011 to present

Emily Black Seminar steering Committee – 2012 to present

Member of the Search Committee for Ecologist position in Biology, Fall 2011.

Member of the Search Committee for Genomic's position in Biology, Fall 2012.

Member of Dr. Blank's Committee for Promotion to Full Professor – Fall 2012.

Member of the Search Committee for Laboratory Instructor position in Biology, Spring 2013.
Member of the Search Committee for Computational Ecologist position in Biology, fall 2013.
Talk entitled, "Time Scales across Biology," for Family Weekend, October 2013.
Member of Undergraduate Curriculum Committee, 2013-present.
Member of Quantitative Reasoning Steering Committee. 2013-present.
Member of *Ad hoc* Search Committee for Opportunity Hire in Mathematics, Fall 2014.
Member of Search Committee for Neuroscience position in Biology at Haverford College, Fall 2014.
Member of Advisory Council Meeting to Chair of Faculty – 2014-15.

Outreach / Community Activities

Participant in Brain and Behavior Summer Institute, summers '93, '94 and '95.
Participant in Camden Conference on the Brain for Pre-College Educators, May 20, 1995. University of Rutgers-Camden. Seminar Title: To swim or not to swim: Control of leech swimming.
Mentor for Joslyn Carpenter, Lambertton High School student and Bryn Mawr class of 1999, fall '94 and Spring '95.
Laboratory demonstrations for Lambertton High School students, April '95 and April '96
Laboratory demonstrations for Philadelphia Middle School students, June 16, 1997
Laboratory demonstrations for Lambertton High School students, March 12, 1998
Neuroscience demonstrations for Stratford Friends students, 1997-2000
Neuroscience demonstrations for Haverford Friends students, 2001
Participant in Brain and Behavior Summer Institute, summer 2007.
Participant and coordinator of HHMI sponsored Fridays in the Lab for high school students from Delaware Valley Friends School, 2004-05, 2005-06, 2006-07, and 2007-08.
Co-Director of HHMI-sponsored Summer Institute for K-12 teachers, Science as Interactive, Interdisciplinary Inquiry, July 21 – August 1, 2008.
Coordinator and instructor in STEM Posse Summer Immersion program. July 2013.

Community Relations

Open Campus Day - April '91, '92, '93, '95, '96. Tea/ dinner with prospective students and their parents.
Fundraising Volunteers Weekend, October 1994. Dinner with volunteers.
Wednesdays at Mid-Day. Round-table admissions panel with prospective students, their parents and faculty. Summer '93.
Vice President of the Haverford Faculty Swim Club, 1992.
Treasurer of the Haverford Faculty Swim Club, 1993 - 2001.
Member of Two College Committee for Academic Cooperation, fall '94 - Spring '95.
Monitor for the 1995 Commencement.
Represented the Biology Department and the Neural and Behavioral Science concentration at a prospective student's day, September 21, 1996.
Member of the Parent's Day Committee - Fall '97.

Majority Inspector for Haverford Township 5th ward, 1st precinct - May 20, 1997 Primary Elections

Volunteered for MoveOn.org during Presidential Election – November 2004.

Job Shadowing Sponsor for Lower Merion High School, November 2004.

Supervised Heather Melville, a graduate student of Dr. DiBenedetto at Villanova University, with her MS thesis project using the Biology Department's confocal microscope – January 2008 to May 2009. In recognition of my help, Villanova University paid the College \$400 toward maintenance costs of confocal microscope.

Supported Dr. DiBenedetto's students from Villanova using the department's confocal microscope – September 2009 to May 2010.

Haverford Township Little League umpire, summer '00 – present.

Member of MainLine Brewers Association- March 2014 – present.