

Curriculum Vitae

PAUL GENE GREENWOOD

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EDUCATION:

Ph. D. Florida State University, Biological Science, 1987
M. S. Florida State University, Biological Science, 1983
B. A. Knox College, Biology, 1980

PROFESSIONAL POSITIONS:

2017-present	Dean, College of Natural and Health Sciences, University of Tampa
2017-present	Professor of Biology, University of Tampa
2015- 2016	Senior Associate Provost and Dean of Faculty, Colby College
2011- 2015	Associate Provost and Associate Dean of Faculty, Colby College
2004- 2017	Professor of Biology, Colby College
2001 (fall)	Director, CBB Biomedical Semester Program, London, England
1996-1999	Chair, Department of Biology, Colby College (Associate Chair, 2006-2007)
1996- 2017	Dr. Charles C. and Pamela W. Leighton Research Fellow
1993- 2004	Associate Professor of Biology, Colby College
1987- 1993	Assistant Professor of Biology, Colby College
1986-1987	Instructor in Animal Diversity, Department of Biological Science, Florida State University

HONORS AND AWARDS:

National Academies Education Fellow in the Sciences, 2014-2015
Charles Bassett Distinguished Teaching Award, Colby College
Florida State University Psychobiology Fellowship, 1981-1985
Phi Kappa Phi, Florida State University
Phi Beta Kappa, Knox College
College Honors in Biology - Knox College

PRINCIPAL COURSES

Cell Biology	Animal Cells, Tissues, and Organs
Cellular Dynamics	The Cell Cycle and Cancer
Biochemistry II	

EXTRAMURAL GRANTS:

- 2002 National Science Foundation, Major Research Instrumentation Program. (Co-PI) Project Title: Acquisition of isothermal titration and differential scanning microcalorimeters for chemistry and biology research. Award = \$117,220.
- 1996 National Science Foundation, Academic Research Infrastructure Program. (Co-PI) Project Title: Facilities renovation in Arey Life Sciences Building for advanced molecular biology, cellular biology, and microbiology. Award = \$230,107.
- 1996 Merck/AAAS Undergraduate Science Research Program. Award = \$60,000
- 1991 National Institutes of Health, AREA grant. Project Title: Calcium binding proteins and membranes of nematocysts. Award = \$91,805.
- 1990 NECUSE grant for three instructional workshops in Cellular and Molecular Biology at Colby College, January, 1991. Award = \$10,500.
- 1988 National Science Foundation, Instrumentation and Laboratory Improvement Program. Project Title: Fluorescence microscopy in teaching laboratories and student research. Award = \$66,950
- 1988 Grass Foundation Trustee Gift Program Award. Voltage/current clamp apparatus, World Precision Instruments. Award = \$3,950
- 1984 National Institute of Health users grant for the HVEM facility at the University of Wisconsin, Madison

PROFESSIONAL SOCIETIES:

American Society for Cell Biology
Society for Integrative and Comparative Biology
Association for the Sciences of Limnology and Oceanography

RESEARCH INTERESTS:

Our research is focused on the development, discharge physiology, and biochemistry of nematocysts, the stinging structures common to jellyfish, sea anemones, corals, and related organisms. One project is the isolation and characterization of a unique calcium-binding protein that is a component of the nematocyst venom. Another project is an investigation of how predators of cnidarians protect themselves chemically and physically from nematocyst discharge. A third project uses molecular markers to study intraspecific and interspecific variation in several populations of the sea anemone *Metridium*.

PUBLICATIONS:

Research and Review Articles:

LaRiviere, F. J., A. G. Newman (Colby '07), M. L. Watts (Colby '08), S. Q. Bradley (Colby '10), J. E. Juskewitch (Colby '04), P. G. Greenwood, J. T. Millard. (2009). Quantitative PCR analysis of diepoxybutane and epihalohydrin damage to nuclear versus mitochondrial DNA. *Mutation Research* 664: 48-54.

Greenwood, P. G. (2009). Acquisition and use of nematocysts by cnidarian predators. *Toxicon* 54: 1065-1070.

Greenwood, P. G., K. Garry (Colby '01), A. Hunter (Colby '01), M. Jennings (Colby '00). (2004). Adaptable defense: a nudibranch's mucus inhibits nematocyst discharge and changes with prey type. *Biological Bulletin* 206: 113-120.

Greenwood, P. G., I. Balboni (Colby '90), and C. Lohmann (Colby '97). 2003. Evidence that a sea anemone's environment affects discharge of its isolated nematocysts. *Comparative Biochemistry and Physiology A* 134: 275-281.

Greenwood, P. G. and M. Yunes (Colby '95). 1997. How calcium is held in nematocysts: molecular modeling of poly γ -glutamic acids and detection of a specific calcium binding protein in nematocysts of *Metridium senile* Linnaeus, 1761. In (den Hartog, J.P., ed) *The Proceedings of the 6th International Conference on Coelenterate Biology*, Museum of Natural History, Leiden, The Netherlands. pp. 209-214.

Greenwood, P. G. and L. K. Garrity (Colby '91). 1991. Discharge of nematocysts isolated from aeolid nudibranchs. *Hydrobiologia* 216/217: 671-677.

Greenwood, P. G., L. A. Johnson (Colby '89), and R. N. Mariscal. 1989. Depletion of ATP in suspensions of isolated cnidae: A possible role of ATP in the maturation and maintenance of anthozoan cnidae. *Comparative Biochemistry and Physiology* 93A: 761-765.

Greenwood, P. G. 1988. Nudibranch nematocysts. In (D. Hessinger and H. Lenhoff, eds.) *The Biology of Nematocysts*, pp. 445-462. Academic Press, San Diego.

Young, C. M., P. G. Greenwood, and C. J. Powell (U. Alberta '85). 1986. The ecological role of defensive secretions in the intertidal pulmonate *Onchidella borealis*. *Biological Bulletin* 171: 391-404.

Greenwood, P. G. and R. N. Mariscal. 1984. The utilization of cnidarian nematocysts by aeolid nudibranchs: nematocyst maintenance and release in *Spurilla*. *Tissue and Cell* 16: 719-730.

Greenwood, P. G. and R. N. Mariscal. 1984. Immature nematocyst incorporation by the aeolid nudibranch *Spurilla neapolitana*. *Marine Biology* 80: 35-38.

Other Papers:

Greenwood, P. G. and J. H. Henson. (1992). Cytoskeletal transformation of sea urchin coelomocytes. A laboratory exercise in *Exercises in Cell Biology for the Undergraduate Laboratory* published by the American Society for Cell Biology.

Greenwood, P. G. 1991. Secretion. In (F. N. Magill, ed.) *Magill's Survey of Science: Life Science*. Salem Press, Pasadena, CA. pp. 2445-2451.

Abstracts of Presentations at Meetings:

1999. The effects of neurotransmitters on nematocyst discharge in the sea anemone *Metridium senile*. *Mol. Biol. Cell* 10: 229a.

1995. The cnidophage cytoskeleton and nematocyst discharge in the nudibranch *Aeolidia papillosa*. *Am. Zool.* 35: 116A.

1992. Calcium binding proteins in acontial nematocysts of the sea anemone *Metridium senile*. *Mol. Biol. Cell* 3: 341A.
1991. Nematocysts isolated from two populations of the sea anemone *Calliactis tricolor* differ in their discharge response to test solutions. *Am. Zool.* 31: 26A.
1990. Calcium-binding proteins of nematocysts located by ⁴⁵Ca-overlay. *Am. Zool.* 30: 82A.
1989. Spirocyst development in the sea anemone *Haliplanella luciae*. *Am. Zool.* 29: 110A.
1989. The cnidophage cytoskeleton and its possible role in nematocyst orientation in an aeolid nudibranch. *J. Cell Biol.* 107: 683a.
1986. The orientation of nudibranch nematocysts: the cnidophage cytoskeleton. *Am. Zool.* 26: 130A.
1984. Nematocyst maturation in vitro: the effects of ATP on isolated nematocysts. *Am. Zool.* 24: 31A.
1983. Immature nematocyst development and nematocyst symbiosis in an aeolid nudibranch. *Am. Zool.* 23: 922.
1982. Cnidosac ultrastructure and nematocyst incorporation in the aeolid nudibranch *Spurilla neapolitana*. *Am. Zool.* 22: 940.

OTHER RESEARCH PRESENTATIONS (without separately-published abstracts):

Association for the Sciences of Limnology and Oceanography, Honolulu, HI, 2017
Marine Science Speaker Series, University of New England, 2012
Maine Biological and Medical Sciences Symposium, MDIBL, 2011
Maine Biological and Medical Sciences Symposium, MDIBL, 2009
Graduate Seminar at The University of Maine, Orono, ME. 2006
Graduate Seminar at The University of South Carolina, Columbia, SC. 2006.
Maine Biological and Medical Sciences Symposium, MDIBL, 2004
7th International Symposium on Coelenterate Biology. Lawrence, KS. 2003.
Graduate Seminar at the University of East London, London, UK., 2001
Graduate Seminar at the University of New Hampshire, Durham, NH, 2001
Seminar at Bates College, 1997
6th International Symposium on Coelenterate Biol., Leiden, The Netherlands, 1995
Seminar at Dickenson College, Carlisle, PA, 1995
Graduate Seminar at Georgetown University, 1994
Seminar at Bowdoin College, 1991
Seminar at The University of Southern Maine, 1991
Graduate Seminar at The University of Maine, 1990
Seminar at Bates College, 1990
Seminar at The University of Maine at Farmington, 1990
5th International Symposium on Coelenterate Biology, Southampton, England, 1989
1st International Symposium on the Biology of Nematocysts, Irvine, CA, 1986
Benthic Ecology Meeting, Boston, MA, 1986

FORMAL STUDENT PRESENTATIONS SPONSORED (International, National, and Regional):

Frederick, CJ ('11), Levine, SR ('11), Cochrane, E. ('13), and Barnett, AE ('14). Development of microsatellite primers in the sea anemone species *Metridium senile*. Presented at the Maine Biological and Medical Sciences Symposium, Mount Desert Island Biological Laboratory. April 15-16, 2011.

Craig-Müller, Sören A. ('09), Kelsey R. Hilton ('08), and Paul G. Greenwood. Intraspecific variation of ITS-1 and ITS-2 in the rDNA cluster in the sea anemone *Metridium senile*. Presented at the Maine Biological and Medical Sciences Symposium, Mount Desert Island Biological Laboratory. April 17-18, 2009.

Trevor Hanly*, Christian Crannell*, Kelsey Hilton*, Katie Ludwig*, Frederick LaRiviere, Paul G. Greenwood, and Julie T. Millard. Diepoxybutane damage within three different loci of chicken genomic DNA. Presented at the American Chemical Society Annual Meeting. March, 2006

Johnson, Jennifer. The effects of neurotransmitters on nematocyst discharge in the sea anemone *Metridium senile*. Presented at the American Society for Cell Biology Annual Meeting, December 11-15, 1999.

Oeltjen, Josh. The characterization and purification of a novel calcium binding protein in the nematocysts of *Metridium senile*. Presented at the Northeastern Section of the American Chemical Society. April 26, 1997.

Sisson, C. G. The cnidophage cytoskeleton and nematocyst discharge in the nudibranch *Aeolidia papillosa*. Presented at the American Society of Zoologists Annual Meeting, December 27-30, 1995.

Shatney, Jennifer and Yunes, Michael (with P. G. Greenwood and Richard Blanquet). A specific calcium binding protein in acontial nematocysts of the sea anemone *Metridium senile*. Presented at the 6th International Conference on Coelenterate Biology. Leiden, The Netherlands, July, 1995.

Ellis, Ramsey. Calcium binding proteins in acontial nematocysts of the sea anemone *Metridium senile*. Presented at the American Society for Cell Biology Annual Meeting. Denver, CO, November, 1992.

Ackerly, Melissa L. Calcium-binding proteins of nematocysts located by ⁴⁵Ca-overlay. Presented at the American Society of Zoologists Annual Meeting. San Antonio, TX, December 27-30, 1990.

Kupson, Jonathan E. Spirocyst development in the sea anemone *Haliplanella luciae*. Presented at the American Society of Zoologists Annual Meeting. Boston, MA, December 27-30, 1989.

Garrity, Lynne K. Factors governing nematocyst discharge in nudibranch molluscs and in nematocysts isolated from aeolid nudibranchs. Presented at the Fifth International Conference on Coelenterate Biology. Southampton, England, July 10-14, 1989.

(In addition, more than fifty of my research students have presented their work at local and statewide research symposia.)

PEDAGOGY MEETINGS AND RELATED ACTIVITIES:

National Academies Summer Institute on Undergraduate Education in Science. Harvard University, Cambridge, MA. June 15-20, 2014 (with follow-up meeting to discuss Implementation Summaries on March 6-7, 2015).

National Society for Experiential Education. St. Petersburg, FL. September 30 – October 2, 2013.

Majors Biology Assessment Resources Writing Project at Harvard University, October 8-10, 2010, February 4-6, 2011, September 30-October 3, 2011, and March 1-4, 2012.

Presenter, Active Learning Workshop, Colby College, April, 2000.

NECUSE Workshop - Innovative Approaches to Teaching Introductory Biology. Bates College, August, 1993.

PEW Foundation meeting of the NECUSE cluster. Harvard, Univ., July, 1993.

NECUSE Introductory Biology Conference, Williams College, May 3-5, 1991.

MEDUSA meeting at the Darling Center, University of Maine. November, 1990.

Maine Undergraduate Science Consortium (MEDUSA) meeting at USM. September 15, 1989.

Meeting of the NECUSE Biology Task Force. Mount Holyoke College, June, 1988.

NSF Conference: "Undergraduate teacher education and the liberal arts: creating models of excellence in science and mathematics teaching." Middlebury College, October, 1988.

REVIEWER:

Proceedings of the Royal Society B; Marine Biology; Zoology; Biological Bulletin; Journal of Experimental Zoology; Hydrobiologia; Invertebrate Biology; Journal of Molluscan Studies; Cell Biology Education; Journal of Experimental Biology; Toxicon; Biology Open; Royal Society Open Science

Benjamin/Cummings Publishing Co. (Lab Manual; *Principles of Cancer Biology*; Intro. Biology Textbook)

W.H. Freeman and Co. (*Molecular Cell Biology*, 5th ed.; new Introductory Biology textbooks; *Biological Science*, 3rd ed. and 4th ed.)

Garland Publishing, Inc. (*Essential Cell Biology*, 2nd ed.; *The Biology of Cancer*)

Blackwell Science, Inc. (*11th Hour Cell Biology*)

Israel Science Foundation