

Michael V. Rosario, Ph.D.

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West Chester University of Pennsylvania
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EDUCATION

Ph.D., Biology, Duke University (2013 – 2015)

M.S., Organismic and Evolutionary Biology, University of Massachusetts Amherst (2010 - 2013)

B.A., Integrative Biology, University of California Berkeley (2005 – 2009)

ACADEMIC POSITIONS

National Science Foundation Postdoctoral Fellow, Brown University (2016 – 2018)

Computational Science Intern, Sandia National Laboratories (2013)

FUNDING

National Science Foundation Postdoctoral Research Fellowship in Biology (2016-2018)
Broadening Participation
\$138,000 in support of study

Information Initiative at Duke Undergraduate Expedition (2014)

Department of Energy Computational Science Graduate Fellow (2011 – 2015)
\$152,000 in support of study

Northeast Alliance for Graduate Education and Professoriate Fellowship (2010-2011)
\$63,000 in support of study

PUBLICATIONS

Rosario, M. V., & Roberts, T. J. (2020). Loading rate has little influence on tendon fascicle mechanics. *Frontiers in Physiology*, 11, 255.

Rosario, M. V., Olberding, J. P., & Deban, S. M. (2019). Playing with power: mechanisms of energy flow in organismal movement. *Integrative and comparative biology*, 59(6), 1511-1514.

Olberding, J. P., Deban, S. M., **Rosario, M. V.**, & Azizi, E. (2019). Modeling the determinants of mechanical advantage during jumping: consequences for spring-and muscle-driven movement. *Integrative and Comparative Biology*, 59(6), 1515-1524.

Werth A.J., Diego R., **Rosario M.V.**, Moore M.J., Sformo T.L. (2018). How do baleen whales stow their filter? A comparative biomechanical analysis of baleen bending. *Journal of Experimental Biology*. 221:jeb189233.

Werth, A.J., Harriss R.W., **Rosario, M.V.**, George, J.C., Sformo, T.L. (2016). Hydration affects the physical and mechanical properties of baleen tissue. *Royal Society Open Science*. 3:160591.

Rosario, M.V., Sutton, G.P., Patek, S.N., Sawicki, G.S. (2016). Muscle-spring dynamics in time-limited, elastic movements. *Proceedings of the Royal Society, B*, 283: 20161561.

Rosario, M.V., Patek, S.N. (2015). Multi-level analysis of elastic morphology: the mantis shrimp's spring. *Journal of Morphology*, 276:1123-1135.

Scott, S.N., Templeton, J.A., Hough, P.D., Ruthruff, J.R., **Rosario, M.V.**, Peterson, J.P. (2015). Statistical validation for heat transfer problems: A Case Study. *Computational Methods and Experimental Measures*. 3:101-120.

Smith, A.J.*, **Rosario, M.V.***, Eiting, T., Dumont, E.R. (2013). Joined at the hip: linked characters and the problem of missing data in studies of disparity. *Evolution*. 1558-5646.

*co-first authorship

Patek, S.N., Green, P.A., **Rosario, M.V.** (2013). Treatise on Zoology - Anatomy, Taxonomy, Biology. The Crustacea, Volume 4: Internal Morphology. Brill Press. Editor: Fred Schram.

Patek, S.N., **Rosario, M.V.**, Taylor, J.R.A. (2013). Comparative spring mechanics in mantis shrimp. *Journal of Experimental Biology*, 216:1317-1329.

McHenry, M.J., Claverie, T., **Rosario, M.V.**, Patek, S.N. (2012). Gearing for speed slows the predatory strike of a mantis shrimp. *The Journal of Experimental Biology*, 215:1231-45.

Patek, S.N., Dudek, D.M., **Rosario, M.V.** (2011). From bouncy legs to poisoned arrows: elastic movements in invertebrates. *Journal of Experimental Biology*, 214: 1973-1980.

INVITED TALKS

West Chester University, Department of Biology (10/30/19)

College of Wooster, Department of Biology (11/15/18)

University of Missouri, Division of Biological Sciences (10/25/17)

Department of Energy, Computational Science Graduate Fellowship (7/25/17)

SELECTED PRESENTATIONS AND PUBLISHED ABSTRACTS

Olberding, J.P., Azizi, E., Deban, S.M., **Rosario, M.V.** (2019). Energy flow in elastic structures: not so unusual. Annual Meeting of the Society for Integrative and Comparative Biology. (Tampa, Florida).

Rosario, M.V. and Roberts, T.J. (2018). The ability of tendons to buffer energy during eccentric contractions depends on lengthening dynamics. Annual Meeting of the Society for Integrative and Comparative Biology. (San Francisco, California).

Rosario, M.V., Sutton, G.P., Patek, S.N., Sawicki, G.S. (2017). The springs of time-limited bullfrogs jumps and slow-preparation grasshopper leaps are tuned to their muscle dynamics. *Annual Meeting of the Society for Integrative and Comparative Biology*. (New Orleans, Louisiana).

Rosario, M.V., Sawicki, G., Sutton, G.P., Patek, S.N. (2015). So much work, so little time: maximizing elastic energy within the duration of muscle contraction. *Annual Meeting of the Department of Energy Computational Science Graduate Fellowship*. (Arlington, Virginia)

Rosario, M.V., Smith, A.J., Eiting, T., Dumont, E.R. (2014). The case of the missing body parts: computational approaches to the fossil record. *Annual Meeting of the Department of Energy Computational Science Graduate Fellowship*. (Arlington, Virginia)

Rosario, M.V., Dumont, E.R., Patek, S.N. (2013). Shrimp springs: how shape affects strength in energy storage. *Annual Meeting of the Society for Integrative and Comparative Biology*. (San Francisco, California)

Rosario, M.V., Patek, S.N., Dumont, E.R. (2011). Comparing elastic energy structures in mantis shrimp using finite element analysis. *Integrative and Comparative Biology*, 51: E117. (Salt Lake City, Utah)

Rosario, M.V., Taylor, J.R.A., Patek, S.N. (2010). Probing the evolutionary biomechanics of elastic energy storage in mantis shrimp. *Integrative and Comparative Biology*, 50: E289. (Seattle, Washington)

DISTICTIONS AND ACHIEVEMENTS

Interviewed by the Journal of Experimental Biology for “Early Career Scientist” series

Best Student Oral Presentation Award, The Crustacean Society (2011)

Best Student Poster Award, Division of Comparative Biomechanics, Society for Integrative and Comparative Biology (2010)

Best Student Poster Award, The Crustacean Society (2010)

TEACHING EXPERIENCE

Instructor, Department of Biology, West Chester University. *Bio 259, Human Anatomy and Physiology 1*. An introduction to human structure and function. Skeletal, muscular, and nervous systems are emphasized. Laboratory involves study of human development and gross anatomy of the skeletal, muscular, and nervous systems. (2018 – present)

Instructor, Department of Biology, West Chester University. *Bio 521, Topics and Research Methods in Ecology, Evolution, and Organismal Biology*. Focusing on both major topics in ecology, evolution, and organismal biology as well as basic coding principles for replicating results and analyses from foundational and current literature. This course emphasizes both the how and why computation is important in organismal biology. (2020 – present)

Instructor, Department of Biology, West Chester University. *Bio 490, Biology Seminar*. Seminar for biology students to learn how to effectively engage in scientific discourse in both professional and public situations. This course assists undergraduates in developing effective resumes and cover letters. (2019)

Instructor, Department of Ecology and Evolutionary Biology, Brown University. *Comparative Biology of the Vertebrates*. The biology, structure, and evolutionary history of the vertebrates considered phylogenetically, emphasizing evolution of the major body systems. Stresses an evolutionary approach to the correlation of structure and function with environment and mode of life. Labs include dissection of several different vertebrates and comparative osteological material. Emphasis of course is on critical thinking rather than memorization of material. (2017)

Instructor, Graduate Program in Organismic and Evolutionary Biology, Univ. Mass., Amherst. Department of Biology, Duke University. Department of Ecology and Evolution, Brown University. *SOURCE: studying, originating, and understanding R code examples*. Interactive workshops created to teach basic coding and statistics to biologists by processing, analyzing, and simulating biological datasets. (2010 - 2017)

Teaching Assistant, Department of Biology, Duke Univ. *Vertebrate Anatomy*. Prepared and guided students through various dissections of vertebrate animals; designed practical exams to test students' knowledge of comparative anatomy and functional morphology. (2015)

RET mentor. Mentored and advised high school teacher in Research Experiences for Teachers program; aided in materials testing and hypotheses testing. (2012)

Teaching Assistant, Department of Biology, Univ. Mass., Amherst. *How Organisms Move*. Designed computer labs using the R to process biomechanical datasets, and demonstrate basic computational skills needed to perform biomechanical analyses. (2012)

Biology Undergraduate Research Apprenticeship, Department of Biology, Univ. Mass., Amherst. *Creating a 3-Dimensional Model of a Biological Spring*. Supervised an undergraduate student with manipulating and analyzing finite element models created from micro-CT scans (2010)

Undergraduate Student Instructor, Department of Integrative Biology, UC Berkeley. *Human Anatomy Lab*. Provided hands on instruction using models, wet specimens, and cadavers; held weekly office hours (2008)

SERVICE AND COMMITTEES

Committee member to the following Master's students: Ariel Leahy, Abigail Downs, Veronica Siko, Nicole Seltz

Advisor to the following Master's students: Veronica Siko

Biology Department Webmaster (2019 – present)

Advisory committee (2019 – 2020)

Educational Partner of the Center for Engineering and Mechanobiology (2020 – present)

Academic advisor to the Darlington Biological Society (2018 - present)

Reviewer for WCU Research in Math and Science Grant (2019)

Reviewer for WCU College of Math and Science Student Engagement Award (2019)

College of Science and Math Recruitment Committee (2018 – 2019)

Reviewer for Brown Dissertation Development Grant. (2016 - 2018)

Application Reviewer for Department of Energy Computational Science Graduate Fellowship (2017 - present)

Reviewer for: Journal of Experimental Biology, Journal of Morphology, Journal of the Royal Society Interface, PlosOne