



Alison Krufka

Associate Professor
Biological Sciences

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Education:

BS (Biology), College of William and Mary

PhD (Developmental Biology), University of Wisconsin-Madison

Postdoctoral (Genetics, Cell, and Developmental Biology), University of Minnesota-Twin Cities

Research Expertise:

Discipline Based Education Research | Evolution and development of the lateral line system |
Urea cycle function and evolution

My research focuses on effective ways to integrate scientific skills, authentic inquiry, and an understanding science into undergraduate curricula. I am working on three projects that incorporate scientific skills and inquiry into the classroom: 1) integration of biology and engineering through development of inquiry based cell culture technology and biomaterials lab modules, 2) study of the effective implementation of the CREATE approach to teaching the process of scientific inquiry through directed analysis of primary literature, and 3) the development/assessment of a scientific skills based transfer student course.

I am investigating the evolution and embryonic development of lateral line system using threespine stickleback. We seek to understand how adult variation in the number and size of neuromast sensory organs are generated during embryonic development. I also am interested in the evolutionary conservation of urea cycle genes. We hypothesize the urea cycle genes function in embryos prior to the formation of ammonia excretion pathways and protect the developing brain from the breakdown of yolk proteins. The conservation of urea cycle genes from fish to mammals allows us to study urea cycle disorders and the toxicity of hyperammonemia on brain development using the zebrafish model.

Member of:

American Association for the Advancement of Science

American Society for Cell Biology

Society for Developmental Biology

Recent Academic Projects:

I serve as the Program Director of the Cumberland County College Bridge to Rowan University NIH-sponsored Bridges to the Baccalaureate Program.

Recent Publications:

Hoskins S, Krufka A (2015) The CREATE Strategy Benefits Students and Is a Natural Fit for Faculty. *Microbe* 10:108-112.

Caldovic L, Haskins N, Mumo A, Pinter M, Tuchman M, Krufka A (2014) Expression Pattern and Biochemical Properties of Zebra sh N-acetylglutamate Synthase. *PLoS ONE* 9:e85597.

Evarts S, Krufka A, Holbrook L, Wilson C (2014) I'm Looking Over a White-Striped Clover: A Case Study in Natural Selection. In: *Science Stories You Can Count On: 51 Case Studies With Quantitative Reasoning in Biology*. Herried C, Schiller N, Herried K, eds. Arlington, VA, NSTA Press.