

NICOLE DANOS, Ph.D.

Department of Biology
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CURRENT EMPLOYMENT

Assistant Professor of Biology. I am a broadly trained Vertebrate Comparative Anatomist who uses both model and non-model organisms to study the relationship between form and function. My studies focus on the anatomy and mechanical properties of tissues, especially soft ones, and how these might contribute to critical organismal functions such as walking and eating.

PAST EMPLOYMENT

Post-doctoral researcher in **Neuromechanics, Biology, Tufts University** (2014 to 2016).

Post-doctoral researcher in **Muscle Physiology, Ecology and Evolutionary Biology, University of California, Irvine** (2012- 2014).

Laboratory instructor for **Evolutionary Human Physiology and Anatomy, Harvard University** (2011).

EDUCATION

Ph.D., Biology. 2011. **Harvard University**. Dissertation: “Mechanical effects on the development and evolution of locomotor form and function.”

M.S., Organismic and Evolutionary Biology. 2005. **University of Massachusetts, Amherst**. Thesis: “Biomechanics of the skin during swimming in the American eel, *Anguilla rostrata*.”

B.A., Integrative Biology. 2002. **University of California, Berkeley**.

SELECTED AWARDS AND HONORS

Co-Principal Investigator, NSF award “MEETING: International Congress of Vertebrate Morphology, July 8-12, Barcelona, Spain” (award no. 1306718)

Five Distinguished Teacher awards, Bok Center for Teaching and Learning, Harvard University. 2008-2011.

Robert A. Chapman Memorial Scholarship, Harvard University, 2006.

Sigma-Xi Grant-In-Aid-of-Research, 2004.

Fulbright Scholarship (Cyprus-America Scholarship Program), 1998.

PUBLICATIONS

Danos, N., Holt, N., Sawicki, G. and Azizi, E. (2016). Modeling age-related changes in muscle-tendon dynamics during cyclical contractions in the rat gastrocnemius. *J Appl Physiol* 121: 1004–1012, 2016.
doi:10.1152/japplphysiol.00396.2016

Holt, N. C., **Danos, N.**, Roberts, T. J. and Azizi, E. (2016). Stuck in gear: age-related loss of variable gearing in skeletal muscle. *J. Exp. Biol.*, 219(Pt 7), 998–1003. <http://doi.org/10.1242/jeb.133009>

Danos, N. and Azizi, E. (2015). Passive stiffness of hindlimb muscles in anurans with distinct locomotor specializations. *Zoology*, 118 (4), 239–247.

Azizi, E., Abbott, E., Larson, N. and **Danos, N.** (2014). Reduce torques and stick the landing: Limb posture during landing in toad. *J. Exp. Biol.* **217**, 3742-3747.

Danos, N. and Aguilar-Roca, N. (2014). Case studies in the use of graphical illustrations in science teaching. In *Graphicacy and Culture: Refocusing on Visual learning*, by Danos, X. Loughborough Design Press, UK.

Danos, N. and Ward, A. (2012). The homology and origins of intermuscular bones in fishes: phylogenetic or biomechanical determinants? *Biol. J. Linnaean Soc.* **106** (13), 607-622.

Danos, N. and Lauder, G. (2012). Challenging zebrafish escape responses by increasing water viscosity. *J. Exp. Biol.* **215**, 1854-1862.

Danos, N. (2012). Locomotor development under novel hydrodynamic conditions in zebrafish (*Danio rerio*). *J. Exp. Zoology A.* **317** (2), 117-126.

Danos, N. and Staab, K. L. (2010). Can mechanical forces be responsible for novel bone development and evolution in fishes? *J. Applied Ichthyol.* **26**, 156-161.

- Danos, N.**, Fisch, N. and Gemballa, S. (2008). The musculotendinous system of an anguilliform swimmer: Muscles, myosepta, dermis, and their interconnections in *Anguilla rostrata*. *J. Morph.* 269, 29-44.
- Danos, N.** and Lauder, G. V. (2007). The ontogeny of fin function during routine turns in zebrafish *Danio rerio*. *J. Exp. Biol.* 210, 3374-3386. Inside JEB commentary by Blackburn, L. (2007). TURNING PERFORMANCE IN GROWING ZEBRAFISH, vol. 210, pp. iii.

TEACHING & MENTORING

- Laboratory Teaching Fellow. **Evolutionary Human Anatomy and Physiology**, Harvard University. Earned distinguished teacher award. 2011.
- Laboratory Teaching Fellow. **Evolution of Vertebrates**, Harvard University.
Prepared and supervised weekly museum-based laboratory exercises in vertebrate comparative anatomy. Earned distinguished teacher awards. 2009, 2010.
- Teaching Fellow. **Advanced Structure and Physiology of Vertebrates**, Harvard University.
Supervised two undergraduate students conducting independent research projects. 2008.
- Teaching Fellow. **Evolution**, Harvard University.
Led 2-hour weekly sessions discussing "On the Origin of Species" and introductory evolution concepts. Earned two distinguished teacher awards. 2008, 2010, 2011.
- Teaching Fellow. **Patterns and Processes of Fish Diversity**, Harvard University.
Survey of fish diversity with focus on major anatomical innovations. 2005.
- Organizer and leader. **Classic Readings in Evolutionary Biology**, University of Massachusetts Amherst.
Departmental seminar series. 2004.
- Teaching fellow. **Functional Morphology and Ecology of Marine Fishes**, Friday Harbor Marine Labs, University of Washington. Assisted students with independent field research projects. 2004.
- Laboratory instructor. **Introductory Biology**, University of Massachusetts Amherst. 2003.

- Mentor to undergraduate women in science and engineering** through the Harvard Women In Science and Engineering program 2005 to 2008.
- Mentor for the High School Apprenticeship Program** (Army Educational Outreach Program). 2015.

CONFERENCE PRESENTATIONS WITH PUBLISHED ABSTRACT

- Danos, N.**, Holt, N. and Azizi, E. (2015). Age-related changes in the material properties of muscle-tendon units. *Integr Comp Biol* **55**, E40.
- Holt, N., **Danos, N.**, and Azizi, E. (2015). Unable to shift gears: the loss of variable gearing in aged muscles. *Integr Comp Biol* **55**, E81.
- Deslauriers, A., **Danos, N.** and Azizi, E. (2014). Do visual cues modulate motor control strategies during landing in toads? *Integr Comp Biol* **54**, E264.
- Danos, N.** and Azizi, E. (2014). Passive properties of anuran hindlimb muscles. *Integr Comp Biol* **54**, E47.
- Reynaga, CM, **Danos, N.** and Azizi, E. (2014). Conflicts between locomotor modes: terrestrial and aquatic locomotion in the Senegal running frog, *Kassina senegalensis*. *Integr Comp Biol* **54**, E337.
- Danos, N.** and Azizi, E. (2013). Muscle-collagen interactions at the fiber bundle level. *Integr Comp Biol* **53**, E47.
- Dean, M., Huber, D., Goo, B., **Danos, N.**, Shimada, K., Summers, A. (2012). On the jaws of lamniform sharks. *Integr Comp Biol* **52**, E43.
- Danos, N.** and Ward, A.B. (2011). Effects of body shape on myoseptal tendon ossification in teleost fishes. *Integr Comp Biol* **51**, E29.
- Danos, N.** (2010). Effects of body shape on myoseptal tendon ossification in teleost fishes. *Integr. Comp. Biol.* **51**, E29-E29. Presented at the 9th International Congress of Vertebrate Morphology, Punta del Este, Uruguay.
- Danos, N.** (2009). Sensory input for routine turns in zebrafish. *Integr. Comp. Biol.* **49**, 43.
- Danos, N.** (2008). Locomotor plasticity of zebrafish larvae in high viscosity environments. *Comp. Biochem. & Physiol. A*, **150**(3), S70-S70. Presented at the annual meeting of the Society of Experimental Biology, Marseille, France.

- Danos, N.**, Fisch, N. and Gemballa, S. (2007). The musculotendinous system of an anguilliform swimmer: Muscles, myosepta, dermis and their interconnections in *Anguilla rostrata*. *J. Morph.* 268, 1064-1064. Presented at the 8th International Congress of Vertebrate Morphology, Paris, France.
- Danos, N.** and Lauder, G. V. (2007). Ontogeny of fin function during routine turning in zebrafish (*Danio rerio*). *Integr. Comp. Biol.* 46, E31-E31.
- Danos, N.** and Brainerd, E. L. (2006). Biomechanics of the skin during swimming in the American eel, *Anguilla rostrata*. *Integr. Comp. Biol.* 45, 984-984.
- Danos, N.** (2001). Biomechanics of ventilation in the ratfish, *Hydrolagus colliei*. *Am. Zool.* 41, 1640-1640.

INVITED LECTURES

- Danos, N.** (2015). Passive properties in an active work: the importance of tissue mechanical properties in vertebrate biology. Concord Field Station, Harvard University.
- Danos, N.** (2014). Studies of the form-function relationship between collagenous structures and locomotion in vertebrates. Department of Biology, California State University Long Beach.
- Danos, N.** (2013). Passive muscle properties determine active force production. Department of Biology, Hurvey Mudd College.
- Danos, N.** (2009). The effect of increased viscosity on the development and evolution of intramuscular bones in fishes. Interdisciplinary Approaches in Fish Skeletal Biology. Tavira, Portugal.

INDUSTRY EXPERIENCE

- Consulted for Apex Medical Technologies on a project funded by the Bill and Melinda Gates Foundation. 2013.
- Tufts Technology Transfer office internship. 2015.

EXTERNAL REVIEWER

Nature; Journal of Experimental Biology; Proceedings of the Royal Society; Journal of Morphology; Journal of Anatomy; Journal of Biomechanics; Zoology

PROFESSIONAL SOCIETIES

Society for Integrative and Comparative Biology; Sigma-Xi Associate Member; Society for Experimental Biology

SCIENCE OUTREACH

- Science in the News (2006). Public lecture at Harvard University, titled "The Science of Global Warming Solutions."
- Nerdnite (2007). Public lecture, titled "Fish Swimming."
- Film producer of "*Gallus Domesticus*" (2010). A film about a fish biologist and his interactions with animals outside the laboratory. Filmed in part at Harvard's Museum of Comparative Zoology Laboratories.

PREVIOUS RELEVANT RESEARCH EXPERIENCE

- Program manager** for *HerpNet*, an NSF-funded initiative to connect 36 herpetological natural history collections in North and Central America via a distributed database. University of California Berkeley, 2003.

LANGUAGES

English, German and Greek (fluent). Spanish, French (reading and writing) and Classical Greek (reading).

RELEVANT COMPUTER SKILLS

IGOR-Pro, MATLAB, R- studio, Adobe Creative suite.

REFERENCES

Emanuel Azizi, Ph.D.

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Biology
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