James Townsend

Marine biophysicist

Email: jptownsendii@gmail.com
Homepage: jptownsend.github.io
Google scholar: http://bit.ly/jptiiGS
ORCID: 0000-0002-4782-6083

EDUCATION:

PhD, Biochemistry and Biophysics **May, 2018**
University of Pennsylvania
Dissertation: *Biochemical and Biophysical Methods in Ctenophore Physiology*
Committee: Drs. Alison Sweeney (advisor), Mark Goulian, Paul Janmey, Kim Sharp (chair)

BA, Biology (hons.) **June, 2012**
University of Chicago
Honors thesis: *The complex folding behavior of a designed protein*. Advisor: Dr. Tobin Sosnick

POSITIONS:

Postdoctoral associate **September 2021 – present**
University of Florida/Whitney Laboratory for Marine Biosciences, St. Augustine, FL
Developing methods for nanoscale CT scanning in gelatinous marine invertebrates.
Advisor: Dr. Mark Q. Martindale

Postdoctoral researcher **June 2019 – August 2021**
Providence College/Marine Biological Laboratory, Woods Hole, MA
Investigated the diet and feeding mechanics of oceanic ctenophores through DNA metabarcoding of gut contents and *in situ* predator-prey interaction studies, collected through blue water SCUBA diving in the Gulf Stream. Advisor: Dr. Jack Costello

Community Scientist **July 2018 – May 2019**
BioBus, Greater NYC area
Designed and facilitated informal science education experiences for K-12 students at high economic need schools throughout NYC, with a focus on Manhattan's Lower East Side. Cofounded the Marine Ecology Explorers Club and an intensive marine invertebrate DNA barcoding internship for high school students at Eastside Community High School.

RESEARCH PUBLICATIONS:

Tassia MG, David KT, Townsend JP, Halanych KM. (2021) TIAMMAt: Leveraging biodiversity to revise protein domain models, evidence from innate immunity. *Molecular Biology and Evolution*, 38, 5806–5818. doi: https://doi.org/10.1093/molbev/msab258

Townsend JP, Merces GOT, Castellanos GP, Pickering M. (2021, preprint). Colloblasts act as a biomechanical sensor for suitable prey in *Pleurobrachia*. BioArXiv. doi: https://www.biorxiv.org/content/10.1101/2020.06.27.175059v2

Gemmell BJ, Dabiri JO, Colin SP, Costello JH, Townsend JP, Sutherland KR. (2021) Cool Your Jets: Biological Jet Propulsion in Marine Invertebrates. *Journal of Experimental Biology*, 224.

Xu NW, Townsend JP, Costello JH, Colin SP, Dabiri JO. (2020). Field testing of biohybrid robotic jellyfish to demonstrate enhanced swimming speeds. *Biomimetics* 5(4), 64. doi: https://doi.org/10.3390/biomimetics5040064

Townsend JP, Tassia MG, Damian-Serrano A, Whelan NV, Halanych KM, Sweeney AM (2020). A mesopelagic ctenophore representing a new family, with notes on family-level taxonomy in Ctenophora: *Vampyroctena delmarvensis* gen. nov. sp. nov (Vampyroctenidae, fam. nov.). *Marine Biodiversity.* 50:34 doi: 10.1007/s12526-020-01049-9

Townsend JP, Gemmell BJ, Sutherland KR, Colin SP, Costello JH (2020). Ink release and swimming behavior in an oceanic ctenophore, *Eurhamphaea vexilligera* Gegenbaur, 1856. *Biological Bulletin* 238, 1: 206-213. doi: 10.1086/709504

Townsend JP and Sweeney AM (2019). Catecholic compounds in ctenophore colloblast and nerve net proteins suggest a structural role for DOPA-like molecules in an early-diverging animal lineage. *Biological Bulletin* 236, 1: 55-65. doi: 10.1086/700695

Cai J, Townsend JP, Dodson TC, Heiney PA, and Sweeney AM (2017). Eye patches: Protein assembly of index-gradient squid lenses. *Science* 357, 564. doi: 10.1126/science.aal2674

OTHER PUBLICATIONS:

Klompen A, Townsend J, Chang SE, Mitchell M, Helm R. (2021) *Coral emoji proposal (approved for Unicode 14.0)*. https://www.unicode.org/L2/L2020/20220-coral-emoji.pdf

Klompen A, Chang SE, Helm R, Kim D, Mitchell M, Townsend J. (2021) *Jellyfish emoji proposal (under review for Unicode 15.0)*. https://www.unicode.org/L2/L2021/21217-jellyfish-emoji.pdf

SELECTED FIRST-AUTHOR PRESENTATIONS:

"Stop, Ink, and Roll: In situ observations of *Eurhamphaea vexilligera* swimming behavior" Society for Integrative and Comparative Biology, Austin, TX: *2020*

"Catecholic compounds in ctenophore colloblast and nerve net proteins suggest a structural role for DOPA-like molecules in early animal evolution" Society for Integrative and Comparative Biology, San Francisco, CA: *2018*

"The Slimes That Bind: physiology and biochemistry of *Mnemiopsis* mesoglea" Ctenopalooza, Whitney Laboratory for Marine Bioscience, St. Augustine, FL: *2016*

AWARDS AND HONORS:

- Best Student Presentation, Ctenopalooza
  Whitney Laboratory for Marine Bioscience, St. Augustine, FL: *2016*
- Buchsbaum Prize for Excellence in Photomicrography, B/W division
  American Microscopical Society: *2016*
- Third Place in Biophysics, Graduate Student Poster Award,
  Univ. of Pennsylvania Department of Biochemistry and Biophysics: *2015*
- Honorable Mention, Graduate Student Poster Award,
  Univ. of Pennsylvania Department of Biochemistry and Biophysics: *2014*

FELLOWSHIPS:

- NIH Structural Biology and Molecular Biophysics Training Grant: *2014-2015*
- NIH Neuroscience and Neuroengineering Fellowship: *2010-2011*

TEACHING ASSISTANTSHIPS:

- Physiology, Marine Biological Laboratory, Woods Hole, MA: *Summer 2015*
- Macromolecular Biophysics: Principles and Methods, Univ. of Pennsylvania: *Autumn 2013*
- Introduction to Biology for Majors, University of Chicago: *Spring 2011*
- Molecular Biology of the Cell, University of Chicago: *Autumn 2010*

OCEANOGRAPHIC CRUISES AND FIELDWORK:

- Antarctic fieldwork: Surveying benthic invertebrates on the NBP 20-10 cruise aboard the RVIB *Nathanial B. Palmer* from Port Hueneme, CA to Punta Arenas, Chile, then through the Bransfield Strait and into the Weddell Sea, totaling 3 months at sea: *2020*
- Three week-long cruises aboard the NSF-UNOLS research vessel *R/V Hugh R. Sharp*, collecting specimens by midwater trawling and performing experiments in the northwestern Atlantic Ocean: *2015-2016*
- Four summer field seasons collecting samples and conducting physiology experiments at Friday Harbor Laboratories (Friday Harbor, WA) and at the Marine Biological Laboratory (Woods Hole, MA): *2014-2017*

MENTORSHIP AND OUTREACH:

- LRSM REU Student mentorship, Philadelphia, PA: *Summer 2016*
  Led materials science research project on ctenophore tentacle adhesion with a visiting undergraduate biology student from Univ. of Puerto Rico Cayey
- Undergraduate mentorship, Philadelphia, PA: *2015-2016*
  Led ecological data collection examining the effects of water quality on ctenophore abundance and physiology in the salt marshes of SE New Jersey
- BioBus guest instructor, Philadelphia, PA and New York, NY: *2014-2017*
  Collected and showcased ctenophores, echinoderms, and crustaceans from the mid-Atlantic coast to groups of science enthusiasts young and old

ADDITIONAL COURSEWORK:

- Bioinformatics Bootcamp, Auburn University, *Summer*, *2017*
  An intensive week-long workshop on next-generation DNA sequence analysis, phylogenomics, and other bioinformatics topics.
- Invertebrate Embryology, Friday Harbor Labs, University of Washington: *Summer*, *2014*
  Collected, spawned, and experimented on embryos from representatives of dozens of invertebrate phyla including ctenophores, sponges, cnidarians, echinoderms, and more.

CERTIFICATIONS:

AAUS Scientific Diver
PADI Rescue and Enriched Air Nitrox Diver