

Ciarán A. S. Shaughnessy, PhD

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Education and Professional Training

- Present **Postdoctoral Research Fellow** (human physiology, translational cystic fibrosis disease research)
 Department of Pediatrics, National Jewish Health (Denver, CO)
 Advised by Dr. Pamela Zeitlin, Chair of Department of Pediatrics
- 2019 **Ph.D. in Organismic and Evolutionary Biology** (vertebrate physiology and endocrinology)
 University of Massachusetts at Amherst (Amherst, MA)
 Advised by Dr. Stephen D. McCormick (Senior Scientist, U.S. Geological Survey)
 Dissertation: “Physiology of a basal vertebrate, the sea lamprey (*Petromyzon marinus*): osmoregulation and corticosteroid action”
- 2015 **M.Sc. in Biological Sciences** (vertebrate physiology)
 DePaul University (Chicago, IL)
 Thesis: “Physiological effects of aquatic hypercarbia on seawater acclimation in the white sturgeon (*Acipenser transmontanus*)”
- 2012 **B.Sc. in Chemistry**
 The Illinois Institute of Technology (Chicago, IL)
 Honors Thesis: “Existence of a chemical signal from *Enteroctopus dofleini* utilized by *Carcinus maenas* to avoid octopus predation, including a strategy for chemical elucidation”

Academic Publications and Presentations***Peer-Reviewed Publications*** (*denotes equal contribution):

- 6 Barany, A., **C. A. Shaughnessy**, J. Fuentes, J. M. Mancera, S. D. McCormick. 2020. Osmoregulatory role of the intestine in the sea lamprey (*Petromyzon marinus*). *Am J Physiol Regul Integr Comp Physiol*. (in press)
- 5 **Shaughnessy, C.A.**, S. D. McCormick. 2020. Functional characterization and osmoregulatory role of gill Na⁺/K⁺/2Cl⁻ cotransporter (NKCC1) in sea lamprey (*Petromyzon marinus*), a basal vertebrate. *Am J Physiol Regul Integr Comp Physiol*. 318: R17–R29
- 4 *Bayse S., ***C.A. Shaughnessy**, A. Regish, S. D. McCormick. 2020. Upper thermal tolerance and heat shock protein response of juvenile American shad (*Alosa sapidissima*). *Estuar Coast*. 43:182–188
- 3 **Shaughnessy, C.A.**, S.D. McCormick. 2018. Reduced thermal tolerance during salinity acclimation in brook trout (*Salvelinus fontinalis*) can be rescued by prior treatment with cortisol. *J Exp Biol*. 2018:jeb.169557.
- 2 **Shaughnessy, C.A.**, E.C. Anderson, M. Kasparian, J.M. Lamontagne, J.S. Bystriansky. 2017. Survival and osmoregulation of the purple marsh crab (*Sesarma reticulatum*) at varying salinity and pH. *Can J Zool*. 95:985-989
- 1 **Shaughnessy, C.A.**, D.W. Baker, C.J. Brauner, J.D. Morgan, J.S. Bystriansky. 2015. Interaction of osmoregulatory and acid-base compensation in white sturgeon (*Acipenser transmontanus*) during exposure to aquatic hypercarbia and elevated salinity. *J Exp Biol*. 218:2712-2719

Other Published Works:

Shaughnessy, C.A. and Hall, D.J. Fishes of the Presumpscot River: To the Sea and Back. In Voices of the Presumpscot River. Sanford, R.M., Plumley, W. (Eds). North Country Press: Unity, ME. (in press)

Presentations (° denotes presenting author; * indicates oral presentation):

- 2019°* **C.A. Shaughnessy**, S.D. McCormick. Development and corticosteroid control of ionoregulation in sea lamprey (*Petromyzon marinus*). Society of Experimental Biology (Seville, Spain)
- 2018°* **C.A. Shaughnessy**, A. Barany-Ruiz, D. Ferreira-Martins, S.D. McCormick. Ionoregulatory mechanisms in the gill of a basal vertebrate, the sea lamprey (*Petromyzon marinus*). 13th International Congress on the Biology of Fish (Calgary, Canada)
- 2018° A. Barany-Ruiz, **C.A. Shaughnessy**, J. Fuentes, J.M. Mancera, S.D. McCormick. Osmoregulatory mechanisms in the gut of sea lamprey (*Petromyzon marinus*) during metamorphosis and seawater exposure. 13th International Congress on the Biology of Fish (Calgary, Canada)
- 2017°* **C.A. Shaughnessy**, A. Barany-Ruiz, S.D. McCormick. 11-Deoxycortisol promotes seawater tolerance in metamorphosing sea lamprey (*Petromyzon marinus*). 18th International Congress of Comparative Endocrinology (Lake Louise, Canada)
- 2017 A. Bárany, **C.A. Shaughnessy**, J. Fuentes, J.M. Mancera, S.D. McCormick. Osmoregulatory effects of 11-deoxycortisol in the intestinal tract of sea lamprey (*Petromyzon marinus*). XI Congress of Iberian Association for Comparative Endocrinology (Vigo, Spain)
- 2017°* **C.A. Shaughnessy**, S.D. McCormick. Reduced thermal tolerance during salinity acclimation in brook trout (*Salvelinus fontinalis*) can be rescued by prior treatment with cortisol. Life Sciences Graduate Research Symposium (Amherst, MA)
- 2016°* **C.A. Shaughnessy**, S.D. McCormick. Cortisol influences thermal tolerance in Brook Trout (*Salvelinus fontinalis*) during seawater acclimation. 12th International Congress on the Biology of Fish (San Marcos, TX)
- 2016 S. Martin, **C.A. Shaughnessy**, S.D. McCormick. Salinity tolerance and osmoregulation in larval sea lamprey (*Petromyzon marinus*). Five College Coastal and Marine Sciences Program Symposium (Amherst, MA)
- 2015° **C.A. Shaughnessy**, S.D. McCormick. Cortisol influences thermal tolerance in Brook Trout (*Salvelinus fontinalis*) during seawater acclimation. The Fifteenth Symposium of the Center for Neuroendocrine Studies (Amherst, MA)
- 2015 J. S. Bystriansky, **C.A. Shaughnessy**. Kinetics and pH optima of gill Na⁺/K⁺-ATPase from white sturgeon (*Acipenser transmontanus*) following exposure to elevated salinity and aquatic hypercarbia. 9th International Congress of Comparative Physiology and Biochemistry (Kraków, Poland)
- 2015° **C.A. Shaughnessy**, S.D. McCormick. Cortisol influences thermal tolerance in Brook Trout (*Salvelinus fontinalis*) during seawater acclimation. North American Society for Comparative Endocrinology (Ottawa, Canada)
- 2015 E. R. Sgarlat, **C.A. Shaughnessy**, S.D. McCormick. Osmoregulation and thermal tolerance during salinity acclimation in Brook Trout (*Salvelinus fontinalis*). Five College Coastal and Marine Sciences Program Symposium (Amherst, MA)
- 2014°* **C.A. Shaughnessy**, D.W. Baker, C.J. Brauner, J.D. Morgan, J.S. Bystriansky. Osmoregulation and acid-base balance in white sturgeon (*Acipenser transmontanus*) during exposure to elevated salinity and aquatic hypercarbia. 11th International Congress on the Biology of Fish (Edinburgh, United Kingdom)
- 2014°* **C.A. Shaughnessy**, D.W. Baker, C.J. Brauner, J.D. Morgan, J.S. Bystriansky. Osmoregulation and acid-base balance in white sturgeon (*Acipenser transmontanus*) during exposure to elevated salinity and aquatic hypercarbia. Canadian Society of Zoologists (Montreal, Canada)
- 2013° **C.A. Shaughnessy**, E.C. Anderson, M. Kasparian, J.M. Lamontagne, J.S. Bystriansky. Survival and osmoregulation of an estuarine crab after acute exposure to varying combined pH and salinity stress. Canadian Society of Zoologists (Guelph, Canada)
- 2013°* **C.A. Shaughnessy**, E.C. Anderson, M. Kasparian, J.M. Lamontagne, J.S. Bystriansky. Identification and physiology of crabs from the ACE Basin acclimated to different pH and salinity levels. Midwest Ecology and Evolution Conference (South Bend, IN)
- 2013° **C.A. Shaughnessy**, J. Radloff, J.S. Bystriansky, S.K. Balfry. Osmoregulation in wolf eel (*Anarrhichthys ocellatus*) during acclimation to dilute seawater. Society for Integrative and Comparative Biology (San Francisco, CA)
- 2012° **C.A. Shaughnessy**, J.A. Terschak. Chemically-mediated giant Pacific octopus avoidance by Eastern Pacific green crabs. Chicago Area Undergraduate Research Symposium (Chicago, IL)

Research and Teaching Appointments***Research Appointments:***

2020–Present	Postdoctoral Research Fellow Department of Pediatrics, National Jewish Health (Denver, CO)
2016–2019	National Science Foundation (NSF)-supported Research Assistant University of Massachusetts / U.S. Geological Survey (Turners Falls, MA)
2015	Subcontractor (Biological Research) U.S. Fish & Wildlife Service / U.S. Geological Survey (Turners Falls, MA)

Instructor of Record:

2018	NATSCI191: First-Year Seminar (Topic: Animal Physiology) University of Massachusetts (Amherst, MA)
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Teaching Assistant:

2017	STEM Ambassadors Program	University of Massachusetts (Amherst, MA)
2016, 2015	BIO 153: General Biology II	University of Massachusetts (Amherst, MA)
2015	BIO 494: Life After Biology	University of Massachusetts (Amherst, MA)
2014, 2013	BIO 193: Anatomy; Physiology	DePaul University (Chicago, IL)
2014, 2013	BIO 192: Ecology; Evolution	DePaul University (Chicago, IL)
2013	BIO 310: Vertebrate Physiology	DePaul University (Chicago, IL)
2012	BIO 191: Cell Biology; Genetics	DePaul University (Chicago, IL)
2011	CHEM 122: General Chemistry	Illinois Institute of Technology (Chicago, IL)

Academic Awards and Fellowships

2019	Company of Biologists Travel Award (£350)
2018	University of Massachusetts College of Natural Sciences Teaching Fellowship (\$3,000)
2018	International Congress on the Biology of Fishes Student Travel Award (\$800)
2017	North American Society for Comparative Endocrinology Louis J. Guillette, Jr. Award (\$500)
2014	International Congress on the Biology of Fishes Student Travel Award (\$300)
2014	Canadian Society of Zoologists EPCOR Water Ltd. Student Travel Award (\$500)
2014	Canadian Society of Zoologists William S. Hoar Award Finalist (Best Student Presentation)
2014	DePaul University Graduate Research Fund Travel Award (\$500)
2014	Sigma Xi Grants-In-Aid of Research (GIAR) Award (\$900)
2013	Journal of Experimental Biology Travelling Fellowship (£1,500)
2013	Canadian Society of Zoologists Student Travel Award (\$175)
2013	DePaul University Graduate Research Fund Travel Award (\$500)
2012	American Institute of Chemists Student Award
2012	Illinois Institute of Technology Clinton E. Stryker Distinguished Student Service Award
2011	Illinois Institute of Technology College of Science and Letters Undergraduate Research Funding (\$24,000)
2010	Illinois Institute of Technology Most Outstanding Student Leadership Award
2007	Illinois Institute of Technology Marvin Camras 5-Year Full-Tuition Academic Scholarship (\$140,000)
2007	Mechanics Savings Bank <i>Banking on the Future</i> Scholarship (\$1,000)

Outreach, Service, and Mentorship***Outreach and Service:***

2014–2019	Science Advisory Board Member, Friends of the Presumpscot River (Portland, ME)
2019	Public lecture hosted by Friends of the Presumpscot River. <i>To the Sea and Back: Why a Freshwater Fish Wanders into the Ocean and How it Finds its Way Home.</i> (Westbrook, ME)

2016–2019	Union Steward, Graduate Employees Union, UAW 2322 (Amherst, MA)
2019	Head Coach, Mens Ultimate, University of Massachusetts (Amherst, MA)
2018	Head Coach, Boys Ultimate, Amherst Regional High School (Amherst, MA)
2016–2017	UMass STEM Ambassador Program Mentor (Amherst, MA)
2015–2017	Editor and Contributing Author, <i>That's Life [Science] Blog</i> (Amherst, MA)
2016	Public lecture hosted by Friends of the Presumpscot River. <i>To the Sea and Back: The Physiology of Anadromous Fishes</i> . (Westbrook, ME)
2013–2014	Conference Judge, Chicago Area Undergraduate Research Symposium (Chicago, IL)
2013	Highlighted in <i>Scientia Magazine</i> for white sturgeon research (Chicago, IL)
2012	Highlighted in <i>IIT Magazine</i> for octopus pheromones research (Chicago, IL)
2011–2012	Founder and President, <i>Undergraduate Research Journal of the Illinois Institute of Technology</i> (Chicago, IL)

Manuscript Referee For The Following Journals:

Biology and Environment
Comparative Biochemistry and Physiology
Fish and Fisheries
Frontiers in Physiology
Journal of Endocrinology
Journal of Experimental Marine Biology and Ecology
Journal of Fish Biology
Molecular Ecology
Scientific Reports

Mentored The Following Undergraduate Students:

2019	Hadley Kerr (University of Massachusetts; Honors Thesis)
2018–2019	Frederick Meyer (University of Massachusetts; Marine Science Certificate)
2017	Alec Daigle (University of Massachusetts; Honors Thesis)
2016	Sarah Martin (University of Massachusetts; Marine Science Certificate)
2014–2015	Emily Sgarlat (University of Massachusetts; Marine Science Certificate)
2013–2014	Emma Whitmore (DePaul University)
2013–2014	Niki Gianni (DePaul University)
2013–2014	Bazla Sukhera (DePaul University)
2012–2014	Kim Dam (DePaul University)

Past And Current Professional Memberships

Endocrine Society
 North American Society for Comparative Endocrinology
 Society of Experimental Biology
 Society for Integrative and Comparative Biology
 Canadian Society of Zoologists
 Sigma Xi: The Scientific Research Society
 The Crustacean Society

Laboratory Skills

Live animal care and handling; dissection; *in vivo* and *ex vivo* experimentation; *in silico* genomic analyses (gene discovery, gene synteny, phylogenetic modeling); molecular cloning; real-time, quantitative polymerase chain reaction (qPCR); Western blotting; immunohistochemistry (IHC); radioimmunoassay (RIA); receptor binding assay; enzyme immunoassay (EIA/ELISA); electrophysiology; spectrophotometry; various hematological analyses