**Claire L. Riggs**
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## CURRENT POSITION

NIH MOSAIC Scholar, Postdoctoral Researcher: 2019 – present
Cellular and molecular biology of the stress response
Division of Rheumatology, Inflammation, and Immunity, Brigham & Women's Hospital
Department of Medicine, Harvard Medical School
Advisors: Dr. Paul Anderson and Dr. Pavel Ivanov

## PREVIOUS APPOINTMENTS

Visiting Lecturer, Human Physiology & Cellular Stress Response 2022 – 2023
Department of Biological Sciences, Wellesley College

Post-Doctorate Fellow, comparative physiology – anoxic turtles 2018 – 2019
Department of Biology, Saint Louis University
Research group of Daniel Warren's lab

Graduate Student, NSF GRFP Fellow, comparative physiology and biochemistry 2011 – 2018
Biology Department, Portland State University
Research group of Dr. Jason Podrabsky

## EDUCATION

**Ph.D.** (Biology) Portland State University, Portland, OR 2017
Advisor: Jason Podrabsky
Dissertation: *Investigating the role of small noncoding RNAs in vertebrate anoxia tolerance*

**B.A.** (Biology), Magna Cum Laude, Kalamazoo College, Kalamazoo, MI 2011

## RESEARCH FUNDING: GRANTS & FELLOWSHIPS

*Current*

National Institutes of Health, NIGMS, MOSAIC K99 2023 – 2025
Stress tolerant annual killifish: a new model for the cellular stress response
Riggs, C.L. (PI) (~$250,000)

*Past*
National Institutes of Health, NIGMS, NRSA Individual Postdoctoral Fellowship (F32) 2021 – 2023
UBAP2L and the Cellular Stress Response
Riggs, C.L. (fellow), Anderson, P.A. and Ivanov, P. (co-sponsors) ($99,224)

National Science Foundation, Graduate Research Fellowship 2012 – 2017
($128,000)

National Science Foundation, Doctoral Dissertation Improvement Grant, 2015 – 2016
Division of Environmental Biology

Small RNA regulation and the evolution of extreme anoxia tolerance
($19,305)

National Science Foundation, CAPES-NSF Graduate Research Opportunities Worldwide (GROW) 2015
Characterization of habitat and anoxia tolerance of Brazilian annual killifish
São Paulo State University (Universidade Estadual Paulista "Júlio de Mesquita Filho", **UNESP**)
Institute of Biosciences, Department of Morphology, lab of Dr. Claudio Oliveira
($8,000)

Science Communication Fellowship (see Professional Dev. Workshops) 2015
Special Genomics Fund scholarship, Oregon Museum of Science and Industry
($2,500)

HHMI Deliberative Democracy Pedagogy (DDP) fellow (see Professional Dev. Workshops), ($2,000) 2015

Sigma Xi, *Grant in aid of Research*, $700 2013

HHMI Undergraduate International Research Fellowship 2010
Center for Structural Biology, Venezuelan Institute of Scientific Investigations, Caracas, Venezuela
($4,000 + travel expenses)

HHMI Undergraduate Research Fellowship 2009
Department of Biology, Portland State University
($5,500)

## AWARDS AND HONORS

*Travel Grants*

- American Physiological Society Intersociety Meeting for Comparative Physiology, $330 2022
- The Fisheries Society of the British Isles Travel Grant, £1,000 2018
- Marie Brown Travel Award, $400 2017
- Society of Integrative and Comparative Biology, Charlotte Mangum Student Support 2013
- PSU, Student Educational Travel award, $500 2013

*Academic Distinctions*

- Hillman-Crawshaw Award in Vertebrate Physiology, $1,000 2018
  awarded for excellence in vertebrate physiology research at Portland State University
- NSF Vizzies Challenge semi-finalist for acrylic painting depicting annual killifish 2018
- Nominated for Graduate Teaching Assistant Award, Lead Lecture TA Principles of Biology 2016
- 3rd place poster award for Alumni night, Portland State University 2015
- 2nd place poster award for Alumni night, Portland State University 2012
- H. Lewis Batts Prize in Biology, Kalamazoo College, 2011
  awarded for efforts to further the spirit of collegiality in the Biology Department
- Kalamazoo Bridge Award, Kalamazoo College 2009 – 2011
- Kalamazoo Honor's Scholarship, Kalamazoo College 2007 – 2011
- Alpha Lambda Delta Honor's Society Member, Kalamazoo College 2007 – 2011

PUBLICATIONS

*****Indicates undergraduate coauthor
**Indicates research featured on journal cover

PEER-REVIEWED ARTICLES

**Riggs, C.L.,** Kedersha, N., *Amarsanaa, M., Zubair, S.N., Ivanov, P., Anderson, P. 2024. UBAP2L contributes to formation of P-bodies and modulates their association with Stress Granules. *Journal of Cell Biology.* 223:10, 1-21. doi: 10.1083/jcb.202307146.

Makeeva, D.S., **Riggs, C.L.**, Burakov, A.V., Ivanov, P.A., Kushchenko, A.S., Bykov, D.A., Popenko, V.I., Prassolov, V.S., Ivanov, P.V., and Dmitriev, S.E. 2023. Relocalization of Translation Termination and Ribosome Recycling Factors to Stress Granules Coincides with Elevated Stop-Codon Readthrough and Reinitiation Rates upon Oxidative Stress. *Cells*. 12.

Alderman, S.L., **Riggs, C.L.**, Bullingham, O.M.N., Gillis, T.E., Warren, D.E. 2021. Cold-acclimation induces life stage-specific responses in the cardiac proteome of Western painted turtles (*Chrysemys picta bellii*): implications for anoxia tolerance. *J Exp Biol*; jeb.242387. doi: https://doi.org/10.1242/jeb.242387

Schnell HM, Jochem M, Micoogullari Y, **Riggs CL**, Ivanov P, Welsch H, Ravindran R, Anderson P, Robinson LC, Tatchell K, Hanna J. 2021. Reg1 and Snf1 regulate stress-induced relocalization of protein phosphatase-1 to cytoplasmic granules. *FEBS J*. 288:16, 4833-4848. https://doi-org.ezp-prod1.hul.harvard.edu/10.1111/febs.15802.

Marmor-Kollet, H., Siany, A., Kedersha, N., Knafo, N., Rivkin, N., Danino, Y.M., Moens, T.G., Olender, T., Sheban, D., Cohen, N., Dadosh, T., Addadi, Y., Ravid, R., Eitan, C., Cohen, B.T., Hofmann, S., **Riggs, C.L.**, Advani, V.M., Higginbottom, A., Cooper-Knock, J., Hanna, J.H., Merbl, Y. Van Den Bosch, L., Anderson, P., Ivanov, P., Geiger, T., & Hornstein, E. 2020. Spatiotemporal Proteomic Analysis of Stress Granule Disassembly Using APEX Reveals Regulation by SUMOylation and Links to ALS Pathogenesis. *Molecular Cell*. https://doi.org/10.1016/j.molcel.2020.10.032.

**Riggs, C.L.**, Kedersha, N., Ivanov, P., & Anderson, P. 2020. Mammalian stress granules and P bodies at a glance. *Journal of Cell Science*. 133:jcs242487, 1-9.

**Riggs, C.L.**, Woll, S.C. & Podrabsky, J.E. 2019. MitosRNA and Extreme Anoxia Tolerance of Embryos of the Annual Killifish *Austrofundulus limnaeus*. *Scientific Reports*. 9:19812, 1-17.

**Riggs, C.L.**, *Le, R., Kültz, D., Zajic, D., *Summers, A., *Alvarez, L., & Podrabsky, J.E. 2019. Establishment and characterization of an anoxia-tolerant cell line, PSU-AL-WS40NE, derived from an embryo of the annual killifish *Austrofundulus limnaeus*. *Comparative Physiology and Biochemistry, Part B*. 10.1016/j.cbpb.2019.02.008

**Riggs, C.L.**, *Summers, A., Warren, D.E., Nilsson, G.E., Lefevre, S., Dowd, W.W., Milton, S., & Podrabsky, J.E. 2018. Small Noncoding RNA Expression and Vertebrate Anoxia Tolerance. *Front. Genet.* 9:230.

Wagner, J., Singh P., Romney, A., **Riggs, C.**, Minx, P., Woll, S., *Roush, J., Warren, W., Brunet, A., & Podrabsky, J. 2018. The genome of *Austrofundulus limnaeus* offers insights into extreme vertebrate stress tolerance and embryonic development. *BMC Genomics*. 19:155.

****Riggs, C.L.** & Podrabsky, J.E. 2017. Small noncoding RNA expression during extreme anoxia tolerance of annual killifish (*Austrofundulus limnaeus*) embryos. *Physiological Genomics*. 49:9, 505-518.

**Podrabsky, J.E., **Riggs, C.L.**, Romney, A.L., Woll, S.C., Wagner, J.T., Culpepper, K.M., & Cleaver, T.G. 2017. Embryonic development of the annual killifish *Austrofundulus limnaeus*: An emerging model for ecological and evolutionary developmental biology research and instruction. *Developmental Dynamics*. 246: 779-801.

Sulbarán, G., Biasutto, A., Alamo, L., ***Riggs, C.**, Pinto, A., Méndez, F., Craig, R. & Padrón, R. 2013. Differential Head Environments in Tarantula Thick Filaments Support a Cooperative Activation Process. *Biophysical Journal* 105, 2114-2122.

BOOK CHAPTERS

**Riggs, C.L.**, Kalyan, G., Romney A.L.T, Podrabsky, J.E *Under review.* Detection of mitochondrial tDRs in killifish embryos and other non-model organisms, *In:* Ivanov, P. & Polacek, N. (ed) *tRNA-derived RNAs*, *Methods Enzymol*.

**Riggs, C.L.** & Ivanov, P. 2023. Stress, membrane-less organelles, and liquid-liquid phase separation, *In*: Uversky, V.N. (ed) *Droplets of Life*, Elsevier, p. 505-524.

Podrabsky, J.E., **Riggs, C.L.** & Wagner, J.T. 2015. Tolerance of Environmental Stress, *In:* Berois, N., García, G., de Sá, R.O., (ed) *Annual Fishes: Life History Strategy, Diversity, and Evolution,* CRC Press, Boca Raton, p. 159-184.

Podrabsky, J.E., ***Riggs, C.L.** & Duerr, J.M. 2012. Anoxia Tolerance During Vertebrate Development–Insights from Studies on the Annual Killifish *Austrofundulus limnaeus. In:* Padilla, P. (ed) *Anoxia*. Intech: Rijeka. http://www.intechweb.org/

RESEARCH PRESENTATIONS

SELECTED & INVITED ORAL PRESENTATIONS

Illuminating the cellular stress response: insights from killifish embryos to human cells. 2024
**Oregon Health and Sciences University**, Oregon Institute for Occupational Health Sciences. Portland, OR. Invited speaker.

UBAP2L: at the intersection of stress granules and p-bodies 2023
RNA Granules 2023, Surrey, UK
**Riggs, C.L.**, Kedersha, N.K., Anderson, P.A., Ivanov, P., Abstract selected for oral presentation.

Fish embryos to cell culture: a new approach to studying anoxia tolerance 2019
**Southern Oregon University**, Biology Department Seminar Series, Invited speaker.

Extreme vertebrate anoxia tolerance: a window into mitosRNA function 2019
**University of New Mexico**, Biology Department Seminar Series, Invited speaker.

Investigating the role of small noncoding RNAs in vertebrate anoxia tolerance 2018
**Saint Louis University**, Biology Department Seminar Series, Invited speaker.

Mitochondria-derived Small Non-coding RNAs in Extreme Anoxia Tolerance 2017
**Experimental Biology**, Annual meeting, Chicago, IL
**Riggs, C.L.** and Podrabsky, J.E., Abstract selected for oral presentation and poster presentations.

Small Noncoding RNA Expression During Extreme Anoxia Tolerance, 2017
**Hatfield Marine Science Center**, Oregon State University, Invited speaker.

Small RNA expression in the extreme anoxia tolerance of annual killifish embryos. 2017
RNA Biology – 11th Annual Salk/Foundation Ipsen/Science Symposium on Biological Complexity
**Salk Institute, La Jolla, San Diego**
**Riggs C.L.** and Podrabsky, J.E., Selected abstract.

Annual fish and anoxia tolerance 2016
**ICMBio (National Center of Research and Conservation of Aquatic and Biodiversity),**
**CEPTA (National Center of research and conservation of fish),**
Pirassununga Brazil, Invited presentation delivered in Portuguese

CONTRIBUTED PRESENTATIONS

*Cells derived from a naturally stress-tolerant organism avoid canonical stress granule formation.* 2023
**Cell Bio**, American Society of Cell Biology and EMBO annual meeting, Boston, MA
**Riggs, C.L.**, Amarsanaa, M., Ivanov, P., Anderson, P.

*Stress-tolerant annual killifish cells avoid stress granule formation.* **American Physiological Society,** 2022
Intersociety meeting, Comparative Physiology: From Organism to Omics in an Uncertain World
**Riggs, C.L.**, Ivanov, P. and Anderson, P. Poster presentation.

*UBAP2L in the Cellular Stress Response*. **RNA Society,** Annual meeting 2021
**Riggs, C.L.**, Ivanov, P., and Anderson, P. Virtual poster presentation.

*Small Noncoding RNA Expression and Vertebrate Anoxia Tolerance*. 2018
**Society of Experimental Biology**, Annual meeting, Florence, Italy
**Riggs, C.L.**, Summers, A., Warren, D.E., Nilsson, G.E., Lefevre, S., Dowd, W.W., Milton, S., Podrabsky, J.E.
Oral presentation.

*Small RNA gene expression and localization in anoxia tolerant annual killifish.* 2016
**Society for Integrative and Comparative Biology**, Annual meeting, Portland, OR
**Riggs C.L.** and Podrabsky, J.E. Oral presentation.

*Anoxia-responsive small RNA gene expression in annual killifish embryos.* 2014
**American Physiological Society Intersociety Meeting:**
**Comparative approaches to grand challenges in physiology,** San Diego, CA
**Riggs C.L.** and Podrabsky, J.E. Oral presentation.

*Small RNA regulation of gene expression in the anoxia tolerance of annual killifish.* 2014
**Society for Integrative and Comparative Biology**, Annual meeting, Austin, TX
**Riggs C.L.** and Podrabsky, J.E. Oral presentation.

TEACHING AND MENTORING EXPERIENCE

RESEARCH MENTORSHIP

*Brigham and Women's Hospital*

- Safiyah Zubair, research technician June 2023 – present
- Misheel Amarsanaa, undergraduate student, Wellesley College Summer 2023, 2023-24 academic yr
- Ashley Tai, undergraduate student**,** Summer 2022
  The University of Rhode Island, NIH MARC U*STAR and Harvard SHURP trainee
- Tiffany Ye, undergraduate student**,** Summer 2021
  University of Massachusetts Boston undergraduate in Dana-Farber/Harvard Cancer Center (DF/HCC) Summer Program to Advance Research Careers (SPARC))

*Saint Louis University*
- Daniel Halley, undergraduate student Aug 2018 – July 2019

*Portland State University*
As graduate student in Dr. Jason Podrabsky's lab in the Biology Department at Portland State University I mentored and trained high school and undergraduate students. Several were participants in programs designed to encourage minority participation in the sciences: Ronald E. McNair Scholars Program, Louis Stokes Alliance for Minority Participation (LSAMP), and the NIH BUILD EXITO program. Students worked an average of 10 hours/week. Students mentored include nine women, one African American, two Latinas, one Pacific Islander, and seven first-generation college students.

- Meranda Corona, BUILD EXITO PSU undergrad, Present: UC Davis graduate student 2017
- Motutama Sipelii, BUILD EXITO PSU undergrad, 2017
  Present: MPH Candidate at the OHSU-PSU school of Public Health
- Amy Seufert, undergraduate student, Present: PhD Candidate in the Napier Lab at PSU 2017
- De'Junique Brown, PSU undergrad, McNair, LSAMP, BUILD EXITO scholar
  Present: Labor & Postpartum Doula; Lactation Counselor at Black Parent Initiative
- Teo Lê (formerly Rosey Lê), undergraduate student, McNair, BUILD EXITO 2015 – 2017
  Present: Medical Technologist at PeaceHealth SWMC
- Kathleen Lukens, PSU undergrad 2017
- Lucy Alvarez, PSU undergrad, McNair and LSAMP scholar 2015 – 2016
- Florisela Herrejon-Chavez, undergraduate student, McNair, LSAMP 2015
  Present: PhD candidate at Memorial Sloan Kettering Cancer Center in the Gerstner Sloan Kettering Graduate School
- Amanda Summers 2014 – 2015
  La Salle High School student and Villanova University undergraduate student
  Present: medical student at Oregon Health and Science University
- Madison Wray, St. Mary's Academy high school student 2015
  Science Research Methods lab internship

*Additional scientific mentoring*

**Mentor for a Martin Frank Diversity Travel Awardee** Oct 2022
APS Comparative Physiology: From Organisms to Omics in an Uncertain World meeting

**Mentoring Circles Program, mentor** September 2020 - May 2021
Brigham & Women's Hospital Postdoctoral Association
Served as co-mentor to 5 junior postdocs. Facilitated monthly meetings and advised on topics relevant to postdoctoral training.

## TEACHING EXPERIENCE

*Course Development and Instructor of Record*
- Cellular Stress Response BISC/BIOC 337, Wellesley College Spring 2023
- Human Physiology BISC 302 lecture, Wellesley College Fall 2022

*Teaching Assistant*
- Human Anatomy and Physiology Lab BI 301L, 302L, 303L, Portland State University 2011, 2013, 2016
- Principles of Biology BI 211, Portland State University 2015

*Guest Lecturer*
- Comparative Animal Physiology BI314, *Salt and Water Physiology,* Southern Oregon University 2021
- Form and Function BIOL 123, *Insights from anoxia-tolerant vertebrates,* Kalamazoo College 2021

- Genomics BIOL 503, *Gene expression and Transcriptomes,* Saint Louis University 2018
- Principles of Animal Development BI 321, *Development & Environment*, Washington State University, Vancouver 2017
- Principles of Biology BI 211, *Regulation of Eukaryotic Gene Expression,* Portland State University 2015
- Comparative Vertebrate Embryology BI 326, 2015
  *A. limnaeus* – environmental variation and unique biology, Portland State University

PROFESSIONAL DEVELOPMENT WORKSHOPS

*Diversity, Equity, and Inclusion*
**Antiracism in a Scientific Community** 2024
5-session workshop series, hosted by Harvard Catalyst.

**Foundations in Courageous Conversations® workshop** 2023
Hosted by the American Society of Cell Biology, Boston, MA

**SPARK THE MIND: Advancing the Agenda for African-Americans in STEM, attendee** 2019
Harris Stowe State University, Saint Louis, MO

*Mentoring*
**Mentoring Undergraduates workshop: Handling Challenges, Celebrating Successes, Diversity and Inclusion, & Responding to Student Science Writing**
Harvard Science Education Office, Boston, MA 2020

**CURE Mentor Training** 2020
Dana-Farber/Harvard Cancer Center and the HMS/HSDM Office for Postdoctoral Fellow, Boston, MA

*Science Communication*
**Write Winning NIH/NSF Grant Proposals** 2023
Grant Writers' Seminar & Workshops and The American Society for Cell Biology MOSAIC Program, virtual

**Science Communication Fellowship program, fellow** 2015
Oregon Museum of Science and Industry (OMSI)

*Teaching*
**Reinert Center for Transformative Teaching & Learning, workshop participant** 2018 – 2019
Saint Louis University
- Praxis: effective use of film
- Praxis: flipped classroom
- Praxis: giving effective writing feedback

**HHMI Deliberative Democracy Pedagogy (DDP), fellow** 2015
Biology Department, Portland State University
- Completed training on Deliberative Democracy Pedagogy
- Developed Deliberative Democracy module for Principles of Biology (BI 211) on CRISPR ethics

PROFESSIONAL SERVICE AND COMMUNITY OUTREACH

*Academic Service*

**Topic editor:** 2024 – present
Frontiers in Molecular Biosciences Research Topic, "The role of membraneless organelles in physiology and pathology"

**Peer reviewer:** 2019 – present
Comparative Biochemistry and Physiology – Part B, Genome Biology and Evolution, PeerJ, Molecular Cell, Journal of Applied Physiology, BioEssays, AJP: Regulatory, Integrative and Comparative Physiology, Scientific Reports, Journal of Cell Biology, Journal of Comparative Physiology B

**2022 APS Intersociety meeting, planning committee member** March 2020 – October 2022
Comparative Physiology: From Organism to Omics in an Uncertain World

**Graduate Student Representative**, Promotion and Tenure Committee 2014 – 2015
Portland State University Biology Department

**Poster Judge**, American Physiological Society, Intersociety meeting 2022

**SACNAS volunteer** Spring 2021
Reviewed and judged student abstracts for research presentations and travel awards for the SACNAS (Society for Advancing Chicanos/Hispanics & Native Americans in Science) annual meeting.

**Poster Judge,** Sigma Xi Research Symposium May 2019
Judged undergraduate research posters.
Saint Louis University
*Community Outreach*

**Kalamazoo College,** Biology Department Homecoming 2021
Biology Reflections, Invited 10-year alumni speaker

**Invited speaker – virtual** 2020
St. Mary's Academy, *Scientific Research and Methods* class, Portland, OR
Environmental stress response: from the organism to the cell

**Earth Day Art Show, Invited Artist** April 2018
Portland State University
Invited to display original acrylic painting depicting juvenile annual killifish

**Meet-a-Scientist, Research Volunteer** 2015 – 2017
OMSI (Oregon Museum of Science and Industry), Portland, OR
Facilitated hands-on interactive activities on annual killifish embryo anoxia-tolerance, developed in the OMSI Science Communication Fellowship Program for the public. ~ 3 hours/month.

**Friends of Arbor School board member** 2014 – 2017
Arbor School of Arts and Sciences, Tualatin, OR
Served on board and advised on science curriculum at independent K-8 school.

**Invited speaker** 2011, 2014, 2016
St. Mary's Academy, *Scientific Research and Methods* class, Portland, OR
Vertebrate Extreme Anoxia Tolerance

**Invited speaker** 2014
Multnomah Education Service District-Outdoor School staff training collaboration with PSU BIO (Biological Investigation and Outreach), Sandy River outdoor school site, Sandy, OR
Life with little or no oxygen

**Guest speaker** 2013
Arbor School of Arts and Sciences, 6$^{th}$ and 7$^{th}$ grade classes, Tualatin, OR
Genes, environment, and incredible fish!

**Science fair judge** 2013
Intel Northwest Science Expo, Middle school plant-science, Portland, OR

IN THE NEWS

Science Magazine news coverage of annual killifish anoxia-tolerance research: Pennisi, Elizabeth. 2016. A fish back from the dead—Understanding how killifish survive months without oxygen could help stroke victims. *Science Magazine*. 351(6272): 433.

PROFESSIONAL SOCIETY MEMBERSHIPS

| | |
|---|---|
| Biochemical Society | 2023 – present |
| American Society of Cell Biology (ASCB) | 2023 – present |
| Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS) | 2020 – 2021 |
| RNA Society | 2020 – 2023 |
| Society of Experimental Biology | 2018 – 2021 |
| The Fisheries Society of the British Isles | 2018 – 2020 |
| American Association for the Advancement of Science | 2015 – present |
| American Physiological Society | 2014, 2017, 2022 – present |
| Society of Integrative and Comparative Biology | 2013, 2014, 2016, 2017 |
| Sigma Xi | 2013 – 2014 |