Rebecca M. Izen

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Education

Harvard University Class of 2024
Ph.D. Candidate in Developmental and Regenerative Biology

University of Texas at Austin December 2013
B.S. Honors Biology (Dean's Scholars)

- GPA 3.7 / 4.0
- Crawford Endowed Scholarship through the Dean's Scholars program; includes all direct costs of attending UT Austin, 2009 – 2013

Research Experience

Graduate Student, Harvard University, 9/2019 – present
Supervisors: Olivier Pourquie, PhD and Cliff Tabin, PhD

- Developmental and genetic basis for loss of the tail during evolution of dinosaurs into modern birds
- Performed comparative genomics and experimental embryology in alligator and chicken
- Electroporated alligator alleles into chicken embryos to grow a bird with a tail

Post-baccalaureate Research Fellow, National Institutes of Health, 8/2015 – 5/2018
Supervisor: Yoh-suke Mukouyama, PhD"

- Independently developed whole-mount imaging of the inner surface of the mouse skull for a time-course analysis of lymphatic vessel development in the brain meninges
- Performed FACS-isolation of blood endothelial cells from the embryonic mouse brain, followed by culture differentiation assays, to identify mechanisms that inhibit lymphatic vessel development within the brain parenchyma

Evolutionary Biology Lab Technician, Rice University, 8/2014 – 8/2015
Supervisor: Scott Egan, PhD

- Ordered and received supplies to build the laboratory of a new faculty member
- Collected cynipid wasp galls, monitored insect emergence in the lab, preserved and shipped specimens, and extracted DNA
- Supervised undergraduate data collection

Intern, Asuragen, Austin, TX, 5/2014 – 7/2014

- Proof-of-principle for a national genetic screen for Fragile X Syndrome in newborns
- Techniques included DNA extraction, PCR, qRT-PCR, and capillary electrophoresis

Undergraduate Research in Evolutionary Ecology, UT Austin, 5/2012 – 7/2014
Supervisor: Dan Bolnick, PhD

- Travelled and camped with a team of 5 to sample threespine stickleback fish from 16 lake-stream pairs on Vancouver Island, British Columbia

- Independently dissected and photographed 1200 threespine stickleback fish for a multivariate analysis of morphology-microhabitat correlations on an alternating lake/stream transect

Undergraduate Research in Developmental Biology, UT Austin, 7/2010 – 5/2012
Supervisor: Stanley Roux, PhD

- Measured growth rates of Arabidopsis root hairs immediately after treatment with extracellular ATP, apyrase inhibitors, and auxin transport inhibitors, in no phosphate conditions, to test whether auxin mediates eATP signaling

Undergraduate Research in Geoarchaeology (self-guided), UT Austin, 5/2010 – 8/2011
Supervisor: David Laude, PhD

- Measured gamma decay rates of Cesium-137, released in nuclear weapons testing, to assess soil disturbances at a Late Prehistoric base camp in South Texas
    - Nuclear Engineering Teaching Laboratory, UT Austin (Cs-137 Assay)
    - Quaternary Paleoecology Laboratory (Magnetic Susceptibility Assay)
    - Applied Geomorphology Laboratory (Particle size hydrometry)

AgriLife Laboratory, Port Aransas TX, 5/2009 – 7/2009

- Developed feeding techniques to culture sea urchins for developmental research

Publications

Izen, R.M., Yamazaki, T. and Mukouyama, Y. 2018. Postnatal development of lymphatic vessels in the brain meninges. *Developmental Dynamics,* 247 (5): 741-753.

Stuart, Y.E., Veen, T., Weber, J.N., Hanson, D., Lohman, B.K., Thompson, C.J., Tasneem, T., Doggett, A., **Izen, R.M.**, Ahmed, N., Hendry, A.P., Peichel, C.L., and Bolnick, D.I. 2017. Contrasting effects of environment and genetics generate a predictable continuum of parallel evolution. *Nature Ecology and Evolution,* 1(6):158.

Zhang, L., Driscoe, A., **Izen, R.M.**, Busbee, R., Ott, J.R., and Egan, S. 2017. Immigrant inviability promotes reproductive isolation among host-associated populations of the gall wasp *Belonocnema treatae. Entomologica Experimentalis et Applicata*, 132(3):379-388.

Izen, R.M., Stuart, Y.E., Jiang Y., and Bolnick, D.I. 2016. Coarse- and fine-grained phenotypic divergence in threespine stickleback from alternating lake and stream habitats. *Evolutionary Ecology Research,* 17:437-57.

Forbes, A.A., Hall, M.C., Lund, J., Hood, G.R., **Izen, R.M.**, Egan, S.P., and Ott, J.R. 2015. Parasitoids, Hyperparasitoids, and Inquilines Associated with the Sexual and Asexual Generations of the Gall Former, *Belonocnema treatae* (Hymenoptera: Cynipidae). *Annals of the Entomological Society of America,*109 (1): 49-63.

Teaching

Teaching Fellow, Human Developmental and Regenerative Biology, Harvard University (9/2019 – 12/2019)

- Ran a weekly discussion section for an undergraduate gateway course. Sections included active learning activities, paper discussion, content review chalk talks, and practice problems

- Assisted in writing and grading problem sets and exams

Harvard Medical School Kids, Boston MA (7/2019-8/2019)

- Head and supporting teacher in a summer camp for middle-schoolers from underrepresented groups in science
- Designed and taught active learning lessons about evo-devo, differentiation, and patterning the limb

Summer Student Mentoring

2016 Tomoko Oguri, High School Student, National Institutes of Health
2015 Gabriela Zambrano, Undergraduate, Rice University
2015 Leah Topper, Undergraduate, Rice University

Peer Mentor for the Freshman Research Initiative, UT Austin, 7/2011 – 5/2013

- Taught molecular lab techniques and microscopy, provided research advice

Student Teacher, UTeach Program, UT Austin, 8/2011 – 5/2012

- Designed elementary and middle school science labs, managed classrooms, and brought students to shadow researchers at UT

South Texas Archaeology Field School, Texas A&M University, Corpus Christi, TX
Field Supervisor, 5/2010 – 6/2010
Supervisor: Robert Drolet, PhD

- Supervised an excavation block of 5 undergraduates
- Taught excavation, cultural material identification, sample processing, and machète use to clear sites for excavation
- Managed the field laboratory and all record keeping
- Symposium Chair at the Texas Archaeological Society Annual Meeting

Awards

- Graduate Women in Science Fellowship, Honorable Mention, 2021
- National Institutes of Health F31 Predoctoral Fellowship, 2021-2024
- NSF GRFP, Honorable Mention, 2020
- Simmons Award, Harvard Center for Biological Imaging, 2019
- FAES Graduate School Scholarship, NIH, 2016 (declined)
- Special Departmental Honors in Biology, UT Austin, 2013
- College of Natural Sciences Summer Research Fellowship, UT Austin, 2010
- Texas Archaeological Society Annual Meeting Scholarship, 2009-2010
- Texas Archaeological Field School Scholarship, 2009
- NSF Research Experiences for Undergraduates Fellowship, 2008

Posters and Presentations

Izen, R.M., Pourquie, O. Loss of the dinosaur tail during the evolution of modern birds.

- Genetics Department Seminar Series, Harvard Medical School, October 2021 (talk).
- Meet the DRB event, Harvard University, August 2021 (lightning talk).
- Developmental and Regenerative Biology Seminar Series, Harvard University, May 2020 (talk).

Izen, R.M., Yamazaki, T. and Mukoyama, Y. Characterization of lymphatic vessel development in the Central Nervous System.

- Vascular biology branch meeting, NIH, March 2018 (talk)
- Developmental Biology Workshop, NIH, November 2017 (poster)
- NIH Research Festival, September 2016 & September 2017 (poster)
- Lymphatics Forum, Chicago, IL, June 2017 (Nano-talk and poster)
- Genetics and Developmental Biology Center Seminar Series, NIH, March 2017 (talk)
- Postbac Poster Day, NIH, April 2016 & April 2017 (poster)
- Postbac Seminar Series, NIH, November 2017 (talk)

Izen, R.M., Stuart, Y.E., Jiang, Y., and Bolnick, D.I. Coarse- and fine-grained phenotypic divergence among threespine stickleback from alternating lake and stream habitats. Evolution Meetings, Austin, TX, June 2016. (poster)

Izen, R.M., Tran, E., Clark, G., and Roux, S. The effects of NPA and apyrase inhibitors on the growth rate of *Arabidopsis* root hairs in low and high phosphate conditions. Undergraduate Research Forum, University of Texas at Austin, April 2011 (poster)

Izen, R.M., Leitch, M., Landsberger, S., and Drolet, R.P. Undisturbed soils? A geoarchaeological analysis at site 41-NU-54 in the Lower Nueces River Valley, South Texas.

- Undergraduate Research Forum, University of Texas at Austin, April 2011 (poster)
- Texas Archaeological Society Annual Meeting, Corpus Christi, TX, October 2010 (talk)

Izen, R.M. and Drolet, R.P. Shell procurement at two Late Prehistoric base camp sites: 41-SP-220 and 41-NU-54; products from the river and coast. Texas Archaeological Society Annual Meeting, Del Rio, TX, October 2009 (talk)

Izen, R.M., Leon, A., and Bandolon, A. Feed rate study in green sea urchin *Lytechinus variegates*. Undergraduate Research Focus Symposium, Texas A&M University-Corpus Christi, Corpus Christi, TX, June 2008 (talk)