

Cissy J. Ballen

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Dept. of Biology Teaching and Learning
3-154 Molecular & Cellular Biology
Minneapolis MN, 55455

email: balle027@umn.edu
Phone: (607)279-2625

APPOINTMENTS

Postdoctoral Associate August 2016 – Present
University of Minnesota
Postdoctoral advisor: Dr. Sehoya Cotner

Postdoctoral Associate August 2014–2016
Cornell University
Postdoctoral advisor: Dr. Kelly Zamudio

RESEARCH INTERESTS

Undergraduate science education, STEM equity, Quantitative methods

EDUCATION

PhD	University of Sydney, Australia School of Biological Sciences Advisors: Dr. Mats Olsson, Dr. Richard Shine	2010 – 2014
BSc	University of Minnesota Fisheries & Wildlife Biology, Biological Sciences	2004 – 2008

REFEREED PUBLICATIONS

*indicates author was a student advisee

2017: [Ballen](#), C.J., Lee, D.*, Rakner, L., and Cotner, S. Politics a ‘chilly’ environment for undergraduate women in Norway. (In press, **PS: Political Science & Politics**)

2017: [Ballen](#), C.J., Wieman, C., Salehi, S., Searle, J. and Zamudio, K.R. Enhancing diversity in undergraduate science: Self-efficacy drives performance gains with active learning. (In press, **CBE-Life Sciences Education**)

2017: [Ballen](#), C.J. and Greene, H. W. Walking and talking the tree of life: Why and how to teach about biodiversity. **PLoS Biology** 15(3):e2001630.

*Additional coverage on Cornell Chronicle, Science Daily, Phys.org, Biodiversity news

- 2017:** Ballen, C.J. and Mason, N.A. Longitudinal analysis of a diversity support program in biology: a national call for further assessment. **Bioscience** 67(4):367-373.
- 2017:** Ballen, C.J., Blum, J., Brownell, S., Hebert, S., Hewlett, J., Klein, J., McDonald, E., Monti, D., Nold, S., Slemmons, K., Soneral, P., and Cotner, S. A call to develop course-based undergraduate research experiences (CUREs) for nonmajor courses. **CBE-Life Sciences Education** 16(2): mr2.
- 2017:** Mcdiarmid, C.S.*, Friesen, C., Ballen, C.J., and Olsson, M. Sexual coloration and sperm performance in the Australian painted dragon lizard, *Ctenophorus pictus*. **Journal of Evolutionary Biology** 30:1303-1312.
- 2017:** Ballen, C.J., Danielsen, M.*, Jørgensen, C., Grytnes, J. A., and Cotner, S. Norway's gender gap: classroom participation in introductory science. **Nordic Journal of STEM Education** 1(1):179-186
- 2017:** Cotner, S., Ballen, C.J., and Jenó, L.M. Strategies to document active learning in biology. **Nordic Journal of STEM Education**. 1(1):36-42.
- 2016:** Ballen, C.J., Shine, R., and Olsson, M. Multifactorial sex-determination in chameleons. **Journal of Herpetology** 50(4):548-551.
- 2015:** Tobler, M., Ballen, C.J., Healey, M., Wilson, M., and Olsson, M. Oxidant trade-offs in immunity: an experimental test in a lizard. **PLoS One** 10(5):e0126155.
- 2015:** Ballen, C.J., Shine, R., and Olsson, M. Developmental plasticity in an unusual animal: the effects of incubation temperature on behavior in chameleons. **Behaviour** 152 (10):1307-1324.
- 2014:** Ballen, C.J. 2014. Biology of Colour Signaling Reptiles. PhD thesis, University of Sydney: 243.
- 2014:** Ballen, C.J., Shine, R., and Olsson, M. Effects of early social isolation on the behaviour and performance of juvenile lizards, *Chamaeleo calyptratus*. **Animal Behaviour** 88:1-6.
*See additional coverage on Nature Research Highlights, ABC Science, Daily Telegraph, Sydney Morning Herald, Phys.org
- 2013:** Olsson, M. M., Stuart-Fox, D., and Ballen, C.J. Genetics and evolution of colour patterns in reptiles. **Seminars in Cell and Developmental Biology** 24:529-41.
- 2012:** Ballen, C.J., Healey, M., Wilson, M., Tobler, M., and Olsson, M. Predictors of telomere content in dragon lizards. **Naturwissenschaften** 99(8):661-664.
- 2012:** Ballen, C.J., Healey, M., Wilson, M., Tobler, M., Wapstra, E. and Olsson, M. Net superoxide levels: steeper increase with activity in cooler female and hotter male lizards. **Journal of Experimental Biology** 215(5):731-735.
- 2011:** Cotner, S., Ballen, C.J., Brooks, C. D., and Moore, R. Instructor gender and student confidence in the sciences: a need for more role models? **Journal of College Science Teaching** 40(5):96-101.

OTHER PUBLICATIONS

2017: Ballen, C.J. and Newstrom, N. 'Testing hypotheses about sexual violence among adolescents', in Cotner, S. and Nelson, P. *Evolution and Biology of Sex: Laboratory Investigations*, 4E. Bluedoor: Minnesota.

2016: Ballen, C.J. 'Reconstruction and using phylogenetic trees: Active learning module', in Hillis, D.M., Sadava, D.E, Heller, H.C., Price, M.V., eds., *Principles of Life*, 2e. Sunderland, MA: Sinauer Associates.

2016: Ballen, C.J. 'Introduction to population genetics: Active learning module', in Hillis, D.M., Sadava, D.E, Heller, H.C., Price, M.V., eds., *Principles of Life*, 2e. Sunderland, MA: Sinauer Associates.

2016: Ballen, C.J. 'Animal origins and diversity: Apply What You've Learned', in Hillis, D.M., Sadava, D.E, Heller, H.C., Price, M.V., eds., *Principles of Life*, 2e. Sunderland, MA: Sinauer Associates.

2016: Ballen, C.J. 'Protostome Diversity: Apply What You've Learned', in Hillis, D.M., Sadava, D.E, Heller, H.C., Price, M.V., eds., *Principles of Life*, 2e. Sunderland, MA: Sinauer Associates.

2016: Ballen, C.J. 'Deuterostome Diversity: Apply What You've Learned', in Hillis, D.M., Sadava, D.E, Heller, H.C., Price, M.V., eds., *Principles of Life*, 2e. Sunderland, MA: Sinauer Associates.

PUBLICATIONS IN REVIEW OR REVISION

2017: Mason, N.A., Brunner, R., Ballen, C.J., and Lovett, I.J. Cognitive and social benefits among underrepresented first-year biology students in a field course: a qualitative case study of experiential learning in the Galápagos. *Frontiers: International Journal of Study Abroad*. (In revision)

2017: Ballen, C.J., Salehi, S., and Cotner, S. Exams disadvantage women in introductory science. (In review)

2017: Ballen, C.J., Thompson, S.T., Blum, J.E., Newstrom, N.P., and Cotner, S. Discovery and broad relevance may be insignificant components of course-based undergraduate research experiences. (In review)

2017: Ballen, C.J., Aguilon, S.M., Brunelli, R., Drake, A.G., Wassenburg, D., Weiss, S.L., Zamudio, K.R., and Cotner, S. Do small classes in higher education reduce performance gaps in STEM? (In review)

2017: Cotner, S. and Ballen, C.J. Mixed assessment methods make biology classes more equitable. (In review)

SCHOLARSHIPS, GRANTS, AND AWARDS

2017	NSF Research Collaborative Network in Undergraduate Biology Education (RCN-UBE), co-PI	\$49,104
	Travel Award - Gordon Research Conference	\$1,000
	Travel Award - Biology Teaching and Learning Professional Development Grant, University of Minnesota	\$2,500
2016	University Scholarship of Teaching and Learning Practitioners Fellowship, Cornell University	\$1,000
2015	Foundation course online innovation module grant, Cornell University	\$7,500
	Travel Award - Cornell University Teaching Support Scheme	\$2,500
2012	University of Sydney Post Graduate Research Support Scheme	\$2,000
	Travel Award - American Society of Ichthyologists and Herpetologists Graduate Student International	\$2,000
2011	Travel Award - University of Sydney Post Graduate Research Support Scheme	\$2,000
2010-2014	University of Sydney Biological Sciences Postgraduate Scholarship	\$88,000
2009	Outstanding Performance Award for Teaching Assistants in the College of Biological Sciences, University of Minnesota	\$1,000
2004-2008	College of Natural Resources High Ability Non-Resident Scholarship, University of Minnesota	\$50,000

SELECT PRESENTATIONS

Research Seminars and Posters:

2017

Exams disadvantage women in introductory science (poster).

Undergraduate Biology Education Research, Gordon Research Conference, Easton, MA.

Active learning improves diversity in undergraduate science (poster).

National Association for Research in Science Teaching (NARST), San Antonio, Texas.

Norway's gender gap: classroom participation in undergraduate introductory science.

MNT-Konferansen, Oslo, Norway.

Gender equity in science.

Public lecture at University of Bergen, Norway.

The effect of gender on participation and performance of women in STEM.
University of Linköping, Sweden.

2016

Improving diversity in undergraduate science.
BioCEED Center for Teaching Excellence seminar, University of Bergen, Norway.

Active learning improves diversity in STEM.
Evolution conference, Austin, TX.

Longitudinal analysis of a diversity support program in biology: a national call for further assessment.
The Practice of Inclusive Teaching in STEM Workshop. Cornell University, Ithaca, NY.

The road not taken: untraditional paths to professional bliss.
Careers in Molecular Biosciences. Cornell University, Ithaca, NY.

Multifactorial sex determination in chameleons.
Herpetology Club, Cornell University, Ithaca, NY.

2015

What the heck is going on? Active learning in the Biology Classroom.
Department of Ecology & Evolutionary Biology. Cornell University, Ithaca, NY.

Effects of early social isolation on the behavior and performance of juvenile lizards,
Chamaeleo calyptratus.
EvoDay Symposium: Evolution and Behavior. Cornell University, Ithaca, NY.

Biology of Colour Signalling Reptiles.
Department of Ecology & Evolutionary Biology. Cornell University, Ithaca, NY.

2013

Male and female chameleons use different colours to advertise social dominance.
Meeting of the Australian Society of Herpetologists, Point Wolstoncroft, NSW, Australia.

TEACHING EXPERIENCE

- 2017** University of Minnesota
Nature of Life Field Course
Instructor
Itasca, MN
"Promoting Equity in Science"
- University of Minnesota
Nature of Life Field Course
Instructor
Itasca, MN
"An introduction to invasive species: the warty, the slimy, and the parasitic"
- 2016** University of Minnesota
Introductory Biology (BIO 1003 sections 1 and 2, BIO 1055)
Developed a Course-Based Undergraduate Research Experience (CURE) for capstone projects using an authentic dataset
- University of Bergen, Norway
Organismal Biology II
Field course instructor
- 2015** Cornell University and University of New Hampshire
Evolutionary Biology and Marine Biodiversity
Shoals marine Laboratory, Appledore Island
Field course instructor
- Principles of Life 2e* textbook
Active Learning Modules (ALM)
Hillis et al., published by Sinauer Associates and Macmillan Higher Ed.
Contributing writer
- 2014-2016** Cornell University
Evolutionary Biology and Biodiversity
Course developer and instructor
- 2013 - 2015** Contributing writer: Double Helix Science Education Magazine: CSRIO
2010 - 2013 Teaching assistant: Tropical Wildlife Biology
Invertebrate Zoology

2007 – 2009 Teaching Assistant: Animal Diversity
Introductory Biology: Evolution and Biology of Sex
General Zoology
Flowering Plant Diversity
Wildlife Handling and Immobilization for Research

MENTORSHIP EXPERIENCE

Post-doctoral mentorship

Curated monthly seminars for pedagogy post-docs at Cornell University, in which faculty presented on professional development or pedagogical research

Graduate student mentorship

Jerome Evenson, 2017-, collaborator in the Department of Chemistry
Jonathan Andicoechea, 2016-, collaborator on two education projects, University of Minnesota
Nick Mason, 2014-2016, collaborator on two education projects, Cornell University
Nicole Rolling, 2013, Ph.D. student in biology at University of Sydney

Undergraduate mentorship

Neelam Chandiramani, University of Minnesota 2017-
Shivonne McCarthy, University of Minnesota 2017-
Jake Peterson, University of Minnesota 2017-
Azariah Yonas, University of Minnesota 2017-
Connor Neill, University of Minnesota 2017-
Brandon Vanderbush, University of Minnesota 2017-
Sergio Molina, University of Minnesota 2017-
Zoe Koth, University of Minnesota 2017-
Luke Feeley, University of Minnesota 2017-
Steven Wallace, University of Minnesota 2016-
Christine Lian, University of Minnesota 2016-
Olivia Treudeu, University of Minnesota 2016-
Mai Vang, University of Minnesota 2016-
Morgan Burkhart, University of Minnesota 2016-
Dahsol Lee, University of Minnesota 2016-2017, University of Minnesota undergraduate who went on to teach at an Elementary School of Leadership, Engineering, and Technology in Minneapolis, MN.

Callum Mcdiarmid, 2014-2016, University of Sydney undergraduate.
Greg Clark, 2012-2014, University of Sydney undergraduate who
went on to pursue a PhD at University of Sydney.
Chris Jolly, 2012-2014, University of Sydney undergraduate who
went on to become a biodiversity officer in Queensland, Australia.

PROFESSIONAL SOCIETY MEMBERSHIPS

National Association of Biology Teachers, Animal Behavior Society, American Society of
Ichthyologists and Herpetologists, Society for the Study of Evolution