

ELIZABETH N. SCHOCK

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Education

- 2017-present **Postdoctoral Fellow**
Northwestern University
Department of Molecular Biosciences
Mentor: Carole LaBonne
- 2012-2017 **Graduate Student**
Cincinnati Children's Hospital Medical Center (CCHMC)
Molecular and Developmental Biology Graduate Program
Mentor: Samantha A. Brugmann
- 2008-2012 **Undergraduate Student**
Wittenberg University
Biochemistry and Molecular Biology, B.S.
University and Departmental Honors, Summa Cum Laude

Personal Statement

My long-term goal is to **gain a comprehensive understanding of neural crest and craniofacial development and uncover the molecular etiology of craniofacial syndromes**. Throughout my scientific career, I have worked with four different vertebrate model systems (mouse, chick, frog, zebrafish) and value using the most appropriate model system to rigorously evaluate hypotheses. My lab will take a multi-system approach (mouse and frog) to gain insights into both the basic biology of neural crest development and the etiology of craniofacial defects associated with many syndromes. The scientific training and funding I have received through the early stages of my career have primed me to make significant contributions to the fields of developmental biology and neural crest/craniofacial development. I also have vested interest in training the next generation of scientists. I have mentored several undergraduate students throughout my scientific career, many of whom have contributed to publications. Throughout my career, I will continue to prioritize investing in the future of science by being an active mentor, providing significant support to my trainees, and sponsoring STEM education initiatives.

Funding

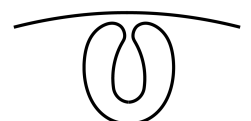
- 2023-present **K99 DE031825** | NIH-NIDCR | \$194,098
"The role of SoxE factors in neural crest cell specialization"



- 2019-2022 **F32 DE029113** | NIH-NIDCR | \$188,982
 "Identifying Sox family transcription factor partners and targets essential for neural crest formation"
- 2015-2017 **F31 DE025537** | NIH-NIDCR | \$112,560
 "The role of ectodermal primary cilia in murine orofacial development"

Peer Reviewed Publications

- 2023 **Elizabeth N. Schock**, Joshua R. York, Ashlyn Y. Tu, Austin P. Li, and Carole LaBonne. "SoxB1 transcription factors are essential for initiating and maintaining neural plate border gene expression" **bioRxiv**. 2023, doi: 10.1101/2023.09.28.560033
- *Discovered a novel role for SoxB1 transcription factors in neural plate border formation*
- 2023 Joshua R. York, Anjali Rao, Paul B. Huber, **Elizabeth N. Schock**, Sara Rigney, and Carole LaBonne, "A shared pluripotency and neural crest gene regulatory network evolved at the base of the vertebrates" **Nature Ecology and Evolution**. *In revision*
- 2023 Brett Horr, Ryan Kurtz, Ankit Pandey, Ben Hoffstrom, **Elizabeth Schock**, Carole LaBonne, and Dominique R Alfandari. "Production and Characterization of Monoclonal antibodies to Xenopus Proteins" **Development**. February 15, 2023, 150(4):dev201309. doi: 10.1242/dev.201309. Cover Art
- 2022 **Elizabeth N. Schock***, Joshua R. York*, and Carole LaBonne. "The Developmental and Evolutionary Origins of Cellular Pluripotency in the Vertebrate Neural Crest " **Seminars in Cell and Developmental Biology**. 2023 Mar 30;138:36-44. Review
- 2020 **Elizabeth N. Schock** and Carole LaBonne. "Sorting Sox: Diverse Roles for Sox Transcription Factors during Neural Crest and Craniofacial Development" **Frontiers**. December 8, 2020; 11: p.606889. Review
- 2018 Elsy Buitrago-Delgado, **Elizabeth N. Schock**, Kara Nordin, and Carole LaBonne. "A transition from SoxB1 to SoxE transcription factors is essential for progression from pluripotent blastula cells to neural crest cells" **Developmental Biology**. August 23, 2018, pii: S0012-1606(18)30259-8
- 2017 **Elizabeth N. Schock** and Samantha A. Brugmann. "Neural crest cells utilize primary cilia to regulate ventral forebrain morphogenesis via Hedgehog-dependent regulation of oriented cell division" **Developmental Biology**. September 21, 2017, 431: 168-178.
- *Identified a non-cell autonomous role for neural crest cells in the*



regulation of ventral forebrain morphogenesis through Hedgehog signaling

- 2017 **Elizabeth N. Schock** and Samantha A. Brugmann. "Discovery, diagnosis and etiology of craniofacial ciliopathies." **CSH Perspectives in Biology**, September 2017, 1;9(9). Review
- 2017 **Elizabeth N. Schock***, Jaime N. Struve*, Ching-Fang, Chang*, Trevor J. Williams, John Snedeker, Aria C. Attia, Rolf W. Stottmann, and Samantha A. Brugmann. "A tissue-specific role for intraflagellar transport genes during craniofacial development." **PLoS One**. March 27, 2017 ;12(3):e0174206.
- *Determined that ciliary proteins have distinct functional roles in different craniofacial cell types*
- 2017 John Snedeker, **Elizabeth N. Schock**, Jaime N. Struve, Ching-Fang Chang, Megan Cionni, Pamela V. Tran, Samantha A. Brugmann, Rolf W. Stottmann. "Unique spatiotemporal requirements for intraflagellar transport genes during forebrain development" **PLoS One**. March 14 2017, 12 (3): e0173258.
- 2016 **Elizabeth N. Schock**, Ching-Fang Chang, Ingrid A. Youngworth, Megan, G. Davey, Mary E. Delany, and Samantha A. Brugmann. "Utilizing the chicken as an animal model for human craniofacial ciliopathies." **Developmental Biology**, July 15, 2016, 415(2):326-337. Review
- 2016 Ya-Ting Chang, Praneet Chaturvedi, **Elizabeth N. Schock** and Samantha A. Brugmann. "Understanding mechanisms of GLI-mediated transcription during craniofacial development and disease using the ciliopathic mutant, *talpid2*", **Frontiers in Physiology**, October 2016, 7 (468): 1-13.
- 2015 **Elizabeth N. Schock**, Ching-Fang Chang, Jaime N. Struve, Ya-Ting Chang, Julie Chang, Mary E. Delany, and Samantha A. Brugmann. "Using the avian mutant *talpid2* as a disease model for understanding the oral-facial phenotypes of Oral-facial-digital syndrome." **Disease Models and Mechanisms**, August 2015, 8(8): 855-866.
- *Validated talpid2 as a model for Oral-facial-digital syndrome and identified developmental defects in neural crest cell migration and differentiation*
- 2015 Ching-Fang Chang, **Elizabeth N. Schock**, Aria Attia, Rolf W. Stottmann, and Samantha A. Brugmann. "The Ciliary Baton: Orchestrating Neural Crest Cell Development." **Current Topics in Developmental Biology**. 2015, 111: 97-134. Review
- 2015 Ching-Fang Chang, **Elizabeth N. Schock**, David A. Billmire, and Samantha A. Brugmann. "Craniofacial Syndromes: Etiology, Impact, and Treatment." **Principles of Developmental Genetics, 2nd Edition**, Editor Sally A. Moody. Elsevier, New York. 2015, 654-671. Book Chapter



- 2014 Ching-Fang Chang, **Elizabeth N. Schock**, Elizabeth O'Hare, Jerry Dodgson, Hans Chen, William M. Muir, Richard E. Edelman, Mary E. Delany, and Samantha Brugmann. "The Cellular and Molecular Etiology of the Craniofacial Defects in the Avian Ciliopathic Mutant, *talpid2*." **Development**. July 2014, 141 (15): 3003-3012.
- 2012 **Elizabeth N. Schock**, Windsor C. Ford, Kirsten J. Midgley, Joseph G. Fader, Michael N. Giavasis, and Michelle L. McWhorter. "The Effects of Carbaryl on the Development of Zebrafish (*Danio rerio*) Embryos." **Zebrafish**. December 2012, 9(4): 169-178.
- *Discovered that carbaryl, an insecticide, causes defects in cardiac looping and neuronal differentiation in zebrafish embryos, a non-target aquatic species*

Honors and Awards

- 2023 Society for Craniofacial Genetics and Developmental Biology Meeting
Postdoctoral poster awardee - 1st place
- 2021 Northwestern Postdoctoral Association Elevator Pitch Competition - 4th place
- 2015 Richard A. Akeson Travel Award (Gordon Research Conference)
- 2014 Outstanding 3rd Year Oral Presentation for Molecular and Developmental Biology Graduate Program
- 2014 Avian Model Systems Meeting Travel Award (Cold Spring Harbor)
- 2013 Full Tuition Scholarship for the Woods Hole Embryology Course
- 2012 Genetics Society of America Undergraduate Travel Award Winner

Leadership Experiences and Service

- 2023 **Manuscript Reviewer** | *Developmental Biology*
- 2023 **Session Co-chair** | Society for Developmental Biology 82nd Annual Meeting
- 2022 **Organizing Committee** | Society for Developmental Biology Annual Meeting
- 2017 **Co-chair** | Gordon Research Seminar for Neural Crest Cells and Cranial Placodes
- 2016 **Organizing Committee** | Department of Developmental Biology Seminar Series | CCHMC

Teaching and Mentoring Experiences

- 2014-present **Undergraduate Mentees**
- Georgina Kalamaris | Northwestern University
 - Ashlyn Tu | Northwestern University | **Contributed to publication**
 - Austin Li | Northwestern University | **Contributed to publication**



- Braden Cronin | Northwestern University
- Julie Chang | University of Cincinnati | **Contributed to publication**

- 2023 **Alumni Panel Member** for the 30th Annual Graduate Student Retreat
Molecular and Developmental Biology Graduate Program |
Cincinnati Children’s Hospital Medical Center
- 2020-2021 **Application Reviewer** for NSF-GRFP Application Editing Workshop
Interdisciplinary Biological Sciences Graduate Program |
Northwestern University
- 2020-2021 **Panel Member** for “Graduate School and Life Science Career” &
“Applying to Postdoctoral Positions” Forums
NSF-Simons Center for Quantitative Biology | Northwestern
University
- 2014-2016 **Chicken Module Instructor** for Introduction to Developmental Biology
Molecular and Developmental Biology Program | CCHMC

Science Outreach

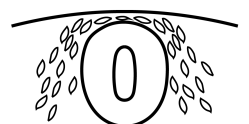
- 2023 SACNAS Science Night at Red Oak Elementary | Highland Park, IL
- 2023 McGaw YMCA Children’s Center STEAM Program | Evanston, IL
- 2017 Hopkins Cub Scout Pinewood Derby Build Day | Cincinnati, OH
- 2015 CCHMC High School Science Symposium (Chick demo) | Cincinnati, OH

Training Experiences

- 2020 **R Fundamentals Bootcamp**
IT Research Computing Services | Northwestern University
· Tidyverse, ggplot2
- 2019 **Introduction to RNA Sequencing Analysis Summer Workshop**
Center for Quantitative Biology | Northwestern University
· Bowtie2, rsem, STAR, htseq-count, DESeq2
- 2013 **Embryology: Concepts and Techniques in Modern Developmental Biology**
Marine Biological Laboratory | Woods Hole, MA
Course Directors - Alejandro Sanchez-Alvarado and Richard Behringer

Oral Presentations

- 2022 Midwest Society for Developmental Biology Meeting | Madison, WI
- 2020 Craniofacial Morphogenesis and Tissue Regeneration Gordon Research
Conference | Tuscany, Italy
- 2015 Society for Craniofacial Genetics and Developmental Biology



- meeting | Baltimore, MD
- 2015 CCHMC Developmental Biology Retreat | Cincinnati, OH
- 2014 CCHMC Fourth Annual Craniofacial Research Symposium | Cincinnati, OH
- 2012 National Conference on Undergraduate Research | Ogden, UT
- 2011 Midwest/Great Lakes Undergraduate Research Symposium in Neuroscience |
Wooster, OH

Poster Presentations

- 2023 Society for Craniofacial Genetics and Developmental Biology meeting |
Cincinnati, OH
- 2023 Society for Developmental Biology 82nd Annual Meeting | Chicago, IL
- 2020 Craniofacial Morphogenesis and Tissue Regeneration Gordon Research
Seminar | Tuscany, Italy
- 2018 International Xenopus Conference | Seattle, WA
- 2017 Gordon Research Conference/Seminar: Neural Crest and Cranial
Placodes | Ventura, CA
- 2016 Midwest Society for Developmental Biology Meeting | Ann Arbor, MI
- 2016 Gordon Research Conference/Seminar: Craniofacial Morphogenesis
and Tissue Regeneration | Ventura, CA
- 2015 Gordon Research Conference: Neural Crest and Cranial Placodes |
Waltham, MA
- 2014 Avian Model Systems Meeting | Cold Spring Harbor, NY
- 2014 CCHMC Third Annual Craniofacial Research Symposium | Cincinnati, OH
- 2013 University of Cincinnati Graduate Student Symposium | Cincinnati, OH
- 2013 Molecular and Developmental Biology Graduate Student Symposium |
Cincinnati, OH
- 2012 10th International Conference on Zebrafish Development and Genetics |
Madison, WI

