Evan C. Brooks, Ph.D.

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EDUCATION

University of Cincinnati — Cincinnati, OH
Ph.D. Molecular and Developmental Biology — Jul 2018 – Jun 2024

North Carolina State University — Raleigh, NC
B.S. Biological Sciences — Aug 2014 – May 2018
Concentration: Molecular, Cellular, and Developmental Biology
Minors: Biotechnology, Genetics, Spanish
Completed with Departmental Honors and *Summa Cum Laude*

North Carolina School of Science and Mathematics — Durham, NC
High school diploma — Aug 2012 – Jun 2014

RESEARCH EXPERIENCE

University of Colorado Anschutz Medical Campus — Aurora, CO
Advisor: Katherine A. Fantauzzo, PhD — Sep 2024 – present
Project: Alternative RNA splicing mediated by Srsf3 in mouse craniofacial development

Cincinnati Children's Hospital Medical Center — Cincinnati, OH
Advisor: Samantha A. Brugmann, PhD — Jan 2019 – Jun 2024
Dissertation: Role of the Ciliary Protein C2cd3 in Embryonic Tissue Patterning

- Hypothesized that mutation in the ciliary protein C2CD3 leads to aberrant Hedgehog signaling that causes aberrant tissue patterning and mandibular cartilage differentiation in developing avian and murine embryos
- Utilized wholemount and sectioned histology to characterize mandibular musculoskeletal phenotypes of embryonic avian and murine embryos
- Utilized RNAscope section *in situ* hybridization, wholemount hybridization chain reaction, and confocal microscopy on embryonic avian and murine tissue samples to spatially and quantitatively assess gene expression
- Processed and analyzed microcomputed tomography files from embryonic murine skulls using Slicer
- Analyzed single-cell RNA-sequencing data from control and *talpid*^{2} avian mandibular prominences using established workflows in RStudio and Seurat
- Performed *in ovo* paralysis experiments in developing avian embryos
- Maintained mouse colony of ~90 cages, including standard husbandry and genotyping
- Performed *in vitro* differentiation of O9-1 neural crest cells into chondrogenic micromasses

North Carolina State University — Raleigh, NC
Advisor: Nanette M. Nascone-Yoder, PhD — Jan 2016 – Jun 2018
Project: Asymmetric Deposition of the Cardiac Jelly Establishes Initial Left-Right Asymmetry in the Developing Heart

- Hypothesized that cardiac jelly in the developing heart tube contributes to cardiac looping in *X. laevis* embryos
- Performed chemical inhibition and gain-of-function microinjection experiments to understand *Pitx2* gene function
- Analyzed cardiac jelly width measurements on Alcian blue-stained *X. laevis* heart sections
- Performed *in situ* hybridizations on *X. laevis* heart sections to validate left-right differential gene expression

Tufts University — Boston, MA
Advisor: Pamela C. Yelick, PhD — May 2015 – Aug 2015
Project: Characterization of Tissue Mineralization Defects in Fin Rays of Zebrafish Mutants

- Hypothesized that mutant zebrafish exhibit delayed tissue mineralization in fin rays
- Performed *in vivo* calcein staining to characterize mineralized tissue in *Tft*^{152N} and *Tft*^{156N} mutant zebrafish
- Examined progression of skeletal defect onset of mutant zebrafish using fluorescence microscopy
- Collected mutant zebrafish for bulked segregant analysis

PUBLICATIONS

1. **Brooks EC**, Griffin CW, Fantauzzo KA. Roles of the RNA-binding protein Srsf3 in embryogenesis and cellular differentiation. *In preparation for Differentiation (Special Issue on Splicing in Development and Disease)*
2. **Brooks EC**, Han SJY, Bonatto Paese CL, Lewis AA, Aarnio-Peterson M, Brugmann SA. Ciliary protein C2cd3 is required for patterning mandibular musculoskeletal tissues. *Differentiation*. 2024; 100782. ***cover photo***
3. **Brooks EC**, Bonatto Paese CL, Carroll AH, Struve JN, Nagy N, Brugmann SA. Mutation in the Ciliary Protein C2CD3 Reveals Organ-Specific Mechanisms of Hedgehog Signal Transduction in Avian Embryos. *Journal of Developmental Biology*. 2021; **9**(2): 12.
4. Bonatto Paese CL, **Brooks EC**, Aarnio-Peterson M, Brugmann SA. Ciliopathic micrognathia is caused by aberrant skeletal differentiation and remodeling. *Development*. 2021; **148**(4): dev194175.

ORAL PRESENTATIONS

1. The ciliary protein C2cd3 is required for mandibular musculoskeletal tissue patterning. *International Society for Differentiation's "Biological Differentiation Across the Scales" Seminar Series*. 2025 Apr 28; Virtual. [link]
2. The ciliary protein C2cd3 is required for mandibular musculoskeletal tissue patterning. *Gordon Research Seminar on Craniofacial Morphogenesis and Tissue Regeneration*. 2024 May 25; Barcelona, Spain.
3. Ciliary protein C2cd3 is required for patterning mandibular musculoskeletal tissues. *46th Annual Meeting of the Society for Craniofacial Genetics and Developmental Biology*. 2023 Oct 11; Cincinnati, OH.
4. Using the *talpid*^{2} to understand cranial neural crest cell differentiation into mandibular musculoskeletal tissues. *29th Annual Molecular and Developmental Biology Graduate Program Retreat*. 2022 Sep 22; College Corner, OH.
5. Understanding the molecular basis of mandibular musculoskeletal patterning: Delineating the identity of Meckel's chondrodysplasias in the *talpid*^{2} mandible. *17th Annual Harold B. Amos Symposium of Albert J. Ryan Fellows*. 2022 May 8; North Conway, NH.
6. Delineating the identity of Meckel's chondrodysplasias in the *talpid*^{2} mandible. *28th Annual Molecular and Developmental Biology Graduate Program Symposium*. 2021 Sep 16 *(virtual due to COVID-19 pandemic)*
7. Characterizing ciliopathic mandibular phenotypes associated with Oral-facial-digital syndrome 14. *27th Annual Molecular and Developmental Biology Graduate Program Symposium*. 2020 Sep 17. *(virtual due to COVID-19 pandemic)*
8. Mechanisms establishing left-right asymmetry in the developing heart tube. *NC State University Initiative for Maximizing Student Diversity's Crosstalk*; 2017 Oct 13; Raleigh, NC.
9. Mechanisms establishing left-right asymmetry in the developing heart tube. *NC State University College of Veterinary Medicine Annual Litwack Research Day*; 2017 Sep 22; Raleigh, NC.
10. Characterization of tissue mineralization defects in fin rays of zebrafish mutants. *Leadership Alliance National Symposium*; 2015 Jul 24-26; Stamford, CT.

POSTER PRESENTATIONS

1. Differential Srsf3 protein interactions upon PDGFRα signaling in mouse embryonic palatal mesenchyme. *4th Annual Rocky Mountain RNA Symposium.* 2025 May 22; Aurora, CO.
2. Differential Srsf3 protein interactions upon PDGFRα signaling in mouse embryonic palatal mesenchyme. *40th Annual University of Colorado School of Dental Medicine Research Day.* 2025 Feb 7; Aurora, CO.
3. The ciliary protein C2cd3 is required for mandibular musculoskeletal tissue patterning. *Gordon Research Conference on Craniofacial Morphogenesis and Tissue Regeneration*. 2024 May 26-31; Barcelona, Spain.
4. The ciliary protein C2cd3 is required for mandibular musculoskeletal tissue patterning. *2024 CCHMC Division of Developmental Biology Annual Retreat*. 2024 May 9; College Corner, OH.
5. Ciliary protein C2cd3 is required for patterning of mandibular musculoskeletal tissues. *30th Annual Molecular and Developmental Biology Graduate Program Retreat*. 2023 Sep 21; College Corner, OH.
6. Centrosomal protein C2cd3 is required for the patterning of mandibular musculoskeletal tissues. *82nd Annual Meeting of the Society for Developmental Biology.* 2023 Jul 21; Chicago, IL.
7. Centrosomal protein C2cd3 is required for patterning of mandibular musculoskeketal tissues. *2023 CCHMC Division of Developmental Biology Annual Retreat*. 2023 May 18; College Corner, OH.
8. Centrosomal protein C2cd3 is required for patterning of mandibular musculoskeketal tissues*. Inaugural Cincinnati Children's Hospital Medical Center Research Symposium*. 2023 May 5; Cincinnati, OH.
9. Using the *talpid*^{2} to understand cranial neural crest cell differentiation into mandibular musculoskeletal tissues. *2022 Midwest Regional Meeting of the Society for Developmental Biology*. 2022 Nov 11; Madison, WI.

10. Using the *talpid*^{2} to understand cranial neural crest cell differentiation into mandibular musculoskeletal tissues. *45th Annual Meeting of the Society for Craniofacial Genetics and Developmental Biology*. 2022 Sep 19; La Jolla, CA.
11. Characterizing ciliopathic mandibular phenotypes associated with Oral-facial-digital syndrome 14. *43rd Annual Meeting of the Society for Craniofacial Genetics and Developmental Biology*. 2020 Oct 19. *(virtual due to COVID-19 pandemic)*
12. Asymmetric deposition of the cardiac jelly establishes initial left-right asymmetry in the developing heart. *Society for Developmental Biology 77th Annual Meeting*; 2018 Jul 21; Portland, OR.
13. Mechanisms establishing left-right asymmetry in the developing heart tube. *17th Annual Biomedical Research Conference for Minority Students*; 2017 Nov 1-4; Phoenix, AZ.
14. Mechanisms establishing left-right asymmetry in the developing heart tube. *NC State University Undergraduate Summer Research Symposium;* 2017 Aug 1; Raleigh, NC.
15. Mechanisms establishing left-right asymmetry in the developing heart tube. *5th Annual North Carolina BioSciences Collaborative Symposium*; 2017 Jul 27-28; Durham, NC
16. Mechanisms establishing left-right asymmetry in the developing heart tube. *Society for Developmental Biology 76th Annual Meeting;* 2017 Jul 15; Minneapolis, MN.
17. Mechanisms establishing left-right asymmetry in the developing heart tube. *NC State Department of Biological Sciences Honors Symposium;* 2017 May 25; Raleigh, NC.
18. The molecular mechanisms establishing left-right asymmetry in the developing heart. *16th Annual Biomedical Research Conference for Minority Students*; 2016 Nov 9-12; Tampa, FL.
19. The molecular mechanisms establishing left-right asymmetry in the developing heart. *State of North Carolina Undergraduate Research and Creativity Symposium*; 2016 Nov 5; Durham, NC.
20. The molecular mechanisms establishing left-right asymmetry in the developing heart. *NC State University Undergraduate Summer Research Symposium*; 2016 Aug 2; Raleigh, NC.
21. Characterization of tissue mineralization defects in fin rays of zebrafish mutants. *15th Annual Biomedical Research Conference for Minority Students*; 2015 Nov 11-14; Seattle, WA.
22. Characterization of tissue mineralization defects in fin rays of zebrafish mutants. *Tufts University Building Diversity in the Biomedical Sciences Research Poster Symposium*; 2015 Aug 5; Boston, MA.

LABORATORY MENTORSHIP EXPERIENCE

Charles W. Griffin, CU Anschutz Cells, Stem Cells, and Development Graduate Program student	Sep 2024 - present
Avelina Lee, CCHMC Molecular and Developmental Biology Graduate Program rotation student	Jul – Aug 2023
Amya A. Lewis, CCHMC BRIMS summer student (freshman, The Ohio State University)	Jun – Aug 2023
Allison Johnson, UC Medical Scientist Training Program rotation student	Jun 2022
Simon J. Y. Han, UC Medical Scientist Training Program rotation student	Jul 2019
Andrea Holderbaum, UC Medical Scientist Training Program rotation student	Jun 2019

EXTERNAL MENTORSHIP EXPERIENCE

Lauren Lobsinger, CU Anschutz Women in STEM (Master's student, Biomedical Sciences)	Sep 2024 – May 2025
Clementine Adeyemi, UC SACNAS (PhD student, Pathobiology and Molecular Medicine)	Aug 2020 – Jul 2022
Brigette Kobs, UC SACNAS (Master's student, Molecular Genetics)	Aug 2019 – May 2020

TEACHING EXPERIENCE

Cold Spring Harbor Laboratory — Cold Spring Harbor, NY

Teaching Assistant, Mouse Embryology, Stem Cells & Cancer Course — June 2025 - present

- Led laboratory session on hybridization chain reaction (HCR) on wholemount mouse embryos
- Taught students how to identify estrous cycles in the mouse for timed matings
- Managed mouse matings, inventory, and logistics for laboratory sessions
- Assisted course instructors as needed with microscopy and *in vitro* cell culture

University of Cincinnati — Cincinnati, OH

Volunteer Lecturer, DB 9085C Introduction to Developmental Biology — Fall 2019, 2021, 2022, 2023

- Led laboratory session on chick embryology for first-year graduate students
- Led students on egg windowing procedures and skeletal anatomy observations
- Answered questions on the utility of the avian model system for developmental biology studies

North Carolina State University Raleigh, NC

Teaching Assistant, BIO 183 Introductory Biology: Cellular and Molecular Biology Spring 2018
- Facilitated group discussion on classwork and lecture material
- Graded exams, classwork, and homework for 25 students in a 93-seat SCALE-UP lecture course

Teaching Assistant, USC 110 Freshman Advancement Seminar Fall 2015, 2016, 2017
- Presented to incoming underrepresented students on academic success and diversity issues in STEM
- Graded weekly homework assignments for ~45 students

Teaching Assistant, BIO 181 Introductory Biology: Ecology, Evolution, and Biodiversity Fall 2016
- Facilitated group discussion on classwork and lecture material
- Graded exams, classwork, and homework for 27 students in a 96-seat SCALE-UP lecture course

Teaching Assistant, LSC 101 Exploring Opportunities in the Life Sciences Fall 2015
- Developed a seminar geared to incoming freshmen on effective note-taking strategies for science courses
- Graded forum posts and seminar reflection assignments for 32 students

PROFESSIONAL SERVICE AND OUTREACH

Presenter, "Navigating a Career in Scientific Research: A Fresh PhD's Perspective" for CCHMC BRIMS Jun 2024
Panelist, "Perspectives from Fellowship Recipients" for CCHMC DB 9089 Grant Writing Course Jan 2022, 2024
Panelist, "Successfully Navigating Graduate School" for UC Graduate College Student Fellows Nov 2023
Judge, University of Cincinnati/Cincinnati Children's SURF Capstone Poster Symposium Aug 2023
NC State University Park Scholarships Regional Selection Committee Nov 2022 – present
Panelist, SDB "How to Prepare for and Apply to PhD Programs" Webinar Sep 2022
Presenter, "Preparing Resumes and CVs for Graduate School" for UC McNair Scholars Program Jun 2022
Co-Chair, "Cell Fates and Potency" Plenary Session at SDB 80th Annual Meeting (virtual) Jul 2021
Presenter, "Professional Previews: Developmental Biology/Embryology" for NC Museum of Natural Sciences Jun 2021
Presenter, "How to Present at Undergraduate Scientific Conferences" for UC WISE Research Program Jun 2021
Presenter, "Social Media for Scientists" for UC/CCHMC National Postdoc Appreciation Week Sep 2020
SACNAS National Conference Travel Award Application Reviewer May 2019
NC State University Alternative Service Break Travel Award Application Reviewer Oct 2018
NC State University College of Sciences Ambassador Aug 2015 – May 2018
NC State University Park Scholarships Ambassador Sep 2014 – May 2018
NC State University College of Sciences Teaching Awards Selection Committee Nov 2017 – Feb 2018
Alternative Service Break Trip to Belize May 2015, 2017

LEADERSHIP AND EXTRACURRICULAR EXPERIENCES

Mentor, University of Colorado Anschutz Medical Campus Women in STEM Mentoring Program Sep 2024 – May 2025
University of Colorado Anschutz Medical Campus SACNAS Aug 2024 – present
  Secretary Mar 2025 – present
University of Cincinnati Black Biomedical Graduates Group (founding member) Aug 2020 – Jun 2024
University of Cincinnati SACNAS Sep 2018 – Jun 2024
  President May 2020 – May 2022
  Secretary May 2019 – May 2020
UC Molecular and Developmental Biology Graduate Program Student Seminar Coordinator May 2019 – May 2020
NC State University Park Scholarships Diversity Academy Committee Sep 2016 – May 2018
NC State University Society for Multicultural Scientists Aug 2014 – May 2018
  Co-President Apr 2017 – Apr 2018
  Vice President May 2016 – Apr 2017
NC State University College of Sciences Teaching Awards Selection Committee Co-Chair Nov 2017 – Feb 2018
NC State University Park Scholarships Class of 2021 Freshman Retreat Facilitator Aug 2017
Alternative Service Break Team Leader to Belize May 2017
NC State University Park Scholarships Class of 2020 Freshman Retreat Facilitator Aug 2016
NC State The Production theatrical hip-hop dance group Aug 2014 – May 2016
  Assistant Director Aug 2015 – May 2016
NC State University Park Scholarships Class of 2018 Learning Laboratory 2 Committee Sep 2014 – Oct 2015

PROFESSIONAL ASSOCIATIONS

Colorado Clinical and Translational Sciences Institute (CCTSI)	2025 – present
American Association for Anatomy (AAA)	2020 – present
Society for Craniofacial Genetics and Developmental Biology (SCGDB)	2020 – present
Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)	2018 – present
Society for Developmental Biology (SDB)	2017 – present
W.E.B. DuBois Honors Society	2015 – present

HONORS AND AWARDS

Poster Prize, 4th Annual Rocky Mountain RNA Symposium	May 2025
1st Place Graduate Student Poster Prize, 2024 GRC on Craniofacial Morphogenesis & Tissue Regeneration	May 2024
Carl Storm Opportunity Fellowship, 2024 GRC on Craniofacial Morphogenesis & Tissue Regeneration	May 2024
Best Overall Graduate Student Presentation, 2022 Midwest SDB Regional Meeting	Nov 2022
Gaskins Foundation Graduate Student of the Year	Oct 2022
1st Place Graduate Student Poster, 45th Annual Meeting of the SCGDB	Sep 2022
Albert J. Ryan Foundation Fellowship	Aug 2021 – Aug 2022
University of Cincinnati Albert C. Yates Fellowship	Aug 2018 – Jul 2023
2019 Ford Foundation Predoctoral Fellowship Honorable Mention	Mar 2019
NC State University Honors Program in Biological Sciences	Oct 2015 – May 2018
NC State University Park Scholarship	Aug 2014 – May 2018
NC State University Scholars Program	Aug 2014 – May 2018
NC State College of Sciences Dr. Lawrence Clark Leadership Award	Mar 2017, Mar 2018
Princeton University Centennial Fellowship Award (*declined*)	Mar 2018
Duke University Dean's Graduate Fellowship (*declined*)	Feb 2018
Park Scholarships Enrichment Grant for Presentation at 17th ABRCMS	Nov 2017
Society for Developmental Biology Choose Development! Fellowship	Mar 2016 – Aug 2017
NC State University IMSD Outstanding Research Award	May 2017
Park Scholarships Enrichment Grant for 2017 Belize Experiential Learning Trip	May 2017
Barry M. Goldwater Scholarship Honorable Mention	Mar 2017
NC State Society for Multicultural Scientists Outstanding Member Award	Apr 2016
American Society for Microbiology Full Travel Award for 15th ABRCMS	Nov 2015
Finalist, Tufts University Building Diversity in Biomedical Sciences Research Poster Competition	Aug 2015
Park Scholarships Enrichment Grant for 2015 Belize Experiential Learning Trip	May 2015
NC School of Science and Mathematics Golden Cupola Award	May 2014
Best Overall Research Project Award, National Society of Black Engineers Technical Innovation Challenge	Mar 2014
Best Visual Display Award, National Society of Black Engineers Technical Innovation Challenge	Mar 2014
Best Paper Award, National Society of Black Engineers Technical Innovation Challenge	Mar 2014

PENDING FUNDING

Grant: Alternative RNA splicing mediated by Srsf3 in mouse craniofacial development
Source: NIH/NIDCR (Award F32 DE035753)
Amount: $241,368
Length: 3 Years (Jul 2026 – Jun 2029) *resubmission for Dec 2025 deadline in progress*

Grant: Alternative RNA splicing mediated by Srsf3 in mouse craniofacial development
Source: Helen Hay Whitney Foundation Postdoctoral Fellowship
Amount: $229,500
Length: 3 Years (Apr 2026 – Mar 2029) *submitted; review in progress*

COMPLETED FUNDING

Grant: Role of the Ciliary Protein C2CD3 in Mandibular Skelotogenesis
Source: NIH/NIDCR (Award F31 DE030664)
Amount: $121,980
Length: 3 Years (Apr 2021 – Mar 2024)

Grant: NC State University Initiative for Maximizing Student Diversity
Source: NIH/NIGMS (Award R25 GM083242)
Amount: $6,750 (stipend)
Length: 1 Year 4 Months (Aug 2016 – Dec 2017)

Grant: Building Diversity in the Biomedical Sciences
Source: NIH/NHLBI (Award R25 HL007785)
Amount: $4,000 (stipend)
Length: 10 Weeks (May – Aug 2015)

MEDIA & PRESS

The Scientist: "Unveiling the Secrets of Head and Face Formation" (featured images) [Link] Aug 2024
University of Cincinnati College of Medicine: "Why Cincinnati?" [Link] and "Student Support" [Link] Oct 2022
The Node: "Avian insights into human ciliopathies" [Link] Feb 2021
NC State University Biological Sciences: "Featured Graduating Senior Evan Brooks" [Link] Feb 2018
The Node: "Meet Evan Brooks – The 2017 Choose Development! Fellow selected to spend one week with the Embryology Course" [Link] Jul 2017
NC State University Academic and Student Affairs: "Four NC State Undergraduates Recognized by Goldwater Foundation" [Link] Apr 2017
Park Scholarships: "Evan Brooks '18 Makes Early Strides Toward a Career in Research and Teaching" [Link] Apr 2016