

Kimberly (Kim) Arena

kimberly.arena@cuanschutz.edu | (631) 487-0157

EDUCATION

- 2022-present** Postdoctoral Fellow, *University of Colorado Anschutz Medical Campus (CUAMC), Department of Pediatrics, Section of Developmental Biology*
- 2016-2022** Ph.D., Biology (Molecular Genomics, Cell, and Development), *University of Virginia (UVA), Graduate School of Arts and Sciences*
- 3.731 GPA
- 2012-2016** B.S., Biology with Distinction; Minor, Psychology, *Duke University, Trinity College of Arts and Sciences*
- 3.548 GPA; Dean's List Fall 2012
 - Study abroad James Cook University, Australia

RESEARCH EXPERIENCE

- 2022-present** Postdoctoral Fellow, *University of Colorado Anschutz Medical Campus, Department of Pediatrics, Section of Developmental Biology, Appel Lab*
Project: Investigating the molecular regulators of the neuron-glia switch and OPC specification during development and after injury in zebrafish
- 2017-2022** Ph.D. Candidate, *University of Virginia, Department of Biology, Kucenas Lab*
Dissertation Title: Characterizing the cellular and molecular mechanisms that drive perineurial glial bridging after spinal motor nerve injury in zebrafish
- 2017** Rotation Student, *University of Virginia, Department of Biology, Grainger Lab*
Project: Investigating the role of *mab21L1* in aniridia in *Xenopus tropicalis*
- 2017** Rotation Student, *University of Virginia, School of Medicine, Yan Lab*
Project: Investigating the role of Akt-mTOR signaling in muscle hypertrophy following resistance exercise in mice
- 2015** Volunteer Summer Research Assistant, *Cold Spring Harbor Laboratory, Krainer Lab*
Project: Assisted an MD/PhD student with a research project on the study of antisense oligonucleotides effect on spinal muscular atrophy
- 2013-2016** Undergraduate Research Assistant, *Duke University Cell Biology, Bagnat Lab*
Senior Thesis: Role of *nfat5* transcription factor on the transport of osmolytes and inflation of zebrafish notochord vacuoles

FUNDING

- 2024-2026** F32NS134612-01 Postdoctoral NRSA, *NINDS, NIH*
- 2021-2022** Distinguished Graduate Mentoring Award, *Department of Biology, UVA*

2019	Britt Travel Award, Department of Biology, UVA
2018-2020	Jefferson Fellowship, Jefferson Scholars Foundation, UVA
2017-2018	T32GM008136-32 Cell and Molecular Biology Training Grant, NIH
2017, 2019	Brain Institute 3 Cavaliers Award, Brain Institute, UVA
2016	GSAS Research and Professional Development Fund, UVA

PUBLICATIONS

2022	TGF-β Signaling Drives Perineurial Glial Bridging after Spinal Motor Nerve Injury in Zebrafish, <i>Glia</i> Arena KA, Zhu Y, Kucenas S (2022). Transforming growth factor-beta signaling modulates perineurial glial bridging following peripheral spinal motor nerve injury in zebrafish. <i>Glia</i>. doi: 10.1002/glia.24220.
2017	Glia Signaling During Neurological Damage and Disease, <i>eLS</i> Yong Y*, Heckle LA*, Arena KA, Goertz JE, Kucenas S, Deppmann C (2017). Glia Signaling during Neurological Damage and Disease. <i>eLS</i>; 1-7. https://doi.org/10.1002/9780470015902.a0027501

TEACHING EXPERIENCE

2025	Biology Affiliate Instructor, BIO 1090 (General Biology Laboratory I), Metropolitan State University-Denver (MSU) • Develop syllabus and Canvas site for the course • Lecture and lead undergraduate students through weekly lab activities • Write assessments, design lectures, grade assignments
2025	Shadowing/Lab Assistant, BIO 4820 (Developmental Biology), MSU • Shadowed a professor teaching Developmental Biology at MSU to a diverse class of undergraduate students • Learned how to design a CURE (course-based undergraduate research experience) for the course • Aided students in class work, developing their independent projects, and carrying out associated experiments • Developed and gave two lectures on neurodevelopment for the course • Wrote exam questions
2024, 2025	Lecturer, DSBS 5500 (Embryology and Craniofacial Biology), CUAMC Dental School • Designed and gave two lectures on embryogenesis and neural crest development to first year dental students • Gave feedback on take home assignments • Wrote test questions and participated in test review sessions • Utilized Canvas to upload lectures, create and grade assignments, and create exam questions
2023-2025	Lecturer, NRSC 7615 (Developmental Neurobiology), CUAMC Neuroscience Graduate Program

- Designed and gave a lecture on glial development and function to first year neuroscience graduate students
- Selected a recent paper on glial biology and lead a paper discussion to first year graduate students in the neuroscience program

2017, 2022

Graduate Teaching Assistant, *BIOL 3040 (Developmental and Regenerative Biology)*, UVA

- Designed and presented multiple lectures to undergraduates
- Wrote exam questions
- Selected papers to be discussed in class and on exams
- Graded and gave personal feedback on all exams and assignments
- Guided in-class lab reports and discussions
- Held weekly office hours and review sessions before exams

2020-2022

Tutor, *High School Biology and Chemistry*

- Tutored middle and high school students in honors biology and chemistry

2018-2019

Guest Lecturer, *Habits of Highly Effective Graduate Students Graduate Seminar Series*

- Lectured to first year graduate students about specific topics that will help them succeed in graduate school

2013, 2016

Co-Director, *Cold Spring Harbor High School Summer Research Program*

- Conducted an independent research project
- Aided high school students in creating and conducting their own research projects and preparing them for competitions

MENTORSHIP

2025

Mentor, *Gates Summer Internship Program (CUAMC)*

- Mentored an undergraduate student under the GSIP program in the lab for the summer (May-August)
- Led my intern on a project focusing on spinal cord injury in zebrafish
- Discussed primary literature around the project, guided my through techniques necessary for the project, edited her final lightning talk and poster presentation

2024

Mentor, *Regis University Undergraduate Internship (CUAMC)*

- Mentored an undergraduate neuroscience student from Regis University with little prior research experience in the lab
- Taught my intern how to conduct basic experiments in zebrafish, how to logically plan out experiments, and how to efficiently read and interpret scientific literature
- Provided feedback and written evaluations throughout the semester

2023-present

Mentor, *Women in STEM (WiSTEM)*

- Joined the WiSTEM program at CU-AMC and serve as a one-on-one mentor to graduate students and professional research assistants, meeting monthly to discuss topics such as graduate school applications, qualifying/comprehensive exam preparation, rotations/choosing a lab, and general struggles encountered in graduate school

- 2022-present** **Mentor, *Rotation Students, Medical Students, and PRAs (CUAMC)***
- Mentored rotating graduate students, medical students, and professional research assistants (PRA) in our lab, guiding them through primary literature, teaching them zebrafish techniques, and aiding in project development, experimental design, and troubleshooting
 - Help with development and editing of presentations for their programs or conferences
 - As a postdoc, I have directly mentored 4 rotation students, 2 medical students, and 2 PRAs
- 2017-2022** **Mentor, *Rotation Students (UVA)***
- Mentored graduate students rotating through our lab by teaching them how to conduct experiments in zebrafish, guiding them through primary literature for the field and the creation of their own project, and providing advice for choosing a lab for their thesis work
- 2017-2021** **Mentor, *Undergraduate Research (UVA)***
- Mentored two undergraduates interested in a career in research
 - Taught my students basic techniques in zebrafish so that they may carry out their own independent research project by the end of their college career
 - Taught my students how to conduct basic experiments, how to logically plan out experiments, and how to efficiently read and interpret scientific literature
 - Aided one undergraduate in writing a review paper, as well as her thesis paper and presentation
 - Guided undergraduate student through the graduate school application process
 - Acted as a role model as a woman in science
- 2018-2019** **Mentor, *Graduate Biosciences Society (UVA)***
- Mentored incoming graduate students in my department to help them adjust to graduate school
- 2014-2016** **Mentor, *Duke Genome Research & Education Society (Duke University)***
- Mentored undergraduate students interested in participating in research in college
 - Met with students to discuss my experience, had them shadow me in my lab

OUTREACH

- 2024** **Volunteer, *Aurora Science and Technology High School Career Day***
- Gave a presentation to several high school classes and answered questions about my career path and what it means to be a scientist
- 2023** **Volunteer, *Anschutz Tour with National Multiple Sclerosis Society (NMSS)***
- Gave a lab tour and talk for individuals with MS involved in the NMSS to establish a bridge between the MS society and research being conducted on myelination at the medical campus
- 2023** **Volunteer, *Animal Science Research Adventure***

- Presented zebrafish larvae at various stages and images from my research and discussed my career path with students attending the week-long Animal Science Research Adventure camp, a program for underrepresented middle schoolers interested in biology and animal sciences

2023

Volunteer, *High School Visit*

- Presented zebrafish larvae at various stages as well as images from my research to local high school students visiting our fish facility to teach them about utilizing zebrafish for biomedical and developmental biology research

2023

Volunteer, *Denver Metro Regional Science and Engineering Fair*

- Ran a booth at the science fair teaching participants how the brain works, including regions of the brain, anatomy of the brain and spinal cord, and neuron anatomy and function

2023

Volunteer, *Neuroscience Outreach Group Museum Day*

- Ran a booth at the Denver Museum of Nature and Science teaching participants about how the brain works, including regions of the brain, anatomy of the brain and spinal cord, and neuron anatomy and function

2021

Volunteer/Lab Host, *BOIP Farmers Market Visit*

- Attended and ran a booth at our local farmers market highlighting the research that the Kucenas lab conducts as well as running interactive activities involving zebrafish embryos and answering questions about graduate school and being a scientist

2021

Project Lead, *BOIP Prolyfyck Kidz Creww Visit*

- Organized BOIP visiting Prolyfyck's weekly Kidz Creww to bring science activities to elementary-middle school aged kids by reaching out to Prolyfyck leaders, organizing volunteers, creating and obtaining supplies for activities, and leading activities at the event
 - Prolyfyck is a local community group that started out as a run club to connect people with the black communities in Charlottesville and to provide a safe space for black runners to see themselves represented. They have grown from just a small run club in the past year and have evolved to take on community projects in addition to their weekly runs, including community clean-ups, running to support locals in need, running for social justice, volunteering at community vaccination and COVID-19 testing clinics, and more

2021

Group Lead, *BOIP End of the Year Middle School Virtual Visit*

- Helped buy supplies and put together kits for 150 middle school students to build a neuron
- Led volunteers in three middle school classes
- Taught students about neurons and guided them through building their own as well as answering questions

2021

Project Lead, *SPI-BOIP Virtual Visits*

- Led and organized volunteer recruitment, teacher connections, scheduling, project development, and implementation of virtual science visits to local

classrooms of varying age groups in collaboration with the Science Policy Initiative at UVA

2019, 2020

Volunteer, *Brain Awareness Week*

- Visited local kindergarten classes to teach kids about basics of the brain

2019

Volunteer, *Woodbrook Elementary School Visit*

- Visited a 1-2 grade class at Woodbrook Elementary school to show them different developmental stages of fish larvae as well as act as a role model for “what a scientist looks like”

2018, 2019

Volunteer, *St. Anne’s Belfield Interactive Week*

- Taught local high school students how to cross fish, inject one stage embryos, and image these embryos over the course of 3 days

2017, 2018

Volunteer, *Walker Elementary School STEM night*

- Walked local elementary school students through how to use a microscope and interpret different slides for various themed activities

2017

Volunteer, *UVA Biology Department STEM day*

- Demonstrated how to ablate neurons and the importance and basics of microscopy in research to local junior high students

LEADERSHIP

2024

Regional Selection Committee, *Jefferson Scholars Foundation*

- Reviewed, scored, and ranked applications from graduate students applying for the Jefferson Fellowship, of which I received when I was a graduate student
- Recommended applications for the interview round

2023-2024

Postdoc Representative, *Southwest Regional Society for Developmental Biology Meeting Education Committee*

- Served on a committee with fellow professors, graduate students, and staff to establish an education program for the 2024 Southwest Regional SDB Meeting
- Worked with other committee members to produce an education program focused on effective outreach programs in developmental biology and reach out to potential presenters and panelists
- Contacted participants across multiple attending universities to coordinate their presentations
- Served as a moderator and wrote discussion questions for the panel portion of the session

2020-2022

Co-Founder and Co-President, *Biology Outreach and Inclusion Program (BOIP)*

- BOIP is an organized outreach effort with a goal of building a relationship between the UVA science community and the local Charlottesville community, with a focus on public schools, community colleges, community groups, and underserved populations

- Organized outreach curriculum, held monthly group meetings, contacted and established relationships between local schools, community groups, and our program, recruited volunteers, oversaw all outreach projects, obtained funding, presented updates and progress to department and faculty members, coordinated and connected with other outreach programs across the University, organized outreach events, attended outreach events

2019-2021

VP of Communications, *Graduate Consulting Club*

- Designed club website and maintained club social media accounts (Facebook, LinkedIn, website, etc.)
- Developed and maintained collaborations with other consulting and business groups within and outside UVA
- Helped organize weekly case study practice groups and virtual alumni seminar series

2019-2020

Regional Selection Committee, *Jefferson Scholars Foundation*

- Reviewed and scored prospective undergraduate applications for the Jefferson Scholars Program

2019-2020

Green Leader, *Green Labs UVA*

- Primary contact between our lab and the Office for Sustainability's Green Labs Specialist
- Coordinated lab efforts to develop more "green" habits and earn Green Labs Certification

2019-2020

Social Chair, *Graduate Student and Post-Doc Association*

- Planned and organized social events for graduate students and post-docs in the Biology department throughout the year, including our welcome week for incoming first year students and our recruitment week

INVITED EVENTS

2025

Talk, *Hilde Mangold Postdoctoral Symposium, International Congress of Developmental Biology, Society of Developmental Biology*

- Invited to give a 15-minute talk on my research

2024

Reviewer, *Development*

- Peer reviewed a paper submitted to Development for publication

2024

Talk, *Cell Biology, Stem Cells, and Development Retreat*

- Invited to give a 15-minute talk on my current research to graduate students, staff, and faculty at the 2024 Cell Biology, Stem Cells, and Development program retreat

2024

Panelist, *Developing Scholars Responsible Conduct in Research Series Mentoring Panel*

- Participated on a panel as a postdoc representative talking to undergraduate and graduate students about mentor-mentee relationships and being a good mentor and mentee

- 2024** **Seminar Speaker, *University of Northern Colorado Biological Sciences Department Seminar***
- Gave a 45-minute talk to undergraduate and graduate students and faculty on my postdoctoral work, answered questions, and attended a post-talk social to further network with faculty and students
- 2024** **Reviewer, *Glia***
- Peer reviewed a paper submitted to *Glia* for publication
- 2024** **Panelist, *Genetics of Development, Disease, and Regeneration (GDDR) T32 Symposium Career Panel***
- Participated on a panel as a postdoc representative at the GDDR T32 symposium discussing my career path and future career goals with graduate students on the T32
- 2023** **Reviewer, *PLOS Biology***
- Peer reviewed a paper submitted to *PLOS Biology* for publication
- 2023, 2025** **Judge, *Long Island Science and Engineering Fair (LISEF)***
- Virtually judged high school projects submitted to LISEF in the cell and molecular biology category
- 2022** **Reviewer, *eLife***
- Peer reviewed a paper submitted to *eLife* for publication
- 2022** **Guest Speaker, *Cold Spring Harbor High School WIMS***
- Gave a talk about my career path and current research to the Cold Spring Harbor High School Women in Medical Sciences (WIMS) after school program
- 2021** **Reviewer, *Frontiers in Cell and Developmental Biology***
- Peer reviewed a paper submitted to *Frontiers in Cell and Developmental Biology* for publication
- 2018** **Panelist, *Graduate Biosciences Society Mental Health Symposium***
- Selected as a panelist to discuss my experience with mental health both prior to and during graduate school to other graduate students to break the stigma around mental health and offer guidance for students who may be able to relate to my experiences

PROFESSIONAL GROUPS

- 2023-Present** **Member, *National Postdoc Association***
- 2022-Present** **Member, *Society for Developmental Biology***
- 2022-2025** **Member, *CUAMC Section of Developmental Biology DEI Book Club***
- Attend and participate in monthly discussions of chapters of books with topics focused on racism/discrimination in science, the environment, and society

- 2020-2022** **Member, *UVA Biology Racism and Science Book Club***
- Attended and participated in weekly discussions of chapters of books with topics focused on racism in science, the environment, and society
- 2020-2022** **Member, *International Society for Regenerative Biology***
- 2018-2020** **Member, *University of Virginia Climbing Team***
- Attended weekly climbing practices and competed in competitions
- 2017-2022** **Member, *Graduate Student and Postdoc Association***
- Attend and actively participate in monthly meetings with fellow biology department graduate students
 - Make suggestions for how we can improve our department and graduate program and help define and come up with solutions to existing problems

VOLUNTEERING

- 2025** **Volunteer, *Denver Stand Up for Science***
- Helped organize the creation of posters on CUAMC campus and marched at the Denver capitol to promote governmental funding of science
- 2024** **Judge, *Southwest Regional Society for Developmental Biology Meeting***
- Served as a judge for the professional research assistant and undergraduate section of the poster presentations
- 2022-Present** **Interviewer, *Denver Duke University Alumni Admissions Advisory Committee***
- Interview prospective Duke University applicants in my local area
- 2019** **Judge, *UVA Neuroscience Distinguished Majors Program Poster Session***
- Judged 10 posters of undergraduates in the Neuroscience Distinguished Majors Program to determine who would present at the spring Fozdar Symposium
- 2019-2022** **Interviewer, *Charlottesville Duke University Alumni Admissions Advisory Committee***
- Interview prospective Duke University applicants in my local area
- 2018-2019** **Head Coach, *Virginia Basketball Academy 2nd Grade Girls Basketball***
- Created practice plans and coached weekly practices and games for local 2nd grade girls
- 2017-2022** **Graduate Recruiter, *Biology Department Graduate Program***
- Organized and participated in events for the recruitment of a new class of graduate students each year
 - Created and presented posters representing our lab, emailed prospective students prior to recruitment weekends, attended social events, led lab and campus tours, walked students to interviews, interviewed students
- 2017, 2018** **Volunteer, *Ronald McDonald House***

- Prepared meals for families staying at the local Charlottesville Ronald McDonald house

2017

Volunteer, *Charlottesville March for Science*

- Helped create posters and marched through Charlottesville to promote governmental funding of science

CERTIFICATES, WORKSHOPS, AND COURSES

2025

Learning How to Teach Workshop (*Career Development Office, CUAMC*)

- Taught by Dr. Laurel Hartley of the Integrative Biology Department at University of Colorado-Denver
- 6x 2-hour interactive sessions focused on:
 - Developing a teaching portfolio (teaching statement, syllabus, and lesson plan)
 - Understanding how individuals learn and how to work with mental models
 - Using backward design and developing learning objectives
 - How to develop successful assessments and how to give quality feedback
 - Establishing active learning activities
 - Creating supportive course policies and classroom culture

2024

Teacher Training Program—Scientific Teaching (*Department of Immunology and Microbiology, CUAMC*)

- Taught by Dr. Aimee Bernard of the Immunology and Microbiology Department at CUAMC
- 5x 1.5-hour interactive sessions focused on learning the basics of scientific teaching such as inclusivity, backwards design, student-centered learning, assessment, and evaluation
- More specific topics included: the basics of curricular design, teaching strategies and tools, assessment techniques and best practices, class session content creation, and effective evaluation
- The program included designing learning objectives for a class we would teach, creating a PowerPoint presentation for a specific class and giving that lecture to our group, and designing assessments for our class

2019, 2021

Title IX Reporting and Trauma Support Training (*Women's Center, UVA*)

- A half-day session driven by the Women's Center at UVA that focused on Title IX reporting, how to identify violations of Title IX, and how to respond to incidences as a mandatory reporter and support involved students

2020

PhD Plus Introduction to Consulting Core Workshop (*PhD Plus, UVA*)

- Taught by Dr. Brendan Boler of the Public Policy Department at UVA
- 8x two-hour sessions “designed to help PhD students and postdocs gain the knowledge, skills, and confidence needed for a consulting job”
- Topics included: hypothesis-driven structured problem-solving, data analytics using Excel, storytelling in PowerPoint, interview skills

CONFERENCES AND MEETINGS

2025	Talk, <i>International Congress of Developmental Biology (San Juan, Puerto Rico)</i>
2024	Talk, <i>CU Anschutz Cell Biology, Stem Cells, and Development Retreat (Breckenridge, CO)</i>
2024	Poster, <i>Gordon Research Conference: Neurodevelopment (Lucca, Italy)</i>
2024	Poster, <i>Gordon Research Seminar: Neurodevelopment (Lucca, Italy)</i>
2024	Poster, <i>Southwest Regional Society for Developmental Biology Meeting (Aurora, CO)</i>
	• Awarded 2nd place for best postdoc poster
2023	Poster, <i>Cold Spring Harbor Laboratory Meeting on Zebrafish Neurobiology (CSHL, NY)</i>
2023	Poster, <i>CU Anschutz Cell Biology, Stem Cells, and Development Retreat (Breckenridge, CO)</i>
2023	Poster, <i>Society for Developmental Biology Annual Meeting (Chicago, IL)</i>
2021	Attendee, <i>International Society for Regenerative Biology Meeting (virtual)</i>
2021	Poster, <i>Virtual Glia Trainee Symposium (virtual)</i>
2020	Poster, <i>UVA Department of Biology Retreat (virtual)</i>
2020	Poster, <i>Cold Spring Harbor Glia in Health and Disease Meeting (virtual)</i>
2019	Poster, <i>European Meeting on Glia in Health and Disease (Porto, Portugal)</i>
2019	Poster, <i>International Symposium on Peripheral Nerve Regeneration (Porto, Portugal)</i>
2018	Poster, <i>Cold Spring Harbor Glia in Health and Disease Meeting (CSHL, NY)</i>
2018	Attendee, <i>Mid-Atlantic Regional Society for Developmental Biology Meeting (Charlottesville, VA)</i>
2017	Poster, <i>Mid-Atlantic Regional Zebrafish Meeting (NYU, NY)</i>

SKILLS AND INTERESTS

Laboratory Techniques

Zebrafish: live-imaging microscopy, laser ablation, zebrafish care, drug treatment, cryostat sectioning, production of transgenics, gateway cloning, mutagenesis, primer design, RNA extraction, RT-PCR, cDNA production, embryo injections, genotyping, PCR, *in situ* hybridization, immunohistochemistry, data collection and analysis, statistical analysis, bioinformatics analysis

Mouse models: molecular cloning, maintaining cell cultures, RT-PCR, mouse care, dissection and organ harvest, cell transfection, RNA extraction, cDNA production, muscle function tests, data collection and analysis

Xenopus tropicalis: primer design, CRISPR, *Xenopus* care, *in vitro* fertilization, embryo injections, genotyping, PCR, data collection and analysis

Languages

English (fluent), Italian (some), French (some), Spanish (some)

Technology

Microsoft Programs (Excel, PowerPoint, Word)
 Research Skills (R, GraphPad/Prism, Illustrator/Adobe)
 Image Processing (ImageJ/FIJI, Imaris, Zen, Fusion)
 Canvas

Additional Interests

Running, Trail/Ultra Running, Climbing, Coaching, Outdoor Recreation/Hiking, Tennis, Fitness, Nutrition, Athletic Training, College Basketball (Go Duke!)