BIOGRAPHICAL SKETCH

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NAME: Cealie, MaKenna

eRA COMMONS USER NAME (credential, e.g., agency login): MCEALIE

POSITION TITLE: Graduate Student Research Assistant

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
Colgate University	BA	08/2015	05/2019	Neuroscience
University of Rochester	PHD	07/2019	In Progress	Neuroscience

A. Personal Statement

I first became interested in neuroscience research as an undergraduate at Colgate University, where I studied the role of environmental influences on song circuit development in a songbird model with Dr. Wan-chun Liu. As Colgate University is composed of primarily undergraduates, I had the unique opportunity to conduct and have ownership of my own experiments much like a graduate student. My work on prenatal and early postnatal auditory experience resulted in a second author publication.[2] After three years working with Dr. Liu as an undergraduate, I knew I wanted to further my research experience and pursue a career as an independent investigator at a research institution. I plan to remain in the field of developmental neuroscience and I will continue to explore how early life environmental impacts affect glia and neurons over time. In the short term, I aim to transition to a postdoctoral position after completing my doctoral studies.

As a graduate student in Dr. Ania Majewska's lab at the University of Rochester, I have remained in the field of developmental neuroscience with a new focus on glia. My doctoral research focuses on examining the effects of developmental ethanol exposure on glia, neurons, and their interactions in the cerebellum in a mouse model of fetal alcohol spectrum disorders (FASD). With the Majewska lab's interest in glia and their mastery of two-photon *in vivo* imaging, I will be provided the tools to examine FASD in a novel way. Additionally, Dr. Majewska is recognized throughout the University as an excellent mentor and has an impressive record for training predoctoral fellows.

When I first began in Dr. Majewska's lab as a rotation student, I studied the effects of developmental ethanol exposure in microglia and astrocytes in the cortex and hippocampus, which resulted in a second author publication.[1] Through this project, I also became involved in Dr. Majewska's collaboration with Dr. Paul Drew at the University of Arkansas. Once I joined the lab, I had the opportunity to be more involved in the publication of this work and gain experience with the revision process. I have also had the opportunity to present my study at a number of virtual conferences and build connections with other scientists in the alcohol field. My new research focus is the cerebellum, as this is a relatively understudied area and behavioral deficits related to the cerebellum have been reported after developmental ethanol exposure in humans.

At the University of Rochester, I was appointed to the Neuroscience Graduate Program T32 Training Grant. I have also been highly involved in the University of Rochester community as a member and later Chief Financial Officer of the Graduate Student Society. Through this group, I have represented graduate student interests and fostered community among my peers. I have gained leadership and communication skills, and worked with people from various backgrounds and departments, which I believe will serve me well as a scientist. Additionally, I became the University of Rochester's BioRender Campus Ambassador. This position will further my

communication skills, while I learn about and spread awareness of a scientific communication tool for researchers.

    This fellowship will allow me to advance my training and career goals, enhancing my ability to secure a postdoctoral position in a lab that uses cutting edge approaches to study neurodevelopment. This will set the stage for me to eventually become an independent researcher with my own laboratory.

1. Lowery, R.; **Cealie, M.**; Lamantia, C.; Mendes, M.; Drew, P.; Majewska, A. (2021). Microglia and astrocytes show limited, acute alterations in morphology and protein expression following a single developmental alcohol exposure. *Journal of Neuroscience Research*, *99*(8), 2008-2025. https://doi.org/10.1002/jnr.24808
2. Rivera, M., **Cealie, M.**, Hauber, M. E., Kleindorfer, S., & Liu, W. C. (2019). Neural activation in response to conspecific songs in zebra finch (*Taeniopygia guttata*) embryos and nestlings. *NeuroReport*. 30(3), 217–221. doi: 10.1097/WNR.0000000000001187

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

2021-Present	University of Rochester BioRender Campus Ambassador
2021-Present	Chief Financial Officer, Graduate Student Society
2021-Present	Graduate Student Society and Postdoctoral Association Leadership Group
2021	Graduate Student Appreciation Week Planning Committee
2020-Present	Neuroscience Representative, Graduate Student Society
2016 – 2019	Undergraduate Research Assistant, Colgate University

Honors

2020-2021	T32 Appointment on Neuroscience Graduate Program Training Grant
2019	Magna Cum Laude, Colgate University
2019	Honors in Neuroscience, Colgate University
2019	Psi Chi Psychology Honor Society, Colgate University
2016-2019	Phi Eta Sigma National Academic Honor Society, Colgate University
2015-2019	Alumni Memorial Scholar, Colgate University

C. Contributions to Science

1. **Undergraduate Research:** I spent three years working in the laboratory of Dr. Wan-chun Liu at Colgate University. Dr. Liu's laboratory studies genetic and environmental influences on vocal learning and communication in songbirds. During my time in his lab, I participated in a number of projects that examined how the environment affected song learning ability and brain circuits. My contributions to this work were included in a publication published in NeuroReport. The work was particularly exciting because it suggested that songbirds have prenatal auditory listening. Additionally, I examined the relationship between movement and neurogenesis in zebra finches. I injected birds with BrdU and performed immunohistochemistry to determine cell survival after birds were wing clipped to limit movement. I collaborated with another student who studied song learning ability in the same birds. This work provides further insight into the relationship between locomotor movement and the development of vocal-motor learning. I presented this work as a Neuroscience Honors Thesis presentation at Colgate University.

   1. Rivera, M., **Cealie, M.**, Hauber, M. E., Kleindorfer, S., & Liu, W. C. (2019). Neural activation in response to conspecific songs in zebra finch (*Taeniopygia guttata*) embryos and nestlings. *NeuroReport*. 30(3), 217–221. doi: 10.1097/WNR.0000000000001187
   2. **Cealie, M.** (Spring 2019). Effects of Motor Movement on Vocal Learning and Juvenile Neurogenesis; Colgate University; Hamilton, NY. (Oral Presentation)

2. **Graduate Research**: My ongoing predoctoral research is focused on the effects of developmental ethanol exposure on neurons and glia in the cerebellum. As fetal alcohol spectrum disorders (FASD) are the most common cause of non-heritable, preventable mental disability with no known cure, I believe the results from my research will provide new details about the mechanisms that translate alcohol exposure to neuropathology. I began my work with a focus on the effects of developmental ethanol on glia in the cortex and hippocampus, which led to a second author publication. I am currently examining how developmental ethanol impacts microglia state and immune responses in the cerebellum, and how these responses may affect microglia interactions with Purkinje cell neurons. Additionally, I am studying how these responses to ethanol may be altered by a peroxisome proliferator-activated receptor-γ (PPAR-γ) agonist, as these modulate immune activation. Through this work, I have gained skills in cranial window implantations and *in vivo* imaging techniques. Overall, I believe this research will further our understanding of how ethanol-induced microglia-mediated inflammation impacts Purkinje cells in the cerebellum and provide a potential therapeutic target for FASD.

1. Lowery, R.; **Cealie, M.**; Lamantia, C.; Mendes, M.; Drew, P.; Majewska, A. (2021). Microglia and astrocytes show limited, acute alterations in morphology and protein expression following a single developmental alcohol exposure. *Journal of Neuroscience Research*, *99*(8), 2008-2025. https://doi.org/10.1002/jnr.24808
2. **Cealie, M.**; Lowery, R.; Lamantia, C.; Mendes, M.; Drew, P.; Majewska, A. Research Society on Alcoholism Conference; Virtual meeting, Summer 2021; Acute Effects of Ethanol on Developing Astrocytes and Microglia in a Mouse Model of Fetal Alcohol Spectrum Disorders (Virtual Poster)
3. **Cealie, M.**; Lowery, R.; Lamantia, C.; Mendes, M.; Drew, P.; Majewska, A. Cold Spring Harbor Laboratory: Glia in Health and Disease; Virtual meeting, Summer 2020; Acute Effects of Alcohol on Developing Astrocytes and Microglia in a Mouse Model of Fetal Alcohol Spectrum Disorders (Virtual Poster)
4. **Cealie, M.**; Lowery, R.; Lamantia, C.; Mendes, M.; Drew, P.; Majewska, A. Research Society on Alcoholism Conference; Virtual meeting, Summer 2020; Microglia-Astrocyte Interactions in a Mouse Model of Fetal Alcohol Spectrum Disorders (Virtual Poster)

D. Scholastic Performance

YEAR	COURSE TITLE	GRADE
	COLGATE UNIVERSITY	
2015	Early European Modernism	B+
2015	General Chemistry I/Lab	A/A
2015	Challenges of Modernity	A-
2015	Puzzling over Pattern: Symmetry	A
2015	Relaxation/Wellness	O
2016	General Chemistry II/Lab	A-/A
2016	Legacies of Ancient World	A-
2016	Intro to Computing I/Lab	A-/B+
2016	Independent Research: Design	S
2016	Intro to Neuroscience	B+
2016	Intro to Archaeology	A+
2016	Molecules, Cells & Genes/Lab	B+/A
2016	Organic Chemistry I/Lab	B+/A-
2016	China	A-
2017	Organic Chemistry II/Lab	A-/A-
2017	Molecular Neurobiology	B
2017	Research Methods Psychology	A
2017	Intro to Sociology	A-
2017	World Archaeology	A+
2017	Functional Neuroanatomy	B

YEAR	COURSE TITLE	GRADE
2017	Psychopharmacology	A-
2018	Welsh Culture and Lit	A
2018	Greek & Roman Medicine	A-
2018	Nonlinearity & Complexity	A
2018	Psychopathology	A-
2018	Intro to Cultural Anthropology	A+
2018	Corporations and Power	A
2018	Biostatistics/Lab	A-/A
2018	Senior Thesis in Neuroscience	A
2019	Contemporary Native American Art	A
2019	Language and Thought	A
2019	Senior Thesis in Neuroscience	A

UNIVERSITY OF ROCHESTER

2019-Present	Neuroscience Student Seminar	S
2019-2021	Neuroscience Journal Club	S
2019	Foundations Modern Biology I	A-
2019	Ethics in Research	S
2019	Cellular Neuroscience	A-
2020	Intro to Programming	S
2020	Integrative Neuroscience	A
2020	Human Brain Anatomy	A
2020	Neuroinflammation	A
2020	Introduction to Data Analysis Methods in Neuroscience	S
2020	Art of Science	S
2020	Teaching Tutorial in Neuroscience	A
2021	App Stats in The Biomed Sciences	A
2021	Bio of Neurological Diseases	A
2021	Science Communication for Diverse Audiences	In Progress

At Colgate University O is a passing grade for physical education. At the Colgate University S is satisfactory completion of a course. At the University of Rochester S is a grade of C plus or better. Students must attend Neuroscience Student Seminar every semester while enrolled. Students must attend Neuroscience Journal Club every semester for their first two years while enrolled.