

# Caroline Downes

East Lansing, MI 48823 | downesc1@msu.edu | (248)445-7631

## EDUCATION

Michigan State University (MSU), East Lansing, MI

May 2024

B.S. Biochemistry and Molecular Biology, Lyman Briggs College

B.S. Anthropology, College of Social Science

Minor: Environment and Health, College of Social Science

Honors College, GPA: 3.935

Molecular Biology Research, Heinrich Heine Universität, Düsseldorf, Germany

May – July 2022

## RESEARCH EXPERIENCE

Research Assistant, Andrechek Laboratory, MSU

July 2021 - present

- Senior Thesis: Functional Characterization of c-Kit and RARa mutations in MMTV-myc model
- Analyzation of two oncogenes with genomic and proteomic methodology creating foundational gene characterization for later graduate-level thesis and grant proposal.
- Collaborated with mentors and supervised students to sequence >500 mouse tumors for genotypic differences increasing organization for downstream thesis materials.

Research Assistant, Feldbrügge Laboratory, Düsseldorf, Germany

May - July 2022

- Research Focus: RNA protein interaction *in vivo*: endosomal mRNA transport in the plant pathogen *Ustilago maydis*
- Studied >1000 microscopy images with ImageJ to contribute to graduate thesis research.
- Actively participated in biweekly lab meetings about laboratory projects and expanded an understanding of them to perform productive independent research.

Research Assistant, Gallo/Conrad Laboratory, MSU

April– July 2021

- Consolidated laboratory cell cultures to successfully expand multiple cell lines, doubling available samples, for later projects.

## LEADERSHIP

President, MSU Council of Students with Disabilities (CSD)

September 2022 - present

- Directed conversations with MSU faculty to successfully implement a student Sharps container program on campus (~50,000 students) beginning in Fall 2022.
- Facilitate board meetings with six other positions to plan events and discuss ways to create a more inclusive campus for students.
- Lead general meeting events with ~15 students that foster a creative and safe environment.

Residence Hall Association Representative, CSD, MSU

September 2021 – May 2022

- Attended biweekly meetings to discuss campus-related topics with residential housing and culinary services to improve campus life for 50,000 students.
- Created and passed legislation that implemented sharps containers for on campus students that need to dispose of biohazard/sharp items.

Member, Inclusive Campus Initiative Student Advisory Committee, MSU

Fall 2022-present

Member, MSU Student Life and Engagement Student Leaders Council, MSU

Fall 2022 – present

Member, MSU Office for Civil Rights Presidents Advisory Committee on Disability Issues, MSU

Fall 2023 – present

Member, MSU University Health and Wellness Unit, MSU

Fall 2023 – present

Student Participant, MSU Hillel Fact Finders, MSU

August 1 – 12, 2023

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## SERVICE

Greater Lansing Food Bank, Bath, MI

May 2021 – March 2022

- Participate as a food sorter volunteer, packaging >500 different types of food bags and boxes for later distribution to seven counties in the Greater Lansing area.

Student Tutoring

September 2017-2021

- Administered tutoring services to improve student's grades and understanding of topics: Mathematics (Algebra 1 to Calculus 1), History, Chemistry, Geophysical Science, Literature, and Spanish Level II.

## WORK EXPERIENCE

Clerical Assistant, Biochemistry Research Store, MSU

September 2022 – present

- Fill ~15 material orders per shift in accordance with order forms and ensure pickup by proper laboratory personnel to result in an increase in necessary laboratory materials.
- Assist customers ordering specific in-stock materials and document account details to ensure they receive the materials they need for research.

Usher/Ticket-checker, Wharton Center, MSU

December 2021 – May 2022

- Directed 50 patrons/show to their seats as an usher by identifying seat locations, leading, and directing them to their correct seats to enable a pleasant experience.
- Certified patron tickets by checking the validity of the presented ticket(s), allowing them to safely enter the performance venue.

Nanny, Private Household, Bloomfield Hills, MI

June – August 2020

- Served as a companion, supervisor, and caretaker to children, ages: 2, 9, and 11 while coordinating with parents to keep children safe, occupied, and entertained.

Camp Counselor, Berkley Parks and Recreation, Berkley, MI

June – August 2019

- Responsible for the safety of 20-40 children/day ages 5 to 15 during the facilitation of activities, games, field trips, and crafts.
- Deescalated conflict with children when appropriate and communicated behavioral challenges with supervisory staff and parents.

## PRESENTATIONS

Downes, C; Weil, M. (February 2023) Michigan State University Diversity, Equity, and Inclusion Training on Disability. Resource Center for Persons with Disabilities, MSU.

Downes, C. (February 2023) Education Abroad Scholarship for Students with Disabilities Informational and Promotion Video. Resource Center for Persons with Disabilities, MSU.

Coffey, M.; Downes, C. (August 2023) Inaugural New Student Orientation DEI Speaker, MSU.

Downes, C. (April 2023). Functional Characterization of c-Kit and RARa mutations in MMTV-myc model. University Undergraduate Research and Arts Forum, MSU.

Downes, C. (April 2023). Functional Characterization of c-Kit and RARa mutations in MMTV-myc model. Research Symposium, Lyman Briggs College, MSU.

Downes, C.; Stoffel, N.; Feldbrugge, M. (2023, March 26-30). RNA-protein interaction in vivo: Endosomal mRNA transport in *Ustilago maydis* [Undergraduate Research Poster Session]. American Chemical Society Spring 2023, Indianapolis, IN, United States.

Downes, C.; Stoffel, N.; Feldbrugge, M. (2023, March 26-30). RNA-protein interaction in vivo: Endosomal mRNA transport in *Ustilago maydis* [International Affairs Committee Poster Session]. American Chemical Society Spring 2023, Indianapolis, IN, United States.

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Kozar, M.; Gray, J.; Strauss, N.; Coffey, M.; Downes, C.; Hamid, N. (September 2022). Inclusive Campus Initiative Student Summit, MSU.

Hoffmann-Benning, S.; Downes, C.; Anker, C. (August 30, 2022) Molecular Biology Research in Duesseldorf Informational Meeting, MSU.

Overbey, M.; Downes, C. (August 2022) Resource Center for Persons with Disabilities (RCPD) Panelist, MSU.

Downes, C.; Stoffel, N.; Feldbrugge, M. (July 2022) RNA-protein interaction in vivo: endosomal mRNA transport in *Ustilago maydis*. Feldbrügge Laboratory, Heinrich-Heine Universität, Düsseldorf, Germany.

Kozar, M. (March 2022) Inclusive Campus Initiative Virtual Community Forum Panelist and Organizer, MSU.

## AWARDS and HONORS

2023 Nominee, Rhodes Scholarship, MSU

2023 Nominee, Marshall Scholarship, MSU

Michigan State University Dean's List (all eligible semesters)

Deutscher Akademischer Austauschdienst—Research Internships in Science and Engineering (DAAD-RISE), American Chemical Society, Germany May-July 2022

James K. Billman Scholarship, Biochemistry Dept., MSU Spring 2024

Excalibur Scholarship, Student Involvement and Leadership, MSU 2023-2024

Samaritan Scholarship, RCPD, MSU 2023-2024

Pamela J. Fraker Undergraduate Scholarship, Biochemistry Dept., MSU Spring 2023

Community Foundation for Southeast Michigan Scholarship, Plante Moran 2022-2023 and 2023-2024

Jeffery and Kathryn Cole Excellence Award Scholarship, Honors College, MSU 2022-2023

Education Abroad Revolving Endowment, RCPD, MSU Summer 2022

Jeffery and Kathryn Cole International Study Award, Honors College, MSU Summer 2022

Research Support, Lyman Briggs College, MSU Spring 2022

Professor Richard L. Anderson Endowed Research Prize, Biochemistry Department, MSU Fall 2021

Larry A. Merriman Memorial Scholarship, GBS Corporation 2020-2021, 2021-2022, and 2023-2024

Cello Performance at Carnegie Hall, New York, Berkley High School, February 2019

Cello performances in Washington D.C.; Carnegie Hall, NYC; Toronto, Ontario, Canada 2011 – 2019

## SKILLS

### Computer Skills

Beginner – R Studio, Python

Intermediate – Analysis using ImageJ and PRISM

### Observation of Skills

One time – Cell transfection via CRISPR/Cas9

Several times – RNA preparation & isolation

Multiple times – Mouse oral gavage and tumor measurement

### Microbiology Skills

Beginner – Cloning via *E. coli*, transformation, retransformation, western blot, restriction digestion, primer creation, and formation of protoplasts.

Intermediate – PCR, sanger sequencing, microscopy, and DNA purification

Advanced – DNA Extraction (tumors, tissue slices, and mouse tail snips), and gel electrophoresis

### Cell Culture Skills

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Beginner – Cell counting.

Intermediate – Freezing cells and thawing cells

Advanced - Culture passing, media changing, and splitting plates.

Chemical Techniques

Intermediate – Distillation, thin layer chromatography, recrystallization, and vacuum filtration

Language

Novice, German (1 semester post-secondary)

Intermediate High, Spanish, (4 years secondary)

## **EXTRACURRICULAR ACTIVITIES**

Council of Students with Disabilities, MSU

Ballroom Dancing Club, MSU

Cello Performance, 2011-2019

Playwriting/Writing

Theatre Performance, 2015-2019

Dance, 2005-2019

September 2020 – present

September 2019 - present