Cassandra (Cassie) Bishop

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA
May 2021
Bachelor of Science in Biological Sciences
Concentrations: Cell Biology, Molecular Biology, and Developmental Biology

GPA: 4.0

RELEVANT COURSEWORK

Advanced Molecular Biology (Graduate), Advanced Cell Biology (Graduate), Immunoengineering (Graduate), Experimental Biochemistry, Experimental Techniques in Molecular Biology, Molecular and Cellular Immunology, Developmental Biology, Genetics, Honors Biochemistry, Honors Modern Biology

HONORS AND AWARDS

SURG Grant Recipient, Carnegie Mellon University **January 2019**
Submitted a grant proposal for and received a $1000 grant from Carnegie Mellon University

Livestrong Cancer Institute SURF Fellow, Dell Medical School at UT Austin **May 2019**
Received a $3000 stipend to complete cancer research as a LCI SURF fellow

Dean's List High Honors, Carnegie Mellon University **Fall 2017 – Fall 2019**
Obtained a GPA of 3.75 or higher

RESEARCH EXPERIENCE

Carnegie Mellon University, Department of Biological Sciences, Pittsburgh, PA
Undergraduate Research Assistant, McCartney Lab **May 2018 – Present**

The Effect of the Microbiota on Chronic and Acute Heat Stress Response

- Constructed and completed survival assays of over 500 sterile germ-free and gnotobiotic (associated with two *Lactobacillus* and two *Acetobacter* strains) *Drosophila*
- Created Kaplan-Meier survival curves and analyzed data using log-rank test and determined that the germ-free flies lived significantly longer than their gnotobiotic siblings

Microbial-Dependent Differential Expression of HSPs during Heat Stress

- Isolate RNA from germ-free and gnotobiotic flies heat stressed for 0-60 hours, generated cDNA, and ran qPCR to quantitate the mRNA levels of stress response genes: *HSP22*, *HSP70*, *HSP83*, and *MSRA*
- Analyzed qPCR and determined that due to the few differences in stress response mRNA expression, HSPs are likely only partially involved in the mechanism by which the microbiota cause decreased survival under heat stress.
- Wrote a grant proposal for and obtained the Small Undergraduate Research Grant (SURG) to fund this project.

Microbial-Dependent Differential Gene Expression in Drosophila Larval Brains

- Dissected brains from germ-free and gnotobiotic *Drosophila* larvae
- Performed immunofluorescence to identify microbial-dependent differential brain-specific gene expression

Interaction between ARC1, Gut Microbiota, and Metabolism

- Quantifying number of cells in fly wings, rate of development, and length of larvae in germ-free and mono-associated *Acetobacter* ARC1 mutants and wild-type flies
- Comparing these developmental conditions to evaluate the interaction between ARC1, *Acetobacter*, and metabolism

LIVESTRONG Cancer Institutes at the University of Texas at Austin, Austin, Texas
Livestrong Cancer Institute Summer Undergraduate Research Fellow, Paull Lab **May 2019 – August 2019**
CtIP Phosphorylation and Cancer Cell Sensitivity to DNA Damage

- Generated a wild type, a phospo-mimic, and a phospho-blocking CtIP cancer cell line using cellular transfection
- Blocked endogenous CtIP expression via shRNA transduction
- Induced Top1 adduct DNA damage using camptothecin and assessed cell survival to study how the phosphorylation state of CtIP affects its function in the DNA repair pathway

PRESENTATIONS

Poster Presentation **May 2019**
Meeting of the Minds Undergraduate Research Symposium, Carnegie Mellon University
Title: Absence of the Microbiota in *Drosophila* Improves Response to Thermal Stress

Poster Presentation **August 2019**
LCI SURF Research Symposium, LIVESTRONG Cancer Institutes
Title: MRN-stimulating CtIP phosphorylation partially rescues CPT sensitivity of CtIP deficient cells

Poster Presentation **April 2020**
The Allied Genetics Conference, Genetics Society of America
Abstract accepted for: Absence of the Microbiota in *Drosophila* Improves Response to Thermal Stress

TEACHING EXPERIENCE

Academic Development, Carnegie Mellon University **August 2018 – Present**
Supplemental Instruction Leader for Introduction to Modern Chemistry and Student Supervisor

- Communicate with professor to develop helpful twice-weekly review sessions for a traditionally difficult course
- Lead review sessions to elucidate and communicate course material and promote student learning through peer collaboration
- As a Supervisor (May 2019-Present), I observe other leaders' sessions and offer constructive feedback to yield more productive, collaborative sessions to promote student learning across the entire Academic Development program of 70 leaders supporting 28 different traditionally difficult courses.

LEADERSHIP EXPERIENCE

Mellon College of Science Student Advisory Council, Carnegie Mellon University **April 2019 – Present**
President

- Communicate and organize information discussed during meetings and results thereof with over 15 students and 5 faculty
- Advance goals in all committees including fundraising, service, and events
- Served as Secretary from April 2018 – April 2019, and as a member since October 2017

University Disciplinary Board/Academic Review Board **January 2019 – Present**
Board Member

- Participate in disciplinary hearings for academic and university conduct code violations

Science National Honor Society, Faith Lutheran High School **August 2016 – June 2017**
Founder and President

- Created and led Science National Honor Society of over 20 members, offering tutoring to over 1000 students in all disciplines of science including but not limited to Earth Science, AP Chemistry, AP Biology, and AP Physics

SKILLS

Research: Raising germ-free and gnotobiotic fly cultures, *Drosophila* larvae dissections, immunofluorescence, phase contrast and fluorescence microscopy, plasmid and genomic DNA extraction, RT-qPCR, SDS-PAGE, RNA extraction, Western Blot, Cell Culture, Immunohistochemistry, Cellular Transfection, Bacterial and Yeast Culture and Transformation

Computer: R, ImageJ, Microsoft Excel, Go language, LaTex, Adobe Photoshop, Microsoft PowerPoint, Microsoft Word