**Hope L. Hersh**

Doctoral Candidate, 4th Year Graduate Research Assistant

Plant Molecular and Cellular Biology Program

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Education

*University of Florida,* Gainesville, FL. August, 2018 – Present

 Doctoral Candidate – Plant Molecular and Cellular Biology

*Michigan State University,* East Lansing, MI. August, 2012 – December, 2017

Bachelor of Science – Double Major in Biochemistry and Molecular Biology and Plant Biology

Research Experience – University of Florida

**Doctorate Dissertation Research –**06/2019-present (Major Advisor: Dr. A. Mark Settles)

* Determine the effects of ionizing radiation on the mutation signatures of algal species (*Chlamydomonas reinhardtii, Arthrospira platensis*)
* Improve germination in cold stress by creating a new *shrunken2* allele in sweet corn using novel CRISPR-adenine deaminase system
* Modify starch accumulation to improve seed set during heat stress
* Analytical chemistry analysis of sugar and starch biosynthesis of sweet corn

**Doctorate Rotational Research –** 08/2018-05/2019

* Dr. A Mark Settles (settles@ufl.edu)
	+ Quantifying total lipids in small sample sizes of *C. reinhardtii* spaceflight samples
* Dr. Jeongim Kim (jkim6@ufl.edu)
	+ Elucidation of an alternative auxin biosynthetic pathway in *Arabidopsis thaliana*
* Dr. Sixue Chen (schen@ufl.edu)
	+ Metabolomic analysis of the facultative CAM plant *Mesembryanthemum crystallinum* using UHPLC-MS

Bachelor’s Research Experience – Michigan State University

**Lab Manager and Research Technician** for Dr. Charles Hoogstraten, 01/2017 – 08/2018

* Produced and purified T7 RNA Polymerase using HPLC
* Did *in vitro* transcription reactions to produce RNA hairpins to be studied via NMR
* Managed purchasing, inventory, and all administrative duties in the lab.

**Undergraduate Research** 2012 – 2017 (Major advisor: Dr. Christoph Benning)

* Development and characterization of transgenic *Arabidopsis thaliana* lines
* Cloning and mutagenesis of *Arabidopsis thaliana* using CRISPR
* Analysis of plant lipids by FAME and Gas Chromatography

Grants Funded

1. OR‐DRPD‐SRI2020: Determining microalgae resistance to ionizing radiation at a genome-wide scale

Dr. A. Mark Settles, *Principal Investigator***; Hope L. Hersh, *Co-Investigator***

Funding Source: Space Research Institute of Florida

Amount Awarded: $177,000

Period of Grant Award: 9/1/2020 – 8/31/2022

Role on Grant: Co-wrote grant, independently executing project

1. Understanding Genome-Wide Mutation Load in Spaceflight Culture of Cyanobacteria

Dr. A. Mark Settles, *Principal Investigator*

Funding Source: National Aeronautics and Space Administration

Amount Awarded: $750,000

Period of Grant Award: 2021-2024

Role on Grant: Co-wrote grant

Publications

1. Junya Zhang, Bárbara S.F. Müller, Kevin N. Tyre, **Hope L. Hersh**, Fang Bai,

Ying Hu, Marcio F.R. Resende Jr., Bala Rathinasabapathi, A. Mark Settles (2020) Selecting for *Chlamydomonas reinhardtii* fitness in a liquid algal growth system compatible with the International Space Station Veggie plant growth chamber. *Frontiers*

1. K Wang, Q Guo, JE Froehlich, **HL Hersh**, A Zienkiewicz, GA Howe, Benning C. (2018) [Two abscisic acid-responsive plastid lipase genes involved in jasmonic acid biosynthesis in Arabidopsis thaliana](http://www.plantcell.org/content/30/5/1006.abstract). *The Plant Cell*. 30 (5) 1006-1022; DOI: https://doi.org/10.1105/tpc.18.00250
2. Wang K., Froelich JE, Zienkiewicz A., **Hersh HL**, Benning C. (2017) A Plastid Phosphatidylglycerol Lipase Contributes to the Export of Acyl Groups from Plastids for Seed Oil Biosynthesis. *The Plant Cell*. 29 (7) 1678-1696; DOI: 10.1105/tpc.17.00397
3. Wang K., **Hersh HL**, Benning C. (2016) SENSITIVE TO FREEZING2 aides in resilience to salt and drought in freezing-sensitive tomato. *Plant Physiology*. pp. 01183.2016; DOI: 10.1104/pp.16.01183

Awards and Recognitions

* Winner of a purse prize of $25,000 from NASA’s Deep Space Food Challenge for Proposal entitled “Space Bread” from Hawthorne, FL – October 2021

<https://www.nasa.gov/press-release/nasa-announces-winners-of-deep-space-food-challenge>

* Featured on University of Florida’s IFAS Communication blog: “UF/IFAS CALs Student Enters the Space (Bread) Race” <http://blogs.ifas.ufl.edu/ifascomm/2021/10/14/uf-ifas-als-phd-student-enters-the-space-bread-race/>
* University Florida IFAS/CALS spotlight on “Space Bread” idea for NASA’s Deep Space Food Challenge: <https://www.youtube.com/watch?v=2OSX4tjpLYM>
* Grinter Fellowship Recipient (2018-2021)
* Best talk and paper (First Place), “Most Interesting Glycolytic Enzyme”, University of Florida Biochemistry Competition, Gainesville, FL (Spring 2019)
* 1st Place Oral Presentation at University Undergraduate Research and Arts Forum, Michigan State University, East Lansing, MI (Spring 2017)

News Article: Getting first prize at the UURAF: Our 3 winners tell us how [https://prl.natsci.msu.edu/design-tests/news-2nd-draft/getting-first-prize-at-the-uuraf-our-3/winners- tell-us-how/](https://prl.natsci.msu.edu/design-tests/news-2nd-draft/getting-first-prize-at-the-uuraf-our-3/winners-%20tell-us-how/) (Spring 2017)

* News Article: [Undergraduate Research Forum - Part 1/3: Hope Hersh](https://prl.natsci.msu.edu/news-and-events/news/undergraduate-research-forum-part-1-3-hope-hersh/)

<https://prl.natsci.msu.edu/news-and-events/news/undergraduate-research-forum-part-1-3-hope-hersh/> (Spring 2016)

Presentations and Conferences Attended

* *Determining Chlamydomonas reinhardtii resistance to ionizing radiation at a genome wide scale*. American Society of Gravitational Space Research Conference (Nov 2021) (**Poster Presentation)** – Baltimore, MD
* Attended Accelerate to Industry (A2i) (May 2020) Zoom Conference
* *Engineered 6-phosphogluconate dehydrogenase assessed in field corn hybrids for mitigation of grain yield loss under heat stress.* International Maize Genetics Conference (March 2020) **(Poster Presentation) –** Zoom Conference
* Attended Plant Science Symposium (2020) Gainesville, FL
* Attended American Society for Gravitational and Space Research Symposium, Zoom Conference (2020)
* *Predicting Sugar and Starch in Mature Sweet Corn Kernels*. International Maize Genetics Conference (2020) **(Poster Presentation) –** Zoom Conference
* *Predicting Sugar and Starch in Mature Sweet Corn Kernels*. International Maize Genetics Conference, Kona, HI (2020) **(Poster Presentation) –** Cancelled due to COVID-19
* Attended Plant Science Symposium (2020) Gainesville, FL
* *Predicting Sugar and Starch in Mature Sweet Corn Kernels*. International Sweet Corn Developmental Association, Chicago, IL (2019) **(Oral Presentation)**
* Attended American Society of Mass Spectrometry Conference for Professional Development in Atlanta, GA (2019)
* Emceed at PMCB Symposium in Daytona Beach, FL (2019)
* *Metabolomic analysis of the facultative CAM plant Mesembryanthemum crystallinum using UHPLC-MS*. Gainesville, FL (April 2019) **(Oral Presentation)**
* *Elucidation of an alternative auxin biosynthetic pathway in Arabidopsis thaliana*. Gainesville, FL (January 2019) **(Oral Presentation)**
* *Determination of a Method for Gravimetric Total Lipid Quantification in Chlamydomonas reinhardtii for Small Sample Size*. Gainesville, FL (November 2018) **(Oral Presentation)**
* Attended Plant Science Symposium (2019) Gainesville, FL
* *Role of Plastid Lipases in Seed Oil Biosynthesis and Plant Development in Arabidopsis Thaliana, with CRISPR-CAS9 Technology.* (2017) East Lansing, MI, **(Oral Presentation)**
* *Dissection of the Role of Plastid Lipases in Seed Oil Biosynthesis and Plant Development in A. Thaliana, with CRISPR-CAS9 Technology*. (2017) East Lansing, MI, **(Oral Presentation)**

Outreach

*University of Florida*

* Judge at American Society of Gravitational Research Undergraduate Poster Presentation Competition – Baltimore, MD (Nov 2021)
* Author and Illustrator of Coloring book teaching K-5 students about the importance of corn as a vegetable
* Mentored 3 undergraduate students in machine learning technology – Cori Dubois, Brenden Burns, David Silverman
* Hosted prospective student luncheon for Plant Molecular and Cellular Biology Program (2020)
* Certified to work with gamma radiation through University of Florida
* Outreach with Milton Hershey School Senior Hall performing GC-MS analysis of Fatty Acid composition for their project with NASA titled “Effects of Microgravity on the Growth of Algae Cysts and Lipid Production
* Hosted Plant Molecular and Cellular Biology New Student Luncheon Fall 2019
* Working with an undergraduate student, Anadaisy Aguirre, who is of a minority class in STEM to mentor her in Biochemistry and Molecular Biology techniques

*Michigan State University*

* Volunteered Impact and Application of Genome Editing Technologies Conference 2017
* Biochemistry Club Treasurer - 2015-2017
* Volunteer for Office of Admissions – Hosting high school students in dorms 2012-13
* (50 Hours)

*Sparrow Hospital*

* Volunteer in Emergency Room 2012-2015 (Total: 209.82 Hours) Promoted to Volunteer Coordinator in 2015