**Regina Bedgood**

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**Education**

**Degree: Doctor of Philosophy**  ***August 2020 – present***

University of Alabama at Birmingham, Birmingham AL

Major: Biology

Cumulative GPA: 4.0

**Degree: Bachelor of Science** *August 2015 – May 2020*

University of Alabama at Birmingham, Birmingham AL

Major: Biology

Minor: Chemistry

Cumulative GPA: 3.88 – *Summa Cum Laude*

Biology GPA: 4.0

**Research Experience**

## Doctor of Philosophy Student Research *August 2020 – present*

## Dr. Karolina Muhktar Lab in the UAB Biology Department, Birmingham AL

**Project 1:** Agrobacterium introduction of pH sensitive fluorescent protein plasmid into *Arabidopsis thaliana*

* Project lead
* Performed dipping of plants
* Plant husbandry of dipped plants through seed collection
* Selective screening of transformants on agar media for T1 and T2 generations

**Project 2:** Confocal microscopy of ion sensitive fluorescent proteins following in vivo time course of ion flux post simulation of biotic stress in *Arabidopsis thaliana*

* Project lead
* Prepared samples for confocal microscopy
* Tested fluorescent lines for tissue age with optimal fluorescence
* Troubleshooting of live tissue imaging
* Performed at the High Resolution Imaging Facility at UAB

**Project 3:** Identification and preliminary characterization of *CCX2* T-DNA insertion mutant in *Arabidopsis thaliana*

* Lead on identification of proper CCX2 T-DNA insertion mutant
* Project team member for phenotype characterization

**Project 4:** Phenotypic characterization of *JAGN1* T-DNA insertion mutant in *Arabidopsis thaliana*

* Project lead
* PCR genotyping to identify mutant
* qPCR characterization of gene expression in mutant
* Tunicamycin induced ER stress assay and pathogen assay with *Pseudomonas syringae* post pre-treatment with salicylic acid

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**Capstone Student and Undergraduate Research Student** *January 2020 – May 2020*

Dr. Karolina Muhktar Lab in the UAB Biology Department, Birmingham AL

**Project:** Characterize nuclear structure changes in *Arabidopsis* during defense response using Cajal bodies as model systems

## Volunteer Undergraduate Research *October 2019 – December 2019*

Dr. Karolina Muhktar Lab in the UAB Biology Department, Birmingham AL

* Micro pipetting
* Seed sterilization
* Agar medium growth
* Screening for GFP *in vivo* under the fluorescent microscope
* DNA extraction
* PCR
* Agarose electrophoresis
* Genotyping
* RNA extraction
* RNA purification
* RNA quantification
* cDNA synthesis
* RT-qPCR
* Plant husbandry of *Arabidopsis thaliana*

**Honors/Awards/ REcognitions**

People’s Choice Award in 3 Minute Thesis Competition for “Can a Humble Plant Inspire the Next Generation of Scientists?” *November 2022*

Sigma Xi Grant in Aids of Research *(*G2022315-2135) for “Identifying the Role of JAGN1 in Plants”

*March 2022*

3rd Place in Graduate Student Oral Presentations of SS-ASPB Meeting *March 2022*

Outstanding Biology Student Award  *March 2022*

People’s Choice Award in 3 Minute Thesis Competition for “Illuminating the Invisible Life of Plants” *November 4, 2021*

Phi Sigma Biological Sciences Honor Society ***April 2019 – Present***

## National Society of Leadership and Success *April 2020 – Present*

## Presidential Honors *Spring 2018, Fall 2019, Spring 2019, Fall 2019, Spring 2020*

Collegiate Honors Scholarship *Fall 2015 – Spring 2020*

**Presentations/publications**

Author “How can glow-in-the-dark stars help us understand plant immunity?” in American Genetic Association Blog (https://blog.theaga.org/how-can-glow-in-the-dark-stars-help-us-understand-plant-immunity/) *November 2022*

Presenter of “Can a Humble Plant Inspire the Next Generation of Scientists?” in 3 Minute Thesis Competition *November 2022*

Presenter of “A Reverse Genetics Approach to Identifying the Function of JAGN1 in Arabidopsis thaliana”

Graduate Oral Presentation at 2022 Southern Section of ASPB Meeting *March 2022*

Presenter of “Illuminating the Invisible Life of Plants” in 3 Minute Thesis Competition

*November 2021*

Presenter of “CRISPR: Where Did It Come From? Where Do We Go?” in Rushton Theater of McWane Science Center, CRISPR Cas-9 Exhibit.  *July 2021*

“Elucidating the Immune Modulated Subcellular H+ and Ca2+ Movement in Arabidopsis thaliana” Graduate Poster Presentation at 2021 Southern Section of ASPB Meeting *April 2021*

“Elucidating the Dynamics of Cajal Bodies in Immune Response of *Arabidopsis thaliana”* Undergraduate Poster Presentation at 2020 UAB Undergraduate Expo *March 2020*

**Leadership positions**

Vice President of Climb On at UAB Student Organization ***January 2022 – present***

## First active Vice President

## Planning, organization, and handling of club events with President and Council members

## Maintenance of Discord Server and Engage page

## Monthly meetings with Council

## Attend weekly club meetings and weekly meetups at local climbing gyms

## Attend and organize outdoor trips; ensure club members’ safety

## Set up as needed meetings with President for planning and troubleshooting

**Teaching Experience**

## Graduate Teaching Assistant

UAB Biology Department, Birmingham AL*August 2020 – present*

**Guest Teacher for Heather Chinoski’s 7th Grade Science Class at Helena Middle School**

As an extension of the Plant GIFT course, I taught five 7th grade classes about plant biotechnology. They learned about the history of plant gene editing from selective breeding for agricultural purposes as well as modern day gene editing with technologies such as agrobacterium for both agricultural purposes and research interests. Students got hands on experience looking at wild type Arabidopsis plants as well as plants grown on solid MS media. Students were assigned as “heroes” or “villains” and had to use the idea of gene editing technology to edit a plant followed by a group discussion about how gene editing is currently used for plants and potential future uses.

**Course:** **Peer BUDS**

This course was a three weeklong summer bridge program for incoming freshman or transfer students and was targeted for students of low income status and/or from underserved schools. My role in the course was to assist in designing and implementing the lab section each day and included lessons such as how to use a micropipette, plating Arabidopsis seeds and implementing a heat stress experiment on them, 4 quadrant streaking of bacterial cultures, gel electrophoresis, etc. Each Friday of the course, the students went on a field trip to local places such as Railroad park, Jones Valley Teaching Farm, City Walk, the UAB Solar House, the Birmingham Botanical Gardens, etc.; I was responsible for driving students and ensuring they all remained safe and accounted for.

**Course:** **Plant GIFT (Genomics Internship for Teachers)**

This course was a weeklong professional development workshop for science teachers. My role in this project was to design the structure of the course including a daily itinerary and objectives, prepare all lab equipment necessary, create worksheets, coordinate with guest lecturers, teach lessons, and implement the course throughout the week.

**Course:** **BY 261 L – Introduction to Microbiology**

## Microscopy use and care, Oil immersion Microscopy, Aseptic technique, Bacteria inoculation, Bacteria isolation, Preparation of Smears, Simple staining, Gram staining, Specialized media, Subculturing, Identification of pure culture, Blood typing, Identification of unknown bacteria. Use of a dichotomous key

**Course:** **BY 123 L – Introduction Biology I**

## Microscope use and care, Biomolecules, Prokaryotic Cells, Gram Staining , Eukaryotic Cells, Osmosis, Diffusion, Enzymes, Cellular, Respiration, Photosynthesis, Mitosis, Meiosis, Human Genetic Traits, DNA Isolation, Genetic Basis of Evolution, Transcription, Translation, Bacteria, Archaea, Protists, Taxonomic classifications

**Guest Lecture for Dr. Karolina Mukhtar**

Department of Biology, University of Alabama at Birmingham *October 2021*

**Course:** BY 351 Plant Biology

Topics covered include:

## CRISPR discovery and background information, CRISPR Cas9 system, Protospacer Adjacent Motifs (PAMs), Guide RNA design using Benchling, *Streptococcus pyogenes* Cas9, On and off targeting of gRNA, Transcription activator-like effectors + nuclease (TALENs), Zinc Finger Nucleases (ZFNs), Meganucleases

## Supplemental Instruction Leader

## Vulcan Materials Academic Success Center, Birmingham, AL *Fall 2018; Fall 2019 – Spring 2020*

## Promote student metacognition by assisting them in thinking through complex concepts

## Create worksheets, mock exams, and additional study tools designed to help students learn, understand, and retain information taught in lecture

## Schedule and conduct supplemental instruction sessions twice weekly and mock exams prior to each lecture exam

## Encourage students, listen to student feedback, be flexible with session plans and adjust as needed based on student understanding

## Maintain contact with VMASC office, course instructor, and students

## Manage canvas page with meeting times, document uploads, and announcements

## Attend course lectures, assist students during class, assist professor during class

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Biology Learning Assistant

Department of Biology, University of Alabama at Birmingham *January 2019 – April 2019*

* Attended five, one-hour workshops centered on learning a variety of teaching strategies with a special focus on equity in the learning space
* Attend weekly meetings pertaining to the teaching plan for the week
* Hold two sessions weekly; implement strategies to create a learning environment conducive to a diverse group of students with different backgrounds, levels of understanding, confidence, learning abilities, and experiences

**Volunteer Experience**

**Summer 2022 Undergraduate Research Expo**

Judge for in person poster presentations *July 28, 2022*

**Central Alabama Regional Science & Engineering Fair (CARSEF)**

Judge for in person poster presentations*March 5, 2022*

**Spring 2022 Undergraduate Research Expo**

Judge for in person poster presentations *April 21, 2022*

## GEAR UP Alabama (Gaining Early Awareness and Readiness for Undergraduate Programs) University of Alabama at Birmingham, Birmingham, AL

***Black Belt Friday – Volunteer***  *January 10, 2020*

* Attended a “Rolling Lecture” *en route* to Montgomery about the history and the present state of the black belt region of Alabama, with a focus on public schools; learned effective mentoring strategies with emphasis on maintaining cultural awareness while engaging with students
* Conducted “College Jeopardy” for a class of high school seniors from Carver High School; myself and a fellow UAB student answered questions about what to expect during college including finances, study skills, social activities, etc.

***UAB Mini Camp – Intern/ Volunteer*** *May 13 – 16 2019/ May 14 – 17 2018*

* Prepared and conducted group activities such as orientation, the UAB resource fair, mock college lectures, recreation time, first generation college student panel, meals in the commons on the green, student involvement showcase, and nighttime activities
* Ensured students were safe and always accounted for
* Helped the program directors with any problems that arose during the camp

***Future Proof Let Us Make Man Conference – Volunteer*** *September 29, 2018*

* Greeting guests, lead them to their destination, and assisted them in moving between workshops
* Assisted speakers during workshops and answered student questions about college student life
* Ensured every guest made it safely to their transportation at the end of the day and assisted program directors in cleaning up from the day’s events

**Laboratory Skills**

* Pathogen assay of *Arabidopsis*
* Tunicamycin ER stress assay
* CRISPR guide RNA synthesis
* *in vitro* Cas-9nuclease assay
* Polyacrylamide, agarose gel electrophoresis
* Agrobacterium insertion of plasmid into *Arabidopsis* genome
* PCR, RT-qPCR
* RNA extraction, purification and quantification, and cDNA synthesis
* *In planta* infiltration of *Arabidopsis*
* Chemical stress treatment assays in seedlings- flagellin22 peptide, salicylic acid
* Root growth assay of *Arabidopsis*
* Genotyping
* Crossbreeding *Arabidopsis*
* *Arabidopsis* husbandry
* Screening for mutants using fluorescent microscopy
* DNA extraction