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12-3-2019

## University Honors Program News

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### Recommended Citation

Georgia Southern University, "University Honors Program News" (2019). *Honors College News Blog*. 76. <https://digitalcommons.georgiasouthern.edu/honors-news/76>

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## Developing the Research Mindset

December 3, 2019

Like all Honors Program students, when Molly Rowe graduates with her degree in biology this fall, she will have completed an independent research project in the form of her honors thesis. Unlike a number of her peers, she will also have two publications in scientific journals.

Lots of students delving into medical research start out tackling the big health issues of the day, and Rowe is no different. She is on the list of authors for two articles that focus on cancer research: “DNA topoisomerase II $\alpha$  and RAD21 cohesin complex component are predicted as potential therapeutic targets in bladder cancer” published in *Oncology Letters*, and “Integration of bioinformatics approaches and experimental validations to understand the role of notch signaling in ovarian cancer” published in the *Journal of Visual Experiments*.

In thinking about her research mindset, Rowe said, “The research process for me usually begins with reading and staying up-to-date with existing scientific literature, then identifying a topic that is intriguing to me and further refining this to develop specific questions or testable hypotheses, and my research mentor, Dr. Dongyu Jia, has really helped me progress from finding a topic of interest to identifying specific questions that can be researched and answered.”

Once a topic has been selected, the work has only just begun. Rowe’s dedication to solving real-world problems has resulted in complex research on her selected topics that can prove to be very challenging.

“Research in general definitely has highs and lows,” she said. “Sometimes experiments that you have spent countless hours on do not work out and sometimes these experiments turn out perfectly. For these publications, the research process was no exception.”

Her experiments involved extensive preplanning in the forms of problem identification, hypothesis creation, and designing and effective, replicable experiment. She and her other research team members also utilized various types of technology from microscopy and antibody staining to advanced computer programs to analyze data from a biostatistics and bioinformatics standpoint. While they encountered many challenges throughout their research, after a lot of work and time spent to ensure accuracy and validity, they were able to overcome these problems and produce results that they were confident in.

With a thorough experiment completed, Rowe could then move on to recording her results and submitting them for publication. “The process can sometimes be very extensive and time-consuming from writing the paper itself and deciding which journal(s) you would like to send it to, waiting to hear from your publisher and potentially having to go through multiple rounds of revision before acceptance,” Rowe explained, “but from this process you truly get to experience the value of peer review firsthand and see how it can help lead to a more meaningful contribution to your field.”

By adapting her experimental approach and thinking outside of the box in her problem solving techniques, Rowe was able to see her work and herself grow into their best versions. “In the end, it is exciting to be able to write about and share the work that we are doing in our lab with others in the scientific community.”



Molly Rowe in the lab.

Even after all of these achievements, Rowe is continuing to challenge herself. She currently has a paper written in association with her thesis work, “Analysis of the Temporal Patterning of Notch Downstream Targets during *Drosophila melanogaster* Egg Chamber Development”, that is currently in the publication process, as well. After graduation Rowe plans to attend medical school at the Medical College of Georgia in Augusta and continue pursuing her passions through research.

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