Thoughts about being a great mentor and fostering a culture of student scholarship at Mason.

As an undergraduate, I was mentored by amazing researchers who are wonderful teachers, advisors, and communicators. Without them I would not have become a scientist or professor. I am so thankful to these mentors. I want them to be proud of me because of my own work with undergraduates. I feel compelled to return the favor to our future generations of young scholars.

A critical time to support undergraduate scholarship is when students are beginning to brainstorm a research project. I aim to help students form and refine their idea, consider their interests, and assess the potential value of the scholarship. These initial conversations are vital for helping our students learn to sink their teeth into priority areas of scholarship. Bruce Alberts, as Editor-in-chief of Science, said scientists need to work harder to train younger scientists to develop proposals and learn to cull ideas. I agree.

Because of the volume of Mason undergraduates wanting to achieve a research experience, I not only mentor individual research projects but I implement other strategies to support undergraduate research.

I reach to advise every student who asks me for help finding a research experience. I make time to study internship opportunities for students and I keep a folder of research experiences, internal and external to Mason. Once I learn about a student’s research interests, I recommend that they reach out to other specific members. This is a great way to connect with other Mason professors and learn about their research. I ask students to bring journal articles for us to discuss. I ask students to come back and tell me how their research is going if they find a research opportunity. I like keeping an open office door.

The 4-VA grant I am leading this summer will build a culture of mentorship for undergraduate researchers, with about 10 students conducting authentic research as a group, with each student having a unique research direction involving a mix of Geographic Information System (GIS) analysis and environmental microbiology. I think effective models for supporting these research experiences will place Mason in a brighter light throughout VA and nationally, because of collaborations with public schools that dual-enroll undergraduates at universities, and with community partners, to mentor a great number of undergraduate research projects. With this 4-VA award, I am creating a course-based research experience that would engage 20-25 new students at a time, for them to contribute to ongoing research. A long term goal is to understand how climate and environmental factors impact the rate of microbial evolution. I believe the overall research will move forward efficiently because of the contributions these young researchers will achieve collectively, summer after summer.

Mentoring undergraduate student researchers is invigorating. I have the pleasure of mentoring a former Governor’s School (GS) student’s OSCAR research project—she is now a full-time biology major at Mason—and it has been a pleasure mentoring her for the nearly five years I’ve known her. She will have her name on 3 or 4 peer-reviewed papers by the time she graduates from Mason. It is a lot of work to sustain the level of research happening at the GS (these students are all Mason undergraduate high school guest matriculants), and course-based research experiences are one mechanism for expanding access to research experiences. I’ve been working to expand these experiences to other school districts, for students to enroll as undergraduates at Mason and conduct research. Loudon County is now offering a research course that I coordinate, for Mason credit, with about 110 students enrolled. Likewise, in the College of Science, we need more courses with RS designations and I’m supporting the development of these through the Accelerator Program, since this interdisciplinary group aims to advance student academic achievement and career trajectories in STEM. One part of advancing student career trajectories is to offer a greater number of quality undergraduate research experiences.

What I most want reviewers to know about my experiences as a mentor:
I have mentored dozens of undergraduates directly and indirectly by encouraging them to think for themselves as themselves and helping them find the right faculty mentor, or enroll in the right internship, summer program, or research course.