

# Promoting Organic Chemistry Education through Undergraduate Research Experiences at WSSU

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## Supporting Information

### **Impact of Undergraduate Research Experiences on Students' Education and Career**

**Path:** Undergraduate research experiences have a significant impact on students' education and career path. Indeed, the undergraduate research experience may be one of the most important factors in affecting students' choice of majors and career path. Among students who worked in my research lab, many students have gone to graduate schools and some landed high-paying jobs in Chemistry field after graduation from WSSU. The following table 1 highlights the educational experiences and career path of some recent undergraduate students after undergraduate training in my research lab at WSSU. All these students except one are from underrepresented groups and eight are women. These achievements and the career path of students after graduation from WSSU further demonstrates the significant impact of undergraduate research on students' educational and career path. The success stories from my students always motivate me to strive to provide innovative high impact research experiences in Organic Synthesis to STEM undergraduates, from underrepresented groups, and set them on the road to become scientists and other professionals in "STEM" field.

**Peer-Mentoring-Program (PMP):** Besides the faculty mentor, we also developed and implemented Peer-Mentoring-Program (PMP). In this "PMP" program, each new group member is paired with a senior student mentor (Peer Mentor), who has typically worked for more than 1

year in our research group. The “PMP” program is very effective in generating student excitement, promoting critical thinking, teamwork, as well as the leadership skills. In the “PMP” program, the new student learn side by side from the peer mentor while the peer mentors gradually grown into an independent researchers and are ready to go to graduate/professional schools or industrial jobs. The four students who served as mentors for “PMP” program are highlighted in the following table (Table 1). Three of them are currently enrolled in PhD, PharmD program and one is employed in Chemistry field.

*Table S1. Educational Experiences and Career Path of Recent Undergraduates*

<b>Students</b>	<b>Achievements and current positions</b>
Student A	BS from WSSU (May 2021); Co-author on one paper. Got an offer from Master in Biomedical Science Program at Wake Forest University, Winston-Salem, NC (Fall, 2021)
Student B	BS from WSSU (May 2021); Co-author on one paper. Got an offer from Master in Biomedical Science Program at Wake Forest University (Fall, 2021)
<b>Student C</b>	Received BS from WSSU (2020); <b>Served as mentor for “PMP” program.</b> Won the outstanding presentation award at 2018 ABRCMS. Co-author on two papers. Currently working on PhD in Pharmacology at the University of North Carolina, Chapel Hill.
Student D	Received BS from WSSU (2020); Co-author on one paper. Currently working on Master degree at NC A&T.
<b>Student E</b>	Received BS from WSSU (2019); <b>Served as mentor for “PMP” program.</b> Co-author on a paper, won third place at CNC-ACS poster vendor night. Currently working on PhD in chemistry at the University of Texas, Dallas.
Student F	Received BS from WSSU (2019); Co-author on a paper. Employed by RJR Tobacco company; Admitted into Master program in Pharmaceutical science at the University of South Carolina in Fall, 2020
Student G	Received BS from WSSU (2019); Co-author on a paper. Won second place in poster competition at 2019 ERN. Currently working on MD at The Medical University of Lublin in Lublin, Poland.
<b>Student H</b>	Received BS from WSSU (2018); <b>Served as mentor for “PMP” program.</b> Co-author on two papers. Currently working on PharmD at the University of Florida.
Student I	Received BS from WSSU (2018); Co-author on two papers. Currently employed by Catalent pharmaceutical company.
<b>Student J</b>	Received BS from WSSU (2018); <b>Served as mentor for “PMP” program.</b> Co-author on two papers. Employed by Exela Pharma Sciences in North Carolina.
Student K	Received BS from WSSU (2018); Co-author on one paper. Employed by LabCorp.
Student L	Received BS from WSSU (2017); Co-author on one paper. Graduated with a Master degree in Chemistry from NC A&T.

Note: Due to privacy protection requirement, the students’ names were not disclosed in this table.

# Student Experiences on Undergraduate Research - End-of-Semester Survey

The goal of this survey is to understand your experience with research in this course. The survey will take less than 5 minutes to complete. Your individual responses to this survey will be kept confidential, and combined responses will be reviewed so we can improve your research experiences. Please direct any questions about this survey to Dr. Fenghai Guo, at [guof@wssu.edu](mailto:guof@wssu.edu). Thank you for your participation!

Q1 Please indicate your level of agreement with the following statements:

	Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree (1)
I identify with other science students. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a strong sense of belonging to the community of scientists. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think of myself as a scientist . (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please add any additional comments about your research experiences.

Student comments:

Q2. Please indicate your level of confidence with each of the following processes:

	Very Confident (4)	Confident (3)	Somewhat Confident (2)	Not At All Confident (1)
Generating a research question (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Explaining the results of a research study (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using scientific literature or reports (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relating results and explanations to the work of others (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reporting results in oral form (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reporting results in written form (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generally functioning as a scientist in a research activity (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Please add any additional comments about your research experiences.

Student comments:

Q3 Please indicate your level of agreement with the following statements:

		Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree (1)
My research project is interesting and exciting (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I understand Importance of heterocycle in Organic Chemistry(2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I understand the importance of sulfur-containing heterocycle (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4 Please indicate your level of agreement with the following statements depending on your role – PMP mentor or PMP mentee:

		Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree (1)
My PMP mentor was helpful (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy serving as PMP mentor (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Please add any additional comments about your research experiences.**

**Student comments:**

Q5 How likely is it that you will...

	Very Likely (4)	Likely (3)	Unlikely (2)	Very Unlikely (1)
Remain in your current major (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Complete a bachelor degree in science (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply to graduate programs in science (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pursue a job/career in science (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please add any additional comments about your research experiences.

Student comments: