



# REU SITE: BUCKEYE REU SITE

La'Tonia Stiner-Jones

Department of Biomedical Engineering

The Ohio State University

## Introduction

- ◆ The Ohio State University BUCKEYE REU SITE is newly funded this year. It aims to increase the number of underrepresented minority (URM) students pursuing graduate degrees in Biomechanics and Mechanobiology (BMMB)
- ◆ Nationally, enrollment of URM graduate students remains low at 6.6%, although URM's comprise 30% of the population<sup>1</sup>. Enrollment of URM's in our Biomedical Engineering (BME) graduate program is 13.6%.
- ◆ More needs to be done to better position us as a society to address the most challenging issued in BMMB and BME. Doing so necessitates a diverse cadre of researchers. This program aims to address the shortage of URM and/or traditionally underrepresented students with advance degrees participating in the BMMB field.

## Specific Aims

- ◆ The Provide opportunities for UGs to conduct **hands-on scientific research** in BMMB.
- ◆ **Increase the number of URM** students pursing graduate degrees in BME and prepare them for **success in** the application process and **graduate school**.
- ◆ Develop UGs ability to comprehend, **contribute** and **communicate** advances in BMMB.

## Methods

- ◆ Pre- and Post- surveys were developed to access the programs effectiveness at achieving our goals. The survey's were administered using our site-licensed online survey tool Qualtrics. The participant surveys were administered the week prior to participants arriving on campus and the day before departure through two weeks post departure. The faculty mentor survey was administered the last day of the program and remained open for 2 weeks. Each group was sent at least two reminders to complete the survey. Ten participants completed the pre-survey and 9 completed the post-survey. Therefore, we only used the data for 9 participants in our analysis. We linked the pre- and post survey data based on the student responses to the demographic and identifying questions in the beginning of each survey. Seven faculty mentors completed the survey. Table 1. shows an excerpt of the pre- and post-survey questions asked of faculty mentors and participants. For question 1 faculty mentors were asked to rate the participants on a scale of 1 (Not at all) to 5 (High). For questions 2- 4 participants were asked to rate how prepared they currently felt with doing each of the following on a scale of 1 (Not at all) to 5 (High).
- ◆ The data was analyzed using GraphPad Prism 8.2.1 software using a paired t-test or average.

Question	Associated Specific Aim
1. Rate the degree to which your BUCKEYE REU participant was actively engaged in independent research?	Provide opportunities for UGs to conduct hands-on scientific research in BMMB.
2. Please rate how prepared you currently feel about applying to graduate school?	Increase the number of URM students pursing graduate degrees in BME and prepare them for success in the application process and graduate school.
3. Please rate how prepared you currently feel about your ability to succeed in graduate school?	Increase the number of URM students pursing graduate degrees in BME and prepare them for success in the application process and graduate school.
4. Please rate how prepared you currently feel about your ability to communicate about research advances in BMMB?	Develop UGs ability to comprehend, contribute and communicate advances in BMMB.

Table 1 Displays an excerpt of the pre- and post- survey questions asked of the faculty mentors and participants.

## Results and Discussion

Item	BUCKEYE REU ASSESSMENT OF AIMS				Mean Diff.	Sig. Diff. <sup>2</sup>	N
	Pre		Post				
	Mean	S.D.	Mean	S.D.			
1	2.28	1.38	4.0	.816	1.71	P<0.01	7
2	2.22	.833	3.88	.927	1.66	P<0.004	9
3	2.66	.866	3.77	.666	1.11	P<0.02	9
4	3	1.0	4	0.5	1	P<0.04	9

Table 2: The data analyzed from the pre- and post- survey, administered to participants and faculty mentors, that was most relevant to the specific aims.

Item	BUCKEYE REU DEMOGRAPHICS
Women	7
Men	3
Underrepresented Minority	10
Rising Senior	7

Table 3: Shows the demographic data for the 10 participants in our cohort.

- ◆ The faculty worked with their participants for 10-weeks and were able to assess the independent research development of their student over time. The mentors indicated that students were engaged in independent research by the end of the program (**P<0.01; Table 2 item 1**). In fact, **seventy-one percent** indicated that their participant meet or exceeded expectations. **Seventy-one percent** also indicated that their participant produced data that could be used in a future publication.
- ◆ The REU SITE included programming to help prepare students for success in the application process and graduate school. The data from **item 2 and 3 of Table 2** indicate that by participating in the program participants felt better prepared for success in the application process and graduate school (**P< 0.04 and P< 0.02**, respectively).
- ◆ The students participated in a journal club together focused on BMMB research being done in their labs and engaged in facility tours of a industry research facility and a clinic research facility which both do BMMB research. The data from **item 4 of Table 2** indicate that by participating in the program participants felt better prepared to communicate about advances in BMMB research (**P< 0.04**).

## Conclusions

- ◆ Participants were able to engage in independent hands-on research
- ◆ Participation in the program increased students perceived preparedness with succeeding in the application process and graduate school.
- ◆ Participation in the program increased students belief in their ability to communicate about BMMB.
- ◆ All of our participants were URM, although it is too soon to determine whether they will ultimately pursue a graduate degree.

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## References

[1] 1.National Science Foundation, N. C. for S. and E. S. *Women, minorities, and persons with disabilities in science and engineering. Special Report NSF 17-310* (2017). doi:SpecialReport NSF 17-310.