

## Undergraduate Research Conference

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In the space below list the title and author of the posters you visited and provide a brief critique of the poster. You must review a minimum of 5 posters. The poster cannot be your own and it can not be a poster from one of your classmates.

**Check one**

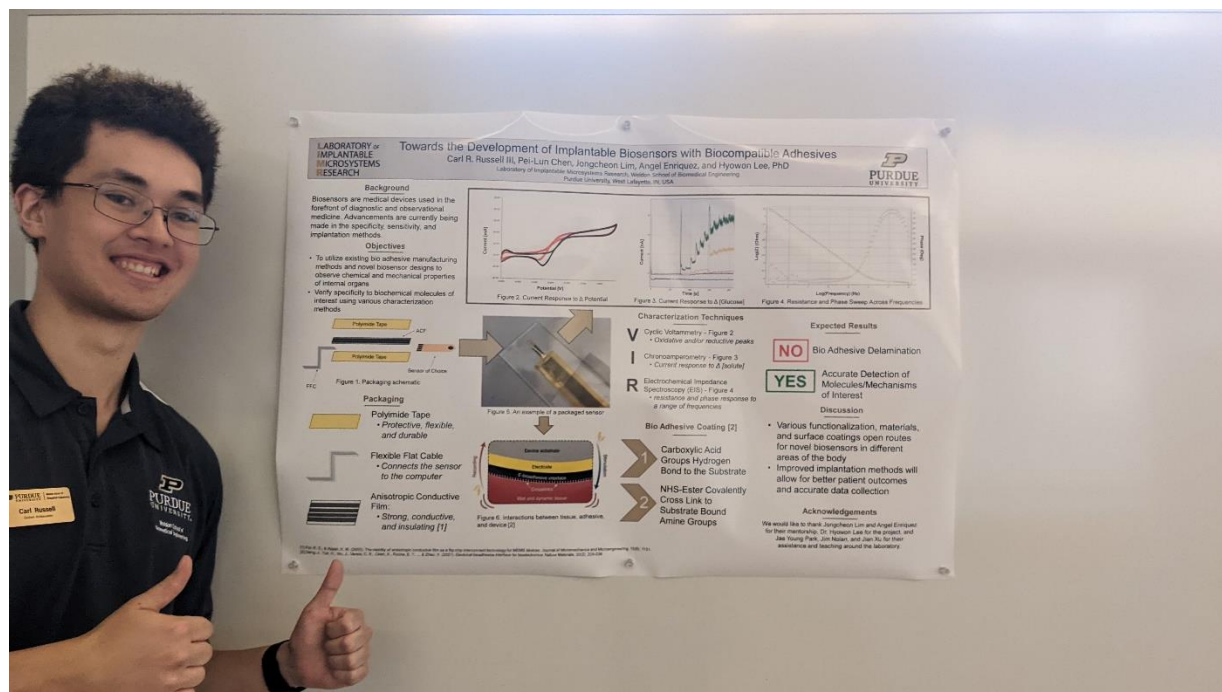
X	Posters were reviewed in-person at the Undergraduate Research Conference 4/12/22
	Posters were reviewed on-line as part of the virtual conference.

Explain (if the posters were reviewed on-one as part of the virtual conference, explain why you were unable to attend the in-person conference.

**Poster 1**

Towards the Development of Implantable Biosensors with Biocompatible Adhesives

Carl R. Russell III, Pei-Lun Chen, Jongcheon Lim, Angel Enriquez, and Hyowon Lee, PhD



I found this poster incredibly interesting and informative, however, if Carl had not been there to talk me through it, it would have been hard for me to understand what was going on, mainly because the vocabulary being used and the diagrams were extremely unfamiliar to me. I would suggest that there would be more text or definitions of the words being used, so people alien to the subject matter would be able to understand most of it

## Poster 2

## Building Interconnected Knowledge of the Cardiovascular System Through Functional Model Manipulation

Lauren Skadberg, Lisa Hilliard

**Building Interconnected Knowledge of the Cardiovascular System Through Functional Model Manipulation**

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**Abstract**

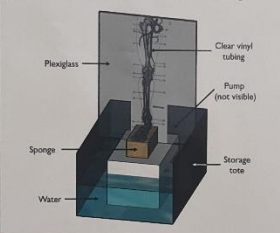
Three-dimensional model manipulation has become a standard component of anatomy education due to the known connections between tactile manipulation and learning gains. It is known these types of activities result in higher engagement levels due to their student-centric nature, yet their ability to foster elevated interconnected knowledge gains further supports their implementation; however, certain modeling methods present potential challenges. Static models lack the structural and morphological changes inherent in living organisms. This dynamic absence creates a disconnect between form and function that introduces difficulties in extrapolating learning to living organisms. While virtual models afford a slightly more dynamic visual representation of the human form, they lack the tangible benefits garnered through kinesthetic exploration and manipulation of physical models. A model incorporating tactile engagement along with maintenance of the dynamic link between form and function in states of health and disease could address these challenges and illicit stronger deductive reasoning gains from students. This is of paramount importance in the training of future practitioners. The goal of this project is to do just that, create a manipulable cardiovascular peripheral perfusion model to emulate clinical symptoms often encountered in select states of cardiac dysfunction. Student volunteers will engage with the model during active instruction sessions. In addition to post-session surveys about preferences, impressions, and perceived knowledge gains, participants will be given an application assessment incorporating problem-based questions to discern both enhanced and transferable learning gains.

**Introduction**

Using a functional cardiovascular perfusion model to supplement traditional didactic anatomy instruction will enhance students' depth and understanding of the intimate connection between structure and function in states of wellness and disease, generating malleable, interconnected knowledge gains in support of problem resolution in application settings.

**Materials**

The three-dimensional model used will be a peripheral perfusion model driven by a cardiovascular emulator. The main materials utilized to construct this model are identified in the image below.



**Methods**

We will have two volunteer student groups to test the effectiveness of the model. Both groups will engage with relevant reference materials such as textbook readings and appropriate visual renderings of anatomical structures. One group's session will incorporate static models and the other, while having more simplistic supportive textual content, will participate in active learning sessions focusing on engagement with three-dimensional models. The experimental group's session will include a scaffolded demonstration of the three-dimensional model to ensure proper problem-based learning methods and usage of the equipment. This experiment will be utilizing a mixed methods assessment incorporating Likert scale questions such as answering how much a student agrees with the statement "The model effectively enhanced my understanding of the topic" measured on a 1-5 scale and open-ended questions to collect data on student perceptions about each method of teaching.

Each participant will complete an anonymous pre-assessment to assess previously established knowledge and a post assessment to analyze gained understanding and application of the learning outcomes. Both groups will have the same challenge application activity to discern the depth of learning.

**Data Analysis & Expected Results**

Based on the known benefits of three-dimensional models in anatomy education, we expect that the group participating in active learning sessions utilizing the three-dimensional model will elicit enhanced learning gains on a post-assessment application centric transfer problem compared to the traditional didactic learning group. Additionally, we expect the three-dimensional model group to report more positive perceptions of the problem-based learning method than the didactic learning method. For future directions, we plan on completing construction of the functional model, testing its integrity, attaining IRB approval, and completing data collection and analysis.

**References**

1. Alchin, D. (2013). Problem- and Case-Based Learning in Science: An Introduction to Distinctions, Values, and Outcomes. *CBE - Life Sciences Education*, 12(4), 264-272. <https://doi.org/10.1186/cbe-12-0139>
2. "Fig. 3. Main Arteries and Veins of the Lower Extremities. Arteries (1).". *ResearchGate*. [https://www.researchgate.net/figure/Main-Arteries-and-Veins-of-the-lower-extremities-Arteries-3-General-Artery-2\\_fig1\\_12501135](https://www.researchgate.net/figure/Main-Arteries-and-Veins-of-the-lower-extremities-Arteries-3-General-Artery-2_fig1_12501135)
3. Prentis, D., Wilkasa, S. R., Lann, R., & Weller, R. (2013). "Let's Get Physical": Advantages of a physical model over 3D computer models and textbooks in learning imaging anatomy. *Anatomical Science Education*, 6(4), 225-226. <https://doi.org/10.1002/ase.1345>
4. Roderbush, D. W., Lajon, R. L., & DeCale, S. E. (2012). Learning by doing: construction and manipulation of a physical muscle model during lectures. *Advances in Physiology Education*, 26(4), 392-396. <https://doi.org/10.1152/advan.00099.2012>

**Acknowledgements**

We would like to thank the School of Health Sciences Undergraduate Honors Research Program for providing the opportunity of carrying out this research.

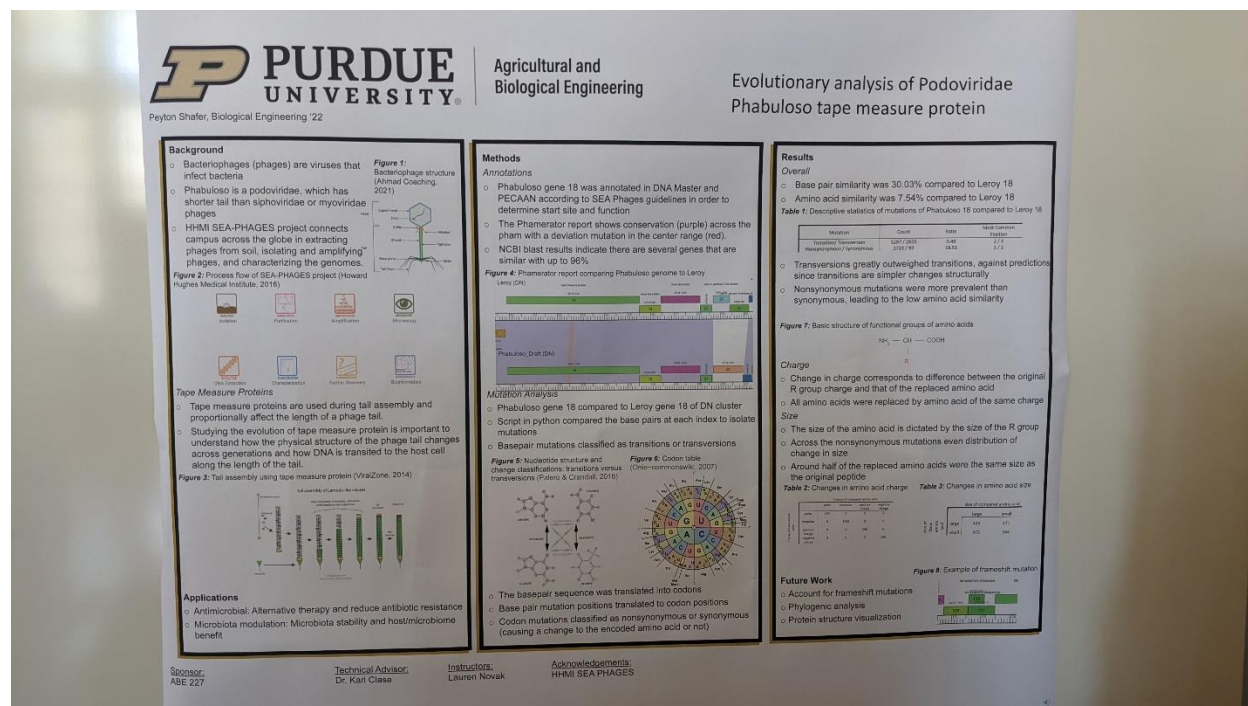
This poster was the opposite of the first poster, and only featured one diagram supported by a lot of text. I believe if I had more time, I would have been able to better understand the poster, but even the walkthrough was difficult because it was hard for me to locate the particular section of text she was talking about, which would be hidden in this huge block of text. Going forward, I would recommend only the important parts of text, and maybe more visuals to speed up understanding.

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## Poster 3

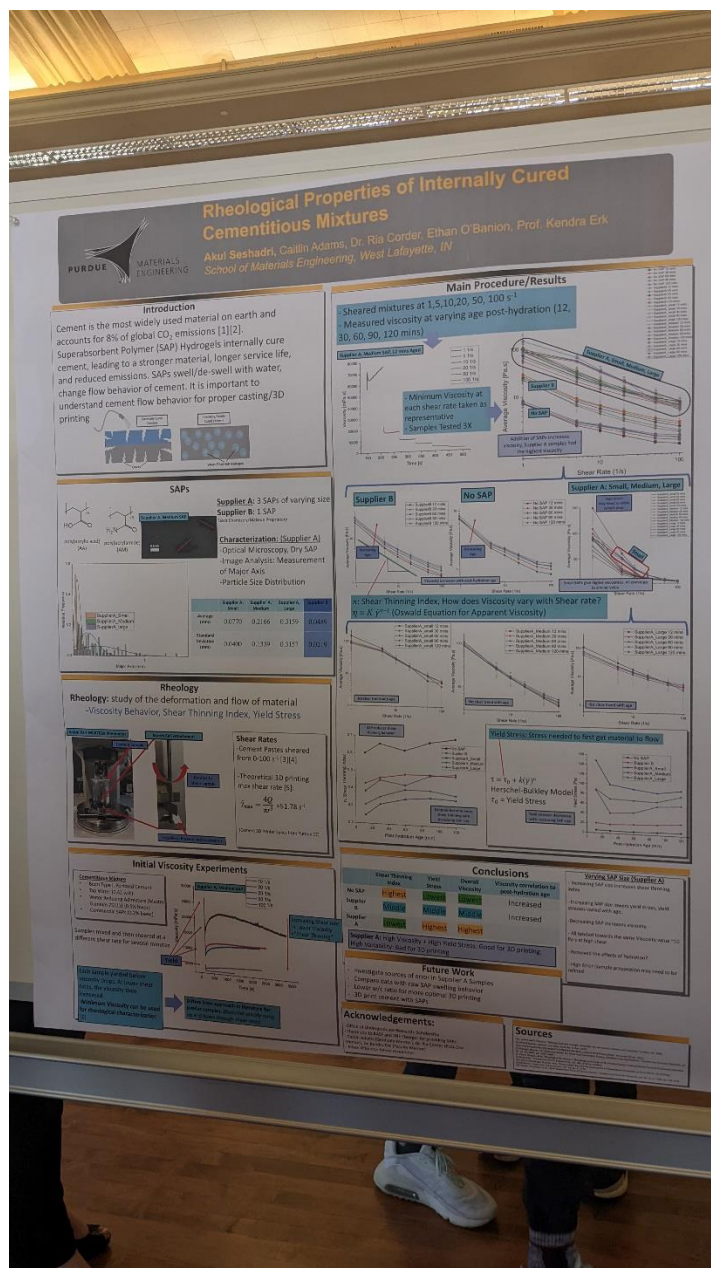
## Evolutionary analysis of Podoviridae Phabuloso tape measure protein

Peyton Shafer



## Rheological Properties of Internally Cured Cementitious Mixtures

Akul Seshadri, Caitlin Adams, Dr. Ria Corder, Ethan O'Banion, Prof. Kendra Erk



This was one of my favorite posters at the symposium. At first, I found the title and most subsequent text confusing and intimidating, however as I read further, I found that each potentially unknown term was clearly defined, and there was a proper sequence to the presentation which allowed developing questions to be answered immediately. I found there to be a great balance between text and graphics, and both were relatively easy to understand, so I was able to spend more time asking more insightful questions instead of questions clarifying the content.

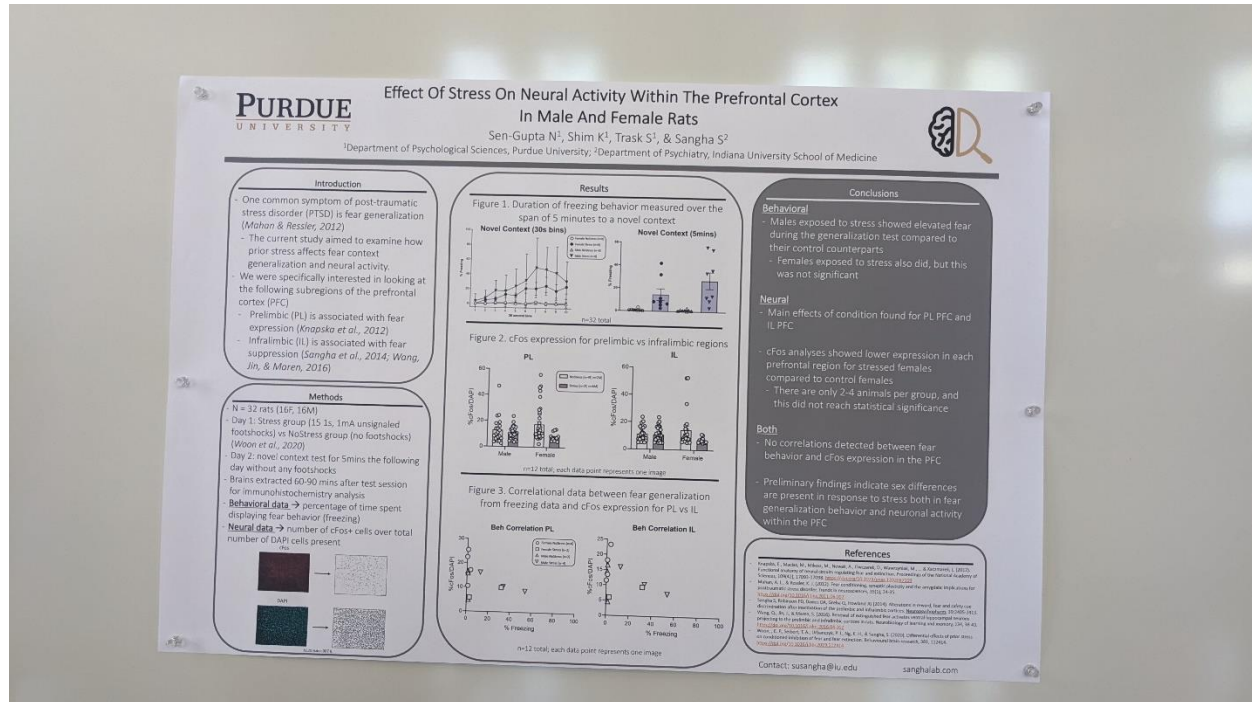


## Undergraduate Research Conference

## Poster 5

## Effect Of Stress On Neural Activity Within The Prefrontal Cortex In Male And Female Rats

Sen-Gupta N, Shim K, Trask S, &amp; Sangha S



Although this poster did not possess the colorful elements that many other posters did, it was one of the easier ones to follow along. This one also had a clear beginning, middle, and end to it, allowing for a smoother flow when reading the poster, and the use of common diagrams made understanding the research much simpler. The work was presented in a way that eliminated the use of complex terms, and conveyed the same message across, which allowed for clearer understanding, and I think I retained the most information out of this poster than the others.