ExEL Research Pillar
A Brief Overview of Student Experiences

ExEL Conference | April 23, 2019
Research Workshops

Research 101
How to Find Research Opportunities
Research Discussion Panel
Workshop Student Feedback - Expectations

Expectations
- To be fun and challenging
- To provide an opportunity for faculty/researcher mentorship
- To help understand how to do research
- To encourage me to pursue my own interests
- To socialize with students with similar goals
Future Goals

- Interested in enrolling in more courses related to research.
- Participating in undergraduate research opportunities is a priority.
- Developing research skills is an important part of my career goals.
Why are you interested in doing research?

- I am interested in doing medical research because I want to become a doctor and I hope to gain new opportunities and insight.
- I am planning to attend medical school. I believe an undergraduate research experience will be beneficial to my future career and my time in medical school.
- Allows you to discover new friends and be involved. A part of something rather than reading about it.
- Research is exciting and interesting. You are testing something which may have never been tested before. In research you have discoveries based on evidence.
- I am interested in doing research because I want to experience in a clinical setting to help in my future education as a pre-dental student.
What have you learned from participating in this research so far?

• I learned how to create an agarose gel for protein extraction. I learned how to change the medium for cancer cells. I learned how to operate under a fine hood and I have observed the handling of cancer cells under various treatments and procedures, such as performing a Western Blot.
• I have learned that there is a correlation between people who have myocardial infarctions and sporting events that are occurring.
• I have learned how to be more confident in the lab.
• The behind the scenes set-up, how to conduct experiments and accurately record/interpret data.
• I’ve learned how to apply the concepts learned in organic chemistry 1 and 2 to actual use. Furthermore, I learned that research can be an extremely long process. Reactions that look easy on paper do not necessarily work well in real life. It's all about working around these problems and figuring out solutions.
Describe your interactions with your research mentor. Include things that you like and things that could improve.

- Our research mentor gives us many opportunities to observe various procedures and treatments (Western Blot, creating a gel, changing cell mediums) and I wish we had more opportunities to perform these various procedures ourselves of course with hands-on teaching.
- My research mentor has a supplemental mentor that is extremely helpful in teaching and explaining the details of the project. He is not overshadowing but letting my partner and I experience most things by doing rather than saying. He is always available and loves our input on the project.
- I feel comfortable working with my mentor and providing feedback to how I should proceed. I’ve been given a lot of autonomy, and it’s nice because my contributions feel like they make a difference.
Is this experience meeting your expectations? If so, what do you like about it? If not, what is different?

- This experience meets my expectations; however, I wish our timings for research were less tentative and there was less of a waiting process in performing certain activities.
- Yes, although receiving a publication on our research seems out of reach right now, it is much more hands-on that I expected and there is a great deal of responsibility being given out. I like how, if we don’t understand what is going on, we are given time to research through databases to better our understanding.
- Yes, I like that despite psychology being my minor I can get involved and understand what is being done. I enjoy the independence and responsibility we are allowed when we conduct the research.
Reflections

Things to consider

• What assumptions were challenged by this experience?
• In what ways did your understanding of the science or the investigation of the problem grow?
• In what ways did this experience relate to what you have learned in the classroom?
• How did this experience affect your strengths and weaknesses?
• In what ways will this experience influence future academic or professional endeavors?
Several things came out of this experience. First, I became the first student at our school to present an original paper in Washington, DC at a Pi Sigma Alpha conference, which was an immense honor. But secondly, was the feeling that **I had come across something I loved**...I knew that whatever I had done in DC I needed to do again.

I knew then and there that this is something that I wanted to **do**...if I go down this path, I would have the opportunity to influence the minds of my students who could potentially become the policy-makers, activists, journalists, and revolutionaries of the future...

- David Rocha
Reflections

Being involved in undergraduate research not only has been a lot of fun but helped further develop my investigational approach as well as my understanding of the investigation set up and approval that occurs before scientific students.

- Catherine Weber
Prior to conducting research and writing a cohesive argument to validly set forth my thesis, I had no idea how much investigation and revision it took to complete a philosophy research paper. I neither realized that the investigation was certainly not relatively straight forward, nor did I initially consider the many elements one must first explain and develop to argue a conclusion soundly.
Reflections

Genesis Alvarez

DEVELOPMENT

• After having conducted and completed my research, I found that my understanding of biomedical ethics had developed significantly. This study was not what I had initially thought. One did not merely discuss issues on current medical practices without a sound basis for our arguments. I learned that through the implementation of a certain philosophical perspective one could develop valid reasoning for the position one holds. My more developed understanding helped me come to terms with the fact that one cannot simply set forth an argument without having sound justification for it, and thus I could with more facility debate with others on various matters.
Reflections

Genesis Alvarez
Reflections

Miloni Shah

Prior Assumptions

- Prior assumptions included having limited lab time and mostly learning within online research. This was first challenged when we were given tasks to do by ourselves. For examples, within a few weeks in, we started changing growth serum for the cancer cells that were growing.

- We believed that studies would be involving a large group of students on animals. This was challenged when we were given an individual cancer cell line to focus on while treating it through in-vitro inspection rather than through rats.

- One assumption was that we would be doing more microscope work while the current study focused on gene expression rather than watching growth rate of the cells.
Reflections

Miloni Shah

Connection to classroom

- Research methods were taught as PCR methods in biology classes and were then expanded on in research.
- Lab techniques used in research were applied to lab work for upper level neuroscience courses, as well as completing a literature review.
- Research methods including studying past sources and history of discovery regarding p21 acetylation were applied to find gene expression for other biological markers.
Reflections

Miloni Shah

Scientific growth and investigation

- Literature readings were done regarding series of proteins that are expressed for cell growth which may be the cause of cancer. This included readings on p21 and MDM2 which link to suppress cell growth in case of tumors. Studies regarding SAHA and RG7378 (anti-cancer drugs) were conducted to find effects on accelerating acetylation rates of p21 gene.
- Investigation included use of different research methods including SDS gels and western blots to extract concentration of anti-cancer drugs that affect cell growth.
Questions?

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