

Undergraduate Researchers 2009 – 2010

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Melissa Chapman, Biology

Survey of Ashkenazi Jewish Young Adults Attitude about Testing for Gaucher's Disease

Faculty Mentor: Dr. Andrea Kalfoglou

Ashkenazi young adults in college and even high school have been encouraged since the 1970s to receive genetic testing for their risk of passing Tay Sachs on to their children. Today, genetic tests include "Jewish panels," tests for carrier status for diseases which are of concern in the Jewish population. Recently, controversy has erupted about whether or not Type 1 Gaucher disease ought to be included in the Ashkenazi carrier-testing panel because Gaucher frequently has mild to no symptoms and usually can be treated with a new enzyme replacement therapy. In rare cases it can be life-threatening and very painful.

We can learn from the carrier-testing experiences of members of the Ashkenazi Jewish population. This study will use mixed methods to conduct a public consultation with Ashkenazi young adults to better understand their knowledge, attitudes, and expectations around carrier testing. These data can serve as a model to inform policymakers about the expectations of consumers for the design and implementation of the next generation of carrier testing. We will first qualitatively explore this topic through focus groups with young adults in Baltimore and New York City who have 1) not been tested; 2) been tested through Dor Yeshorim (a private testing organization that serves primarily the Orthodox Jewish community but wants to expand to provide services for less traditional Jews. The organization does not disclose individual test results); and 3) been tested through a physician/center/laboratory where they received their individual test results. Our findings may have broad-based implications for the development of policy and practice guidelines for multiplex genetic-carrier testing.

How did you find your mentor for this project?

Dr. Kalfoglou is the faculty advisor the Bioethics Student Association for which I was vice-president. She encouraged students to apply to present work at national research conferences. After working on my presentation with Dr. Kalfoglou, I asked her to be my mentor.

How did you know this was the project you wanted to do?

After presenting research in the conference, I realized this was an interesting topic that I wanted to learn and explore more about.

Is this your first independent research project?

No, I did independent research last semester as well.

Do you get course credit for this work?

Yes I am receiving three credits as an independent study, Psyc499

How much time do you put into it?

I meet with my mentor Dr. Kalfoglou once a week to discuss progress on my research. At home is when I do my literature research, work on recruiting participants etc.

How did you hear about the Undergraduate Research Award program?

Last year I participated in URCAD and found out about this amazing program that would enable me to continue working on my research and receive funding as well.

What academic background did you have before you started?

I had done clinical research at St. Joseph's Medical Center one summer.

Was the application difficult to do?

Definitely not. It was pretty simple to do.

How much did your mentor help you with this?

My mentor was a huge part in helping me with my research. She was always there to answer any questions that I had and to make sure the project ran as smoothly as possible.

What is your advice to other students about getting involved in research?

I highly recommend getting involved in research. It's such a worthwhile experience.

What are your career goals?

I plan on going into the health field.

What has been the hardest part about your research?

The hardest part about research is managing your time.

How does your research relate to your work in other classes?

I am a Psychology major, Biology minor, and my research topic deals with both these topics.

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George Cutsail III, Chemistry

Copper Amyloid-beta Complex in Alzheimer's Disease

Faculty Mentor: Dr. Veronika A. Szalai

Alzheimer's disease (AD) is the seventh leading cause of death in the United States. Extracellular proteinaceous plaques of the amyloid-beta ($A\beta$) peptide are linked to dementia in patients. Metal ions like copper (Cu) are in the Ab plaques from AD patients, but the significance of this finding with regard to disease etiology is unknown. We aim to characterize the interaction of copper with $A\beta$ to elucidate its role in AD. The $A\beta$ gene has been amplified by PCR and ligated into a modified pET-21 vector designed by Dr. Garvie (UMBC, Chemistry and Biochemistry). This vector allows for controlled expression and includes a protease site that allows for cleavage of the $A\beta$ peptide. Expression will be evaluated using gel electrophoresis. The Cu:Ab complex changes its size/structure over time and the effect of these changes on neurotoxicity is not known. We will determine neurotoxicity of these Cu:Ab complexes using a rapid neurotoxicity assay developed by Dr. Good (UMBC, Biochemical Engineering). After we have identified which Cu:Ab complex has the largest effect on neuron survival, we will determine its structure using site directed spin labeling. Correlation of neurotoxicity with Cu:Ab structure will aid drug intervention strategies for AD.

How did you know this was the project you wanted to do?

After reading many of the chemistry department's faculty research profiles, Dr. Szalai's interest in copper role in Alzheimer's disease struck me as a great area to research. I simply sent Dr. Szalai an email to set up a meeting to discuss her research. I

have been working with her ever since. I had an interest in inorganic chemistry and this project seemed to be a good fit with my other research experiences in biochemistry.

Is this your first independent research project?

No, I participated in two other research internships before this project

How much time do/did you put into it?

Depends, some weeks I spend just a few hours, but other weeks I have spent much more, sometimes 25+ hours.

How did you hear about the [Undergraduate Research Award](#) program?

I saw information listed on myUMBC and checked out the website.

Was the application difficult to do?

The application was fairly simple. Just a few questions that are very easy to answer if you have a plan before applying.

How closely do/did you work with your mentor on this project?

My mentor helped me shape the proposal and she assisted me with the final edits of my application. We meet once a week to check the progress of my work and to discuss new directions to take. I am able to work very independently on my project with very dedicated guidance from Dr. Szalai.

What academic background did you have before you started?

At the time I received for the URA Award, I had just finished my sophomore year. I hadn't yet taken inorganic chemistry until this year, but you don't need to know everything to do the research. You will learn so much as you go.

What is your advice to other students about getting involved in research?

Get involved early, that way you find what you like and you will have more potential to excel with more time.

What are your career goals?

After UMBC, I plan to go to graduate school to earn a PhD in chemistry. I want to stay in research.

What has been the hardest part about your research?

Sometimes things move very slowly, but then things can fly along the next week. You need patience.

How does your research relate to your work in other classes?

Sometimes it relates, sometimes not. Often I have learned a lot of chemistry and techniques for my research that are simply not covered in undergraduate courses, but basics I have learned can be applied to everything I do.

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Vivian Ekey, Spanish and Political Science

Afro-Porteño Identity Today

Faculty Mentor: Dr. Sara Poggio

The history of people of African descent in Argentina continues to be a mystery to most people. Comparing census results from the 18th and 19th centuries shows a drastic drop in this population. Perhaps the most obvious place to study this trend is the city of Buenos Aires. In 1806, the Afro-Argentinean population seems to have been at its peak, at 30.1%. By 1887, however, this population had dwindled to only 1.8%. Today, Argentina's census has no specific category to account for people of African descent. Amongst most Porteños (Buenos Aires citizens), the general consensus is that there are no Afro-Porteños. More knowledgeable residents may cite the War of Paraguay and the Yellow Fever epidemic, which are thought to have decimated the population in the mid- to late-19th century.

Within the last decade, research has brought to light two key facts. First, there are indeed existing Afro-Argentines, descendant of the original slaves brought to the Rio de la Plata Region (encompasses Argentina, Paraguay and Uruguay.) Secondly, these descendants are actively seeking social and political recognition. After providing historical insight on the topic, my research will take into account not only this population of Afro-Argentines, but other groups of African descendants living in Argentina in order to characterize Afro-Argentinean identity in Buenos Aires today.

How did you find your mentor for this project?

Dr. Poggio was my professor for a course in my major/ and of the same research area. She is a native of the country I did my research in.

How did you know this was the project you wanted to do?

I am interested in social movements and identity politics

Is this your first independent research project?

Yes

How much time do you put into it?

About three hours a day while I was in Argentina; less time now

How did you hear about the Undergraduate Research Award program?

Through the Humanities Scholars program. I am a humanities scholar.

Was the application difficult to do?

No

What is your advice to other students about getting involved in research?

Think long and hard about a research question and devote adequate time to the proposal. Develop methodology.

What are your career goals?

International relations/law work

What has been the hardest part about your research?

Balancing my semester workload with my research

How does your research relate to your work in other classes?

It integrates political science and the humanities

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Scott Gautney, French

Cultural Effect on Sexuality-based Linguistic Differences

Faculty Mentor: Dr. Thomas Field

There is only a rudimentary understanding of the ways in which sexuality and culture interact in structuring language. This study is an exploration in quantitative sociolinguistics in which I interview both heterosexual and homosexual men in France and America. The interview is designed to elicit lexical (or word-based) responses. I am specifically interested in the lexicon of these men as related to sexuality itself. Certain questions in the interview are designed to elicit the words that heterosexual and homosexual men use to talk about men's sexuality. Additional questions are personal in nature in which the subject discusses his feelings towards these words. Once the results are quantitatively analyzed, I will compare them cross-culturally to determine whether there is a difference between French and American speakers (as regards the type of words used and their attached significance) and whether or not any differences could be correlated to

culture.

How did you find your mentor for this project?

My first semester at UMBC, I took MLL 190 with Dr. Tom Field. Later that year, he became my major advisor. After taking a sociolinguistics course with him and being a Research Assistant for Dr. Field's own research, I knew he would be the perfect faculty mentor for this project.

Is this your first independent research project?

Yes.

How did you hear about the [Undergraduate Research Award](#) program?

I received several emails regarding the URA program, though I have to admit I didn't pay them much attention. It wasn't until a professor of mine urged me to apply that I began to plan a proposal.

What academic background did you have before you started?

The only background in research that I had before applying for a URA was a LING 360 (Sociolinguistics and Dialectology) course I took with my current mentor, Dr. Field. In that course, I completed a small-scale research project which is the model for my current research. Then, this past semester, I assisted Dr. Field in his own research and learned a little bit more about the work associated with research.

Was the application difficult to do?

Not at all. The URA website has a lot of helpful information as well as models to help inexperienced students like me prepare a comprehensive proposal.

How much did your mentor help you with this?

Dr. Field helped me in tightening the scope of my project. He also continues to help me by giving me advice and reviewing the work that I am doing to make sure that I am on track. Also, when I took LING 360 with him, he mentioned that little research has been done regarding language and sexuality. This is where I took my inspiration.

What is your advice to other students about getting involved in research?

For many undergraduates, “research” may be a foreign and frightening term. When I first came to UMBC, I made it my goal to avoid doing research at all costs. Then, I decided to apply for the position of Dr. Field’s Research Assistant. Along with the experience I gained in his LING 360 class, I fell in love with the idea of conducting my own research and adding knowledge to the field of Sociolinguistics. My advice is not to be afraid of research; if a certain subject sounds even remotely interesting to you, talk to a professor about getting involved.

What has been the hardest part about your research?

The hardest part of my research thus far is trying to create an interview in both French and English which is culturally accurate and which will give me unbiased results that I can then compare.

How does your research relate to your work in other classes?

In LING 360, I learned the basics of sociolinguistic research. My current project uses what I learned in that class as a general model. It also draws upon what I’ve learned not only in other linguistics courses but also what I’ve learned about French culture in my French courses.

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James Gerity & Tyler Schmitz (not pictured), Physics

Cloud-CubeSat: Designing a Picosatellite

Faculty Mentor: Dr. Vanderlei Martins

At this time, measurements of cloud structure (vapor content, etc.) are difficult to obtain. Generally, these data are collected during in situ aircraft experiments, which typically last several hours. This data snapshot is therefore incomplete; the structure of the cloud has changed by the time the measurements are complete. The goal of the Cloud-CubeSat project is to design and create a picosatellite (10x10x30cm, 3kg) to take these measurements from orbit around the Earth, using Cal Poly’s CubeSat satellite standard as a base. Unlike previous CubeSats, this satellite has very specific pointing requirements, necessitating a sophisticated attitude control system. Such systems, although frequently implemented on larger satellites, are virtually unproven on the scale of a CubeSat. Using hardware and algorithms designed by engineering students at Olin College, our goal is to assemble a prototype of Cloud-CubeSat and construct a testbed to investigate the problem

of three-axis stability.

How did you find your mentor for this project?

Tyler and I both took Dr. Martins’ Physics 224 class, and regularly discussed research with him. He noted our interest and invited us to join his Cloud-CubeSat project.

How did you know this was the project you wanted to do?

I knew this project was something I wanted to be a part of because it brings so many disciplines together, combining the engineering and design aspects of the satellite's actual design with the goals of atmospheric physics.

Is this your first independent research project?

Yes.

Do you get course credit for this work?

Tyler and I both received credit for our work on this project in the Spring 2009 semester.

How much time do you put into it?

During the Spring 2009 semester, Tyler and I met meekly with Dr. Martins and other individuals to discuss the research material, and directed our own research on other days. During the Summer, Tyler and I have both been awarded a JCET Fellowship, and have been continuing our research under that.

How did you hear about the Undergraduate Research Award program?

I first heard about the program from discussions about URCAD in the Society of Physics Students group, and Dr. Martins suggested both Tyler and I apply for a URA after we began working with him.

What academic background did you have before you started?

Both Tyler and I had a few introductory physics courses under our belts and a strong math/computer science background when we started our work.

Was the application difficult to do?

The only difficult thing about it was describing such a neat project in such a small space.

How much did your mentor help you with this?

Dr. Martins has read many URA proposals in previous years, and he offered his opinion on our proposal.

What is your advice to other students about getting involved in research?

Treat research as a normal topic for conversation. Ask around and learn about a lot of different projects in a lot of different fields. Read some scholarly journals in your own time.

What are your career goals?

Nothing specific, but definitely research-oriented.

What has been the hardest part about your research?

Learning how to hunt for and obtain very obscure and niche research material.

What was the most unexpected thing?

The independence; directing my own focus, selecting my own topics for research, etc.

How does your research relate to your work in other classes?

Exploring the dynamics of orienting a spacecraft involve a lot of mathematical manipulation, physical models, and computer simulation, all of which have been covered in my prior and current classwork.

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Mike German, Chemical Engineering and Biochemistry

Evaluating Deoxyribozymes as a Novel Antiretroviral Therapy in HIV-1

Faculty Mentor: Dr. Daniele Fabris

Due to the rapid emergence of strains that are resistant to one or more of the active agents used in typical multidrug regimens targeting the human immunodeficiency virus type 1 (HIV-1), it is necessary to explore the development of novel antiretroviral therapies. As such, we aim to evaluate deoxyribozymes (DZs) as possible therapeutic agents targeting specific, highly conserved domains of the 5'- untranslated region of the HIV-1 genome, such as the packaging signal (Y-RNA) and transactivation response element (TAR), which each play crucial roles during the viral life-cycle. DZs provide substantially more attractive candidates for antiviral applications as compared to their ribozyme counterparts due to their superior chemical stability, lower potential toxicity, and improved catalytic efficiency. While in principle viral infections of any kind might be treated with nucleic acid enzymes designed to cleave essential mRNAs, those viruses that carry an RNA genome, such as HIV-1, appear to be the most promising targets.

How did you know this was the project you wanted to do?

I've worked with Dr. Fabris since the fall of 2007 when I wanted to do some biochemistry research. I enjoyed the work I was doing and the people I was working with, and I felt like the research could eventually be used towards the greater good.

How did you find your mentor for this project?

I took CHEM 300- Analytical Chemistry with Dr. Fabris in Spring 2007 and liked Dr. Fabris and asked him if I could do work with him in the fall.

Is this your first independent research project?

I had an internship down in Texas A&M University in Environmental Engineering. It was not so independent and I don't think we did that much research, but it was something.

Do/did you get course credit for this work?

I got CHEM 399 credit in Fall 2007.

How did you hear about the [Undergraduate Research Award](#) program?

Probably through a website, email, poster, or teacher. I had heard about it before and had ideas for interesting research, but couldn't find professors to work with.

Was the application difficult to do?

No we just wrote about our future plans.

How much did your mentor help you with this?

He was not too involved in the application procedure. Kevin Turner, the post-doc in my lab, has been very supportive of me throughout the time I've worked with him. He has really helped me to become a better scientific writer.

What is your advice to other students about getting involved in research?

Even if the research areas do not sound too interesting, just go out and try some field. I did not get involved until junior year because I was not interested in the web abstracts I saw for professors. But reading a web abstract does not fully explain what a professor is doing at the time, it's best to go and talk to professors you think you can work with.

What are your career goals?

To never enter the "real world." To help save the world, or at least help people to have cleaner water and more plentiful food. To play, have lots of fun, and not lose myself. I would like to have a big family eventually.

What has been the hardest part about your research?

Being patient.

How does your research relate to your work in other classes?

It's related to some topics in biochemistry. I am about to start some modeling work with Dr. Castellanos, and I think deoxyribozymes action and RNA structure could somehow be modeled in an interesting and meaningful way.

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Betty Irungu, Political Science

Ethnic Identity and election Violence

Faculty Mentor: Dr. Tyson King-Meadows

This study aims to evaluate two major concepts. The first concept is the role that identity politics play within Kenyan politics. The second concept to be evaluated is the effect of the reforms of the governance in Kenya, on citizenship. This is an eight -week cumulative study and is divided into three components. The first component analyzes how informal social institutions, such as ethnic identity, inform political culture, through open-ended interviews of targeted citizen stake holders through focus group interviews. The second component, content analysis of newspapers in Kenya, analyzes the frequency of ethnic-based terms and themes in print media and the effect on the electoral process. The final component is the analysis of the semi-structured interviews and identification of patterns and analysis of published regional survey data from the Afrobarometer. Kenyan political culture heavily favors regional and tribal stratification rather than national identity.

Tribalism, which sparked and acerbated the election violence following the December 2007 General election, reinforces regional identity, rather than multiethnic national identity. The main battle should be over preserving political institutions which have promoted growth and not the futile attempt to save the current political institutions. This project will establish where and how this battle may be fought.

How did you find your mentor for this project?

I found my mentor for this project, Dr. King-Meadows, after having taken several courses in the Department of Political Science.

How did you know this was the project you wanted to do?

My project began shortly after reading the current events on the issue, which led me to seek more information.

Is this your first independent research project?

Yes, this is my first independent research project.

Do you get course credit for this work?

Yes, the work for my Undergraduate Research Award is the raw data for my honors thesis in Political Science.

How much time do you put into it?

I typically put in several hours a week either reading or summarizing the relevant literature.

How did you hear about the [Undergraduate Research Award](#) program?

I heard about the Undergraduate Research Award through the Department of Political Science in my course on Research Methods in Political Science (POLI 301).

What academic background did you have before you started?

I am a Sondheim Public Affairs Scholar and I have worked on other research projects with my mentor.

You have a \$1,500 Undergraduate Research Award from UMBC for your work. Was the application difficult to do?

The URA application was challenging as it required attention to detail and knowledge of how my work would contribute to the body of scholarly work on the topic.

How much did your mentor help you with this?

My mentor provided useful information and journal articles as well as a foundation upon which to further build my idea into a URA project.

What is your advice to other students about getting involved in research?

Research is a great way to challenge oneself academically as well as a wonderful preparation for graduate study.

What are your career goals?

I intend to pursue a law degree and a Ph.D. in Political Science or Public Policy.

What has been the hardest part about your research?

The hardest part about my research has been reading the scholarly material on the topic.

What was the most unexpected thing?

The most unexpected thing was my excitement in finding other scholars who share my interests!

How does your research relate to your work in other classes?

My research has helped me in my critical thinking and significantly challenged me to apply relevant scholarly research in my other coursework.

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Shane Logue, Video/Film and Art History

Heinrich Schliemann: Odyssey of the Mind

Faculty Mentor: Ms. Cathy Cook

This research grant will be assisting my funding as I study abroad in Athens, Greece. I will be attending the Hellenic Center for Mediterranean Studies through Arcadia University. During this time of study I will also be researching the controversial German archaeologist Heinrich Schliemann. Schliemann advocated the historical reality of places mentioned in the works of Homer. Schliemann was an important excavator of Troy, along with the Mycenaean sites Mycenae and Tiryns. His successes lent material reflecting actual historical events. I would like to interview art historians in Greece about their views of Heinrich Schliemann. I will be documenting my experience with video and audio taken at some of the ancient sites. I will present my short documentary video upon returning to my Special Topics: Documentary class in the fall.

How did you find your mentor for this project?

Cathy Cook is an experimental documentary filmmaker in the film department and was my Film II professor.

How did you know this was the project you wanted to do?

The pieces all fell together and it just felt right. It was a spark of an idea that I wanted to explore and just needed the resources.

Do you get course credit for this work?

Yes. I combined it with my Study Abroad class, which I received credit.

How much time do you put into it?

About seven hours a week towards the completion of my documentary.

How did you hear about the [Undergraduate Research Award](#) program?

From the UMBC website.

What academic background did you have before you started?

Almost three years of undergraduate studies.

You have a \$1,500 Undergraduate Research Award from UMBC for your work. How did you hear about this program?

I had seen fliers for the URA in the Visual Arts Department and fellow student, Theresa Columbus.

Was the application difficult to do?

It took me about a week to develop my idea and a few hours to complete.

How much did your mentor help you with this?

My mentor was instrumental in planting the experimental documentary idea into my research but not heavily involved in the overall idea.

What is your advice to other students about getting involved in research?

Find something in your everyday life that interests you and expand upon it in hope of finding the unexpected.

What are your career goals?

Graduate school for Film Producing.

What has been the hardest part about your research?

Writing the treatment for the documentary aspect of the research.

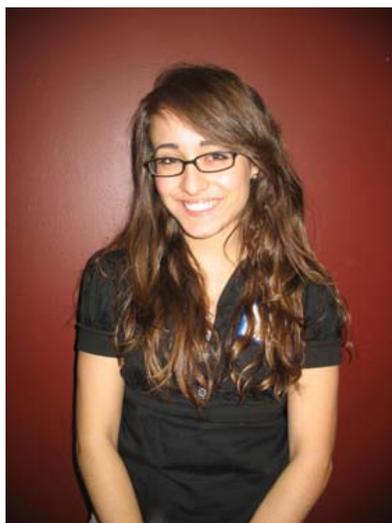
What was the most unexpected thing?

Traveling to Turkey and visiting the ancient site of Troy mentioned in the Iliad. Also, seeing the reproduced Hollywood Trojan Horse from the movie Troy given to Turkey as a "gift".

How does your research relate to your work in other classes?

It is a video documentary about Heinrich Schliemann and so it plays an important role in my Film/Video major. I am also taking a Documentary class as well to guide my research.

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Elizabeth Plum, Biochemistry and Molecular Biology

Aggregation of Potential Drug Delivery Vehicle

Faculty Mentor: Dr. Richard Karpel

Rattlesnakes are well known for their poisonous bites but surprisingly, the venom of the South American rattlesnake *Crotalus durissus terrificus*, possesses a valuable protein called crotamine. This protein is a 42-residue polypeptide with unusual properties not known to other toxins. It is a cell penetrating protein (CPP) and once inside cells, it localizes on chromosomes. Crotamine is not only able to penetrate, but is also a transporter, able to carry small molecules or even entire genes into cells. For example, it has been previously shown that crotamine facilitated the transfection of plasmid DNA into mice bone marrow. Crotamine specifically enters only actively proliferating (AP) cells through an interaction with heparin-glycosaminoglycans (GAG). It forms ternary complexes with these GAGs and DNA. Crotamine is able to bind to negatively charged DNA because it is highly basic, containing 9 lysine and 2 arginine residues. Crotamine-DNA complexes then enter the cell

by endocytosis and localize on the nucleus. Past experiments I have carried in the laboratory have shown that heparin can break up these aggregates and now I seek to characterize both crotamine-DNA and crotamine-GAG aggregates. Researchers have demonstrated that the internalization of these peptides is dependent on the size of the complex, signifying that different aggregate sizes have different transfection efficiencies. Therefore, the rate of endocytosis is dependent on the size of these aggregates and the optimum size will lead to better gene delivery. Because crotamine carries DNA into the cell in aggregated form, the characterization of these complexes is extremely important for understanding of this cell penetrating protein. The purpose of this research is to determine the conditions under which these aggregates form and the size of these aggregates,

including the hydrodynamic radii.

How did you find your mentor for this project?

I took biochemistry with Dr. Karpel in the fall of 2008 and then I approached him and asked him if there was space for me to work in his lab.

How did you know this was the project you wanted to do?

I find it extremely interesting! I work with snake venom that could one day be used to penetrate cells and deliver small molecules.

How much time do you put into it?

I usually go to the lab a couple times a week. It just depends on what needs to be done on that particular week.

How did you hear about the [Undergraduate Research Award](#) program?

I think I saw posters for it. Then I talked to my mentor about it.

What academic background did you have before you started?

I have done research before at NIH.

Was the application difficult to do?

Not at all. It actually helped me to sort my thoughts out about the project.

How much did your mentor help you with this?

If I had any questions, he was willing to answer them.

What is your advice to other students about getting involved in research?

Do it! It is such a great opportunity! It is the experience of a lifetime.

What are your career goals?

I have no clue at this moment. Maybe pharmacy school, maybe medical school. Only God knows!

What has been the hardest part about your research?

The hardest part is definitely putting time into it. I have to manage my time really well between studying, working two part-time jobs, and research.

What was the most unexpected thing?

The most unexpected thing, which was also the coolest thing, is that venom from the snakes that we research on actually comes from Brazil, which is where I am from!

How does your research relate to your work in other classes?

It relates to pretty much everything! I am always applying something that I learn in class, whether it is to make a solution, run an electrophoresis gel, or growing cells.

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Patrick Rife, Visual Arts - Art History

The Cyclical Nature of Obsolescence

Faculty Mentor: Steven Bradley

This research grant will be assisting my funding in building a sculpture/installation that investigates our cultural involvement in the consumption and rejection of technology. My research will allow me to investigate the sculptural properties of vinyl LPs in their physical presence as well as investigating the sculptural abilities of the content that exists on each of the LPs. In addition to aiding in the development of this piece my research will lend invaluable insight into my continued work with sound and how it can be represented in a physical space. This piece aims to initiate a dialogue that will span both cultural and generational boundaries in an effort to find a middle ground and our cultural commonalities.

How did you find your mentor for this project?

Calla Thompson introduced me to Steve Bradley when she was the instructor for my VCII class. Steve and I met one day and had a conversation and really hit it off. It's an interesting relationship because I have yet to take a class with Steve instructing, so it seems I have a much different relationship with him than many of the students in the program.

How did you know this was the project you wanted to do?

I had the idea for this installation in June of 2008 and spent a few months just kind of thinking about it without really talking about it. My background is in sound and music production so as a person who has only recently come to work with visual art, the idea seemed more like a plan I would need to come back to and deal with when I was ready and could financially support the work. Nonetheless, I continued mentally sorting out the rough details. When school re-convened Steve and I got together and I kind of spilled a million things that had been fermenting in my brain all summer, and one of those ideas was this project. Steve had mentioned URA grants to me previously, but at those times I don't think I was there yet in terms of having an idea that I felt strongly enough about to warrant pursuing the grant. After telling him about the project and the rough sketches I had developed, Steve again encouraged me to apply for a URA grant to fund this work. So really the idea more or less showed up right on time for the funding to come through.

Is this your first independent research project?

This is definitely the first independent research project I've done with any real expectations at the end.

Do you get course credit for this work?

Yes, I will be receiving course credit for this work. I was able to set up an independent study that will allow time for me to work on the installation. The sheer magnitude of materials being used requires a tremendous amount of physical labor. I will be working with between 8,000 and 10,000 vinyl records.

How much time do you put into it?

Well the process is just now beginning to gear up. I collected about 1,000 records last week. I think that as the summer comes to an end I will be putting in at least 10-15 hours a week. It's really hard to say because I will put in as many hours as it will take

but I cannot in anyway predict how easy or difficult the process will be. I'm new at this and will have many decisions to make in the creation process to come.

How did you hear about the [Undergraduate Research Award](#) program?

I learned about the URA program through Steve Bradley and my advisor Preminda Jacob.

What academic background did you have before you started?

I will complete my BFA with a focus in art history in December. I have been attending UMBC as a full time student and working nearly full time for the past 4 years.

Was the application difficult to do?

The application was not difficult to do, however it was an application, which means it couldn't just be slapped together. It isn't the kind of thing you fill out at the last minute. Writing the grant proposal was both a challenge and really inspiring. I am by no means a gifted writer. I tend to get my ideas out verbally in fits and starts, lots of rambling and gesturing with my hands, not the kind of thing that's easy to convey in type. This is the area where Steve really helped out the most because he could sit in front of me and hear me talk about the concept and then sit and read my written explanation and help me fill in the gaps.

How much did your mentor help you with this?

As I mentioned before Steve played a really integral part of helping me develop the written grant proposal but he also really helped as a sounding board. Over the course of the last year Steve and I have met at various times and talked about this project. In these meetings we would kind of just brainstorm what the themes were and how they related to the larger concept.

What is your advice to other students about getting involved in research?

I absolutely recommend getting involved with research. There are a ton of really amazing opportunities available. The one thing I highly recommend is coming to the table with something that you really want to work on because if it's something that is only half developed you'll likely lose interest. The period over which this research takes place is a year, which is a relatively long time to focus your energies on a single project.

What are your career goals?

Ultimately I would really like to find a place where I can make work, be it audio or visual, and have it be something I can invest a good deal of time in. I don't need to be able to support myself from my work but I do need to find a life that will leave me time to create. I've been strongly considering a nursing degree as a healthy fall back. I also have an interest in graduate studies, possibly an MFA but I really need to get out and work for a bit before I have any insight into what I would want to focus on. I think the most likely scenario is that I will try and work as an art handler when I graduate in December. I feel like being a handler will allow me the opportunity to survey a wide variety of tasks and jobs within the art world that will hopefully suggest a graduate focus.

What has been the hardest part about your research?

There are a few difficult aspects of my research work. Although the grant is for \$1500.00, which seems relatively significant, it's not really enough for me to fund this project properly, so I'm needing to do a good deal of begging for material. With my need for 8,000-10,000 records I had to be realistic about not being able to pay for them. I think it will be tight using the grant for all of the other aspects of the installation that do not include the records. In addition to the records I need a fairly significant volume of materials that I will absolutely have to purchase. That being said, anyone who has any vinyl records they would like to donate to my project would be a helping me tremendously. Unfortunately, the only thing I can offer in exchange is to haul them away.

What was the most unexpected thing?

The initial proposal for this project called for one installation; one physical piece of sculpture. But now, after starting work on the project, and starting to have more physical time with the materials, I'm realizing that there are probably closer to 6 or 7 pieces that I'd like to create. It's a really good feeling to have your work take on a longer shelf life and to show a greater set of potential than you had initially expected, but it is also really daunting as that would send my need for records somewhere towards 60,000-70,000!

How does your research relate to your work in other classes?

One way specifically that this work has related to other classes is in the non-art aspects of the project. Although this is ultimately an art installation there are a tremendous amount of other issues that come into play. In regard to the physical sculpture, there are aspects of engineering and physics to get it to exist as a sound physical sculpture and then there are lots of technical things with a remote webcam and microphone and an internal speaker system to play the audio piece. If possible I would love to power the electrics via solar power. I will definitely need to reach out to people who are familiar with these problems.

Ultimately, I think my research really informs everything I do as much as the classes I take influence my research and life. When I take academic classes that are far removed from dealing with visual arts I am still in tune with the potential for borrowing ideas. In this project I am working with massive amounts of records, keeping a database of information about each one, and wondering what to do with the information. In summer session I've taken Statistics as a math credit without expecting much else. In the end I've inherited this new perspective on thinking about numbers and data and that translates back to my crux with the data from the installation. In the end, all of my experiences, classes included, influence my work in one way or another.

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Sarah Solomon, Gender and Women's Studies

La Revanche Du Coeur: Women's Oral Traditions as Strategies for Resistance in Mali

Faculty Mentor: Dr. Gloria Chuku

During my semester studying abroad in Mali, I plan to explore the research question: do women in Mali use oral traditions as strategies for resistance? I am interested in gathering stories from women who engage in oral traditions, such as ritual songs, ceremonial songs, and oral stories and family histories. I will investigate whether these oral traditions are liberating for women in Mali by analyzing whether or not they allow women to create strong social networks, to challenge or resist existing gender norms and expectations, or to increase their participation in political, cultural or social activities. I am also particularly interested in the incorporation of women's oral traditions by contemporary female pop singers in Mali. I plan to research how contemporary pop music is an emerging space in which to examine shifting gender norms among new generations of Malians.

How did you find your mentor for this project?

My mentor was the professor of a class that I was taking at the time I decided to apply for a URA.

How did you know this was the project you wanted to do?

I did a research paper on the topic for a class and realized that I wanted to explore further the questions that I asked in the conclusion of my paper.

Is this your first independent research project?

Yes.

Do you get course credit for this work?

I will be getting course credit for the study abroad program in which I am participating, and my research project is part of this program.

How much time do you put into it?

I will spend one semester working on the research, plus months of preliminary research.

What academic background did you have before you started?

Three years of college majoring in Gender and Women's Studies.

You have a \$1,500 [Undergraduate Research Award](#) from UMBC for your work. How did you hear about this program?

Through professors and the e-mails constantly sent out by the Office of Undergraduate Education.

Was the application difficult to do?

Not at all, it was daunting at first but when I sat down to do it I found that it was very simple.

How much did your mentor help you with this?

She looked over it for me and made minor comments.

What is your advice to other students about getting involved in research?

Do it do it do it. It is a wonderful opportunity to do research on topics of your interest and choosing, and it looks great to grad schools.

What are your career goals?

I hope to receive an M.A. in Gender and Women's Studies as well as a law degree, and work in the public interest sector.

What has been the hardest part about your research?

I'm sure the hardest part is yet to come, since I have not left for Africa yet.

What was the most unexpected thing?

The most unexpected thing was how my research topic related so closely to the academic work that I was doing in several of my classes, which was great preparation for me.

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Margarita Tsionsky, Biology

Characterization of SUP3 Homologues in Arabidopsis Defense

Faculty Mentor: Dr. Hua Lu

Plant diseases have devastating effects on world agriculture. Effective control of plant diseases depends on a thorough understanding of disease resistance mechanisms. It remains challenging to identify genes controlling plant defense and to characterize the functions of these genes. The *acd6-1* SUPPRESSOR 3 (SUP3) gene was identified in a large genetic screen aimed to uncover novel defense genes. SUP3 belongs to a small protein family previously shown to have anion transporter (ANTR) activities. There are six members in the SUP3 family; however, physiological functions of these members have not been well understood. We found that SUP3, previously designated as ANTR1, was a negative regulator acting in the key defense signaling pathway mediated by salicylic acid. To begin to understand functions of other members in the SUP3 family in plant defense,

we used a reverse genetic approach to identify mutants for all five SUP3 homologues (designated ANTR2-5). So far we have identified mutants in four of the five *antr* genes. We will further assess the defense phenotypes conferred by these mutants. Our work will reveal if members of the SUP3 family regulate plant innate immunity.

How did you find your mentor for this project?

I started as a T.A. for Microbiology summer after my freshman year; during the semester of teaching I met a doctoral student. She referred me to Dr. Lu who hired me first to help out with routine tasks in the lab. After a couple of months she began training me for research.

How did you know this was the project you wanted to do?

Dr. Lu's lab has worked with one gene belonging to the family that I am researching, and it was shown to have defense functions. My mentor and I agreed that if one gene in the family has a specific function, the others may have similar functions, and I had the time to look into the family in more detail.

Is this your first independent research project?

No. I started with a different set of genes and mutants when I first started research in Dr. Lu's lab. When the results of that project stopped looking promising, my mentor and I decided it was time to change direction.

Do you get course credit for this work?

Absolutely, I have been getting one credit hour a semester for the last three semesters under BIOL499.

How much time do you put into it?

I worked almost full time during the summer and winter semesters. During the school year I have a very busy schedule but I try to put in between five and eight hours each week. Some weeks are slower than others, I work on plants, and they need time to grow before we can do experiments.

You have a \$1,500 [Undergraduate Research Award](#) from UMBC for your work. How did you hear about this program?

Dr. Lu has had URA winners in her lab before. When I got my own project and my understanding of the techniques was sufficient I applied.

What academic background did you have before you started?

When I started working in Dr. Lu's lab, I wasn't even a Biology major. I have had taken a few biology classes, my basic lab techniques weren't horrible because I've had very good lab courses throughout high school and at UMBC. After a year of working with Dr. Lu I added Biology as a second major. My first major was, and still is, Emergency Health Services.

Was the application difficult to do?

I applied for the URA twice, first time, the application seemed impossible, but I had only been in the lab for six months at most. I came nowhere close to getting the funding. By the second year, my understanding of my projects increased and the application seemed a lot easier.

How much did your mentor help you with this?

Dr. Lu proofread my application. She made comments and suggestions, made sure all the science was exactly on point, and told me what could be cut out and what should be added. I am very grateful to her for all the time she has spent to improve my scientific writing skills.

What is your advice to other students about getting involved in research?

Don't give up, and take the opportunities you have. I wasn't sure I'd be very interested in working with plants, but as I began my research, I realized that not only were a lot of the research methods applicable to other fields, but also that my experience broadened my knowledge and understanding of modern research.

What are your career goals?

I'm graduating in May with two BS degrees and staying another year to earn a Master's degree in Emergency Health Services focusing on Epidemiology. Later, I plan to apply to an MD/PhD program. My EHS background makes me think that I will stay in Emergency Medicine, and my goal for the PhD is Epidemiology or Public Health. Not much plant biology in there, but I feel that my research has increased my understanding of scientific research, which is quite different from Public Health research.

What has been the hardest part about your research?

When you work on your own project, when something goes right, you are thrilled to take credit, but when something goes wrong, you are the one who must figure out what happened. The last few months my experiments were not working too well. It took me at least two months of adjustments, consultations with lab members, and rechecking my work to figure out what exactly was going wrong.

What was the most unexpected thing?

I am shocked at how much I have learned. You don't notice it until you go in to present at a conference and start talking. Even if I'm explaining something to other biology majors, it takes a while for me to catch them up on what I do and the theory of my experiments. My dad is a chemist, and sometimes he will start talking about an experiment he is designing and I am actually able to follow him...some of the time.

How does your research relate to your work in other classes?

Biology 304 (Plant Physiology) seems to be easier for me than it is for most of my classmates. I find that my scientific writing is stronger than most other students' since I've written several abstracts for my project, and Dr. Lu even makes us do a journal club over the summer which teaches us to read and analyze papers. My lab techniques are strong; I don't worry about practical exams. Most of my biology classes refer to studying genes and pathways through mutations. That's exactly what I do so it makes the class material more realistic.

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Michelle Wilson, Visual Arts

Male Breast Cancer: Three Portraits

Faculty Mentor: Ms. Calla Thompson

In 2008, according to the National Cancer Institute, men accounted for one percent or 1,990 of all breast cancer cases in the United States. My research will combine documentary photographs of three male breast cancer survivors with their written narratives as a way to record the physical and psychological effects of male breast cancer. Because of the relative rarity of breast cancer in men, some men prolong discussing changes in their bodies with a physician. My research will, through photographic documentation and intimate dialogue with survivors, examine the stigma of male breast cancer, extending the current dialogue that represents it as a female disease. I will produce portraits of shirtless male breast cancer survivors post-surgery, as well as photographs of the subjects involved their daily lives. In addition to acting as a record of three men's struggles and triumphs, the images combined with written testimonies will convey the

importance of awareness and early detection as critical to long term survival.

How did you find your mentor for this project?

Professor Calla Thompson suggested I look into the URA to further a project I began in her Documentary Photography class. It only seemed appropriate that I ask Professor Thompson to be my mentor.

How did you know this was the project you wanted to do?

The project is documenting male breast cancer survivors in an effort to bring awareness. My reasons for doing so are twofold. First, my research will attempt to reject the stigma of male breast cancer, extending the current representation of it as a strictly female disease. It is my hope that by bringing men into the discussion, we can promote early detection. I am also motivated on a more personal level, because my father is a survivor of breast cancer.

Is this your first independent research project?

Yes.

Do you get course credit for this work?

Yes, I am receiving three independent study credits.

How much time do you put into it?

The amount of time I put into the research varies each week. Currently, I spend several hours weekly searching for subjects, photographing, and doing further research.

How did you hear about the Undergraduate Research Award program?

In the fall of 2008 I took Documentary Photography with Calla Thompson. The final project was a documentary of our choosing, I documented male breast cancer and the effects. During the critique I mentioned in the future I would like to take this project to the next level and photograph more survivors as a means to educate men about male breast cancer. Professor Thompson asked if I had heard of the Undergraduate Research Award. I did a little research on the URA and found this was exactly what I was looking for.

What academic background did you have before you started?

I had taken several photography classes.

Was the application difficult to do?

The application was not difficult to complete. I created a draft and put some ideas on paper. Professor Thompson helped with the editing and asked me write more in depth about specific parts of the application. With her help a concise application was created.

What is your advice to other students about getting involved in research?

If you have an idea, speak with your professors!

What are your career goals?

I want to be a documentary photographer.

What has been the hardest part about your research?

Thus far the hardest part of the research has been finding subjects. Breast cancer affects about 200 men in the US each year. Men make up less than one percent of the total number breast cancer cases.

What was the most unexpected thing?

Today I met with my first subject, and the conversation that took place was amazing. He is very active in educating men about breast cancer. His photographs and testimony along with two other men will create a series that can be used to educate others about male breast cancer.

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