Looking Ahead...

By Danielle Pilla

I would like to take this time to give some insight on the plans of Genetic Engineering students for these upcoming summer and fall seasons. Below is a list of some of the student plans I was made aware of:

Jamie Dombach ('11) will be interning under Dr. Yingying Tang this summer who is the head of the Molecular Genetics team at the Office of the Chief Medical Examiner of New York. Dr. Tang works on helping the medical examiner determine if there was a genetic disease as the cause of death. She will also be continuing research at Cedar Crest for Dr. Berk investigating the antibacterial properties of turmeric.

Molly McQuilken ('12) received an American Society of Microbiology (ASM) Undergraduate Research Fellowship for this summer. She will be working on her project in lab 137 and hopes that having this fellowship will open up more internship opportunities for her in the future and help her get into a good graduate program.

Beth Bachert ('11) will be spending the summer at Duke University in North Carolina. She has an internship involving the study of recombination in Drosophila with Mohamed Noor. She plans on going to graduate school and finding a program in either genetics or microbiology.

Elizabeth Saunderhaus ('12) will be doing research at the University of Washington in Seattle as part of the Amgen Scholars Program. She will be working with Dr. Joshua Akey in his lab where he does research on polymorphisms in the human genome. He researches how one’s environment affects the certain polymorphisms. He also does some research on the genomes of dogs, too.

Kayla Hager ('11) will be going to the Mount Sinai School of Medicine this summer for their Summer Undergraduate Research Program. MSSM is located in the upper east side of Manhattan and has fantastic Cancer Biology facilities that she hopes to be placed in. It is a 10 week program that will allow her to get more hands-on research experience as well as an inside look into their graduate programs.

Sarah Klein ('11) will be staying at Cedar Crest College this summer and researching full time with Dr. Walther. She is a recipient of the 2010 ASM Research Fellowship, so her research will hopefully be presented at next year’s ASM meeting.

Laura Werner ('11) will be working at an Eye Doctor’s office at home this summer to get some experience being an optometrist. She is also planning on volunteering at a local charity that collects eye glasses and ships them to needy children in third world countries. Next year she hopes to apply and get into optometry school.

Brandy Haines ('10) will be attending the University of Delaware this fall to earn a PhD from the biological sciences department with a concentration in the Chemistry-Biology Interface program. It is not completely decided, but after completion of her laboratory rotations, she will most likely be working on the genomes of dogs, too.

Inside this issue:

<table>
<thead>
<tr>
<th>Inside this issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent Undergraduate Internships</td>
</tr>
<tr>
<td>PJAS and BSAD Events</td>
</tr>
<tr>
<td>Alumni Visits</td>
</tr>
<tr>
<td>PAS 2010</td>
</tr>
<tr>
<td>GE Club Awards</td>
</tr>
</tbody>
</table>

Special points of interest:

- Undergraduate Research Internships (page 2-3)
- GE Club reaches out to the community (page 4)
- Heather Cook talks about H1N1 in New York City (page 5)
- GE Club wins Community Service Club of the Year Award (page 7)
Recent Undergraduate Internships

By Gina Dougherty

This past summer I interned at the New York City Office of Chief Medical Examiner (OCME) Forensic Biology Laboratory with their Molecular Genetics Group. They are in charge of natural death cases, specifically sudden infant death syndrome and sudden unexplained death syndrome (SIDS/SUDS). These cases come about when the cause of death remains unexplained after a thorough forensic autopsy and a detailed death scene investigation. They also looked into pulmonary embolism cases, a blockage of the main artery of the lung. They analyzed these cases by looking at DNA sequences for known mutations associated with other cases. I specifically worked on the optimization of PCR parameters for detecting mutations in SIDS/SUDS cases. A list of exons is amplified for these cases. I was testing different master mixes that would amplify all exons at once to limit the amount of reagents and batches for casework testing. I would carry out reverse transcription from RNA, amplify resulting cDNA, and used electrophoresis to analyze the product. With the PCR master mix I titrated concentrations of primers, dNTPs, Mg2+, polymerase enzyme, enhancer, betaine, as well as altered extension time of cDNA. I also worked on organizing their literature database of SIDS/SUDS mutations as well as their SIDS/SUDS case description database. While at the OCME I was able to witness autopsies, attend biweekly lab meetings and journal clubs, see how casework is carried out, and learn how to work on different instruments. I loved this internship and found it to be a very enjoyable experience. I learned many new things during my internship and met a great group of people.

By Beth Bachert

Over the summer, I was privileged to work on an NIH funded research project at Cedar Crest studying the effect of gene expression on codon usage in Cryptococcus neoformans. I was a member of the Reese lab the previous semester, working on isolating and identifying the organism from the environment. When Dr. Kliman made a research proposal to study codon bias in environmental isolates of Cryptococcus neoformans, it only made sense that I helped with the project. The internship was a great experience because while I had been exposed to lab work the prior semester with Dr. Reese, which mainly involved culturing the organism and using biochemical tests to confirm the species, I was able to practice many genetic techniques like PCR, gel electrophoresis, cloning, and sequencing while working with Dr. Kliman. I was able to stay on campus free of charge while I worked in the lab, and worked with a lively group of students. I feel the internship prepared me for the research I would be doing in graduate school. I would recommend anyone to apply for internships in their field to gain experience before going to graduate school or applying for jobs.
Recent Undergraduate Internships

By Danielle Pilla

During the summer of 2009, I was an intern at Thomas Jefferson University. Throughout this time I did research in Dr. Michael Root's laboratory studying HIV glycoproteins and the escape mutations that confer resistance to entry inhibitors. This project involved a lot of cloning and protein purification, and I learned many new techniques such as high performance liquid chromatography (HPLC) and circular dichroism. By the end the ten week program, I was beginning to make crystals for x-ray crystallography and I learned the basics of “shooting” crystals and reading the spots of diffraction. This experience was fantastic since I met many new people that helped me out in different ways, and it gave me connections to other institutions that I applied to for graduate school. It also gave me the chance to appreciate what my life will be like as a full time research scientist. Dr. Michael Root even decided to visit here in the fall 2009 semester because of his curiosity about this school. During his presentation, he went into more depth about HIV glycoproteins and the mutations that occur to block entry inhibitor drugs from being successful. Thomas Jefferson University was a great place to work. I will never forget the people I met and the times we shared inside and outside the work environment.

By Christina Matika

Last summer, I was the recipient of an undergraduate research fellowship from the American Society for Microbiology. What this means was that I was able to get paid to do my own research here at Cedar Crest (the stipend is $4,000). I am a member of Dr. Walther’s research lab, and I study telomeres and double-stranded breaks in Saccharomyces cerevisiae. With this fellowship, ASM will also pay you up to $1,000 (for travel and housing) to attend their General Meeting in May if you submit your abstract and it gets accepted. Since my abstract did get accepted, I will be going to San Diego at the end of May to present my research at the meeting!
Pennsylvania Junior Academy of Science

By Cristina Cardenas

The Pennsylvania Junior Academy of Science is a statewide organization established in the early 1930s in which students between 7th and 12th grade are invited to present a science experiment they conducted. The purpose of this organization is to stimulate and promote an interest in science and mathematics in students. During their experiments, students are encouraged to follow the scientific method. They then prepare a written report and give an oral presentation in front of judges who are usually volunteers. On February 27th of this year, the Genetic Engineering Club, members of Alpha Phi Omega, and other Cedar Crest College students joined a multitude of other volunteers, from scientist to teachers and many other kinds of people, to participate in this great event. There were many talented students who presented projects above expectation, such as the 8th grader who found that as the spiciness in peppers increase, from banana peppers to ghost peppers, the ability of bacteria to survive decreases. This was a great opportunity that we were happy to be a part of.

BASD Science Fest

By Danielle Pilla

In October 2009, members of the Genetic Engineering Club attended the Bethlehem Area School District Science Fest which is an event held to make children excited about science. Many individuals were invited to this event including policemen and veterinarians to let the students see the many different aspects of science. The Genetic Engineering Club hosted an arts and crafts event where we taught children about DNA in a creative way. We decided to make DNA bracelets that would spell the kids’ names. Each base of DNA was a different color bead, and each letter of the alphabet was given three bases to act like codons in translation. While these concepts were not the focus of the craft, they indirectly became familiar with DNA and how it is translated into proteins (i.e. their name). We all had a great experience with the kids and the bracelets were a hit.

Genetic Engineering Club members attended the BASD Science Fest where they taught children about DNA by making name bracelets. From front to back: Rachel Orlen, Jamie Dombach, Beth Bachert, and Danielle Pilla. CJ Krise and Nyssa Kudravy were also present at this event.
Blast from the Past: Alumni Speakers

A Visit from Kristi Clark

By Jamie Dombach and Elizabeth Sunderhaus

During the fall semester of the 2009 academic year, Cedar Crest alumnae Kristi Clark, who is currently in her second year of graduate school at the University of Delaware, came back to give an informative talk about graduate school and the application process. During her talk, Kristi discussed the importance of choosing a school that not only has a research project that you are interested in but also a location that you enjoy since you are going to be living there for the next four to seven years. She also noted the importance of choosing a research director with whom you feel comfortable being around. Overall Kristi led a very informative discussion on the stresses and thrills of applying to and surviving graduate school.

Kristi also wanted to give us some insider tips about what graduate school committees are looking for in their students. She thinks that the most important detail on a graduate school application is the personal statement. Some of the tips she mentioned were to explain the reason for wanting to attend the institution and what makes your application stand out above the rest. Clark also mentioned some tips to improve your applications. Internships are an important part of the process. Interning in different areas of the workforce, like in the pharmaceutical field or a collegiate research institution, give an applicant unique perspectives that help the applicant to decide what he or she would like to study in graduate school. Doing research before attending graduate school gives an applicant firm starting point because a lot of graduate school has to do with choosing the specific research and lab that an applicant’s research will be done in. Kristi told about her own experience in graduate school and how she chose the lab she wanted to do her thesis in which involves work on exonucleases.

A Visit from Heather Cook

By Danielle Pilla

In the spring of 2010, the Genetic Engineering Club invited Heather Cook, a 2002 Cedar Crest graduate, to talk about her experiences after college. Directly out of school, she went to Columbia University where she earned her Master’s degree in Public Health. She has worked on West Nile Virus and MRSA, and her talk, entitled “From Pipettes to a Pandemic: Working as a Research Scientist in NYC,” was about her experiences working on the H1N1 epidemic in New York City. During her presentation, Heather discussed the difficulties and the amount of time required to figure out the number of people sick and dying from this disease. The information regarding her contacts with the Centers for Disease Control and Prevention (CDC) showed the extent to which her information was used for the country and the world to see. Heather also explained the issues they had to deal with including school closures which have consequences on both educational and economic levels. The most interesting point that she made was that her biggest fear was not the number of people who could get sick and die but rather the riots that would break out when people discovered there may not be enough supplies to take care of their loved ones. Her presentation highlighted features of epidemics and pandemics that many people fail to consider until the stressful situation arises.

Heather Cook (right) serving as Biology 121/122 Instructional Assistant during her years at Cedar Crest College. Left is the recipient student, Erin Nedderman.
The weekend of April 9-11\textsuperscript{th}, 2010 marked the 86\textsuperscript{th} annual meeting of the Pennsylvania Academy of Sciences (PAS). As usual, Cedar Crest was well represented, tying for third for the number of abstracts accepted. Members and advisors of the Ettinger, Karnas, Reese, and Walther labs were all in attendance. Everything from the role of replication protein A to the time course for differentiation of photoreceptors was presented either through a talk or a two-hour poster session. Myself, Brittany Fikes, and Michelle LaClair participated in the cell biology poster session with our project entitled: “Three approaches to investigating the role of alpha-(1,3)-glucanases from Cryptococcus neoformans”, a collaboration of our three separate, but intimately related projects. Molly McQuilken, Kayla Hager, Kirsten Nole, Rachel Orlin, Emily Ross, Catherine Mogle, and Katherine Kemmerer also presented posters on their projects. Oral presentations were given and well received from Kimberly Moran, Tasha Cornish, Christina Matika, and Catherine Bradshaw. As is precedent, the research from Cedar Crest was met with considerable interest and respect.

Members of the Reese Lab at the PAS meeting this semester. \textit{Right:} Brittany Fikes. \textit{Below (from left to right):} Brittany Symbol, Michelle LaClair, and Brittany Fikes.
Looking Ahead, continued

likely be conducting her dissertation research in the lab of Dr. Fidelma Boyd working on evolution and pathogenesis of various Vibrio species.

**Gina Dougherty (‘10)** will be starting the Master’s Program for Forensic Science. She will be spending the summer at Cedar Crest working on her research as well as her master’s thesis. Her research is investigating fire debris analysis with regards to DNA. She will specifically be looking at the impact heating up the evidence for purposes of identifying the accelerant has on DNA.

**Danielle Pilla (‘10)** will be attending Duke University in the fall to earn a PhD in the Microbiology and Molecular Genetics graduate program. She hopes to work in a lab that focuses on pathogens and/or disease treatment methods. She also hopes to join the Duke Scholars and Infectious Disease Program during her graduate career to get direct insight into infectious disease clinical cases.

**Christina Matika (‘10)** plans on finding a job working as a lab technician this summer. She's looking at universities such as Thomas Jefferson, University of Penn, Penn State Hershey, and Drexel for jobs. She's also looking in industry as well, including Centacor, Fox Chase Cancer Center, and Sanofi Pasteur, among other places. Her goal is to work in a lab doing research on infectious diseases, immunology, or tumor biology/molecular biology and plans on going to graduate school in the nearby future to obtain a master's degree.

**CJ Krise (‘10)** will be shadowing a genetic counselor at Penn State Milton S. Hershey Hospital this summer. She is currently applying for lab jobs after graduation and plans on applying to master's programs for genetic counseling next year.

Reaching Out

By Danielle Pilla

In spring 2010, the Genetic Engineering Club won the Community Service Club of the Year Award. This reward, which was given by the Lutz Center, honored our community service efforts which include helping with the Biology Olympics, PJAS, and the BASD Science Fest among other activities. In addition, Dr. Karnas, the GE club faculty advisor, was granted the Faculty of the Year Award. Without her help, Genetic Engineering Club would not have had the opportunities to help with any of the events. Dr. Karnas is also the primary reason that Biology Olympics even exists. I feel I speak for every officer in the Genetic Engineering club when I say, “Thank you Dr. Karnas and every member for making this year so successful!”

*Top:* Genetic Engineering Club Eboard holding the Community Service Club of the Year Award. From left to right: Rachel Orlen (Secretary), CJ Krise (President), Danielle Pilla (Vice President), and Gina Dougherty (Treasurer).

*Bottom:* Dr. Karnas, advisor to the Genetic Engineering Club, holding her Faculty of the Year Award.
Cedar Crest College
Department of Biological Sciences
100 College Drive
Allentown, PA 18104

Phone: 610-606-4611
E-mail: geclub@cedarcrest.edu

If you like what you see, contact us at:
geclub@cedarcrest.edu

Hey Alums! We’d love to publish articles about your exciting careers in upcoming editions of the Gene Scene. Contact us at geclub@cedarcrest.edu