

Lifelines

Fall 2012



Biology/Allied Health Department

Undergraduate Research Grows Among Biology Majors

Undergraduate research is growing in the biology department at Southern. More students are requesting research and internships and the number has grown to over 25 this year. Projects include a water filtration system, storm water run-off, Emergency medicine stroke protocol, Methicillin Resistant *Staphylococcus aureus* (MRSA), and a new two year Conifer Dendrochronology project on Southern's campus involving six students beginning in November 2012.

Below are two stories of senior biology majors involved in research over this past summer.

Through lots of prayer and determination, I found myself at Loma Linda working under Dr. Bill Hayes with graduate students Carl Person, Ricky Escobar, and Eric Grin, who all welcomed me warmly. Though I was only there for about a month, I learned myriads. One of the most important things I learned was to be persistent and observant. Many times, the smallest things made the biggest difference. When I left Loma Linda, the snakes were tucked away in their cages, but my passion for research had exploded. I look forward to seeing what the future holds.

Reptile Venom Research Naomi Jackson



Poisonous snakes, strange people wearing white lab coats and hiking boots, and a hot desert—was I dreaming? No, this was real. This was real research. This summer I had the privilege

to intern in the Biological Sciences Department at Loma Linda University. What I did ranged from observing reptile life in the desert (an activity called “herping”) to purifying and analyzing snake venom and to purifying DNA from Bahamian iguana blood samples.

This experience was beyond expectations, and, a few months prior, didn't even exist as a thought in my mind. I heard about this program from a professor at Southern Adventist University. About to enter my fourth and final year of college as a biology major heavily interested in a career in research, I knew I had to take this opportunity.

Heparin-Help or Hindrance? Ryan Rigsby



During the summer of 2012, Ryan Rigsby volunteered over 150 hours at the Florida Hospital Center for Thrombosis Research (FHCTR), located in Orlando, Florida. Ryan worked directly with Senior Research scientists. He received training in the use of high-performance liquid chromatography (HPLC) machinery. His main job was to perform HPLC on a variety of immune complex molecules (ICs). He mixed antigen and antibody solutions together in different ratios

Research Grows, Cont. on pg3



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Field Ecology



Every other summer, students have the amazing opportunity to study Tropical Biology in Indonesia. It was suggested that the department offer a second trip that is monetarily less challenging during the alternate years. Field Ecology offers students the opportunity to travel to different ecological biomes to meet their ecology core requirement. Future Field Ecology classes will study the ecology of the Rocky Mountains, the Everglades, and Yellowstone. These field experiences will allow students to study ecology where it happens and grow their wonder and understanding of God's creation.

In the summer of 2013, students taking Field Ecology will travel to the Bahamas. The first two and a half weeks will be spent in the classroom and then one week will be spent in the Bahamas studying marine and island ecology. Imagine sleeping in a cabin on the beach with the breeze



lulling you to sleep and spending your days snorkeling and studying island wildlife. Not a bad way to earn college ecology credit.

Our destination will be Andros Island, the largest of the Bahamian islands. Students will stay at Forfar Field Station and spend their days studying the different island ecological environments. I was fortunate to do my Master's research on this island and hope to show the students my study subject, the endangered Bahama Oriole, found only on that island. Students will also be able to study marine vs. freshwater environments, big island

vs. small cay habitats, search for iguanas, and learn about other plants, animals, and biological niches found in this tropical paradise. Even though the island is the largest in the Bahamas, it is the least populated so students will get to see the unique island culture without the impact of tourism. The trip is open to sixteen students on a first come basis. The trip will include a lab fee and students will need to put down a non-refundable deposit to secure their spot. Interested students should contact me at vlee@southern.edu for more information.

Valerie Lee

Research Grows, Cont. from pg 1

and incubated the solution before running it through the HPLC system. Graphs generated from this procedure were then used to analyze the extent of IC formation and the approximate molecular weight of the ICs. Different IC graphs were then compared with one another.

Ryan's work fit into the bigger picture of research at FHCTR. The basic research laboratory team has been studying the mechanism of heparin-

induced thrombocytopenia (HIT). In this disease, a patient given the anticoagulant heparin surprisingly generates blood clots. The cause is thought to be an allergic reaction to heparin. Antibodies bind to heparin and then platelets are activated, leading to coagulation. In their experiments based on this mechanism, the researchers cannot assume that mixing an antigen and antibody together will generate an immune complex. They must experi-

mentally demonstrate that it forms. Thus, Ryan's work was a crucial part of the team's research. In the future, his data may be published in a scientific journal article.



Gilbert Burnham, M.D., Ph.D. Presents in E.O. Grundset Lecture Series

Dr. Burnham ('64) is a professor in the Department of International Health, The Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland, and lectured during alumni weekend on human filarial infections. These parasites are found throughout Africa and Southeast Asia and cause diseases like river blindness and elephantiasis.

He began his interest in parasites while taking Parasitology at Southern Missionary College, and continued it as a hobby at Malamulo Adventist Hospital in Malawi. He documented the prevalence of onchocerciasis (River Blindness) in southern Malawi and implemented phase IV clinical trials for ivermectin (Mectizan). This drug is currently the main treatment for filarial infections, and Dr. Burnham chairs the Mectizan Expert Committee that monitors the treatment

for 100 million people at risk for these parasites.

The Mectizan Donation Program, which accepts donations that are used to purchase drug treatments for filarial infections, is an excellent success story and is helping to reduce the filarial infections throughout the regions endemic for the disease. Dr. Burnham's future goal is the eradication of these infections in the America's and possibly throughout Africa.

New Faculty Profile



The Biology/Allied Health Department continues to expand. This fall semester Mr. Aaron Corbit, Ph.D.c has become the newest member of the Biology faculty. He comes

to us directly from Loma Linda University where he conducted his doctoral research on both rattlesnake ecology and the medical aspects of rattlesnake bites in humans.

Despite beginning life in Berrien Springs, Michigan, he spent most of his childhood in Northern California. After completing his Bachelors of Science in Biology at Pacific Union College in 1998, he moved to Chicago, spending six years as a middle and high school science teacher at North Shore SDA Junior Academy and then two years as an elementary science textbook editor for Pearson Scott Foresman.

Here at Southern, he will be teaching classes such as Vertebrate Natural History, Herpetology, Issues in Science and Society, as well as several sections of Anatomy and Physiology lab. Aside from all things venomous and reptilian, he enjoys studying Adventist theology, ecotheology, and origins issues. He hopes that the education he facilitates will lead students toward a more vibrant and relevant Christian experience. Aaron brings with him his wonderful wife, Michelle, and his three children, Madeleine (7), Nathalie (4), and Ethan (1).

Undergraduate Biological Research Facility

Over the past few years, the Biology Department has been taking on a new emphasis to promote undergraduate research in preparing students for professional and graduate schools. Due to the blessing of increased enrollment, the biology laboratory spaces are bursting at the seams with students for both labs and lectures, challenging us to find space for student research classes and projects. In 2010, the old greenhouse space was removed and closed in along the south side of Hickman Science Center. Plans are currently being drawn up to convert this space into a new Undergraduate Biological Research Facility that will be utilized in research based classes such as Ecotoxicology,


Developmental Biology, and Entomology. This will provide students with a place to set up and maintain ongoing research projects under faculty guidance and supervision. The Undergraduate Biological Research Facility is also being designed to attract students who are interested in pursuing research as a career in academia and industry. It is our goal to provide the best training possible for those interested in research and continue training future Ph.D. research scientists with a focus on God as the Creator and Healer. Also in the planning stage is a new biology degree with a research emphasis. Recent major research equipment purchases have included an ultra-centrifuge,

refrigerated micro-centrifuge, two 96-well microplate readers currently being used to study activity of various enzyme systems using fluorescence and absorption, two growth chambers for cell tissue cultures, a fluorescence microscope, a sonicator for disruption of cell membranes to aid in protein purification, and equipment used in two-dimensional gel electrophoresis. When complete, the Undergraduate Biological Research Facility will be a show piece of undergraduate research and innovation.

Ben Thornton, Ph.D.



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