The energy crisis of the '70s and '80s resulted in more than an awareness of the cost of fuel. It triggered the development and implementation of energy efficient buildings. The Alliance to Save Energy estimates that “residential and commercial buildings account for 41% of total U.S. energy consumption.” While energy-efficient buildings have contributed to a reduction of energy usage, they have also contributed to an indoor environment containing air that is often more polluted than what may be found outside the building.

Types of pollutants that accumulate in indoor spaces include outgasses from furnishings, carpets, and cabinetry made of pressed wood products. Cleaning supplies and the use of fuel-burning combustion appliances, also contribute to indoor pollution. Of particular interest are the biological contributors to indoor pollution like the molds or fungi.

Most fungal populations, which are harmless saprobes degrading dead material found in outdoor environments, are important in recycling elements tied up in dead materials. However, a handful of these fungal genera can contribute to significant health problems in sensitive people if they gain a foothold in an indoor environment.

The concentration of indoor fungal growth is determined by the available moisture. Wet drywall will contribute to the growth of fungal organisms that include Cladosporium, Penicillium, Aspergillus, and Stachybotrys, which could result in expensive remediation to remove the fungus. The health effects for sensitive individuals include asthma attacks, skin rashes and allergies, pulmonary disorders, fatigue, and joint discomfort. Long-term effects may result in a compromised immune system or put at risk those with an already compromised immune system, such as cancer patients.
Administration (OSHA). The EPA has stated that the concentration of indoor fungal spores should be less than what is found outside, and those found indoors should be similar to what is found outside the building. The health effects are difficult to determine because one individual may have serious reactions to indoor fungal growth, yet a nonsensitive person living in the same space may have no adverse responses. Also, fungal growth often contains bacteria or even dust mites that contribute to poor air quality.

Indoor fungal growth became a topic of personal interest to Rutger’s researcher, Joan Bennett, when her home was flooded during Hurricane Katrina in 2005. Once she was able to enter her home, she found heavy fungal contamination on the walls and was unable to remain in her home for more than a few minutes without developing headaches and feeling dizzy and nauseous. Prior to this experience, she had been skeptical of sick building syndrome, but after experiencing her symptoms, she investigated the effects of fungal products on fruit flies.

Dr. Bennett exposed fruit flies to 1-octen-3-ol, the mushroom alcohol that gives fungal growth its characteristic musty odor. The exposed fruit flies developed symptoms similar to those found in Parkinson’s disease patients. The affected flies had difficulty walking, a slower gait when compared to unexposed flies, and other movement disorders.

Through investigation, using molecular techniques, researchers found that 1-octen-3-ol had attacked the genes that deal with dopamine, which resulted in degenerating neurons and the Parkinson’s-like symptoms in the fruit flies.

A sabbatical leave during the Fall 2015, allowed me to develop fungal spore identification skills and to begin a new research project. I am interested in determining the effect of fruit fly exposure to whole fungal colonies in a controlled environment. The flies will be housed in a plexiglas habitat (see photo on page 1) above a chamber containing fungal colonies, without direct contact with the fungus. It will be interesting to see if Dr. Bennett’s results can be obtained using the whole fungus and to see if different fungal colonies have different effects on the fruit flies.

By Ann Foster

Alumni Spotlight
Jon Miller, Pre-Medicine, Class of 2009

What are some of your favorite memories from Southern?
Meeting my wife, all-night softball, vespers, other school functions.

What advice do you have for our pre-med students about undergrad?
Do not give up pursuing your dreams of becoming a physician, if God is clearly calling you to medicine.

Where did you attend medical school?
East Tennessee State University Quillen College of Medicine.

What advice do you have for our pre-medical students about medical school?
Learn how you study best and be willing to adjust your study habits for each class. Honor God by keeping the Sabbath. This will be one of your greatest assets during the rigorous academic load. Additionally, spend time with God each morning before class so that you will have energy and wisdom.

For each class: preview, lecture, review. Do lots of practice questions! This is key to doing well on board exams.

Tell us about your residency.
My first year of residency is with the University of Tennessee in Chattanooga at Erlanger Medical Center. It’s a general internship where I rotate in various disciplines including surgical, medical, and primary care specialties. My next three years of training will be in dermatology at Mayo Clinic in Rochester, Minnesota, starting July 2016.

Tell us about your family.
I’ve been married to Rebecca (Erickson) Miller for almost seven years. We met in classes during our second year at Southern. Last year, we had our first child, Truly Grace Miller. Becoming parents has enriched our lives more than we could have imagined!

By Valerie Lee

Anything else you’d like to share?
My wife and I had a terrific educational experience at Southern. In addition to a great academic experience, we also made lifelong friends and developed a stronger relationship with God.

By Valerie Lee

Jon with wife, Rebecca, and daughter, Truly Grace,
Students in Service

AMOR Projects in Pucallpa, Peru

Being a student missionary is an experience that I thought I was prepared for when I left Southern for the jungles of Peru, but you can never be truly prepared for the adventures God has in store when you decide to serve Him.

I have always been passionate about mission work and had planned to be a student missionary (SM) ever since I was in academy. Wanting to get involved, I signed up for Southern’s medical mission trip to AMOR Projects in Pucallpa, Peru, during spring break of 2014. I knew then that AMOR was the type of place where I wanted to serve. I returned the following year as the student leader of Southern’s medical mission trip, which confirmed my decision to be an SM in Peru the next year.

Having been to Pucallpa twice already, I had an idea of what I would be doing as a student medical volunteer. That all changed, though, during the summer just over a month before the planned departure date. I received an email that the doctor was moving, and AMOR Projects didn’t know if they would be able to find another on such short notice.

With my future up in the air, I dedicated my time to studying for the MCAT and praying that the clinic at AMOR would find a doctor.

At last, a doctor was found! Peru was a go, the catch being that medical clinics would be only one week a month because the doctor lived in Lima. At first I was disappointed. This changed everything I had been planning, but I soon found out that God knows the plans that He has for me, plans to prosper me and not to harm me (Jeremiah 29:11). God had in mind a year in which I would grow not only in medical knowledge, but in spirituality as well.

The first week of every month, Doctora Theodora comes from Lima to hold medical clinics, not just at AMOR Projects, but also mobile campaigns to the surrounding communities. After holding a medical clinic in a community, we will return in the following weeks with home-to-home health presentations. These visits help us build relationships with the people that, by the work of the Holy Spirit, open the door for the opportunity to give Bible studies. Through this system, we are able to reach the people of Pucallpa using the method of Christ.

Ellen G. White says in The Ministry of Healing, p. 143: “The Saviour mingled with men as one who desired their good. He showed His sympathy for them, ministered to their needs, and won their confidence. Then He bade them, ‘Follow Me’.”

Through assisting in the medical clinics, I have learned how to look for symptoms of and to diagnose illnesses common to this area, to prescribe medications (all, obviously, double-checked by the doctora), to give shots, and so much more. The first time that the doctora sat back to watch as I talked to a patient was absolutely nerve wracking. Afterward, I presented her with my thoughts on the problem and my recommendation for medication. She was always there for my questions, but by letting me jump in head first, with her mentoring throughout, I have been able to learn so much.

In the weeks without clinic, my task was to give health presentations, which I found to be quite the challenge. I didn’t speak Spanish, and yet there I was, attempting to talk about hygiene. Without God, I wouldn’t have been able to do anything. What started as a struggle has become such a blessing. I have had opportunities like never before to share about God. I still have so much to learn, but each day is a new opportunity.

The aspect of my SM year that “wasn’t according to my plan” has turned out to be the part that has helped me to grow the most. We are able to continue the work of healing by reaching out to address more than physical pain alone.

If you’ve been considering doing mission work, or even if you haven’t, I would encourage you to do so. It’s a grand adventure, and it’s also everyday life. I still study, work hard, and get bitten by too many mosquitoes, but in every moment I know that I am a part of God’s plan. Peru has become my home. I pray that you embrace whatever path God is leading you down, whether at home or abroad.

By Krista Bonney
Senior, B.S. Biomedical/Pre-Med
Student Missionary
AMOR Projects - Pucallpa, Peru
Congratulations  
Seniors  

Allied Health Graduates 2015-2016

Signe Anderson  
AS Dental Hygiene

Caleb Arauz  
AS Physical Therapy

Isaac Boateng  
AS Physical Therapy

Brendon Boyd  
AS Physical Therapy

Kayana Bromfield  
AS Physical Therapy

Seong Cho  
AS Physical Therapy

Virginia Dedman  
AS Nutrition/Dietetics

Victoria Delote  
BS Medical Lab Science

Macy Fisher  
AS Speech Lang Path

Kevin Freeman  
AS Speech Lang Path

Samantha-June Gozo  
AS Physical Therapy

Nathan Grunder  
BS Medical Lab Science

Ana Kim  
AS Dental Hygiene

Samantha Landau  
AS Dental Hygiene

Ryan McCollough  
AS Nutrition/Dietetics

Brianna Melgar  
AS Dental Hygiene

Jamin Moon  
AS Physical Therapy

Earl Obana  
AS Physical Therapy

Jordan Powell  
AS Speech Lang Path

Eldar Preval  
AS Nutrition/Dietetics

Sydney Reedl  
AS Speech Lang Path

Christopher Royster  
AS Physical Therapy

Brooke Schuler  
AS Speech Lang Path

Stacy Sidabutar  
AS Dental Hygiene

Maya Swartz  
AS Speech Lang Path

Kailie Taina  
AS Dental Hygiene

Tyler Thomas  
AS Physical Therapy

Kalli Wilkens  
AS Physical Therapy
Biology Graduates 2015-2016

Victoria Ahles
BA Biology

Joshua Arauz
BA Biology

Katelyn Birge
BA Biology

Crystal Catarama
BS Biomedical

Andrew Chapman
BS Biomedical

Alyssa Cheung
BS Biology/Research

Paris Christodoulides Jr.
BA Biology

Peter Chun
BS Biomedical

Seth Daly-Stennis
BA Biology

Da Dang
BA Biology

Lindsay Gardner
BA Biology/Teaching

Matthew Green
BA Biology

Loren Hall
BS Biomedical

Austin Krishingner
BA Biology

Alexander Harris
BA Biology

Cindy Kim
BA Biology

Nicholas Lampasi
BA Biology

Crystal Larrew
BA Biology

Angie Lee
Interdisc-Biol/Musp

Sean Leeper
BA Biology

Michelle Mangowal
BA Biology

Taylor Mittleider
BA Biology

Sonia Moral
BS Biomedical

Emily Park
BA Biology

Katelyn Pauls
BA Biology

Christian Pinango
BA Biology

Masanari Sakugawa
BA Biology

Lauren Santos
BA Biology

Adrian Sarli
BS Biomedical

Joel Severiano, Jr.
BA Biology

Felicia Soedargo
BA Biology

Molly Theus
BA Biology

Cathleen Thompson
BS Biomedical

Austin Wagner
BA Biology

Dillon Yap
BA Biology

Nicole Yim
BA Biology
Department Happenings

We are happy to let you know some of the exciting things happening in the Biology/Allied Health Department.

Alumni giving over the past few years has enabled us to purchase a new HPLC (High Pressure Liquid Chromatography). This powerful instrument allows us to separate complex mixtures of chemicals. Professor David Nelsen uses it to separate venoms into individual toxins, allowing us to ask more specific questions about the venom, such as “Which specific toxin within the venom shows antimicrobial properties?” It has also allowed Professor Ben Thornton’s students to test for environmental toxins and Professor Ann Foster’s students to examine toxins produced by fungi. We are just starting to discover all of the exciting applications for this instrument.

General Biology II class (winter semester) is at the highest enrollment ever. Anatomy & Physiology and Basic Microbiology classes are down a bit due to changes in nursing requirements. Majors’ courses are quite full—to the point Professor Nelsen opened an additional special topics course in Toxinology. This is the study of toxins in plants and animals. Interest in our courses continue to rise.

There are two (new-to-us) workhorse Market Forge autoclaves installed in the stockroom. The older autoclave was so specialized that it was difficult for students to run, and was too expensive for a yearly maintenance contract. Now we will be able to function more quickly and inexpensively.

Additionally, we are thankful to Andrews University for their donation of a laminar flow hood. We partner with Andrews in training Medical Lab Science students, so when they updated their lab, we were offered their outgoing hood. This supplements the other hoods we have and looks great in the Genetics lab.

By Keith Snyder

Megan Jewell and Christine Han use the new laminar flow hood.