

Lifelines



Biology/Allied Health Department

What Is in the Air?

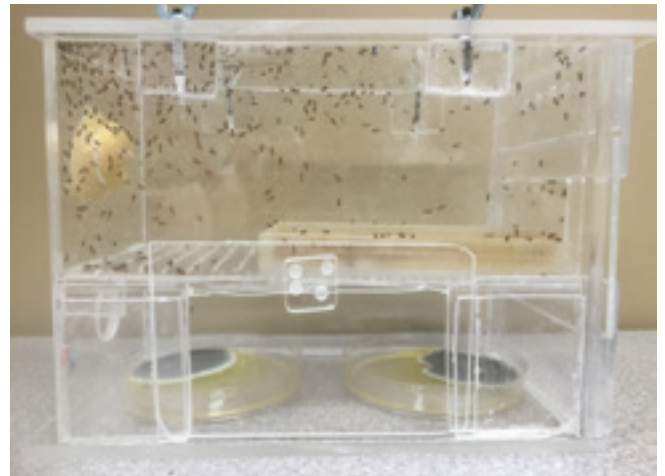
The energy crisis of the '70s and '80s resulted in more than an awareness of the cost of fuel. It triggered the development and implementation of energy efficient buildings. The Alliance to Save Energy estimates that "residential and commercial buildings account for 41% of total U.S. energy consumption." 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.



Fruit fly (*Drosophila melanogaster*) chamber.

The impact of indoor fungal growth on human health has been under discussion by professionals in the mold remediation industry, the Centers for Disease Control (CDC), the Environmental Protection Agency (EPA), and the Occupational Safety and Health

Continued on page 2



Power for Mind & Soul

Biology/Allied Health
Department
P.O. Box 370
Collegedale, TN 37315
Phone: 423.236.2926
Fax: 423.236.1926
southern.edu/biology

Joyce Azevedo, PhD
Randy Bishop, MSPT
Aaron Corbit, PhD
Ann Foster, PhD
Lucinda Hill, MD
Valerie Lee, MS
David Nelsen, PhD
Rick Norskov, MD
Lee Spencer, PhD
Keith Snyder, PhD
Debbie Strack, Office Mgr.
Ben Thornton, PhD
Tim Trott, PhD

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 Rutgers' 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!

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.



Krista Bonney, student missionary, assists patients at a glasses clinic. Photo by Jordan Samuel

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.



Children listen as Krista gives a health presentation.

Photo by Jordan Samuel

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

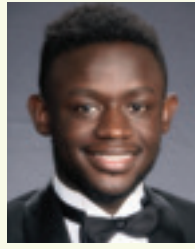
Allied Health Graduates 2015-2016



Signe Anderson
AS Dental Hygiene



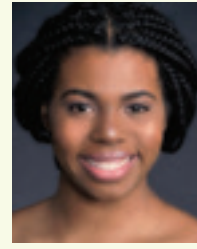
Caleb Arauz
AS Physical Therapy



Isaac Boateng
AS Physical Therapy



Brendon Boyd
AS Physical Therapy



Kayana Bromfield
AS Physical Therapy



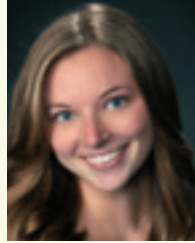
Seong Cho
AS Physical Therapy



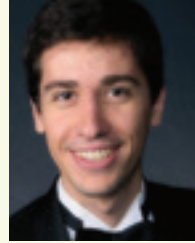
Virginia Dedman
AS Nutrition/Dietetics



Victoria Delote
BS Medical Lab Science



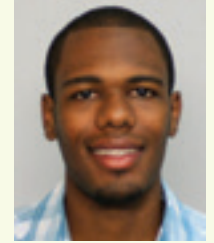
Macy Fisher
AS Speech Lang Path



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



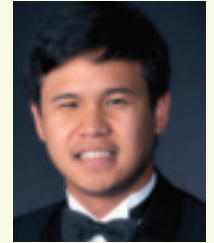
Ryan McCollough
AS Nutrition/Dietetics



Brianna Melgar
AS Dental Hygiene



Jamin Moon
AS Physical Therapy



Earl Obana
AS Physical Therapy



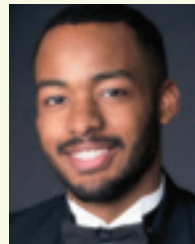
Jordan Powell
AS Speech Lang Path



Eldar Preval
AS Nutrition/Dietetics



Sydney Reed
AS Speech Lang Path



Christopher Royster
AS Physical Therapy



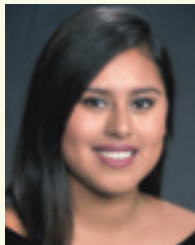
Brooke Schuler
AS Speech Lang Path



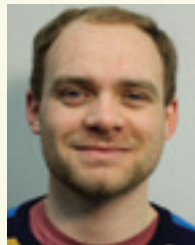
Stacy Sidabutar
AS Dental Hygiene



Maya Swartz
AS Speech Lang Path



Kailie Taina
AS Dental Hygiene



Tyler Thomas
AS Physical Therapy

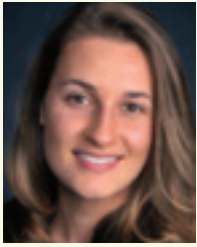


Kalli Wilkens
AS Physical Therapy

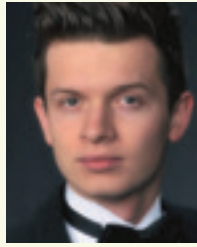
Congratulations Seniors



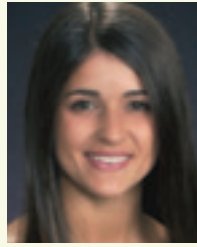
Biology Graduates 2015-2016



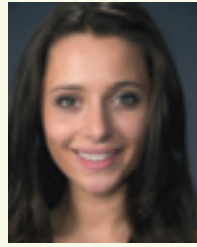
Victoria Ahles
BA Biology



Joshua Arauz
BA Biology



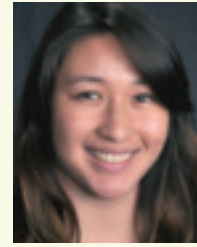
Katelyn Birge
BA Biology



Crystal Catarama
BS Biomedical



Andrew Chapman
BS Biomedical



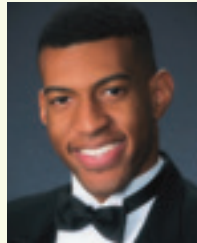
Alyssa Cheung
BS Biology/Research



Paris Christodoulides Jr.
BA Biology



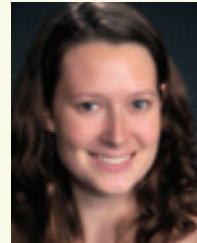
Peter Chun
BS Biomedical



Seth Daly-Stennis
BA Biology



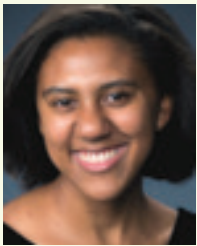
Da Dang
BA Biology



Lindsay Gardner
BA Biology/Teaching



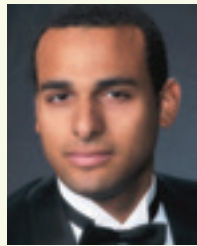
Matthew Green
BA Biology



Loren Hall
BS Biomedical



Austin Krishingner
BA Biology



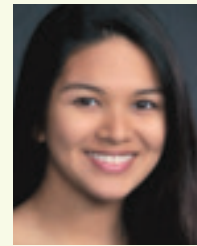
Alexander Harris
BA Biology



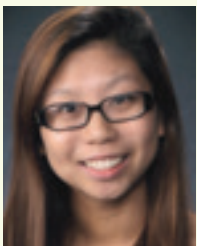
Cindy Kim
BA Biology



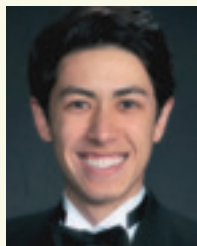
Nicholas Lampasi
BA Biology



Crystal Larrew
BA Biology



Angie Lee
Interdisc-Biol/Musp



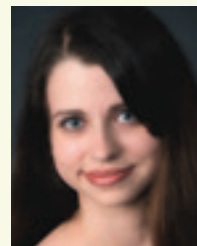
Sean Leeper
BA Biology



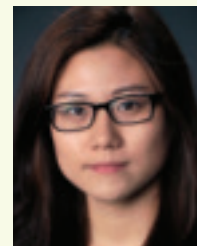
Michelle Mangowal
BA Biology



Taylor Mittleider
BA Biology



Sonia Moral
BS Biomedical



Emily Park
BA Biology



Katelyn Pauls
BA Biology



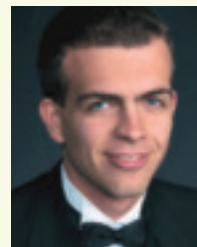
Christian Pinango
BA Biology



Masanari Sakugawa
BA Biology



Lauren Santos
BA Biology



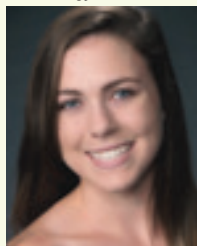
Adrian Sarli
BS Biomedical



Joel Severiano, Jr.
BA Biology



Felicia Soedargo
BA Biology



Molly Theus
BA Biology



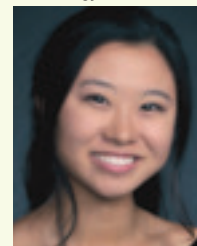
Cathleen Thompson
BS Biomedical



Austin Wagner
BA Biology



Dillon Yap
BA Biology



Nicole Yim
BA Biology





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Power for Mind & Soul

Biology/Allied Health
Department
PO Box 370
Collegedale, TN 37315
1.800.SOUTHERN
www.southern.edu



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

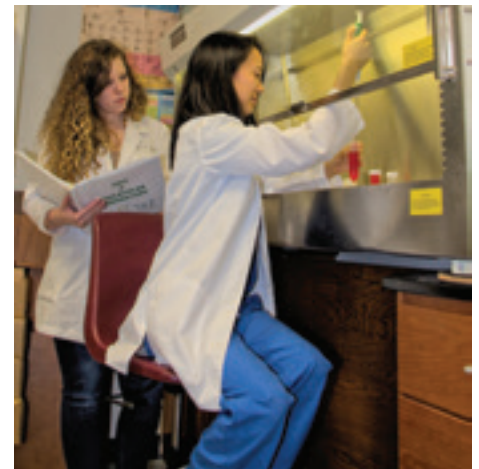
semester) is at the highest enrollment ever. Anatomy & Physiology and Basic Microbiology classes are down a bit due to changes in nursing requirements. Majors’ courses are quite full—to the point Professor Nelsen opened an additional special topics course in Toxinology. This is the study of toxins in 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.

