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Biology Department

Winter 2012

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Lifelines

Winter 2012



Biology/Allied Health Department

Ancient DNA New Discoveries

It is hard to believe that a year has gone by since we introduced our ancient DNA project (aDNA) in our biology department newsletter. We have made a lot of progress in this last year, but we have also had a number of challenges to overcome. All told, though, it has been a marvelous experience. God has really been working on our behalf!

We currently have four students working on the aDNA conifer project. All of them are continuing from last year and their expertise is continually growing. Evgeny, Caleb, and Melissa are juniors, and we hope that they will still be involved next year. Greg is a senior and will be graduating. He has been a joy to work with and we will miss him next year, but we know he will do well in his chosen career. We hope to be able to invite one or two sophomore students from genetics class to join our team. In this way, our most experienced students can help train the new students who join the project and our team expertise will continue to grow.

By the end of last year, we had recovered DNA from our modern comparative specimens as well as from our fossil Miocene cones from Canada. In doing so, we demonstrated that the technique we were using works. In our modern specimens, the published primers used by other



Caleb Ho-A-Shoo, Melissa Seidel, Greg Jeon, Evgeny Chirshev with Dr. Joyce Azevedo, principle investigator.

researchers in the DNA Bar-Coding Protocol worked for us as well, and we obtained distinct bands for each gene on our gels. Our fossil material, however, did not yield single distinct bands. The fossil gene sequences produced multiple, smaller bands or blurred streaks. This told us that we recovered DNA from the fossil material, but the DNA had been fragmented into smaller pieces.

The first major challenge, then, became, "How do we develop primers to recover each of the DNA fragments?" We sent our recovered DNA from the modern spruce species off to be sequenced. We also downloaded sequences from modern specimens preserved in GenBank to augment the sequences of our own that we got back. After studying the combined sequences of specimens, we saw that much of the gene did not vary at all between the different spruce species. There



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ADVENTIST UNIVERSITY

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, Ph.D.
Randy Bishop, MSPT
Ann Foster, Ph.D.
Lucinda Hill, M.D.
Valerie Lee, M.S.
Rick Norskov, M.D.
Lee Spencer, Ph.D.
Keith Snyder, Ph.D.
Debbie Strack, Office Mgr.
Ben Thornton, Ph.D.
Neville Trimm, Jr., Ph.D.
Tim Trott, Ph.D.

Ancient DNA (cont. from pg. 1)

were only a few regions where there was variability between the different species. We call these our “critical” regions. Now we do not have to sequence the entire gene in order to tell the different species apart. We only have to have the “critical” regions. We then developed our own new primers specific to each critical

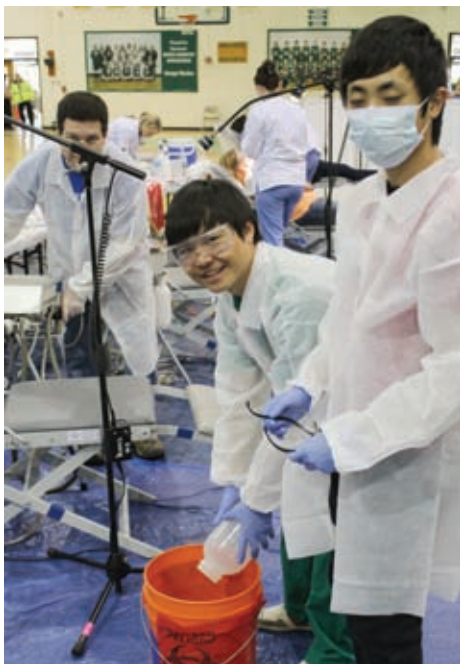
region. If our new protocol works, we can look for smaller DNA fragments from our ancient DNA material; we do not need the whole fossil sequence. To date, we have completed developing new primers for the “critical” regions in the *rbcL* gene, and are testing them in our modern species specimens to verify that we recover the regions that

we are looking for. We have to repeat this process for the *trnH-psbA* spacer. We should be finished developing our new primer sets and verifying that they work by the end of the school year.

Please keep us in your prayers that the Lord will continue to bless this project.

A Very Active Pre-Dental Club

Having set service as a main theme of the year, the Pre-dental club has focused most events on serving God and others.



Andrew Lee and Kevin Dang cleaning waste bottles during RAM clinic

Some of the different community service activities our club participated in include volunteering at a health fair, buying back Halloween candy from elementary children and donating it to the Christmas parade held by the Samaritan Center, in-reaching during Wellness week, being part of the tornado relief effort in our local area, visiting boys at Advent Home, and volunteering at a middle Tennessee Remote Area Medical (RAM) Clinic.

The RAM Clinic is one of the best

opportunities offered to pre-professional students where we can learn about medical careers through serving the community. This year, it was held on March 11 at Rhea County High School. Several club members and other Southern students spent the entire day working alongside healthcare professionals getting a first-hand experience of medical fieldwork.

Pre-dental club's last community service opportunity for the year is giving aid to an orphanage in Kenya as a part of the Maasai Development Project.

We are currently collecting clothes, blankets, and hygienic items to send to Kenya. Donation boxes are available at Talge, Thatcher, and inside the lobby of Hickman Science Center for faculty and students to give items. Letters were sent to local dentists for help as well. Please support the club in helping orphans and spreading God's blessings.



Patients anxiously waiting in the bleachers to be seen.

Other than community service projects, the club also provided fun and learning events like fall vespers at Dr.



Andrew Lee, Naomi Jackson, Dr. Keith Snyder, Christina Shin, Kevin Dang, Amos Chon, and Esther Joung.

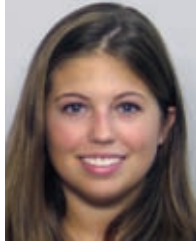
Im's house, winter vespers at Dr. Snyder's house, practice interviews with Dr. Filler, and convocation for tips on taking the DAT (Dental Aptitude Test). As our last activity, the club is planning a trip to the University of Alabama at Birmingham/School of Dentistry in April. Almost all club members are studying to get into dental school, and we are providing a direct look at what dental school will be like.

Those who attend will be able to talk to current dental students and Dr. Filler, Dean of Admissions. We are hoping to expose participants to as much of dental school as possible to give them a good idea of what to expect. More details are available on Southern's Pre-dental Club's Facebook page.

Biology Graduates 11-12



Oyinda Ajumobi
BS Biomedical



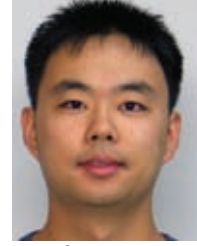
Heather Bauer
BA Biology



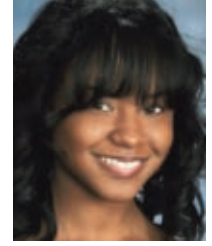
Cassie Brauer
BS Biology



Lauren Caradonna
BS Biology



Amos Chon
BS Biology



Andhere De la Rosa
BS Biomedical



Eric Edgerton
BS Biology



Matt Hacker
BA Biology



Lawrence Hlabangana
BS Biology



Martina Houmann
BA Biology



Josh Jaeger
BS Biomedical



Greg Jeon
BS Biology



Eric Johnston
BS Biology



Jenessa King
BA Biology



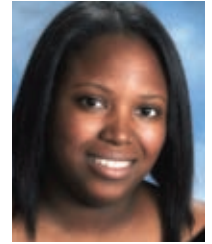
Sidney Lauw
BS Biology



Nicolas Ludi
BS Biology



Roger Miller
BA Biology



Sabine Monice
BS Biology



Joliann Penn
BS Biology



Tara Weeks
BS Biomedical

Allied Health Graduates 11-12



Daniel Biddinger
AS Physical Therapy



Sarah Doe
AS Occupational Therapy



Gina Espinoza
AS Occupational Ther



Jesse Fisher
AS Physical Therapy



Kalli Fjarli
AS Speech Pathology



Daniel Gonzalez
BS Clinical Lab Science



Julenne Henriquez-Gil
AS Physical Therapy



Michael Huffaker
AS Physical Therapy



Lise Ingabire
BS Medical Lab Science



Chris Jenkins
BS Clinical Lab Science



Jin Kang
AS Physical Therapy



Nicholas Kaytor
AS Physical Therapy

Allied Health Graduates 11-12 (continued)



Kristie Lee
AS Physical Therapy



Kim McKenzie
AS Occupational Therapy



Alfredo Mendez
AS Occupational Ther



Kelli Mertz
AS Dental Hygiene



Mariah Richardson
AS Occupational Ther



Alva Roberts
AS Speech Pathology



Jill Rouse
AS Physical Therapy



Cassi Sommerville
AS Physical Therapy



Jordan The
AS Physical Therapy



Jewel Thompson
AS Occupational Therapy



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U.S. POSTAGE
PAID
PERMIT NO. 7
Collegedale, TN 37315

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