“Research can be both rewarding and frustrating,” said Dr. Andrew Samuelsen, Department of Biology, as he described several challenging and rigorous biology research projects for a group of students gathered in Science Hall in November. “Over the years I’ve learned that students who’ve been involved in original research projects at Albright have found their experience to be valuable, even if it didn’t result in publication of their work.”

In the “Cuticle Project,” students in Samuelsen’s cell biology lab attempted to cultivate human cuticle cells so they could be used for other experiments. Albright alumnus Jay Buckley ’01 successfully cultured his cuticle cells after a prolonged starvation period. Unfortunately, other students who subsequently worked on the project were unable to replicate the results using “starved” cells. They were also plagued by cell line contamination problems. So they may try, among other approaches, modified starvation procedures used by other researchers. “One of our conclusions was that it is very difficult to replicate the starvation procedures,” Samuelsen said.

For her honors thesis project, Lauressa Werst ’05 is attempting low-volume blood cell culture. She wants to create high-quality human chromosome spreads. Ultimately she hopes to be able to construct a diagrammatic representation of chromosomes called a karyotype.

In the “Franklinia Project,” Samuelsen is collaborating with Dr. Stephen Mech and Dr. Susan Munch to try to determine if there is significant diversity among various populations of the...

Concerning Cuticles, Mutant Tobacco and Tea

Concerning Cuticles... continued inside
Concerning Cuticles, Mutant Tobacco and Tea

Continued from cover

Franklinia Plant, a member of the tea family that hasn’t been known to grow in the wild since the early 1800s. The team has been isolating the DNA from various Franklinia plants grown in arboreta across the U.S. (including one plant growing outside Science Hall) and wants to compare microsatellite sequences to see if significant differences have developed among plants that have grown apart from each other.

When Samuelsen was in graduate school, he inadvertently created a mutant tobacco plant that grew abnormally at low temperatures but flourished at higher temperatures. At the time he was unable to determine the cause of the problem.

Recent research indicates that the mutant may overproduce a substance called GABA. Becky Miller ’05 is sequencing the gene responsible for GABA production in normal vs. mutant plants as part of her honor’s thesis project. She is hopeful that the mutant will show a genetic defect.

“The take-away message is that you should never give up,” Samuelsen told the assembled students. “You may find yourself with your back to the wall, but that just means you need to come up with different ways to find solutions.”

“...Students who’ve been involved in original research projects at Albright have found their experience to be valuable...”

– Dr. Andrew Samuelsen, Department of Biology

Additional Albright Creative & Research Experience (ACRE) projects in the sciences include:

■ Adrian Chesh ’05 (Stephen Mech, Ph.D.) Using Radio Tracking to Evaluate Homing Ability in White-Footed Mice
■ Charles Frankhouser ’06 (Christian Hamann, Ph.D.) Modification of Current Ion Exchange Resins for Removal of Perchlorate
■ Gary Willman ’06 (Christian Hamann, Ph.D.) Synthesis of Ambrox From a Natural Product (Gary was also supported by a Merck Summer Undergraduate Research Fellowship.)
■ Nicole Hart ’06 (Stephen Mech, Ph.D.) Population Demographic Study of the Deer Mouse, Peromyscus leucopus
■ Quintina Herrera ’05 (Frieda Texter, Ph.D.) Studies of Unfolding of Arylamine N-Acetyltransferase Induced by Urea and Guanidine HCl Followed by CD Spectroscopy
■ Marissa Moyer ’05 (David Osgood, Ph.D.) The Role of a Plant Invader (Lythrum salicaria) in Early Wetland Development
■ John Touhill ’05 (Frieda Texter, Ph.D.) Thermal Denaturation of Recombinant N-Acetyltransferase 2 by CD Spectroscopy
SCIENCE ALUMNI RECEIVE RECOGNITION

Steven Nack, M.D. ’75 was named the 2004 Physician of the Year by the Philadelphia/Delaware Chapter of the Crohn’s & Colitis Foundation of America. Each year the chapter honors physicians for their service to the community and for their efforts to bring aid and comfort to the victims of inflammatory bowel disease and their families.

Nack credits Albright for giving him a solid foundation. “My Albright education was instrumental in my success in medical school,” he says. “Basically, when I got to medical school I found myself almost ‘overprepared’ for the basic science courses of the first year. I breezed through them, scoring some of the top marks in my class.”

Jan Warischalk ’74 was named Pennsylvania School Nurse of the Year by the Pennsylvania Association of School Nurses and Practitioners. She received her bachelor’s degree in nursing, and has served as a nurse in the Fleetwood, Pa., school district for the past 14 years.

Warischalk, who sees as many as 50 children during a typical day, says her Albright education prepared her for the role. “Albright gave me the foundation, especially the professionalism I need in my position,” she says. “We had great instructors who were strong role models.”

CHEMISTRY AND BIOCHEMISTRY DEPARTMENT RECEIVES GIFT OF EQUIPMENT

Johnson and Johnson Pharmaceutical Research and Development, LLC, has donated three pieces of scientific equipment that will add to the extensive resources of the Department of Chemistry and Biochemistry. When purchased new by Johnson and Johnson just a few years ago, the equipment had a combined value in excess of $165,000. Albright obtained it through the efforts of Dr. Frieda Texter ’72, professor of chemistry and biochemistry.

A Varian Saturn 2000 Gas Chromatography-Mass Spectrometry System, used to separate and identify components of volatile mixtures, will complement a similar Hewlett-Packard instrument already in use at Albright.

An Agilent Technologies HP 3D Capillary Electrophoresis System, which separates components of aqueous mixtures using electric current, will allow us to introduce a new technology into our curriculum.

Finally, a Shimadzu High Performance Liquid Chromatograph System received from Johnson and Johnson augments our collection of liquid chromatography instrumentation with a modern, computer-driven model. Liquid chromatography separates components of aqueous or organic mixtures in the liquid phase.

Commenting on the acquisition, Texter noted that “these three new pieces of equipment complement the impressive instrument collection maintained by Albright College, allowing us to continue to expand the opportunities we provide our students for hands-on experience.”
If you were blind you wouldn’t be reading this sentence right now. But could you? Perhaps, if experiments conducted by Darren Stoltzfus ’06 this summer were refined, expanded and further pursued.

Stoltzfus, a physics major, worked with holograms, or three-dimensional photographs of light waves. Since they were conceived and developed in the late ‘40s and ‘50s, scientists have worked to give them practical applications.

For instance, when used in combination with lasers, holograms can identify a person’s fingerprints. And it’s not just the stuff of science fiction, considering that fingerprint identifiers are routinely used by the security industry of today.

Stoltzfus wanted to know if holograms could also be used to identify individual characters, such as letters on a page. If so, that could lead to the development of hand-held devices that translate written words into audio signals, enabling blind people to “read” the printed page.

“The idea was to learn more about holography and to learn some lab techniques,” Stoltzfus said. “I wanted to learn something about pattern recognition and what the limits were on what you could do.”

Stoltzfus worked on the project, made possible through an Albright Creative & Research Experience (ACRE) grant, with guidance from Brian Buerke, Ph.D., assistant professor of physics.

Before Stoltzfus and Buerke could even begin to use holograms they had to learn how to make them. That in itself was a slow process. “In the beginning we were just trying to get holograms to work,” Buerke said. “We had to get them developed and make sure everything was running smoothly before we could conduct the experiment.”

In the end Stoltzfus learned that it is possible to use holograms to recognize letters – but it’s not easy. “The system is very sensitive to vibrations,” he said. What’s more, the reference letters had to be precisely positioned to get a positive ID. Even when everything was properly aligned the identification was fairly weak, primarily because letters aren’t nearly as complex as fingerprints and therefore don’t have as many of the surface variations that aid in recognition.

As it turned out, Stoltzfus may have learned as much about the experimentation process as he did about holograms. “At first I thought I’d work in the lab doing experiments like we’d done in class,” he said, “but it turned out to be completely different. I learned so much more about the process from start to finish.

“For instance, you have to order all your supplies, but before you can do that you have to research what you need,” he said. “To be able to understand how a whole lab setup works as compared to a classroom setup was a very valuable experience for me.”
Michael DiFelice ’02 likes to stay busy, and Albright gave him the chance to do just that – both in the classroom and out. That may have helped him get into the University of Pennsylvania School of Dental Medicine, and it certainly didn’t hurt when he applied for a scholarship from the Air Force. DiFelice came to Albright with an academic talent grant in science and a Eugene Shirk Scholarship. Long interested in pursuing a health-related career, he’d been in Explorer posts for both dentistry and medicine. He knew what each profession required, but it wasn’t until his sophomore year that he chose dentistry over medicine. “I like to work with my hands,” he says, “and dentistry seemed to be a better fit.”

His path decided upon, he chose upper level pre-professional courses that included microbiology, immunology, bacteriology and molecular genetics. “Classes I knew I’d see in dental school,” he says. “It was good background, it did a good job of preparing me.”

DiFelice was active outside the classroom as well, swimming on the College team and as a member of the Pi Kappa Phil fraternity, the Beta Beta Beta biological honors club and Alpha Epsilon Delta, the pre-medical honors society. What’s more, he served as student government president in his junior and senior years. Today he’s vice president of the Penn Dental chapter of Delta Sigma Delta, an international dental fraternity. His busy schedule helped him develop his leadership and time management skills. That, along with his academic record, made him a more-attractive candidate for Penn Dental, and the U.S. Air Force.

“The summer before I started dental school I received a scholarship through the Health Professions Scholarship Program,” he says. “That means that the Air Force will pay for my last three years at dental school.” He, in turn, has committed to serving three years in the Air Force.

DiFelice was commissioned as a second lieutenant in January 2003. He’ll complete his military training, and be promoted to captain, after finishing at Penn in May 2006. When he does, he’ll be joining an elite group of graduates. “They only awarded about 30 of these scholarships,” he says. “I believe I got mine in part because of all the things I did at Albright.”

“Going with the Air Force is a great way to serve my country,” he adds. “I think I got the most out of my education and the most out of Albright. It prepared me for the world and made me who I am.”

Science Success Story

Albright College was host for the October meeting of the Lehigh Valley Section of the American Chemical Society. Curt Hare, Ph.D., professor emeritus at the University of Miami and a research professor at Franklin and Marshall College, presented a program titled “Organics in Your Water.” The organics in question include pharmaceuticals and personal care product (PPCPs) such as ibuprofen, antibiotics, caffeine and perfumes. Until now these products have received little attention, but they deserve greater scrutiny because they’ve begun to appear in streams and may have an impact on water supplies.

Hare noted that PPCPs have been linked to birth defects in amphibians and sex changes in fish. While treatment of influent water with chloramine in combination with other steps provides safe drinking water, the treatment of wastewater would require both financial and political capital to fully address the problem, he said.
Time to brush up on your knowledge of anatomy and physiology.

The first ten readers to submit the correct answers to the following questions will receive an ultimately cool Albright cooler bag! Answers will be provided in the spring 2005 issue of Fusion.

1. **Where is the incus located in the body?**
2. **What does the Loop of Henle do?**
3. **What causes the “lub dub” sounds of the heartbeat?**
4. **Where are the cells in the body that monitor body temperature?**
5. **What does the abducens nerve do? [Bonus: which cranial nerve is it?]**
6. **Which cells secrete insulin?**

Email your answers to jstoudt@alb.edu or send them via mail to Jennifer Stoudt, Albright College, 13th & Bern Streets, P.O. Box 15234, Reading, PA 19612-5234. If you’d rather take the quiz online, go to www.albright.edu/fusionquiz.

Just two of our readers were able to correctly answer all the questions in last issue’s quiz. Congratulations to Todd Trout ‘84 and Leslie Hersh ’69, who received an Albright cooler bag for their efforts.

Here are the questions and the answers we were looking for:

1. **What three elements are liquid at or near room temperature?** Mercury (Hg), Gallium (Ga) and Bromine (Br)
2. **What is the odor of sulfur?** Sulfur itself is odorless.
3. **What color is pure copper sulfate?** Pure copper sulfate is white.
4. **What is the odor of natural gas (methane)?** Methane is odorless.
5. **Where does helium come from?** Helium is isolated from natural gas.
6. **Where will the new organic chemistry lab be located?** In the new Science Center.