RU College of Science and Technology
Radford University

January 27, 2011

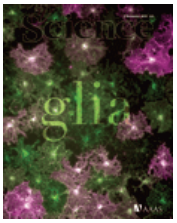
CSAT Bi-weekly Newsletter

From the Dean's Desk

Lane Published in *Science*

Chemistry faculty member Kimberly Lane's article "Alleviating Cancer Drug Toxicity by Inhibiting a Bacterial Enzyme" was recently published in *Science* (*Science* **330**, 831 (2010)), one of the premier scientific journals in the country. "This paper describes several years worth of work, spanning several labs at multiple insti tutions," Lane says.

Lane and two other researchers investigated an enzyme known as beta-glucuronidase, which is produced by several species of bacteria found in the human gut. Lane says, "we are interested in this protein because it has been implicated in the severe side effects experience with the cancer chemotherapy drug CPT-11. This drug is a highly effective chemotherapy agent, but its use is limited by the intestinal damage associated with its administration."



The research focused on searching for inhibitors that could target the enzyme, beta glucuronidase, and shut down its activity without killing the bacteria, which are necessary for human health. "In this study, we present several novel inhibitors and show that they can inhibit the activity of the enzyme in a test tube, and can inhibit the activity of the enzyme in bacterial cells. Not only that, but these inhibitors could decrease the side-effects of CPT-11 administration in rats." These finds are crucial for the study. The fact that the inhibitors are being tested and prove to be working on the rats, may lead to human trials.

"I am continuing the research here at Radford University, working with undergraduate students to study this enzyme in more detail. We have been studying the stability and activity of the enzyme. We are currently getting ready to start thermodynamic characterizations of the binding of the lead compound from this paper to the beta-glucuronidase. These studies could lead to the optimization of this compound in its development into a human drug," Lane says.

— Cameron Elliott

Alumni Career Panel and Pre-Med Panel January 28

The College of Science and Technology and the CSAT Pre-Med Club will host an Alumni Career Panel presentation and Pre-Med panel presentation on Friday, Jan. 28 beginning at 3 p.m. in the Bonnie Auditorium as a part of RU's Homecoming celebration.

All CSAT students and faculty are encouraged to attend.

Our first panelist will be Emily Williamson. Williamson is a 2009 biology graduate and is currently a Clinical Research Associate at Washington Cancer Institute at the Washington Hospital Center in Washington, DC. She is also the Primary Coordinator for Breast Cancer Clinical Trials.

Next, David Bradshaw is a1990 geography graduate. In March of 2008, he founded his own company, InteractiveGIS, which combines databases and maps together in a way that allows you to see specific details about certain areas on a map. He credits his classes in geography in fueling his passion to start his own GIS company.

The final panelist, Seth Perry, a 2003 computer science and political science graduate, is currently completing his PhD in the Environmental Design and Planning with a research focus on the mapping and spatial analysis of broadband Internet access in rural areas and its impact on economic development. Mr. Peery is Senior GIS Architect in the Enterprise GIS Research and Development Administration department at Virginia Tech.

The Pre-Med Panel will include 1992 graduate Dr. Gregory Alouf, 1994 graduate Dr. Ray Tuck and 2010 graduate and current medical student Ryan McFague.

Inside this issue:

Upcoming Events:

- CSAT Alumni Career Panel Presentation, Jan. 28 at 3 p.m. in Bonnie Auditorium
- Pre-Med Career Panel, Jan. 28, 4 p.m. in Bonnie Auditorium
- MES Lecture by Dr. Robert C. Whisonant, Dr. Judy Ehlen, Feb. 1 at 7 p.m. in Bonnie Auditorium

Geography Student Spends Winter Break in Peru

Instead of going home to spend winter break with his family, geography major Joseph Rudolph traveled to Amaru Mayu, Peru, to complete an independent study in environmental science. “I decided to widen my web of travel so that I can add to and improve my own knowledge of society and help preserve an endangered natural environment through volunteering in Peru,” Rudolph says.

Rudolph says, “research led me to the non-profit international volunteer organization ‘A Broader View.’ This organization serves primarily humanitarian projects around the world. The project I believe is the best fit for my academic major and concentration of studies is an initiative by the Asqrideq’ Ngod, for the protection, conservation and sustainable management of the vulnerable ecosystems of Amaru Mayu.”

As a volunteer, Rudolph chose to participate in forest and water handling. “The objective of forest handling is to recover, protect, conserve, manage, and increase the biodiversity and commercial value of the secondary and primary forests in the protected area of Lote Amaru Mayu. The object of water handling is to recover historic levels of the Height Lagoon in Lote Amaru Mayu. The restoration of natural water levels will attract fauna and animal life to once again populate the area,” he says.

Rudolph says that his experiences were amazing and it is hard to choose his favorite. “South America, especially the jungle is a world of its own. I would say the greatest part of the trip was either seeing Machu Piccu and creating a path to an unmapped waterfall in the middle of the jungle. But then again each area I visited was so different from the last with so much to offer, it’s hard to say, “ he says.

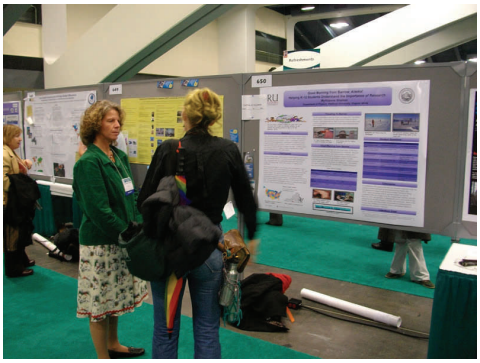
Rudolph discovering an unmapped waterfall in the jungle.

--Cameron Elliott

Physics Faculty Member Presents Barrow Research

Physics instructor Mythianne Shelton presented the results of her educational outreach work at the Fall 2010 meeting of the American Geophysical Union. Shelton coordinated Skype sessions with a number of elementary, middle and high school classrooms in southwestern Virginia during the first week of March 2010. She started the sessions at 6 a.m. in Barrow, which is four time zones behind Virginia.

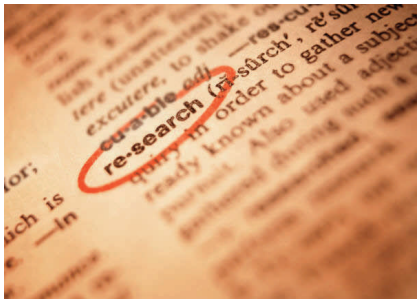
She had previously coordinated lessons related to Alaska and the polar regions with the classroom teachers. She often communicated with four classrooms per day, sometimes even right after returning from the morning trips out on Barrow's ice. In addition, she fully participated in the sea ice research, including the data processing. She also presented her work to the scientists and townspeople in Barrow at the end of the trip.



Shelton (left) speaks with an interested colleague during the poster presentation segment of the meeting.

CSAT Faculty Members Receive University Research Grants

Six faculty members in the College of Science and Technology received the University-wide research grants, which were given to support research-related activities in 2010 and 2011.



The Faculty Professional Development Leave and Research Support Committee met on Friday, November 12, 2010 to review the applications for these awards.

Mark Whiting, assistant professor of Psychology and Mark A. Cline, associate professor of Biology, received a $20,000 grant for their proposal “Elucidating central mechanisms associated with neuropeptide VF-induced satiety.”

Andrew Foy, Instructor of Geospatial Science, and Bernd Kuennecke, Interim Director of School of Environmental and Physical Science and Professor of Geospatial Science, received a $18,650 grant for their proposal “Improving the Temporal Scale of Remote Sensing Data: A balloon platform for airborne sensors to study local vegetation phenology.”

Biology faculty members Jeremy Wojdak and Robert Sheehy received a $19,736 grant for their proposal “Effects of parasite genetic diversity on host infection rates.”

— Xiuming Wang

Curiosity Leads to Entrepreneurial Adventure for Alumnus

Twentieth century American poet and satirist Dorothy Parker once said "the cure for boredom is curiosity. There is no cure for curiosity." This is definitely true for 1993 computer science alumnus Jeff Clark. His active curiosity is taking him on a wild entrepreneurial adventure that has led to a recent $10 million contract with The Naval Air Warfare Center for the research and development of virtual environment technologies to support U.S. Navy aircrew training simulators and mission rehearsal systems.

Prior to hopping on the entrepreneurial roller coaster, Clark's professional career took off when he was hired by a small research and development firm upon graduating from Radford. There he learned about project-based engineering and the defense research and development industry, and even contributed to proposals and published scientific papers. In 1996, Clark was hired at the Air Force Research Laboratory in Mesa, Arizona, where he worked for a large defense contractor and got a glimpse of the processes required for larger projects.

"I was fortunate enough to unofficially report to the Air Force Program Manager for the program that I supported. She was an experienced, high ranking Air Force civilian who made a point to teach me how the civilian side of the government worked: management structure, budgets, contracts and department of defense politics – not the most compelling topics for technically oriented individuals, but necessary knowledge for those who would move into management or someday own a defense business. I count her as the most influential mentor that I've had professionally," says Clark.

While employed at The Air Force Research Laboratory, the entrepreneurial adventure innocently began in 1997 when Clark co-founded Renaissance Networks. During his free time, Clark and a partner researched the potential for modifying off-the-shelf wireless LAN technology to build dedicated Internet connectivity to businesses throughout the city. Clark describes his first foray into business as satisfying his curiosity, "the company was primarily a tax shelter for a hobby and largely an artifact of living a single lifestyle, receiving a decent paycheck, and having too much time on my hands!"

But by the middle of 1998, the company started selling its services to local businesses. "I needed day-to-day help in order to continue to build the company while still working full-time," says Clark. So he convinced his brother, RU communication graduate Matt Clark, to pitch in with sweat equity in exchange for an ownership share of the company. In 2000, Jeff Clark "quit his day job" and took the helm of Renaissance Networks as President until 2004 – when he founded his second company Renaissance Sciences Corporation.

Matt Clark served as Vice President for Operations for Renaissance Networks until the company was sold to SparkPlug Communications in 2007. By that time, Renaissance Networks had deployed its proprietary cell-like fixed wireless architecture to more than 500 businesses across the Phoenix metropolitan area. Matt remained with Sparkplug, which merged with Airband Communications to form the largest business to business fixed-wireless Internet provider in the country. Recently, Matt was promoted to Western Regional General Manager at Airband.

While president of Renaissance Networks, Jeff Clark stayed in contact with his colleagues in simulation training research and development. "During the Renaissance Networks years, I never quite lost touch with the industry that started my career, even providing consulting services in this specialty through Renaissance Networks," says Jeff Clark. Over the years, he began seeing a growing interest in this area and saw a niche a new company could fill. Renaissance Sciences Corporation's (RSC) first customer was his former employer The Air Force Research Laboratory. Since RSC's inception in 2004, it has specialized in pushing the limits of physically-based modeling of environments and observers in real-time application to provide training opportunities to government defense agencies. "No simulator user would say that any simulation is 'better than the real thing,' however the budgetary pressure to complete increasingly complex training objectives in the simulator rather than the aircraft has steadily increased," says Clark.

According to Clark, RSC is currently most engaged in night vision goggle simulations, thermal sensor simulations, and the production of large scale terrain simulation databases. He says that his company focuses on incorporating realistic synthetic experiences for different mission conditions. "Today, the customer wants to use the simulator to train the employment of the aircraft's weapon systems, to train team tactics, to operate in all environments – especially at night. With these trends has come the requirement for deeper realism in all of the subsystems, foremost of which sensors," says Clark, "It would not be too much of a stretch to think of our work in this area as very elaborate but realistic video games."

RSC's clients include the United States Special Operations Command, U.S. Army, U.S. Navy, U.S. Air Force, U.S. Department of Homeland Security, Canadian Air Force, Royal Netherlands Air Force and the Chilean Air Force among others.

Over the last decade, Clarks professional life could be described as a rollercoaster ride. "I think that week-to-week experience of building a company from the ground up is mostly characterized by the emotional investment required to put into perspective the highs and the lows, both of which are significantly amplified from anything I remember before I 'quit the day job' 11 years ago this coming June," says Clark. "The lows most often have to do with financial pressures – there were a number of times in the early days when I wasn't quite sure where the next payroll was coming from. Today, the timing of those pressures is less acute, but all of the numbers are much larger," he says. The highs, he says, are worth the occasional struggle, "it is hard to beat the experience of seeing significant milestones achieved by the organization you've taken those risks to build – hiring the first employee, the tenth, the twentieth, watching an employee achieve a milestone important to his or her development, building your first 'nice' offices, or landing your largest ever contract," adds Clark.

And the company's largest ever contract was announced in January of 2011. RSC was awarded a $10 million contract for U.S. Navy simulator research. If, according to the great American satirist Dorothy Parker, that the cure to boredom is curiosity, then Clark will not be bored for many years to come.

Renaissance SCIENCES CORPORATION

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CSAT STEM Club News

The CSAT STEM Club had its first meeting on Tuesday, January 25 at 6 p.m. in the Stuart Hall Lounge. Dr. Rogers was at the meeting to make some welcoming remarks and Dr. Chris Hermann and Dr. Kim Lane talked about the Blue Ridge Highlands Science Fair. Refreshments of cupcakes and pizza were served.

The officers had their first meeting of the year on Monday, January 24 at 7 p.m. in the Peery Hall kitchen. The CSAT club will also be having a point system this semester, and the person with the most points who comes in first and second place will receive Carowinds/Busch Gardens/Dollywood ticket.

The CSAT STEM Club will be assisting with the Alumni Career Panel on Friday, January 28 in the Bonnie Auditorium at 3 p.m. On Saturday, February 12, the club will be assisting with a CSAT Open House for prospective students.

Club t-shirts will be ordered from Elevenwest and sold for $15 for anyone who wants one. Later in the semester, on April 2, we will be traveling to the Smithsonian in Washington D.C. We will be leaving that at 5 a.m. from campus to make the trip.

On Thursday, February 10, at 5 p.m. Dr. Ian Barland will be the club's first faculty guest speaker. Also this semester, we will host Dr. David Evans, Associate Professor of Information Technology from UVA who will discuss computer security.

There will be many volunteer opportunities this semester, and we want to encourage everyone to volunteer if they are available. These opportunities include:

CSAT Open House, Saturday, Feb 12th
- 12 to 3:30 p.m.
- Dress well, help visiting families, act as representatives of RU

Super MACC
- Monday, March 14th
- Scorekeepers, Timekeepers, Ambassadors
- 4 to 9:30 p.m.

Science Exploration Day
- Merit Badge College
- Saturday, March 26th
- Teaching Assistants for classes
- ALL DAY LONG EVENT

Blue Ridge Highlands Science Fair
- March 4th and 5th, Friday and Saturday—RU Campus

Jasmine Jackson

Secretary of CSAT STEM Club

Photos from recent CSAT STEM Club meeting.