

# Exploration & Discovery

NEWS AND INFORMATION FROM THE DIVISION OF RESEARCH AND GRADUATE STUDIES VOLUME 5, ISSUE 4

## Cancer-Fighting “Smart Bomb” Wins License, Proceeds to Phase I Trial

*EDITOR’S NOTE: As we went to press on this edition of E&D, we received the very sad news of the passing of Dr. Anne Kellogg, the innovative researcher featured in this story. Kellogg died of lung cancer on January 23, 2011 at age 57. We hope this article serves to honor her memory and highlight her important contributions to ECU and the medical research community.*

The fight against certain types of cancer may have reached an important new milestone, thanks to the work of an ECU researcher.

**Dr. Anne Kellogg’s** identification of the cancer-cell-targeting monoclonal antibody DS-6 is licensed by ImmunoGen, Inc., a Waltham, Mass.-based biotechnology company.

Working in partnership with the international pharmaceutical company Sanofi-Aventis (formerly Aventis), ImmunoGen is testing the humanized CA6-binding antibody, HuDS-6, as well as several other anticancer agents in FDA-approved clinical trials. The first patients began receiving HuDS-6 as part of a Phase I clinical trial in September 2010.

This clinical trial is an important next step in the journey to explore whether this antibody could play a critical role in treating common forms

of ovarian, breast and other solid tumors.

An associate professor of pathology and laboratory medicine at the Brody School of Medicine, Kellogg had focused her research on monoclonal antibodies since joining ECU in the early 1990s.



Dr. Anne Kellogg, monoclonal antibody pioneer

Monoclonal antibodies are made by identical immune cells that are clones of a unique parent cell. Given almost any substance, it is possible to create

monoclonal antibodies that specifically bind to that substance; they can then serve to detect or purify that substance. Thus, monoclonal antibodies can serve as a vehicle for more targeted drug delivery to different tissue types, reducing overall toxicity to the patient.

In the case of HuDS-6, the monoclonal antibody acts much like a smart bomb, targeting certain solid tumor cells and delivering a potent dose of drugs for use in the treatment of cancer. HuDS-6 has been linked to a chemotherapeutic agent for targeted treatment of solid ovarian, breast and other solid tumors.

Kellogg credited ECU’s Office of Technology Transfer, and in particular OTT Director **Marti Van Scott** for supporting her research and handling the extensive paperwork involved in the licensing process.

“This whole process of drug discovery and development demonstrates how well academia, biotechnology, and pharmaceutical companies can work together,” she said.

Should HuDS-6 become part of a successful cancer treatment, ECU would receive license royalties, monies that can be used to fund further research as well as other university-wide programs and initiatives.

### ECU Research Goals: Aligning with the Nation’s “Grand Challenges”

In July 2010, a joint directive from the Office of Management and Budget and the Office of Science Technology Policy mandated that all federal science agencies prioritize funding in the six areas:

- 1) Supporting translational research that will create jobs.
- 2) Defeating dangerous diseases.
- 3) Moving toward a clean energy future.
- 4) Understanding and adapting to global climate change.
- 5) Managing competing demands for land and water.
- 6) Developing technologies to protect troops and citizens.

The agencies defined these priorities as the nation’s “Grand Challenges,” and much of ECU’s research activities already fall within these categories.



The East Carolina region possesses unique versions of each of these priorities, and ECU is dedicated to aligning with this new mandate to locate external funding to address them.

Watch for more on our region’s Grand Challenges and ECU’s research initiatives in future editions of this newsletter.

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## GRADUATE RESEARCH

### Chad Michael Hunter

*Cancer Research on the Fly*

When it comes to research in genetics, specifically DNA replication in cancer cells, graduate student **Chad Hunter** is making progress on the fly.



The cell biology major uses the common fruit fly to investigate what occurs when two proteins are mutated and when their interaction is disrupted. He hopes to show that these two proteins are needed in tandem for efficient DNA replication to occur in the cell.

One of the proteins Hunter is studying is RecQ4, which has a direct link to cancer in humans. He hopes to determine the effect of RecQ4 on different tissues. He thinks mutating a small protein at the genetic level and seeing results such as smaller size or deformed body parts is "pretty cool." He's also very appreciative of the ECU biology dept.'s close-knit environment, one of the reasons he says that ECU is great place to be for graduate work.

A recipient of the James S. McDaniel Scholarship, Hunter is president of the Biology Graduate Student Association and recently presented at the Drosophila Research Conference. "The most rewarding part about my research is when I uncover new information that no other human knows yet," he says.

## QAR Conservation Lab Restores Blackbeard's "Pirate Nation"



Did Blackbeard draw on this to say "Arghhhh!"? A sword hilt was just one of the latest artifacts from the NC-based shipwreck of the *Queen Anne's Revenge* (QAR), flagship of the notorious pirate, revealed as part of an unveiling ceremony held at the NC Department of Cultural Resources QAR Conservation Lab at ECU's West Research Campus this past December. "It is very appropriate that Blackbeard's recovery is part of pirate nation," Deirdre Mageean, vice chancellor for graduate studies, told the Daily Reflector at the ceremony. "ECU takes seriously its mission of service, education and outreach, and this partnership exemplifies that mission."

Since 2003, researchers at ECU have been hard at work identifying, cataloging, and preserving the ship's remains, a joint project between ECU and the North Carolina Department of Cultural Resources. The recovered artifacts from the shipwreck, located just off Shackleford Banks, are brought to ECU for cleaning and preservation before sending many on for display at the NC Maritime Museum in Beaufort. Full recovery, including the ship's hull, is expected by 2013, and a complete exhibit is planned for 2018, the 300th anniversary of the ship's sinking.

Through graduate assistantships and class visits the QAR Lab provides opportunities for students to learn and participate in the painstaking process of marine archaeology and historical preservation. According to Sarah Watkins-Kenney, chief conservator, "the majority of artifacts are brought up from the seafloor encased in thick mineral concretions that must be chipped off, piece by piece, a process that can take months to complete." Recently the lab was able to purchase an X-ray machine to expedite this process, allowing researchers to see what, if any, objects are within. For the latest on the QAR research project, go to: <http://www.qaronline>.



Chief conservator Sarah Watkins-Kenney and youth visitor

## Gemperline, Former Student Share Chemistry Award

At the October 2010 annual meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, **Dr. Paul Gemperline**, ECU's dean of graduate studies and professor, analytical chemistry, and **Patrick Cutler**, one of his former students, were among the honorees presented with the 2010 William F. Meggers Award. Cutler, currently a PhD student at the University of New Mexico, acquired his BS and MS in chemistry at ECU.

The award recognizes the authors of an outstanding paper or series of papers appearing in *Applied Spectroscopy* journal. Cutler and Gemperline, pictured second from right and far right in the photo, shared the award with David M. Haaland of Sandia National Laboratories and Erik Andries of Central New Mexico Community College for their joint paper "Methods for Kinetic Modeling of Temporally Resolved Hyperspectral Microscope Images of Fluorescently Labeled Cells."



## REGIONAL OUTREACH

### ECU Innovation Showcased at National Conference

ECU's regional outreach gained even more prominence recently as 41 faculty and staff members and seven graduate students were invited to present at the 2010 National Outreach Scholarship Conference (NOSC), up from nine presenters the previous year. According to **Dr. Beth Velde**, director of ECU's Engagement and Outreach Scholars Academy within the Office of Engagement, Innovation and Economic Development (OEIED), ECU's presentations are indicative of ECU's strength in engaged scholarship and demonstrate why ECU is a Carnegie Engaged University. ECU gained membership in NOSC in early 2010, and is the 13th university and first non-land grant institution to be offered membership.

Representing the OEIED at the event along with Dr. Velde were Associate Vice Chancellor **Ted Morris**, Innovation Design Lab Director **Wayne Godwin**, Industry and Economic Development Director **Ruthann Cage**, and Community and Regional Development Director **Kenneth Flowers**.

Velde led a conference presentation entitled "Process

Doing, Becoming and Being an Engaged Scholar," which described ECU's Engagement and Outreach Scholars Academy, including the curriculum, partnership development activities, and outcomes. Morris, Godwin, and Cage gave a poster presentation entitled "Unleashing Innovation through the Language of Design," which highlighted ECU's Innovation Design Lab and the philosophy, outreach initiatives, and process of taking an invention from ideation to commercialization to drive innovation on campus and throughout the region. Flowers' poster presentation showcased the ECU Community Enhancement and Economic Transformation Initiative (CEETI), which provides technical assistance, resources, economic development products and expertise to distressed communities to help foster regional competitiveness and transformation. CEETI includes the Municipal Management and Innovation initiative, the Talent Enhancement Demonstration with NC Commerce, and ECU's Outreach Network.

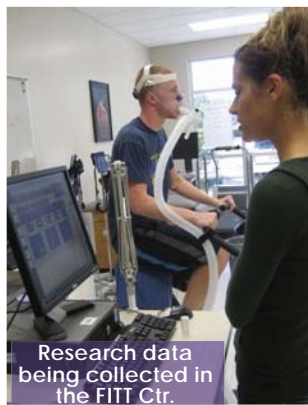
## Exercise Rx: ECU's Human Performance Lab Helps Us Keep FITT

Using components of research and service, the Human Performance Laboratory (HPL), housed within ECU's College of Health and Human Performance, continually strives to better understand the physiology and prevention of diseases including heart disease, obesity, and diabetes, and offer opportunities to get people involved in making physical activity and a healthy lifestyle a permanent part of their lives. HPL has been performing research and providing service to Greenville and surrounding communities since 1981.

Research conducted by HPL is performed collaboratively with scientists and physicians at the East Carolina Heart Institute, the Brody School of Medicine, and numerous other departments within ECU. Many studies involve a variety of exercise testing at HPL's FITT (Fitness, Instruction, Testing, and Training) Building and include aerobic capacity assessment, submaximal exercise testing, and strength assessment in order to look at the effects of physical activity on life-altering diseases.

As an example, ECU and Duke University recently collaborated on a 10-year project funded by the National Institutes of Health to discern the type of exercise prescription that best reduced risk factors for cardiovascular disease in middle-aged, overweight individuals. The first phase of this project has resulted in 26 scientific papers indicating how specific exercise programs affect various factors linked with developing heart disease.

A benefit to the subjects participating in these studies is that once the testing is completed, the individuals are able to use the FITT Center to continue reaching their physical activity goals.



In addition to research, HPL offers a variety of community outreach services, including its Cardiovascular Health Assessment Program, designed to establish a participant's heart disease and diabetes risk status, offer insight on modifying heart disease susceptibility, and provide exercise prescription and body composition assessment.

Graduate and undergraduate students are a crucial part of the success of the research and service elements of HPL. The students not only get hands-on experience with the exercise testing and training, but they leave a lasting impression on the participants. Many of the individuals who have incorporated physical activity into their routine have done so in part due to the knowledge and motivation the students offer.

For more on HPL and its research and services, go to: <http://www.ecu.edu/hpl>

### J. P. Walsh, PhD

*Oceanographer Studying the Seafloor*

"Of course, we still don't really know the impacts on the ocean below and the long-term ecological consequences. Our work will hopefully shed some light."

So blogged **Dr. J.P. Walsh**, associate professor in the Dept. of Geological Sciences and the Institute for Coastal Science and Policy, from the Deepwater Horizon site in the Gulf of Mexico while aboard *Pisces*, a research ship operated by the National Oceanic and Atmospheric Administration (NOAA), this past September. Using a device to core the seafloor, Walsh helped retrieve samples from depths greater than one mile down to aid NOAA in its ongoing assessment of the spill's ecological impact.



Walsh was pleased to provide this crisis response support, but is also very excited to be leading a research project examining sediment layers building the seafloor seaward of New Zealand's Waipaoa River. This river has a catchment about 10 times smaller than Greenville's Tar River, but discharges about 1,000 times more sediment to the coast. Studying the geological record of this river, which had several major floods within the past year, can provide useful insight into the frequency and magnitude of extreme climatic conditions, which may have been less common in the past.

The National Science Foundation is funding this geological research, including four expeditions over the year. Walsh and other researchers from ECU, the University of Washington, the Virginia Institute of Marine Science, and New Zealand's National Institute for Water and Atmospheric Research return to sea in February 2011. Keep informed about Walsh's New Zealand adventure by going to: <http://www.ecusstorm.blogspot.com>

### Jared Brown, PhD

*Testing the Toxicity of Nanomaterials*

While there are more than 800 products engineered using nanotechnology currently on the market, there is a significant lack of testing associated with these materials, despite emerging observations of adverse respiratory and cardiovascular effects.

That's about to change with research by **Dr. Jared Brown**, assistant professor in the Brody School of Medicine's Dept. of Pharmacology and Toxicology. In November 2010, Brown was awarded a 2010 Outstanding New Environmental Scientists (ONES) grant by the National Institute of Environmental Health Sciences (NIEHS) in order to continue his research on the toxicity of nanomaterials. The award is for five years and worth \$2.2 million.

Most specifically, Brown will focus on carbon nanotubes (CNTs), tiny cylinders of pure carbon developed via nanotechnology that are then used in transistors and computer chips. "We have preliminary but convincing evidence that CNT exposure activates resident mast cells, either directly or indirectly, thereby contributing to both pulmonary and cardiovascular pathology," he says.

Brown's ONES-funded research will include: 1) examining mast cell activation in lungs of mice exposed to multi-walled CNTs; 2) examining the role of the protein molecule IL-33 in mediating mast cell activation; 3) clarifying the role of mast cells in contributing to altered vascular reactivity within the cardiovascular system; 4) using cell-based models to establish the mechanisms by which multi-walled CNTs lead to mast cell activation.

"This understanding will allow us to design better models and in vitro screening tools to predict nanomaterial toxicity," Brown says.



## Compliance Close-Up: Conflict of Interest (COI)

As members of an academic community, we make and form various relationships and commitments with colleagues, business acquaintances, relatives, and friends. In addition we are often called upon to collaborate with others, to conduct peer review, or to serve as consultants. These relationships and extracurricular activities may, at times, be perceived by others as (or have the potential to become) a situation where our professional objectivity may be compromised or have the appearance of being compromised by financial or other personal considerations.

Such a situation is commonly known to be conflict of interest (COI). Here are some important points to keep in mind regarding this compliance issue:

**COI is inherent to academia and actual or appearance of COI can occur in many instances.**

Such circumstances can occur when an individual's COI could lead to or give the appearance of biased research and reporting, when students are in a position of being exploited in your research, or when you may have the opportunity to make recommendations in purchasing, employment or rank, or admitting students. Because of this, it is very important for faculty and researchers serving in any kind of review capacity to be sure that their academic and research interests and relationships do not interfere with their objectivity of the process.

**COI can be of a financial or non-financial nature.** Financial COI involves anything of real or potential or

perceived value such as income, equity, or royalties, such as when a researcher or a family member of the researcher has equity in research sponsored by a company. Non-financial COI typically involves board membership, executive positions, scientific advisory panels, or trusteeship where positional or informational value may exist. Your role in these activities may at times conflict with your professional responsibilities or responsibilities to ECU.

**Having a COI does not mean that an activity or project cannot be done.** COI simply has to be managed prior to the activity. Disclosures to ECU, collaborators, sponsors, and the public are necessary to manage a COI. In some cases, additional oversight, monitoring, or independent review may also be needed.



**COI management should not rest solely with the conflicted individual but in collaboration with others who can independently and objectively review the situation.** At ECU, a COI disclosure form must be completed by ALL faculty and EPA staff and sub-

mitted to the chair/dean or appropriate unit administrator on an annual basis, as well as updated any time within the year if your situation changes. Where a COI has been disclosed, a COI management plan will be developed and is required to be in place.

The Office of Research Compliance Administration (ORCA) is responsible for reporting and management of COI at ECU. **Please contact ORCA at 328-9473 for assistance for COI information and assessments.**

### RSG STAFFING NEWS

**Wanda Wynne** has joined the Division of Research and Graduate Studies team as an assistant vice chancellor, responsible for planning, development and formulation of budgets and budget policies. As part of her duties, she will analyze and manage budget throughout the year and also oversee all human resources-related transactions requiring divisional review and approval.

Wanda is a native of Pitt County and received a BS in Business Administration from ECU in 1982. She worked as an employment interviewer with the Employment Security Commission and as a revenue officer for the NC Dept of Revenue before coming to ECU in 1999. She has served ECU as the director of student loans and as an accountant in the University and Health Sciences budget offices.

### FUNDING DEADLINES & UPCOMING EVENTS

See new RGS External Funding Website [www.ecu.edu/rgs/fundingopps.cfm](http://www.ecu.edu/rgs/fundingopps.cfm)

- **DOD** - Broad Agency Announcement—Extramural Medical Research Programs, 9/30/2011.
- **EPA** - Understanding Day Care Environments of Children, 6/15/2011.
- **HRSA** - Rural Health Network Planning, Rolling date.
- **OSP** - ECU Faculty/Staff Grant Training with Marjorie Piechowski (Willis Bldg), 4/25-27/2011. Contact Tamara McKeel @ 328-9535 to register.
- **NIH** - 2011 NIDA Award Program for HIV/

AIDS Research (DPI), 5/26/2011.

• **NSF**

- Fostering Interdisciplinary Research on Education (FIRE), 5/20/2011.
- Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM), 8/11/2011.
- Science of Science and Innovation Policy (SciSIP), 9/9/2011.
- Computer and Network Systems (CNS), 9/15/2011.
- Information and Intelligent Systems (IIS), 9/15/2011.
- Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers, 10/3/2011

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