



Universitas



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2014

"...ONLINE NEWSLETTER FROM THE PITTSBURG STATE UNIVERSITY COLLEGE OF ARTS & SCIENCES"

IN THIS ISSUE

Fighting Cancer with Nanotechnology

The next big thing in the battle against cancer and other diseases is very, very small.

In his lab at PSU, Santimukul Santra is conducting research on the use of polymeric and iron oxide nanotheranostics as potential delivery methods for life-saving anti-cancer drugs. As he works, Santra imagines a time in the not-too-distant future when treatments for cancer and a host of other diseases will be personalized, targeted and free of the debilitating and often dangerous side effects of some current therapies, thanks to the use of these tiny structures and nanobiotechnologies.

"This is my dream," Santra said.

Santra's research, with eight other scientists in New York, Florida and Massachusetts, was published this year in "Nature Communications."

Microscopic nanoparticles are the future of personalized medicine, Santra said.

"(Nanoparticles) provide more surface area, more surface energy and thereby, more reactivity," Santra said.

At the same time, they can be designed to interact only with certain types of cells within the body.

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In the study, Santra and the other researchers used iron oxide nanoparticles (ferumoxytol) as a vehicle for delivering chemotherapy drugs directly to human prostate and breast cancer cells. They found that the drugs were delivered much more efficiently using the ferumoxytol than by traditional methods.

One big advantage of using ferumoxytol, Santra said, is that it's already clinically approved and is used frequently in the treatment of iron deficiency and for MR Imaging. Because of its magnetic properties, iron oxide is also easily traced and monitored in the body.

Deaven Thompson, a junior biology major from Pittsburg, works in a polymer chemistry lab at the Kansas Polymer Research Center.

Once loaded with the cancer-fighting drug, the iron oxide nanoparticles act like microscopic packages that are small enough to pass through the kidneys and liver on their way throughout the body. When the nanoparticles encounter the cancer cells, they release their cargo, triggered by the specific pH of the cancer cell or enzymes it produces.

"That's the magic of using nanomedicine to deliver therapeutic drugs directly to the disease site and this can be easily done by decorating the nanoparticles' surface with receptor targeting molecules," Santra said. "(You no longer have) the chemotherapy drug destroying the healthy cells along with the cancer cells."

A great deal of work still remains before clinical trials can begin, but Santra said he believes the researchers' use of the clinically approved ferumoxytol as a delivery system could speed the process.

Santra and Ram Gupta, whose research focuses on the use of polymers as degradable biomedical implants and as super capacitors, were recruited to PSU as part of the university's new Polymer Chemistry Initiative. They have joined a team of more than a score of PSU researchers who have distinguished themselves in various aspects of polymer science.

Santra said he was attracted to continue his research at PSU because of the university's new Polymer Chemistry Initiative.

"The Polymer Chemistry Initiative is an ideal platform for me to continue my nanotechnology research for fighting cancer and infectious diseases," Santra said.

Specifically, he cited the relationship between the Department of Chemistry, the Kansas Polymer Research Center and the College of Technology and the facilities each contributes to support the initiative.

"We have cutting-edge research facilities. So whatever kind of research you want to do, you can do from here,"



Karl Kunkel, Dean, College of Arts and Sciences

From the Dean

Welcome to the Fall 2014 edition of Universitas, the newsletter for the College of Arts and Sciences at Pittsburg State University. It is my pleasure to provide a few significant recent program accomplishments in the College and I am certain you will agree Arts and Sciences continues to make progress serving our students along with the regional community.

Ribbon cutting for the new Bicknell Family Center for the Arts is December 7. Construction of this \$33 million facility is nearing an end and planning for programming is well underway. This center will be the new home for our theatre and music programs, along with a new gallery space for our Art Department. Theatre students not only will have the opportunity to act in productions, but also learn "behind the scenes" production techniques in a state-of-the-art facility as they prepare for future careers. Music students will have a world-class venue for recitals and performances, and art students will have a contemporary gallery to learn skills in planning and displaying exhibitions. This facility not only is a tremendous community resource but also a place for student training and learning. Please [click here](#) to learn more about the new Bicknell Family Center for the Arts.

In September, the Kansas Board of Regents gave final approval for our Irene Ransom Bradley School of Nursing to offer the Doctor of Nursing Practice degree program, the first doctorate at Pittsburg State. This graduate

Santra said.

Santra came to PSU from the University of Central Florida where he did almost six years of post-doctoral research. There, he had more than 18 top-class peer-reviewed papers published and accumulated six U.S. patent applications.

Santra earned his Ph.D. in synthetic polymer chemistry and organic chemistry from the Indian Institute of Technology-Bombay.

Definitions

What is a nanoparticle? A nanoparticle is a microscopic particle with at least one dimension less than 100 nanometers. A nanometer is one one-billionth of a meter. Still confused? Imagine this: A human hair is about 80,000 to 100,000 nanometers wide and a sheet of paper is about 100,000 nanometers thick. You get it – it's really, really, REALLY small.

What is a polymer? Polymers are large molecules consisting of many repeating smaller units. There are both natural and synthetic polymers and they're in you and all around you.

For more information, contact the PSU Department of Chemistry at 620-235-4748 or visit the [Department of Chemistry website, www.pittstate.edu/departement/chemistry](http://www.pittstate.edu/departement/chemistry).

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Preschool Celebrates 50th Anniversary

The Early Childhood Preschool Laboratory in the Pittsburg State University Department of Family and Consumer Sciences celebrated its 50th birthday with a reception and tours from 11 a.m. until 1 p.m. on Thursday, Sept. 25. Visitors gathered in the lobby of the FCS building, located on the south side of the PSU Oval, where early childhood majors led the tours.

Amber Tankersley, associate professor of early childhood development and preschool director, said the preschool has had a significant impact on both children and university students in its first half century.

"The PSU Early Childhood Preschool Lab has been a great asset for both the children who attend the preschool and the university students who work in the lab," Tankersley said. "Children benefit from the warm, friendly environment and low student-teacher ratio. At the same time, university students get invaluable experience under the supervision of



David Osborne and Susan Marchant

Georgia on my mind

Teachers like to see their students succeed, and Dr. Susan Marchant got to do just that recently as she made a road trip to Georgia to see David Osborne play for President Jimmy Carter's 90th birthday. The concert, held in the Jackson Performance Hall at Georgia Southwestern State University, also featured two of David's musical colleagues: internationally known bassist Danny DeMorales, and drummer/vocalist Paul Stubblefield.

"David and his trio played beautifully," says Marchant, who is now Interim Chair of the PSU Department of Music, "and I was delighted to have an opportunity to be present for this very special performance."

David Osborne is a native of Miami, OK. He earned his bachelor's degree at Oral Roberts University, and he began graduate study at Indiana University before transferring to PSU, where he completed an MM in organ performance in 1984.

David has been performing for the Carters for 26 years. During his early professional years in Florida, he and

SSRM: NEW SCHOLARSHIPS PROVIDE NEW OPPORTUNITIES

Several students from Pittsburg State University's Sustainability, Society and Resource Management (SSRM) program will be returning to school with a little extra money in their accounts thanks to new scholarships available exclusively to PSU students from the EMW Sustainability Fund.

In the fall of 2014 four students received the first \$1000 awards: Srs. Taylor Cunningham (Cherryvale) Grace Fritz (Spring Hill), Jordan Garbin (Girard), and Soph. Rachal Magatham (Olathe).

The EMW Sustainability fund was established by an anonymous donor in order to support PSU's interdisciplinary SSRM degree program within the College of Arts & Sciences. The academic program remains the only one of its kind in the state of Kansas and results from a joint initiative between the departments of biology, geography and communication.

"This scholarship money will allow me to work less hours in order to cover costs of tuition so I can work on independent research projects to present at conferences and the PSU Research Colloquium," said Cunningham, president of PSU's Students for Sustainability.

The SSRM program has experienced rapid enrollment rates and generated interest from students with a variety of backgrounds who are learning, negotiating, and addressing several complex problems facing the natural environment.

Magathan seeks a future career working in the energy sector focusing on global sustainability in developing nations while Fritz hopes to use geographic information systems to more effectively track conservation efforts in our national parks system.

For more details about the Sustainability, Society, and Resource Management program at Pittsburg State University contact: jtriplett@pittstate.edu, chooey@pittstate.edu, or amason@pittstate.edu.

The 411 on the DNP at PSU

On Wednesday, the Kansas Board of Regents gave approval for Pittsburg State University to offer its first doctoral degree. The board approved a proposal from PSU's Irene Ransom Bradley School of Nursing to transition its current master's level advanced practice nursing program into a doctor of nursing practice degree.

"This is a major milestone for the university, the Irene Ransom Bradley School of Nursing and for healthcare in the region," said Mary Carol Pomatto, university professor and director of the school. "We are excited to be able to meet this growing need for highly trained healthcare professionals."

Karl Kunkel, Dean of the College of Arts and Sciences at PSU, said the new program takes the university to a new level of service for the four-state region.

"This degree is the coming professional standard for

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Removing the Boundaries of Knowledge

Ciência sem Fronteiras, Science without Borders, a program of the Brazilian government, has come to PSU.

According to its website, Science without Borders, "...aims to launch the seeds of what could revolutionize the R&D system, the Brazilian students and researchers exposed to an environment of high competitiveness and entrepreneurship." They aim that "the best students and researchers will undertake research in the best and most relevant Universities around the World."

According to Aaron Hurt, of PSU's International Student Services, there are currently 37 Brazilian students at PSU paid for by Science without Borders, and eight of those are in the College of Arts and Sciences.

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Benjamin Tayo and Graphene

“Graphene,” according to Dr. Benjamin Tayo, Assistant Professor of Physics at Pittsburg State University, “is a two-dimensional material with excellent mechanical, electronic and optical properties.”

He should know. He studies graphene and has recently had his “Effective Mass versus Band Gap in Graphene Nanoribbons: Influence of H-Passivation and Uniaxial Strain” published in the journal **Materials Focus**.

“These properties make graphene a potential candidate for applications in ultrafast electronics, optoelectronics, energy conversion, and so forth,” says Tayo.

In order to use graphene in digital circuits that can be switched ON and OFF or in light-harvesting (photovoltaic) applications, a way has to be found to control its electronic properties.

“Several different methods have been used in doing this,” says Tayo. “One way is to pattern graphene sheets into small nanoribbons having a finite width but infinite length.”

Another unique way to tune the electronic properties of graphene is to apply strain on the piece of graphene nanoribbon.

“Because graphene has breaking strength of over 100 times greater than steel film of the same thickness, it can sustain large amounts of strain without breaking,” says Tayo. “This makes it possible to alter its electronic properties by applying external strain.”

Doing either of these things, however, degrades graphene’s ability to be used in ultra-fast electronics, so solving one problem creates another.

“In my research,” says Tayo, “I utilize a simple quantum mechanical approach based on the tight-

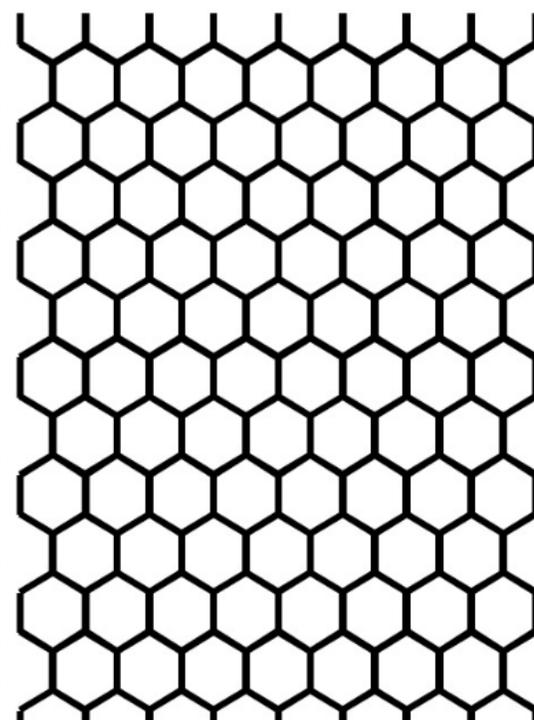


Fig. 1 Graphene nanoribbons with finite width and infinite length. Finite width helps to confine the motion of electrons due to quantum effects, making it possible to induce a width-dependent energy gap in graphene.

Telegramms from Faculty

Lowell Mick White, Assistant Professor of English, has published a new book by the title *Professed*. It is a comic novel set at a large university. It is available on Amazon: Search **Lowell Mick White Professed**.

Stephen Meats, Professor Emeritus of English, has brought out a new edition of this book of poetry *Looking for the Pale Eagle*. This is also available on Amazon: Search **Looking for the Pale Eagle**.



Scott Thuong, The Department
of Mathematics

headed to OU, where he worked toward his doctorate and was a teaching assistant.

It was this experience that led him to pursue teaching as a career, he said.

"I think with teaching you can really make a difference in someone's life," he said. "Research is great, but it affects a small amount of people. With teaching, I think I can help a much larger audience. It's just great when a student comes into your class hating math, but at the end of the class you can see they understand it; the light bulb goes on. Moments like that really make teaching worthwhile."

This piece was created using an article from the Joplin Globe

Scott Thuong: Getting an early start

Scott Thuong, new Assistant Professor of Mathematics at Pittsburg State, has got an early start to his career.

Dr. Thuong was perhaps the youngest Missouri Southern State University student in the school's history. He graduated from the University of Oklahoma with a doctorate in mathematics.

"I find mathematics very exciting, and what I like most about it is usually there's more than one way to attack a problem or get a solution," he said. "And I really like the creativity aspect of mathematics."

Thuong attended Thomas Jefferson Independent Day School in Joplin and graduated in 2006 from the online-based University of Missouri High School. He then enrolled at Missouri Southern State University the following semester at age 14.

He was part of the honors program and, thanks to Missouri Southern being a smaller school, was able to work closely with faculty in the math and computer information science departments to reach graduation by 2009.

After obtaining his undergraduate degree, Thuong

DNP at PSU

advanced practice nursing and will provide students the necessary training for outstanding careers as nurse practitioners and nurse educators," Kunkel said. "Given our rural location, this region in Kansas has a serious need for advanced practices nurses to offer primary healthcare for residents. We are thrilled to be in a position to provide a doctoral-level program meeting national professional standards, advancing future careers of our students, and delivering a much-needed service to our region."

In making their case for the new degree program, university officials noted that the demand for doctoral level advanced practice nurses is expected to increase both in the region and across the nation. The university cited the recommendation of the Institute of Medicine that "by 2020, the field of nursing provide twice as many doctoral graduates in order to build a primary care workforce in the U.S."

Pomatto said PSU's doctoral degree program will be the first in Kansas that is not located in a metropolitan area.

"It is significant," Pomatto said, "because a majority of Southeast Kansas counties are in the bottom quartile of the Health Index ranking for the state."

For more information, contact the Irene Ransom Bradley School of Nursing at 620-235-4431.

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his family drove regularly to Plains, Georgia, where he would play specials at the Maranatha Baptist Church and the family would attend Jimmy Carter's famous Sunday School class.

His career path eventually led to the famous hotel venues in Las Vegas.

"I have been at Caesar's Palace and The Bellagio for the last 18 years," he says. "Now I'm exclusively at the spectacular Bellagio in the entertainment capital of the world. I also perform 30 concerts around the nation in concert halls and theaters." Among those concerts are his regular visits to the White House, where he has played at the invitation of the past five presidents.

Sales of his 27 CDs recorded for the North Star label have now reached 5 million, and he has been honored with multiple awards from the Los Angeles Music Awards Committee. He is a member of the international roster of Steinway Artists.

This was Susan Marchant's second trip to Southwest Georgia. In 2004, she took the PSU Choir to Americus for performances at the international headquarters of Habitat for Humanity and, with David's assistance, to Plains for a Sunday morning performance at the Carters' church. During the recent 90th Birthday festivities, she had an opportunity to chat with Mrs. Carter about David's years at PSU as well as the choir's visit to their church ten years ago.

In 2013, David Osborne received the PSU Alumni Meritorious Achievement Award.

Telegrams from Students

Amy Tripp, Social Work Senior, was recognized by the City of Pittsburg with the declaration of Amy Tripp Day. See

<http://www.fourstateshomepage.com/story/d/story/amy-tripp-day/39820/gsAKd1JMpk7D9YnNs4L-g> for details.

experts in early childhood education."

Tankersley said the preschool laboratory program at PSU began in the fall of 1964 with a group of five boys and five girls between the ages of 3-5 years old. The program, located in the basement of the old Chandler Hall, was initially open from 9-11:30 a.m. for two days a week.

The lab was discontinued for a short period sometime after 1968 and then was reinstated in the fall of 1971. At that time there were six boys and six girls enrolled.

In 1998, the enrollment was increased to 16 and the program was licensed to accept up to 24 children. The preschool's week expanded from two to four days to serve the increase in students needing to take courses associated with the lab.

In the spring of 2001, the Department of Family and Consumer Sciences and the preschool program were relocated to other facilities on campus to make way for the demolition of Chandler Hall and the construction of a new building on the same site. During this time, the preschool operated in a farmhouse on the east side of campus.

The department and the preschool lab moved into their current home upon the completion of the new FCS building in 2003. In 2012, the preschool program was accredited by the National Association for the Education of Young Children (NAEYC), a distinction held by fewer than 10 percent of preschool programs in the U.S.

Today, the preschool lab continues to serve children from both the campus and the larger community by offering a morning and an afternoon session. Each session runs Monday-Thursday and is limited to approximately 20 children each. Parents choose to send their child for either a three- or a four-day week.

University students in classes such as developmental planning, interacting with children, and preschool student teaching participate in the lab as part of their course requirements.

"This is an important experience for students who will find careers in public and private preschools, child care centers, before- and after-school programs, YMCAs, county extension programs and parent education," Tankersley said. "Research continues to confirm the importance of high-quality early education, so we expect opportunities to grow in this vitally important area."

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Graphene

binding approximation to describe how the energy gap and effective mass of electrons in graphene nanoribbons vary in the presence of applied external strains and edge passivation. My findings shed new insights into the behavior of electrons in graphene and will be useful in modelling the transport of electrons in real graphene electronic devices.”

From the Dean

program is the new standard for advanced practice nursing and provides the highest available opportunity for our students to pursue careers in both nurse practitioner positions as well as nursing education. In addition, our graduates will be meeting the future primary healthcare needs of our region. Facilitating career paths for our students and meeting regional community needs are major aspects of our role as a public university and both of these goals are reflected in this new doctoral program in nursing.

The Pittsburg State University polymer initiative, centered in the College of Arts and Sciences, began in 2012 and involves the Kansas Polymer Research Center, a world-renown research facility on our campus, the Plastics Engineering Program in the College of Technology, and the Chemistry Department in Arts and Sciences. This past October the Kansas Board of Regents approved our proposal to offer the Master of Science in Polymer Chemistry. This new graduate program provides the next step beyond the Bachelor of Science in Polymer Chemistry approved last Spring. In addition, Chemistry faculty in the Polymer Initiative are making tremendous strides in their research laboratories truly making Pittsburg State a national leader in this field. I'm thrilled to report the Polymer Initiative is moving from an implementation phase to the pursuit-of-excellence. [Click here](#) to learn more about the Polymer Initiative.

Also, during the past year a task force comprised of faculty from the Department of Modern Languages and Literatures, along with stakeholders from across campus, met to envision the future of language instruction on our campus. I'm very pleased to report the group recommended a new comprehensive major program in Modern Languages with options in "Language and Culture" as well as "Secondary Education" (teacher training). Each option has a track in Spanish and another in French. This proposed new degree program is progressive, applied, and ideal as a second major for students in business, social work, justice studies, Nursing, construction, and various other

programs across campus. The program provides yet another example of the College of Arts and Sciences striving to meet the needs of our students as they seek skills and credentials necessary for careers and global citizenship. If this proposal progresses through the curricular approval process as we hope, including review by the Kansas Board of Regents next Spring, we should be first offering the new program to students in Fall 2015.

The College also welcomes two new Department Chairs who began duties last summer. Susan Marchant, a long-standing and popular Music faculty member, agreed to serve as Interim Department Chair in Music and Dr. Barbara Bonnekennen, previously an administrator at New Mexico Institute of Mining and Technology, graciously accepted my offer to become new Department Chair in History, Philosophy, and Social Sciences. I look forward to working with Dr. Marchant and Dr. Bonnekennen on the College Leadership Team.



Barbara Bonnekennen

The pages of this newsletter provide information on additional outstanding accomplishments of our students and faculty. For continual updates on

developments in the College of Arts and Sciences, I encourage you regularly to visit our [college website](#) and [Facebook page](#).



Susan Marchant

It continues to be a very exciting time in the College and, in my fourth year as Dean, I am more convinced than ever it indeed is special to be a Gorilla from Arts and Sciences!!

Karl R. Kunkel, Ph.D.

Professor and Dean



Telegrams from Alumni



Jean Coltharp, MS Mathematics 2014, is currently teaching at Missouri Southern State University while she pursues an interdisciplinary doctorate in Mathematics and Curriculum and Instruction from University of Missouri, Kansas City.



Rob Smith, MS History 2014, won third place last spring in the Phi Alpha Theta regional graduate competition for his paper, "Of One Being With the Father: Polygenism and Scientific Racism in the United States Scientific Community."

Removing the Boundaries

The impact of these students is beginning to be felt in our science classes, according to Ram Gupta, Assistant Professor of Chemistry.

“I have two [of these] students in both of my classes,” says Gupta. “They are very motivated. They don’t have much polymer background [this early in their education], but I observed that they are very enthusiastic to learn new things. They always participate in class discussion and think creatively to answer the questions.”

For the students themselves, it is also a positive experience according to Leticia Guilhen, who came to PSU from UNISO in Sorocaba, Brazil where she majors in Biotechnology.

“I can see a huge difference in my development,” says Leticia. “The program Science without Borders gave me the opportunity, which my parents could not afford, of study abroad.”

According to Leticia, taking academic classes in a different country is not only helpful for a professional but also personal growth.

“I major in Biotechnology,” she says, “and this semester I am enrolled as student in Genetics, Pathogenic Bacteriology and Polymers in Nanotechnology as theory and laboratory classes.” This is a variety of classes that wouldn’t be possible in the Brazilian system.

Emely Baldi, who is a pharmacy major in Brazil, notes other differences.

“In United States, students can choose a major and a minor,” says Emely, “while in Brazil, it is not possible. In Brazil we only can choose one major, and if you change your mind you usually lose the credits that you already have.”

There are also other differences she notes.

“Here students can choose their own schedule of classes,” she says. “However, in Brazil some universities have classes pre-defined for each semester.”

But how does the difference affect learning?

“This opportunity to learn in a different system of learning was great for my development. I can see that it helped me to be more organized in my studies, gave the opportunity to learn a second language, and also gave me the opportunity to learn more about my major.”