

Research Georgia

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**Georgia's University
and Medical
Research Programs**

**Solving Problems,
Stimulating the
Economy**

**Northside Hospital
Improving Cancer Care**

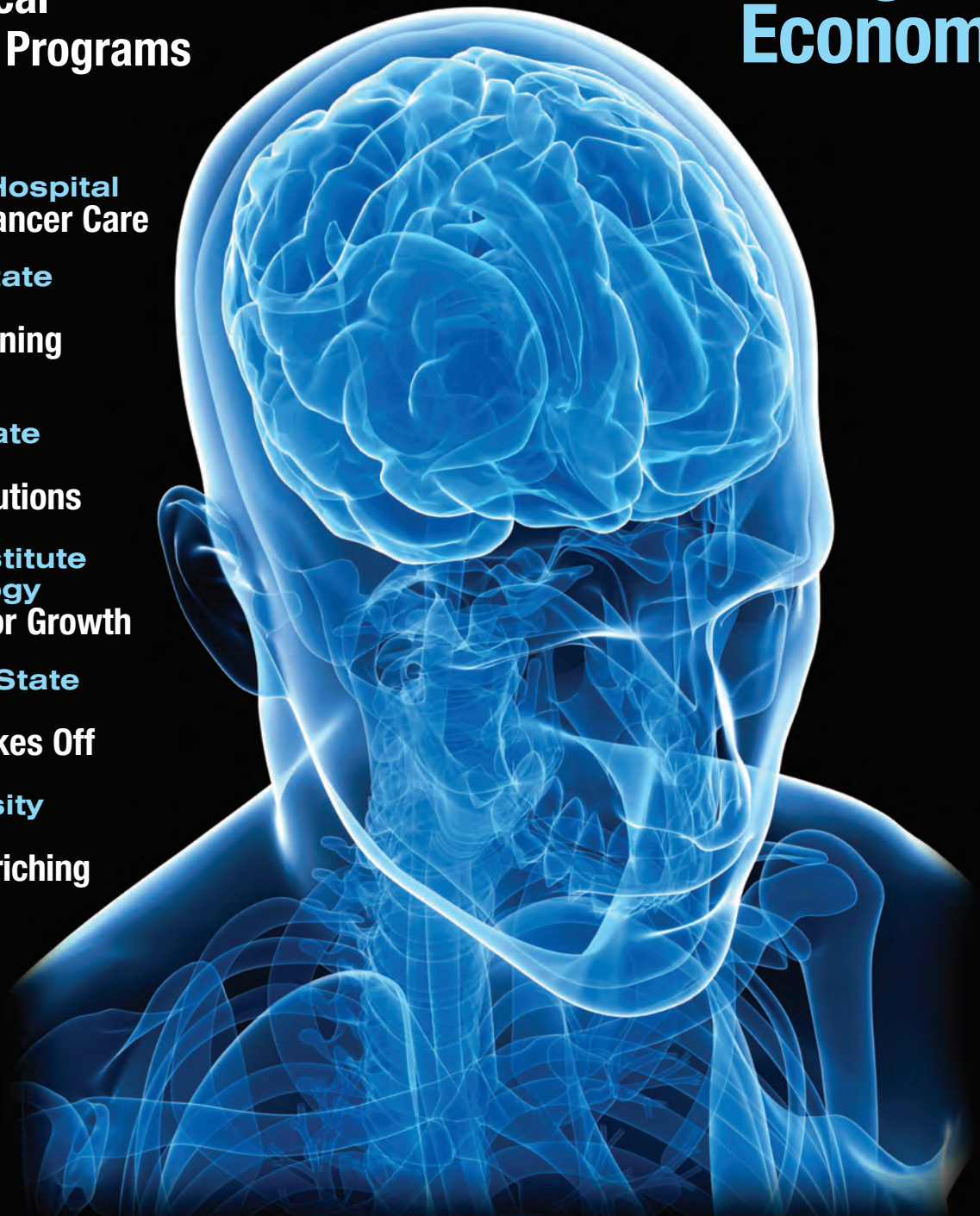
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Research In Georgia:

Solving Problems, Stimulating the Economy

As Georgia's leaders look to the state's economic future, they have focused on industries with potential for growth and job creation. That often includes enterprises heavily involved in research and development, and that's why there's more interest than ever in the research being conducted by the state's universities, hospitals and other organizations.

Research, they say, not only leads to improving the way we live and work, but also often leads the way to the creation of new industries and new jobs.

In recognition of the importance of research to future growth, Gov. Nathan Deal earlier this year realigned the state's relationship with the Georgia Research Alliance (GRA), a nonprofit organization that brings together Georgia's research universities, business community and state government to help launch science- and tech-based companies out of university laboratories. The Alliance is now under the umbrella of the Georgia Department of Economic Development, the primary state agency charged with business recruitment and expansion.

The University of Georgia, Georgia Tech, Georgia State University, Valdosta State University, Kennesaw State University and Northside Hospital are representative of the universities, hospitals and organizations throughout the state that are involved in a wide variety of research programs.

The University of Georgia has ongoing research projects throughout the state. For example, in its hometown of Athens, UGA is an incubator for new companies built on its innovative life sciences research. Since 1972, more than 100 startups have been formed, including 60 based in Athens.

At Kennesaw State University, research activity is flourishing. Over the past five years, the number of sponsored funding awards had doubled from 58 in 2006 to 116 in 2011. During the same period, external funding has nearly quadrupled, to \$16.6 million in FY11. The scope of research endeavors at Kennesaw State also is broadening, with faculty conducting research in fields such as biochemistry, neuroscience, biology, archaeology and sociology.

The Georgia Institute of Technology, a national leader in technological education, is focusing its research efforts on providing innovative solutions to complex problems facing industries in the state of Georgia and across the nation. Georgia Tech research labs produce more than 400 invention disclosures annually, and Tech is one of the state's top patent producers.

Georgia State University is becoming one of the country's leading urban research universities and was recently named one of the best places for researchers to



work in academia by *The Scientist* magazine. Georgia State researchers are involved in projects in a broad spectrum of fields, including biotechnology and drug design, disease detection, public health, business, law and education.

Valdosta State University, in South Georgia, encourages undergraduate research and provides funding for various discipline-based research and scholarly activities. Last year, the university funded six projects, including anticancer research that developed three novel cancer drugs that have been accepted for testing at the National Cancer Institute.

Healthcare is an area that has seen many major advances and Atlanta's Northside Hospital is already putting many of those advances to use while helping in research to find new ways to improve care. The hospital is a member of the National Cancer Institute's Community Cancer Centers Program, offering expanded research opportunities and state-of-the-art cancer care.

Find out more about these research programs and other projects on the following pages of this special Research Georgia section.

NORTHSIDE HOSPITAL

Cancer Care Program Offers 'Best of Both Worlds'

More than 37,000 people in Georgia will be diagnosed with cancer this year. Patients facing cancer want the best possible chance for a cure. The Cancer Care Program at Northside Hospital offers the best of both worlds: clinical excellence on par with academic-based programs along with the personalized and attentive care of a community hospital.

For more than 40 years, Northside has provided patients with high-quality cancer care. Patients now have expanded care options as Northside recently was selected to join the National Cancer Institute (NCI) Community Cancer Centers Program (NCCCP), an exclusive national network of community cancer centers, offering expanded research opportunities and state-of-the-art care.

In addition, the Commission on Cancer (CoC) of the American College of Surgeons granted its Outstanding Achievement Award to Northside during 2010. Northside is one of a select group of 90 currently accredited and newly accredited cancer programs across the United States and one of only two programs in Georgia.

Services offered by the Cancer Care Program span the continuum of patient care from prevention to treatment. Using a multidisciplinary approach, Northside's highly-skilled physicians, surgeons and staff provide patients with promising hope for a disease-free existence in a number of specialties.

Offering the Best Hope for a Cure

Transplanting healthy marrow is the best hope for patients with leukemia, lymphoma and other life-threatening blood and solid tumor diseases. The Blood & Marrow Transplant (BMT) Program at Northside is one of the largest clinical transplant programs in the Southeast and has been nationally recognized for excellence in transplantation.

Distinguishing Highlights Include:

- The best survival rates for matched related and unrelated transplants of any program in the nation, according to outcome data released by the National Marrow Donor Program (NMDP), the federally funded organization that facilitates most matched unrelated donor (MUD) transplants in the United States.
- Receiving the prestigious BMT-CTN award from the National Heart, Lung, and Blood Institute (NHLBI) and the National Cancer Institute (NCI), a competitive award recognizing the top transplant centers in the United

States and funds national leading-edge clinical trials. Of more than 120 programs, Northside is one of only 20 BMT programs in the United States to be awarded this status. With this position, Northside is the only community hospital to serve as a national Core Clinical Center and will be at the forefront of developing new standards to improve patient outcomes.



A Premier Hospital for Women's Health

GYN Program

The GYN program at Northside Hospital continues to diagnose and treat more cases of GYN cancer than any other program in Georgia. The program has seen recent advancements including a complete renovation of a 19-bed inpatient unit; expansion of GYN oncology chemotherapy services; and an addition of a GYN Oncology Nurse Navigator.

Northside's multidisciplinary team includes gynecologic oncologists and surgeons who bring experience and expertise in diagnosing and treating GYN cancers.

Distinguishing Highlights Include:

- Leads the way in groundbreaking procedures for better outcomes and less invasive treatments.
- Northside has performed more Hyperthermic



Intraperitoneal Chemoperfusion (HIPEC) procedures for ovarian cancer than any other hospital in the United States.

- Northside was the first in Georgia to perform robotic radical hysterectomy for gynecologic oncology patients and ranks in the top five percent of all robotic GYN programs in the country.

Breast Care Program

Northside's Breast Care Program is the largest single hospital program in the Southeast, diagnosing and treating more breast cancer cases than any other community hospital. Comprehensive services cover every aspect of breast care including education, genetic counseling, imaging, radiation, oncology, surgery, support and rehabilitation. National accreditations include the American College of Radiology Breast Imaging Center of Excellence and the National Accreditation Program for Breast Centers.

As a leader in breast cancer care, Northside is committed to implementing the latest technological advances for early detection of the disease. Now women who undergo routine mammograms at Northside have the latest breast imaging technology available to them, digital breast tomosynthesis. This groundbreaking technology from Hologic's Selenia Dimensions System gives Northside's board-certified radiologists a closer view of the inner structure of the breast. It can show cancers that are otherwise hidden and can prevent recalls by the overlapping of normal tissue.

Pioneers in state-of-the-art treatment

Northside offers patients all necessary cancer treatments of surgery, chemotherapy and radiation therapy in Atlanta, Forsyth and Cherokee. Patients will benefit

from Northside's state-of-the-art facilities and latest technologies in their communities and close to home.

A recognized robotic surgery leader, Northside ranks in the top 5% for GYN and 10% for robotic prostate procedures. Northside patients will benefit from an experienced surgical team with the latest daVinci surgical systems.

Northside is the first in Atlanta to offer fluorescence imaging technology with its new Si robotic surgical systems. The specially-designed camera and endoscopes allow surgeons at Northside to capture images of tissue and surrounding blood vessels by injecting a unique fluorescence dye that is activated by near-infrared light. The fluorescence imaging helps identify healthy versus unhealthy

tissue to aid in the surgical excision.

Nearly two-thirds of all cancer patients receive radiation therapy at some point during their treatment. Northside now offers radiation oncology services system-wide in Atlanta, Forsyth and Cherokee. Each center is staffed by a specially trained team including radiation therapists, a medical physicist, a medical dosimetrist and registered nurses.

Caring for the whole patient

The Northside Hospital Cancer Care Program consistently has placed a strong focus on quality of care, providing compassionate-patient centered care. In addition to clinical excellence, Northside integrates support and survivorship programs to treat not just the cancer, but the whole person.

As an NCCCP hospital, Northside will continue to expand these programs in addition to bringing patients greater access to quality care and clinical trial opportunities. The Nurse Navigator program has expanded to offer support to breast, gynecologic, BMT/leukemia, GI and lung cancer patients and their families.

NCCCP sites also bring additional clinical research and advanced diagnostics and treatment, which often are available only at large academic medical centers and research universities, into the community, where they are more accessible to the patients who need them.

The Cancer Care Program integrates experience, expertise and state-of-the-art treatment. As one of the largest and most respected providers of cancer services in Georgia, Northside Hospital is committed to providing patients with high quality care.

For more information on our Cancer Care Program, visit www.northside.com.

Providing Students With Valuable Research Experience

Ryenne Ogburn never imagined she would have the opportunity to work on an anticancer research project while in college. The senior chemistry major at Valdosta State University is just one of many undergraduate students who have the opportunity to contribute on research projects and scholarly activities.

Working with Dr. Thomas Manning, professor of chemistry, Ogburn and several other undergraduate students are focusing on the development of anticancer drugs from marine organisms.

With students by his side, Manning makes frequent trips to the mucky waters off the Gulf Coast of Florida to harvest samples of sediment for research on three natural anticancer drugs — bryostatin, ET743 (trade name Yondelis or Trabectedin) and Taxol. These drugs have been harvested from trees and marine organisms for several decades.

According to Manning, production costs, which include the high cost of extraction and large quantities required, have resulted in rising drug prices for consumers. By harvesting bacteria, from what Manning describes as “bacteria farms” in the ocean, the group is finding less expensive methods of producing these cancer-fighting drugs.

“From these ‘bacteria farms’ in the Gulf of Mexico, we are developing ways to harvest more bacteria at a fraction of the cost of what people are doing in the lab,” Manning said. “It’s a completely different approach, but a much simpler approach.”

Manning also added the environmental benefits of the project. “This is a green technology approach to synthesizing pharmaceutical agents and is currently supported by the Environmental Protection Agency.”

Ogburn and her classmates assist Manning with the harvesting of the sand sediment, which is then brought back to the laboratory for processing and purification. Bryostatin is extracted from the marine organism bryozoa. It currently takes approximately 14 tons of harvested bryozoa to obtain less than one ounce of bryostatin. The bryozoa, *Bugula neritina*, is a seasonable marine creature that can be difficult to find in even small quantities.

“We are currently working to get one gram of bryostatin that is pure,” Manning said. “It will then be sent to the National Cancer Institute and used for numerous research projects dealing with cancer and even Alzheimer research.”

Manning and VSU recently applied for a U.S. patent on the process to synthesize any drug that comes out of the ocean using the pharmaceutical aquaculture technique developed at the university.

Research Opportunities

Valdosta State encourages undergraduate research and has made significant strides in providing funding for various discipline-based research and scholarly activities. Last year, the university funded six projects, including Manning’s anticancer research, through its new Quality Enhancement Plan (QEP).

The QEP promotes undergraduate engagement in disciplined-based inquiry. The selected projects help undergraduate students gain specific research skills and enhance their analytical thought process for problem solving.

Manning encourages his students to engage in research projects and sees it as a partnership. Not only does research provide students with the opportunity to develop special skills needed for graduate or medical school, but it often gives them a different prospective on problem solving.

The group has developed three novel cancer drugs that have been accepted for testing by the DTP program at the National Cancer Institute (NCI). One of the compounds has been tested in almost 700 experiments at NCI and performed extremely well when inhibiting cancer cell growth. It is currently being considered for animal trials. While the focus of the group has been the economical



Valdosta State students help Dr. Thomas Manning, professor of chemistry, harvest samples of sediment for research on anticancer drugs.

production of known but very expensive drugs, these experiences have resulted in producing some new and inexpensive compounds.

"The students who work in the lab have a much higher percentage for going to medical school or graduate school," Manning said. "We have had undergraduate students from large degree granting schools come to VSU just so that they can do research and have the opportunity to co-author a paper for publication."

Engaging Students

Manning realizes that his research and teaching are not only helping the medical and scientific community, but are directly affecting the lives of students who pass through his classes and engage in research partnerships.

Ogburn has found her experience in the lab important to her professional goals.

"I like the math aspect of chemistry — you can see where everything is going," said Ogburn, who plans to get a doctorate in analytical chemistry. "Working in the lab has allowed me to use a variety of equipment including HPLC and ultraviolet-visible spectrometers."

It is this hands-on experience that has motivated Ogburn to apply to graduate school.

"All the opportunities that Dr. Manning has offered me have opened my mind to say 'wow, I can really do this' because of all the lab experience," Ogburn explained. "Dr. Manning gives you opportunities to go on and do more."



Senior chemistry major Ryenne Ogburn is gaining valuable experience as a research assistant working on the development of anticancer drugs from marine organisms.

Caley Allen agrees that the research opportunities she received at Valdosta State have helped her in graduate school. Now working on a doctorate in computational organic chemistry at Auburn University, Allen fully appreciates the educational experiences afforded to her as a student at Valdosta State.

"Working with Dr. Manning greatly prepared me for graduate school. The work environment was independent, and he was updated from week-to-week on the progress. His approach to undergraduate research taught me how to be dedicated and problem solve on my own without

someone over my shoulder," Allen said. "Dr. Manning also greatly encouraged public speaking. Either in the form of a poster presentation or PowerPoint presentation, being able to present scientific data in a comfortable, professional and confident manner in front of your peers and academic research advisors is an invaluable skill to develop within the scientific community."



Dr. Thomas Manning, professor of chemistry, discusses with students the process for harvesting bacteria from samples of sediment found off the Gulf Coast of Florida.

Allen had the opportunity to work with Manning on two research projects; and both won top honors at professional competition and were published in national publications. "Chemistry in a Nanodrop" was presented at the Southeastern Regional Meeting of the American Chemical Society, where it placed second out of more than 200 entries. Allen received first place for overall graduate and undergraduate oral presentations at the joint meeting of the Georgia and Florida Academies of Sciences.

The second project, "Carbon Nanotube and CO₂ Supercritical Fluids" was a chapter in the book *Computer Based Projects for Chemistry Curriculum*, co-authored by Manning and Auror Perex Gamatges, professor of chemistry at Instituto Superior de Tecnologías y Ciencias Aplicadas.

Manning works to engage his students at various levels of the research process. "For many students there is a turning point, when they go to a conference and present a paper or poster; they see that their work is just as good as or better than a student at a larger university. A light goes on and they see themselves, not just competing against fellow students at Valdosta State, but against students across the country."

With more than 50 papers published in national and international peer-reviewed journals, co-authored by his undergraduate students, Manning encourages his students to find an interesting problem and try to solve it.

"Sometimes the student will have ideas and suggestions that were not initially thought of," Manning said. "Students are not just sitting in a classroom copying information off a board; they are ready to do field work and look for the answers to the problem. The independence benefits them."

Creating Solutions To Conquer 21st Century Challenges

Recently named one of the best places for researchers to work in academia by *The Scientist* magazine, Georgia State University, located in downtown Atlanta, is quickly becoming one of the country's leading urban research universities. Combining state-of-the-art research facilities and top-notch investigators across a broad spectrum of fields including biotechnology and drug design, disease detection, public health, business, law and education, Georgia State is addressing 21st century challenges critical to the quality of life for residents in Atlanta, Georgia and beyond.

Providing award-winning infrastructure to help investigators combat chronic diseases and dangerous viruses

Georgia State's award-winning Parker H. Petit Science Center features 249,000 square feet of research centers and laboratory space giving researchers access to technologies that rival any facility in the world. This technology allows on-site research centers to focus on solving some of our most challenging health care issues. Among them are:

Combating chronic diseases – Researchers within the Center for Inflammation, Immunity and Infection work to better understand the molecular basis of inflammatory diseases such as chronic obstructive pulmonary disorder, asthma, rheumatoid arthritis and inflammatory bowel disease so that better therapeutics, without adverse side effects, can be developed.

Expediting therapeutic intervention – The primary goal of the Center for Diagnostics and Therapeutics is diagnosing and treating diseases based on and guided by molecular signatures and/or biomarkers. These discoveries help expedite therapeutic intervention.

Battling dangerous viruses – The Viral Immunology Center investigates viruses that directly affect the central nervous system, posing a danger to human health and well being. The center works to identify unique biomarkers for rapid identification of disease-causing pathogens and to exploit these technologies to design, develop and implement efficacious interventions.

Developing quality of life solutions

Georgia State University investigators are working to provide a better quality of life for underrepresented populations. Some of these research programs include:

Improving literacy skills – Educators are using early intervention techniques and hearing screenings to help children who are deaf or hard of hearing improve their literacy skills.

Addressing health disparities in disadvantaged communities – Investigators affiliated with the Center of Excellence for Health Disparities Research collaborate to address the



Photo: Georgia State University

Georgia State University's award-winning Parker H. Petit Science Center provides researchers access to technologies that rival any facility in the world.

Photo: Georgia State University



Located inside the Petit Science Center, Georgia State University's massive Visualization Wall, one of the largest tiled display arrays in the world, has advanced the collaborative, interdisciplinary, and exploratory nature of the university by providing a state-of-the-art, innovative visualization facility for research, education and outreach. The wall's pixel resolution is the equivalent of approximately 14 IMAX screens – so one can zoom in, drilling down to incredible detail, without losing resolution.

factors that amplify adverse health outcomes in disease burdened communities in metropolitan Atlanta.

Developing rural healthcare systems – The Georgia Health Policy Center and Center for Health Services Research collaborate to address complex issues facing health care today including insurance coverage, long-term care, health care reform, children's health and the development of rural and urban health systems.

Protecting patients' and research participants' rights – Georgia State's highly ranked faculty in the College of Law work to promote patients' and research participants' rights through research that focuses specifically on issues related to conflicts of interest, confidentiality, HIV related laws and policies, and children's health.

Taking research from the lab to the marketplace

Georgia State is proud of the progress its researchers are making in intellectual property. A few of the university's research innovations will be used to:

Increase the shelf life of bananas, peaches and avocados – Georgia State researchers have invented a way to help reduce post harvest fruit loss by increasing the shelf life of certain fruits such as bananas, peaches, and avocados

by up to 10 days. The result of this invention will help growers and retailers make better use of agriculture and energy, and provide more quality produce to consumers.

Offer safer cleaning alternative to shipping industry – As concern over the health of the earth's seas increases, the marine industry is looking for environmentally friendly alternatives to preventing biofilm development on equipment. Researchers at Georgia State may have found the solution within the sea itself, using an antimicrobial protein found in a sea slug for the development of new anti-bacterial industrial compounds that prevent the formation of damaging biofilms on marine materials such as ship hulls, fishing traps and nets.

Develop improved cancer detectors – Current Georgia State research on carbohydrate-based biomarkers could help to better alert doctors to diseases like cancer.

Provide better disease detection

– The Georgia State University Research Foundation has licensed an antigen for B virus, a virus living in non-human primates that can pose a threat to researchers who are accidentally exposed to the virus.



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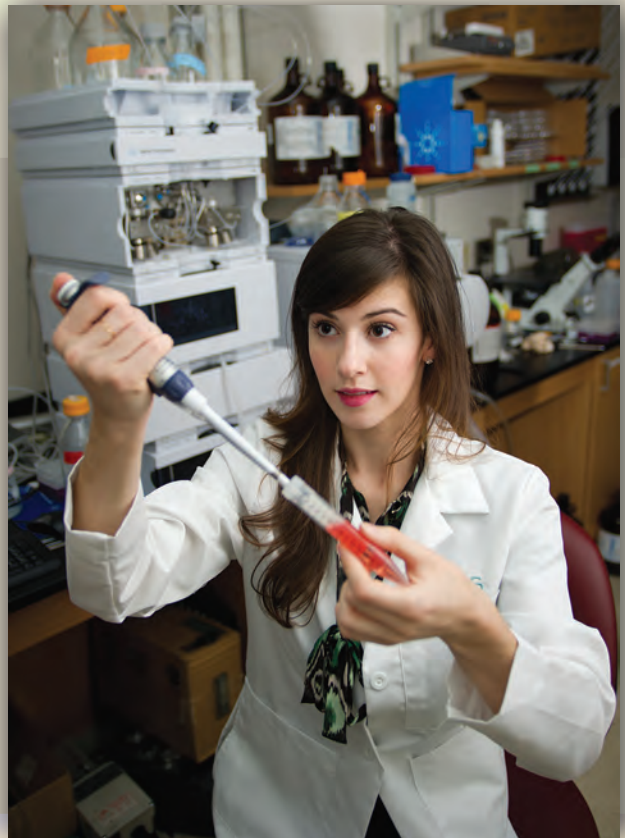
Leading the Way in Innovation And Economic Development

The Georgia Institute of Technology, a national leader in technological education, is focusing its research efforts on providing innovative solutions to complex problems facing industries in the state of Georgia and across the nation. As an incubator for scientific and technological innovation, Georgia Tech is not only conducting leading-edge research but also working to commercialize the results through advanced manufacturing initiatives and new entrepreneurial ventures. Georgia Tech's commitment to cultivating dynamic new companies and partnerships makes it a force for prosperity in the state, the nation, and the world.

An Economic Engine

Georgia Tech remains a vital economic engine for Georgia and the Southeast, with an annual impact of more than \$2 billion. Georgia Tech's partners benefit from six academic colleges with internationally renowned faculty and an innovative student body, the Georgia Tech Research Institute, and the Enterprise Innovation Institute, Tech's business assistance and economic development organization that serves companies from offices around the state. Georgia Tech's resources and track record are powerful selling tools in attracting new business and industry to the state.

- Georgia Tech research labs produce more than 400 invention disclosures annually, and Tech is one of the state's top patent producers.
- In 2010, 41 percent of Georgia Tech inventors were either graduate or undergraduate students. Additionally, 80 percent of invention disclosures listed at least one student as an inventor.
- This past year, the Enterprise Innovation Institute:
 - Helped Georgia manufacturing companies reduce operating costs by nearly \$35 million, increase sales by \$243 million, and create or save more than 1,350 jobs.
 - Assisted companies affiliated with the Advanced Technology Development Center (ATDC), the nation's oldest, university-based business incubator. These companies reported revenues totaling more than \$1 billion and nearly 3,500 jobs. ATDC has also served more than 250 technology startup companies that together generated capital activity of more than \$157 million.
 - Evaluated 125 Georgia Tech research innovations and formed sixteen new companies based on this



intellectual property. These startups have attracted \$60.5 million in investment.

Georgia Tech brings technology to bear on all of its research disciplines. The Institute directs its research toward addressing and resolving societal challenges in critical areas such as biotechnology, data and high-performance computing, nanotechnology, energy and sustainability, infrastructure, materials research, national security, paper science and technology, robotics, and humanitarian systems.

Manufacturing Excellence

Georgia Tech supports a comprehensive program in manufacturing technology that spans research, education, and outreach. A central focus is provided through the H. Milton Stewart School of Industrial and Systems Engineering (ISyE), which *U.S. News & World Report* has consistently ranked as the number one industrial

engineering graduate program in the country, and the Fuller E. Callaway Jr. Manufacturing Research Center, an interdisciplinary facility spanning the entire university that targets specific industry needs in long- and near-term research.

- With partial funding provided by the National Institute of Standards and Technology, Georgia Tech has started construction of an energy pilot plant to develop carbon-neutral energy solutions. The building will come online in 2012 and provide a space where industry can work directly with Institute researchers.

- Georgia Tech and Emory University formed a jointly operated department of biomedical engineering, the Wallace Coulter Department of Biomedical Engineering, which was one of the first of its kind in the country involving a public and a private university.

- The Georgia Tech Materials Research Science and Engineering Center, funded by the National Science Foundation, is engaged in the research and development of epitaxial graphene, a material that can transmit electrical signals faster than silicon with less heat and power consumption.

- Georgia Tech is home to one of the nation's top robotics programs. Applications span assembly, logistics, and inventory management; handling of hazardous materials; and complex tasks such as automated food processing.



President Barack Obama recently named Georgia Tech President G. P. "Bud" Peterson to the Advanced Manufacturing Partnership (AMP) steering committee, solidifying Georgia Tech's role as a guiding force in the field of manufacturing.

AMP is a national initiative of the President's Council of Advisors on Science and Technology (PCAST) that will identify opportunities to catalyze investment in and deployment of emerging technologies with transformative potential for advanced manufacturing in the United States. The PCAST AMP will help guide the nation's investment in advanced manufacturing R&D across a diverse range of technologies with the goal of creating high-quality jobs and enhancing the global competitiveness of the United States.

Entrepreneurial Enterprises

Throughout its long history, Georgia Tech has always focused its efforts on preparing students to use their intellect, ingenuity, and strong work ethic to solve real-world challenges and to improve the lives of people around the globe. Georgia Tech continues to build on its commitment to student innovation and entrepreneurship by fostering programs designed to strengthen these strategic efforts.

Student Entrepreneurial Initiatives

- Now in its eleventh year, the annual Business Plan Competition challenges Georgia Tech students and recent alumni to take their product concepts to the marketplace by launching their own companies. Operated by the College of Management and the Institute for Leadership and Entrepreneurship, the sponsors of the competition have awarded approximately \$570,000 in cash and services to more than 650 participants.

- The InVenture Prize is an innovation competition where Georgia Tech student teams create inventions that are judged by a panel of experts. The teams compete for more than \$30,000 in cash prizes, patent filings funded by the Georgia Tech Research Corporation, and a "People's Choice" award, sponsored by NCR Corporation. This year's competition will air March 13, 2012, on Georgia Public Broadcasting.

- The award-winning TI:GER Program (Technological Innovation: Generating Economic Results) is a partnership between Georgia Tech and Emory University School of Law that brings together PhD, MBA, and law students to learn about the challenges of commercializing innovative technologies. The program recently won a grant from Georgia Tech's Fund for Innovation in Research and Education for an international technology commercialization project to be conducted in collaboration with Ludwig Maximilian University of Munich, Germany.

www.gatech.edu

Research **TAKES OFF** at Kennesaw State University

Research activity at Kennesaw State University is flourishing. Over the past few years, Georgia's third-largest university has evolved from a teaching-focused institution educating undergraduates and master's-degree candidates to a comprehensive doctorate-granting university. Along the way, Kennesaw State's research activity and sponsored programs have significantly increased.

Over the past five fiscal years, the number of sponsored funding awards to Kennesaw State has doubled from 58 in 2006 to 116 in 2011. During the same period, external funding has nearly quadrupled from \$4.3 million in FY06 to \$16.6 million in FY11. In addition, the National Science Foundation (NSF), the U.S. Department of Defense (DOD) and the National Institutes of Health (NIH) have become significant funders of research projects at the university. Every year, KSU faculty are garnering more awards from these key funders.

The scope of research endeavors at Kennesaw State also is broadening as the university supports and hires faculty that are conducting vital research in fields as diverse as biochemistry, neuroscience, biology, archaeology and sociology. New lab equipment and state-of-the-art facilities — such as KSU's newly opened 200,000-square-foot, \$56 million Prillaman Hall Health Sciences Building, and the Science Lab Addition now under construction — also are enabling heightened research activity across campus.

As Kennesaw State continues to attract more research-focused faculty and students to the university's high-quality graduate and doctoral programs in business, education, nursing and international conflict management, campus officials expect externally funded projects to continue their rapid growth and trajectory. The added impact will be that all KSU students will benefit from the expanded research environment throughout the university, providing students at all levels of study expanded opportunities to engage in research and learn from professors conducting scholarly inquiry.

Making strides in neuroscience

In Kennesaw State's new Brain Biomarkers Research Lab, located in gleaming Prillaman Hall, noted neuroscientist Svetlana Dambinova — a distinguished professor in KSU's WellStar College of Health and Human Services — and a team of researchers study the chemical response of the brain in the aftermath of concussions and strokes. One research project, funded by a \$2.38 million DOD grant, may improve the diagnostic certainty of concussions and mild traumatic brain injuries so they can be treated more expeditiously.



Kennesaw State's \$56 million Prillaman Hall Health Sciences Building, opened in 2010, is home to the new Brain Biomarkers Research Lab.

The KSU team, which also includes researchers and medical doctors from Penn State and the University of Pittsburgh, is collaborating in a clinical study validating novel brain biomarkers for concussions and mild traumatic brain injuries. A blood test detecting biomarkers could aid in making decisions in emergency rooms, combat conditions and on-the-field athletic events. The lab test is being employed and validated in several university and hospital settings. Dambinova's research constitutes an enormous advance in neurological diagnostics.

Investigating meth use in suburbia

For years, KSU College of Humanities and Social Sciences Associate Professor of Sociology Miriam Boeri has been following methamphetamine users in suburban Atlanta, shedding light on the role of social relations in drug use and addiction. Boeri's research focuses on the social aspects of drug use and abuse that receive little attention in the current debate and in the development of substance-abuse programs.

Suburban Atlanta has seen a steady increase in meth use in the last decade. Through observation and face-to-face meetings, Boeri has been interviewing non-institutionalized adult drug users. Her sample ranges from the homeless and unemployed to college students and business owners. But with all drug abusers, she sees the same trend: family, friends and co-workers are very influential in addict's drug use, cessation and relapse. Boeri has received \$750,000 in funding from the NIH. Her soon-to-be published book, *Women on Ice: An Ethnographic Study of Women Who Use Methamphetamine*, will be released by Rutgers University Press in 2012.

Cracking nitric oxide's codes, and more

New, state-of-the-art biomolecular research instruments are increasingly allowing Kennesaw State scientists to study interactions among proteins and other biomolecules. With nearly \$1 million in support from the NSF and NIH, biochemist John Salerno, the Neel Distinguished Professor of Biotechnology in KSU's College of Science and Mathematics, is helping medical scientists understand the dynamic molecular structure of nitric oxide synthases — key enzymes that control physiological functions in humans. Unraveling the mysteries of nitric oxide production could, in the near future, lead to better treatments for illnesses such as diabetes, immune diseases and blood-pressure disorders.

Salerno's colleague, Associate Professor of Chemistry Jonathan McMurry, with half a million dollars in NSF and NIH grants, studies how infectious bacteria such as *E. coli* and *Salmonella* move around. Knowledge of how toxic microorganisms move about can shed light on how they cause disease. Assistant Professor of Chemistry Carol Chrestensen's research on protein binding, funded by NSF for \$380,000, has potential applications for the development of anti-inflammatory arthritis drugs.



NSF and NIH grants have allowed KSU faculty such as biochemist Jonathan McMurry to study interactions among proteins and other biomolecules.

Preparing effective teachers

Kennesaw State's Bagwell College of Education is exploring new methods to improve K-12 learning through an urban education curriculum funded by a five-year, \$8.9 million grant from the U.S. Department of Education. The Teacher Quality Partnership grant — the largest award ever presented to Kennesaw State — helps prepare new teachers for work with diverse student populations in seven Cobb County School District schools. The collaborative partnership, with one of the state's largest school districts, provides for a hands-on, two-year clinical experience geared toward the learning needs of culturally diverse student populations. During their junior year, Kennesaw State undergrads in the urban education track spend several hours a week applying strategies to engage students and families in learning.



Adriane Randolph, assistant professor of information systems, outfits a subject with an electrode cap at the KSU BrainLab.

The Teacher Quality Partnership, now entering its second year, offers interns in the urban education track strategies for teaching English-language learners, students with special needs and students from economically disadvantaged backgrounds. KSU interns and faculty from the Cobb County schools co-teach in a yearlong internship during their senior year.

Delving into neuromarketing

Information systems meet neuroscience in Kennesaw State University's BrainLab. Research conducted by Adriane Randolph, assistant professor of information systems in KSU's Coles College of Business, uses computers and mental imaging techniques to better understand how thoughts control computers. With a \$30,000 bioamplifier, a high-tech device that gathers and amplifies the brain's electrical signals, Randolph discovers solutions for brain-computer interfaces by uncovering the underlying traits that affect users' control.

Randolph's experiments in cognitive neuroscience have practical applications in the burgeoning field of neuromarketing, which studies how consumers' brains respond to advertising and other marketing messages. Currently Randolph is launching a project with the Center for Professional Selling at Kennesaw State and is working with a marketing professor at Saint Joseph's University in Philadelphia to determine the effects of brands on the brain. Randolph's research also has applications for improving the quality of life for people with severe motor disabilities.

To stay current on the exciting research taking place at Kennesaw State University, please visit:
www.kennesaw.edu



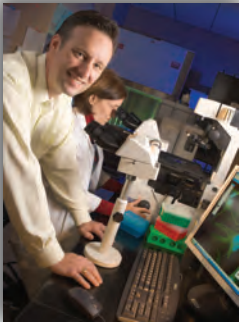
UNIVERSITY OF GEORGIA

UGA Research: Enriching Georgia

The multi-billion dollar economic impact of the University of Georgia extends across the state — from the metropolitan corridors of Atlanta to the briny shores of the coast, and from the fields and forests of the agricultural south to the rugged mountains rising in the north. UGA research supports and extends Georgia's traditional and emerging industries, opens the way to new products and markets, and enhances productivity in all of the state's regions.

Athens

In its hometown of Athens, UGA is an incubator for new companies built on its innovative life sciences research. Since 1972, more than 100 startups have been formed, including 60 based in Athens. Aruna Biomedical, founded by researcher Steven Stice, is commercializing stem-cell derived products that are advancing research and drug discovery for diseases such as Parkinson's and Lou Gehrig's disease. Molecular Therapeutics, founded and led by Dr. Branson Ritchie of the College of Veterinary Medicine, manufactures and sells antimicrobial creams that dramatically accelerate wound healing.



Atlanta

UGA researchers collaborate with Atlanta's growing pharmaceutical industry and public health researchers to find new therapeutics and vaccines that protect animal and human health. Aerovectrx, founded on technology developed by the Centers for Disease Control and Prevention, is collaborating with Ralph Tripp, Georgia Research Alliance Eminent Scholar in vaccine development at UGA, to develop aerosolized therapeutics and vaccines for airborne viruses such as the flu.



James Gathary, CDC Photographic Services

South Georgia

UGA agricultural and plant sciences researchers continue to develop new disease and drought-resistant varieties of Georgia's most commercially important crops — from peanuts, pecans and blueberries to peaches, pumpkins and cotton—as well as to breed turfgrasses and ornamental plants for the state's nurseries. In addition to introducing new



agricultural products, UGA research develops agricultural practices to help sustain Georgia's agricultural economy for future generations. Researchers also are finding ways to use the state's wealth of cost-effective feedstock — from agricultural waste to wood chips — to power a bioenergy industry for our nation's growing energy demands.

The Coast

Coastal Georgia's commercial and recreational fisheries, seafood technology industry and marine businesses have defined a way of life on the Georgia coast for hundreds of years. The UGA Marine Extension Service (MAREX) and Georgia Sea Grant help the fishing industry, especially Georgia's commercial shrimpers, remain competitive and develop new markets, conduct research on sustainability, and educate citizens throughout the state to be good stewards of coastal resources.



North Georgia

UGA has long worked with North Georgia's world-renowned floorcovering industry to solve problems and create opportunities. Now with help from the UGA Archway Partnership, a program that delivers a full range of UGA resources to accomplish community-articulated goals, MBA students, faculty, and recent graduates from the Terry College of Business are identifying ways to develop and sustain a qualified workforce that will strengthen existing industries while allowing the region to further diversify its economic base. Graduate students from the UGA Institute for Nonprofit Organizations have helped create an online small business resource center to equip startup and expanding companies in the region with tools for success.



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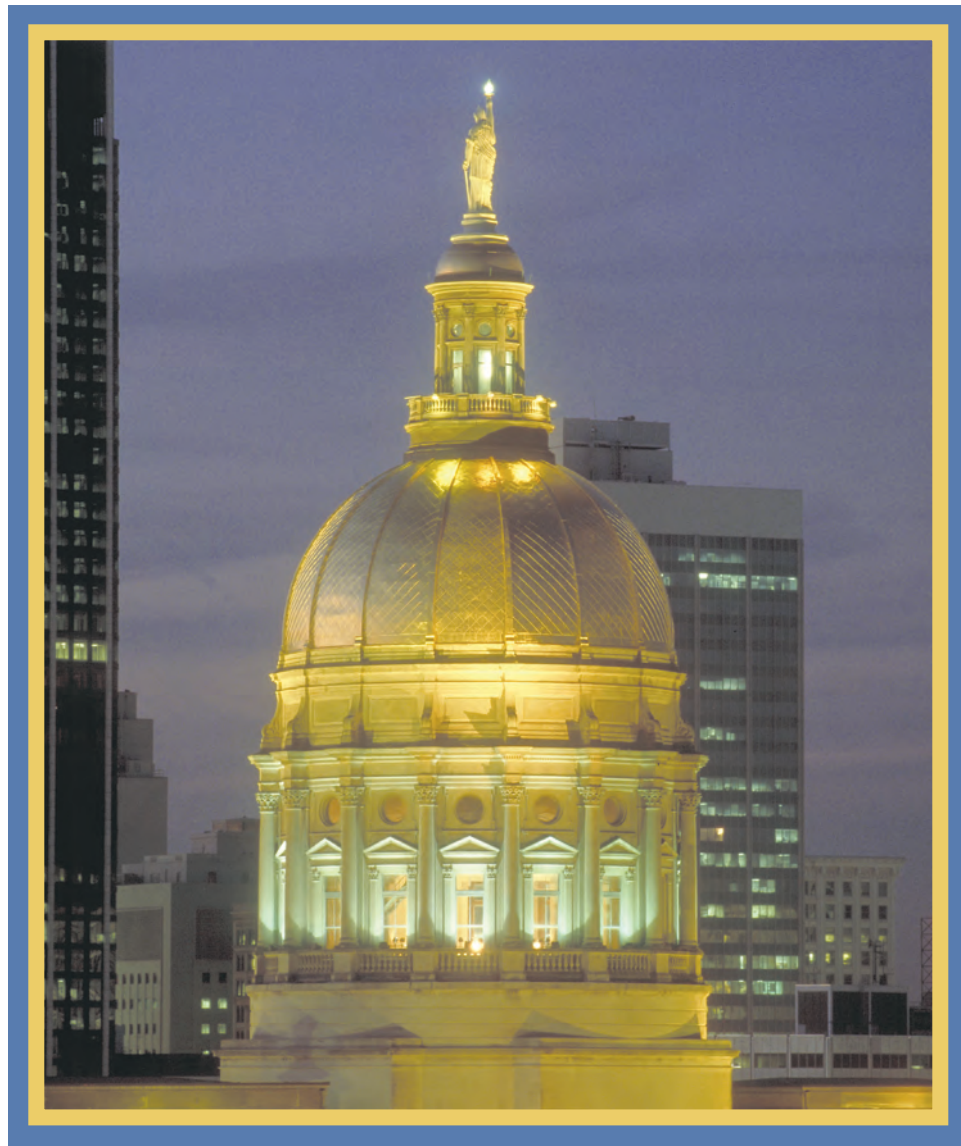


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