

COVER STORY

# Georgia top medical researchers

THEY'RE LOOKING FOR TREATMENTS AND CURES FOR CANCER, AIDS, ALZHEIMER'S DISEASE AND PEANUT ALLERGIES

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Georgia is often lauded for its sweet peaches and even sweeter tea, but it also happens to be a hub for brilliant academic medical researchers. Respected research universities such as **Georgia Tech** and **Emory University** draw top talent, and a high level of collaborations between institutions like these creates a unique environment for scientists in the state. In 2012, medical and biological sciences reached \$752 million in funded studies, most of which comes from the **National Institutes of Health**. Total funding has nearly doubled since 2001.

The state ranks 12th in research funding, though as a city, Atlanta ranks fifth in the United States for research expenditures.

An important driver is the expansion of the **Georgia Research Alliance (GRA)**, which was established in 1990 to foster economic growth by advancing research efforts at partner universities Emory, Georgia Tech, **The University of Georgia**, **Georgia Regents University**, **Clark Atlanta University** and **Georgia State University**. The GRA has lured nationally renowned researchers to the area with perks that include big funding opportunities and a large academic network. It has also established an Eminent Scholars program with 62 inductees, who receive this designation



**\$752 million**

Amount in funded studies reached by medical and biological sciences in Georgia in 2012.

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- ▶ Atlanta ranks fifth in the United States for research expenditures.

because their research contributes significant economic value to the state.

"I think what we're doing is making certain that Georgia continues to develop these kinds of opportunities, and it's our belief that the regions that will be successful are the ones that have built the talent base," said **Mike Cassidy**, president of the GRA.

Research efforts in the state are vast and varied. **Scott Jackson**, professor of plant genomics at the University of Georgia, is sequencing the peanut genome to better understand the proteins that trigger life-threatening peanut allergies. He has received funding from Mars Inc. and the peanut industry itself, for which it would be very lucrative if peanuts could be produced with less allergenicity. Other benefits of this sequencing could include the ability to engineer peanut genes to save water by using it more efficiently.

Georgia's more prominent research areas have achieved that status because they have received more competitive funding, Cassidy said.

"Bottom line, there are only a few areas that have been emphasized early on in terms of investment," he said. "There are many places we can invest, but resources aren't ample."

Studies on cancer have been heavily funded by the NIH. Dr. **Wally Curran Jr.**, executive director of Emory's **Winship Cancer Institute**, received more than \$17 million in funding in 2013, which is more than any other principal investigator in Georgia.

"My main goal is to see that all the efforts in progress against brain tumors and lung cancer culminate with both of those types ... being much more treatable than they are," Curran said. "They may not all be curable, but to be treatable, more like a chronic disease than an immediate life-threatening disease."

Medical devices are also a focus in the region, whether they are used to help advance research efforts or their development is the goal of the research itself.

**Warren Jones** and **Ami Klin**, who have been research partners for more than 15 years, use eye-tracking equipment to detect the earliest signs of autism yet observed. Autism usually isn't diagnosed until after a child turns 2, when behavior and language delays become more apparent. Both are affiliated with **Children's Healthcare of Atlanta's**

TOP RESEARCHERS INCLUDE:



**RAFI AHMED**

Director, Emory Vaccine Center  
Age: 65

**FOCUS OF RESEARCH:** Microbiology, immunology

**SIGNIFICANT ACCOMPLISHMENT:** During the past decade, Ahmed's discoveries on immune memory have changed the way scientists look at memory T-cell differentiation and anti-viral T and B cell immunity.



**RAVI BELLAMKONDA**

Chair, the Wallace H. Coulter Department of Biomedical Engineering, Georgia Tech  
Age: 48

**FOCUS OF RESEARCH:** Neural tissue engineering, brain tumor therapy, biomedical engineering and nanotechnology

**SIGNIFICANT ACCOMPLISHMENT:** Uses technology to mimic the normal nerve structures that brain tumors use to invade the rest of the brain to move inoperable brain tumors to a more operable location or remove them completely.



**DR. MAX COOPER**

Professor, Emory Center for AIDS Research and Emory Vaccine Center  
Age: 80

**FOCUS OF RESEARCH:** Developmental immunology

**SIGNIFICANT ACCOMPLISHMENT:** Derived antibodies from jawless invertebrates that can specifically recognize pathogenic anthrax spores.



**DR. WALLY CURRAN JR.**

Executive Director, Winship Cancer Institute of Emory University  
Age: 62

**FOCUS OF RESEARCH:** Radiation oncology, specifically brain tumors and lung cancer

**SIGNIFICANT ACCOMPLISHMENT:** Received the most funding of any principal investigator in Georgia in 2013, with more than \$17 million.



**SHANTA DHAR**

Assistant Professor, Franklin College of Chemistry, The University of Georgia  
Age: 37

**FOCUS OF RESEARCH:** Nanotherapeutics, bioinorganic chemistry, mitochondria-targeted therapeutics

**SIGNIFICANT ACCOMPLISHMENT:** Won the 2013 National Scientist Development Award from the American Heart Association.



**DR. ALLAN LEVEY**

Director, Emory Alzheimer's Disease Research Center  
Age: 58

**FOCUS OF RESEARCH:** Neurology, specifically Alzheimer's disease and related neurodegenerative disorders.

**SIGNIFICANT ACCOMPLISHMENT:** Levey and his team are conducting the first large-scale Alzheimer's proteomic study. He has more than 270 research publications.



**DENNIS LIOTTA**

Samuel Candler Dobbs Professor, Department of Chemistry, Emory University  
Age: 65

**FOCUS OF RESEARCH:** Therapeutics for AIDS and single-stranded RNA viruses.

**SIGNIFICANT ACCOMPLISHMENT:** Holds approximately 75 U.S. patents, including one for Emtriva, a revolutionary HIV drug he developed with Raymond Schinazi.



**TODD MCDEVITT**

Associate Professor, Walter H. Coulter Department of Engineering; Director, Stem Cell Engineering Center  
Age: 39

**FOCUS OF RESEARCH:** Stem cell engineering

**SIGNIFICANT ACCOMPLISHMENT:** Established the Stem Cell Engineering Center at Georgia Tech to advance the local stem cell research community.



**MARTIN MOORE**

Assistant Professor, Division of Infectious Diseases, Emory University School of Medicine's Department of Pediatrics  
Age: 42

**FOCUS OF RESEARCH:** Fundamental Respiratory Syncytial Virus (RSV) research, potential RSV vaccines and anti-viral drugs.

**SIGNIFICANT ACCOMPLISHMENT:** Won Emory's Innovation of the Year award in 2014 for developing a live attenuated RSV vaccine.



**DR. MARK MULLIGAN**

Director, Hope Clinic of the Emory Vaccine Center  
Age: 55

**FOCUS OF RESEARCH:** Vaccines for HIV/AIDS and other pandemics.

**SIGNIFICANT ACCOMPLISHMENT:** In 1994, Mulligan was the first in Atlanta to give a patient an HIV vaccine candidate.

COVER STORY



JOANN VITELLI

UGA's Scott Jackson studies the genetics and genomics of plants, including the peanut plant.



JOANN VITELLI

Emory's Dr. Max Cooper studies the immune systems of eel-like invertebrates such as saltwater lampreys.

of science, which combines immunology, bioengineering and nanotechnology to better understand the immune system and develop new therapeutics that can modify it to more effectively fight disease.

The strongest area of research in Georgia is immunology. Scores of scientists in the area are working hard to unravel the intricacies of our immune system, and some of their tactics are quite unusual.

Dr. **Max Cooper**, professor at the Emory Center for AIDS Research and Emory Vaccine Center, studies invertebrates such as saltwater lampreys, which he said have the same blueprint for an immune system as humans.

"The practical aspect of it is that the antibodies that they make, although just as specific as ours, are made up of a single chain," Cooper said. "That makes them more easily engineered."

Cooper, like many other local scientists, also studies immune diseases.

HIV research, in particular, has been big in Atlanta since **Raymond Schinazi** and **Dennis Liotta** developed an anti-HIV drug that is prescribed to more than 90 percent of HIV-positive patients in the United States. Emtriva, the current trade name of the drug, was approved by the **U.S. Food and Drug Administration** in 2006.

Liotta estimates that he holds more than 1,000 patents or patent equivalents worldwide, though he has "never bothered to count." He has no training in biomedical research, but became interested in the field when he began consulting for pharmaceutical companies in the late 1980s.

"The AIDS epidemic was killing so many of our most creative people; it was just so devastating," Liotta said. "I said, 'I've got to do something about this, and I'm a pretty good chemist, so maybe I can figure out how to make important drugs less expensively or maybe I could even design some new ones.'"

"Liotta and Schinazi never expected to become such public figures, but their breakthrough discoveries have had such a global impact that they have put Atlanta on the map as a leader in AIDS research," Cassidy said. "Combine their reputation with other assets like the Emory Vaccine Center led by Dr. **Rafi Ahmed** and the vital work being done at the CDC and it's easy to see why Atlanta has become an immunology powerhouse."

Although research dollars have continued to increase annually in Georgia for more than a decade, Cassidy senses the upward trend will level off. He said NIH grants are "flat-lining" due to federal budget cutbacks, and last year's sequestration did no favors for the industry.

"I think this is a very real concern not just for the researchers in Georgia, but for the nation's research enterprise," Cassidy said. "There are many challenges facing the health of our citizenry ... A concern for everybody we're working with is the overall funding climate and the impact on progress toward cures." ❧

**Marcus Autism Center.**

Cassidy said there are many medical devices in development as a result of Georgia Tech and Emory's public-private partnership. The Wallace H. Coulter Department of Biomedical Engineering, formed by the two schools in 2001, is also the home of the newly launched Immunoengineering Center. He said the GRA is very interested in this branch



**ROSS ETHIER**

Professor, Wallace H. Coulter Department of Biomedical Engineering, Georgia Tech and Emory University School of Medicine

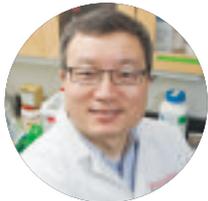
Age: 54

**FOCUS OF RESEARCH:**

Biomedical engineering

**SIGNIFICANT ACCOMPLISHMENT:**

Ethier's current research has the potential to create a new paradigm for treating glaucoma, the second most common cause of blindness.



**BIAO HE**

Fred C. Davison Distinguished University Chair in Veterinary Medicine, The University of Georgia

Age: 46

**FOCUS OF RESEARCH:**

Vaccine development, cancer therapy

**SIGNIFICANT ACCOMPLISHMENT:**

Developed a platform technology for gene delivery using a virus that is a component of the kennel cough vaccine.



**SCOTT JACKSON**

Professor of Plant Genomics, The University of Georgia

Age: 44

**FOCUS OF RESEARCH:**

Genetics and genomics, primarily of plants

**SIGNIFICANT ACCOMPLISHMENT:**

Sequenced crop genomes, including soybeans, peanuts and common beans.



**WARREN JONES**

Director of Research, Marcus Autism Center, Children's Healthcare of Atlanta Assistant Professor, Department of Pediatrics at Emory University School of Medicine

Age: 37

**FOCUS OF RESEARCH:**

Autism and related disorders, pediatrics

**SIGNIFICANT ACCOMPLISHMENT:**

Adapted eye-tracking technology with Dr. Ami Klin that can diagnose children with autism earlier.



**AMI KLIN**

Director, Marcus Autism Center, Children's Healthcare of Atlanta Chief of Division of Autism & Related Disorders in the Department of Pediatrics, Emory University School of Medicine

Age: 53

**FOCUS OF RESEARCH:**

Autism and related disorders, pediatrics

**SIGNIFICANT ACCOMPLISHMENT:**

Along with Dr. Warren Jones, Klin adapted eye-tracking technology being used by the military to use to diagnose children with autism earlier.



**KRISHNENDU ROY**

Director, Georgia Tech Center for Immunoengineering, the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University

Age: 42

**FOCUS OF RESEARCH:**

Immunoengineering, drug delivery and stem cell engineering

**SIGNIFICANT ACCOMPLISHMENT:**

His research on drug delivery has resulted in more than a dozen filed or issued patents.



**RAYMOND SCHINAZI**

Director, Laboratory of Biochemical Pharmacology and Scientific Working Group on HIV Reservoirs and Viral Eradication, Emory University

Age: 64

**FOCUS OF RESEARCH:**

Immunology, HIV/SIV pathogenesis

**SIGNIFICANT ACCOMPLISHMENT:**

Developed breakthrough HIV drug Emtriva, taken by 94 percent of HIV-positive people on the U.S. alongside Dennis Liotta.



**JIN SHE**

Director of the Center for Biotechnology and Genomic Medicine, Georgia Regents University

Age: 52

**FOCUS OF RESEARCH:**

Diabetes, cancer, biomarkers, therapeutics and genomics

**SIGNIFICANT ACCOMPLISHMENT:**

His research has made great strides in early detection of childhood Type 1 diabetes.



**DR. GUIDO SILVESTRI**

Division Chief of Microbiology and Immunology, Emory University School of Medicine

Age: 51

**FOCUS OF RESEARCH:**

Microbiology, immunology, HIV/AIDS

**SIGNIFICANT ACCOMPLISHMENT:**

His groundbreaking research on certain species of African monkeys, which are infected with variants of the Simian Immunodeficiency Virus that doesn't cause disease or develop AIDS, provides a way to study a disease that closely mirrors human HIV in a more humane way.



**BORIS STRIPEN**

Professor, Center for Tropical and Emerging Global Diseases, The University of Georgia

Age: 48

**FOCUS OF RESEARCH:**

Infectious diseases

**SIGNIFICANT ACCOMPLISHMENT:**

Developed genetic engineering tools for human parasites and applied those to discover the mechanisms of drug action and resistance.