Georgia top medical researchers

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

BY ELLIE HENSYLES ehensley@bizjournals.com

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 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 the sequencing could include the ability to engineer peach 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 immunochemistry 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: 47  
FOCUS OF RESEARCH: Neural tissue engineering, brain tumor therapy, biophysical 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 make 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: 50  
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 Pharmacy, University of Georgia  
Age: 37  
FOCUS OF RESEARCH: Nanotherapeutics, bioinorganic chemistry, multidisciplinary targeted therapeutics  
SIGNIFICANT ACCOMPLISHMENT: Won the 2013 National Scientist Development Award from the American Heart Association.

DR. ALLAN LEVY  
Director, Emory Alzheimer's Disease Research Center  
Age: 58  
FOCUS OF RESEARCH: Neurology, specifically Alzheimer's disease and related neurodegenerative disorders  
SIGNIFICANT ACCOMPLISHMENT: Levy 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 MCDAVITT  
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, 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.
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 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.

“Th e practical aspect of it is that the antibodies that they make, although just as specifi cally driven off as we are, are made up of a single chain,” Cooper said. “That makes them more easily engineered.”

Cooper, like many other local scientists, also studies eel-like invertebrates such as saltwater lampreys, which he said have the same blueprint for an immune system as humans. “I was always amazed by how different they are, but for the nation’s research enterprise,” Cassidy said. “They’re the practical aspect of it is that the antibodies that they make, although just as specifi cally driven off as we are, are made up of a single chain,” Cooper said. “That makes them more easily engineered.”

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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 brought into 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 fi gure 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 national 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 “fl at-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.”