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N.C. A&T chosen for bioengineering center

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GREENSBORO — N.C. A&T State University is one of a select group of universities nationwide, and the first historically black institution ever, chosen to lead a prestigious National Science Foundation Engineering Research Center.

That center, which will be one of only a few dozen so-called ERCs created nationwide over the past 25 years, will conduct research in biomedical engineering and nanobio applications using $18.5 million in funding over the first five years of the program, according to the university.

The ERC program is considered the “crown jewel” of science foundation awards. Having one at N.C. A&T is a significant achievement for the university and the community, said Jag Sankar, the N.C. A&T engineering professor who will act as director of the new center.

In conjunction with the ERC, N.C. A&T will launch a new bioengineering department that will grant bachelor’s, master’s and Ph.D. degrees, Sankar said. There will also be an educational outreach component to university, community college and high school students.

“We hope to expand the presence of African-Americans, women, and socially and economically disadvantaged students in bioengineering and nanotechnology,” Sankar said in a prepared statement (officials were not available for interviews for this story). “Ultimately, we want to help foster economic development through innovation that radically changes the way diseases are treated and to place the U.S. health care system in a strong position.”

N.C. A&T will be working with a number of partner institutions over the decade-long project, including the universities of Cincinnati and Pittsburgh and California State University-Los Angeles in the U.S. and Germany’s Hannover School of Medicine as well as the Indian Institute of Technology in Madras, India.

The mission for the ERC is to deliver on the potential of bioengineering and nanotechnology to dramatically improve treatments for cardiovascular, orthopedic and craniofacial ailments. The promise is that new kinds of implants and biodegradable metals may be used that can grow and adapt to the human body they are implanted in and eventually dissolve when no longer needed.

That would spare patients such as children suffering from cleft palate the pain and expense of the multiple procedures used to implant, then later remove, refit and re-implant the current

generation of devices.

Some of the same principles of biodegradable artificial structures are used in other research going on in the Triad, at Wake Forest University's Institute for Regenerative Medicine. There, a team of researchers led by Dr. Anthony Atala is discovering how to regrow internal organs and external limbs from a body's own cells on top of "scaffolding" that disintegrates after the new appendage takes shape.

"The treatment of diseased and traumatized tissues is evolving as medical technologies increasingly harness the body's regenerative powers," said William Wagner, deputy director of the University of Pittsburgh's McGowan Institute for Regenerative Medicine, and deputy director of the new ERC. "This ERC will extend this approach by combining the mechanical attributes of metals with biologically active agents that together will further encourage the natural healing process."

Potential impact

The ERC has the potential for impact on the university as well as its field of study. Also, the exclusivity of the club of chosen host universities puts the program in high demand. More than 140 initial proposals were submitted to the National Science Foundation alongside N.C. A&T's, and 34 of those were asked for complete submissions.

N.C. A&T was one of eight selected for a site visit, and one of five final awards. It was the first historically black university ever selected as a lead institution, the university said.

Host universities benefit from both the prestige and the funding associated with the ERC program, typically adding facilities, programs and faculty over the course of the research.

There are both current and "graduated" ERCs, with graduates having completed the research assigned to their center. Among the graduated centers are Duke's ERC for Emerging Cardiovascular Technologies and N.C. State's Center for Advanced Electronic Materials Processing, according to the Engineering Research Centers Association, a private group.

N.C. A&T has experience as a partner in ERC programs, working with a group led by Virginia Tech on the Center for Power Electronics Systems established in 1998. Power electronic systems are found in most electronic devices and are used to convert and control electric power.

That center illustrates the potential for business and industry to share in the research and activity generated by an ERC. According to the center's Web site at Virginia Tech, there are 80 industrial partners affiliated with CPES.

Each of those partners pays an annual fee ranging from some form of in-kind contribution to $25,000 per year, and in return receives varying levels of access to research data generated by the project and opportunities to participate in center programs.

One of the goals of an ERC is to move laboratory discoveries into the marketplace quickly, often through spinoffs and licenses.

According to a chapter on ERCs in the 2007 book The Creative Enterprise (published by Greenwood Publishing Group), between 1985 and 2002 the 37 ERCs funded during that period produced 90 spinoff companies as well as 391 patents and 908 inventions.

It will take some time to gauge the particular impacts of N.C. A&T's new research center, but the school said it has already formed a consortium of nearly 30 product development and industrial partners in the nano- and biotechnology markets that will help it transfer ERC-developed technology to patients.