



MARINE CORPS PHOTO BY CPL. JUSTIN UPDEGRAFF

*North Carolina has the third-biggest military presence in the country. It contributes \$66 billion to the state gross product each year.*

# Enlisting

*North Carolina's small businesses are dreaming up  
and developing technologies for the military.*

**R**aleigh-based Vadum Inc. builds technology for electronic warfare. “All of our work is very advanced technology, one step out of academia,” says CEO Gary Edge. In January, his company was selected by the Pentagon’s U.S. Defense Advanced Research Projects Agency to develop countermeasures for enemy radar systems. It’s not the only victory for the company that started in 2004 and employs 20 people. “Last year, we submitted 13 proposals, and six were accepted for contract awards. We won two Navy programs

this year already that deal with submarines. One is an electronic surveillance system for a torpedo that would deploy, float to the surface and ‘listen’ for various signals.”

Technology is one of the most powerful weapons in the U.S. military’s arsenal, and the Pentagon is recruiting small businesses, such as Vadum, and universities to develop it. Companies in North Carolina were awarded \$2.7 billion worth of defense contracts in 2015, according to the North Carolina Military Business Center. “Businesses in North Carolina are well-positioned to perform

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*It's not only small businesses that support the military in North Carolina. Community colleges, such as Fayetteville Tech, help personnel transitioning out of the military apply the skills they learned in the service to civilian careers.*

this R&D work, which will expand businesses, grow jobs and expand the economy of our state," says Denny Lewis, the center's federal business adviser.

Department of Defense needs are rooted in 17 industries. Most are in North Carolina's wheelhouse, including information technology, advanced materials, biotechnology and life sciences, textiles and biomanufacturing. Gaining that work begins when DoD solicits proposals for Small Business Innovation Research and Small Business Technology Transfer projects each year. Selected companies first receive about \$150,000 and six months to develop a product. Then they can apply for Phase II money, often about \$1 million, and begin production. If they are accepted for Phase III, a large manufacturer takes over production. "We usually fund two or more of these companies at the same time," says Bradley Guay, a program manager at the Army Research Office in Research Triangle Park. "In Phase III, they can get money

from companies such as [Chicago, Ill.-based] The Boeing Co."

There were 29 SBIR awards in various phases, worth about \$7 million, in North Carolina in 2012. The small businesses that won them have fewer than 500 employees, are independently owned in the U.S., and are capable of completing Phase I and at least half of Phase II research. Businesses must meet similar requirements for tech transfer projects. They have to involve a research university, which receives 30% of the funding. Of the \$7.4 million awarded to universities nationwide from 2011 to 2015, Raleigh-based N.C. State University was first with \$1.7 million, and UNC was 12th at about \$770,000. "We've been actively engaging the university systems to more comprehensively engage the military in North Carolina," says Stephen Lee, chief scientist at the Army Research Office at RTP and an adjunct faculty member in UNC Chapel Hill's chemistry department. "We've been conducting

workshops to include the academic community, working with businesses in North Carolina, working with the professors. We have workshops on the biomedical needs and the needs of the Special Forces at Fort Bragg. An example might be having a little laboratory that can test for anthrax or Ebola that might hook to your iPhone. You could do this in the field instead of taking it back to a lab and waiting days for results."

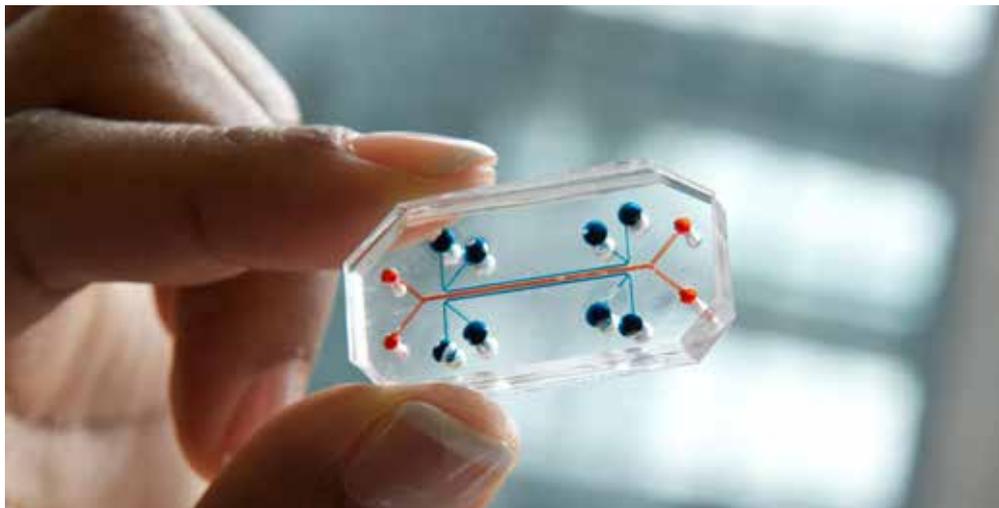
Developing successful DoD projects requires a team approach. Research Triangle Park-based N.C. Biotechnology Center connects companies and university-based scientists to monetize research. It's a successful model that's been used to grow the state's biotechnology sector, which contributes \$73 billion to the state's economy each year. "Life sciences, as a whole, get a lot of attention from economic-development agencies in other states, regions and nations," says Mary Beth Thomas, vice president of the Centers of Innovation, the Biotech Center program that develops industry sectors. "Biodefense technologies and solutions are a great example of that. Our efforts seek to better understand the needs and challenges our military faces. Then we work to educate the companies and partners in North Carolina's life-science community about how their technology or innovations can be translated into solutions with positive impacts for our warfighters and veterans."

Gerald Hayes is founder and president of nonprofit Wake Forest-based Wireless Research Center of North Carolina, which engineers and tests wireless communications. It works with small businesses with Phase I innovation research funding. He admits that some of the technology sounds like science fiction. "Now, they're looking at wearable sensors that don't need batteries and can measure your position or your blood sugar. You can put on a T-shirt with all these sensors that are powered by your movement. The warfighters and the first responders could benefit. It's kind of daunting but amazing at the same time."

Hayes is a member of Pinehurst-based North Carolina Defense Business Association's Science and Technology Committee with Phil Williams, a technology developer and consultant. "With all the challenges there are to win contracts today, we tell people that we're focused on engaging technology and researchers within industries in North Carolina, to find something of value that [the military] needs," Williams says. "It takes a team to win. And in North Carolina, we have mostly small companies, not a lot of prime contractors like Boeing. So we're working to help small companies become subcontractors and contractors in technology development. By teaming up, we look like a bigger company and can get a program that we wouldn't be able to go after alone. It's about what we can do together to grow jobs and help our men and women in the military."

Presenting a complete package — from development to production — will make North Carolina shine in DoD's dimming fiscal picture. Its budget was \$691 billion in fiscal year 2010. In fiscal year 2017, it was \$583 billion. Just because it has less to spend doesn't mean its needs are fewer. "DoD must repair and modernize equipment worn out by 15 years of war, conduct a troop reduction and balance readiness by juggling training, personnel and equipment costs while maintaining preparedness to defend our nation," Lewis says.

North Carolina's five DoD and one Coast Guard bases were home to 102,000 active-duty personnel in June 2015, according to the N.C. Department of Commerce. It's the third-largest military presence in the U.S. and contributes about \$66 billion to the state gross product each year. But there's room for more, Lewis says. The military business center "is working to establish a DoD liaison in North Carolina to facilitate connecting North Carolina companies to existing requirements in the DoD and assisting them in monetizing their R&D investments. Scores of North Carolina businesses and research centers have



DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

*The Department of Defense is enlisting small businesses and research universities to develop technology within 17 industry sectors. Many are active in North Carolina.*

innovative commercial technologies relevant to the DoD but do not care to engage with DoD for a number of reasons: unfamiliarity, distrust, cost in money and time and no local DoD

representative to educate, inform, encourage and mentor. Our nation's service members need the best enabling technologies, and North Carolina companies could help... " ■

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