

In compliance with the Fiscal Year 2010 Defense Authorization Disclosure and Transparency Requirement the following requests for authorization of funding have been submitted to the House Committee on Armed Services for consideration:

**Project Name:** Armed Forces Institute for Regenerative Medicine (NC/TX)

**Recipient:** Institute for Regenerative Medicine at Wake Forest University

**Recipient Street Address:** 391 Technology Way  
Winston-Salem, NC

**Requested Amount:** \$10,000,000

**Explanation of the request (*must include purpose and why it is a valuable use of taxpayer funds*):** The Armed Forces Institute for Regenerative Medicine (AFIRM) is a strong national effort to address the unprecedented challenges of caring for service members returning from Afghanistan and Iraq with multiple traumatic injuries. Some of our wounded warriors face the daily challenges of recovery from severe limb, head, face and burn injuries that require years of treatment and may result in a significant lifetime impairment. Therapies developed by the AFIRM project will greatly benefit wounded warriors, as well as the civilian population with burns or severe trauma due to illness or injury. The AFIRM (NC) team is committed to developing clinical therapies over the next five years focusing on the following five areas:

- Burn repair;
- Wound healing without scarring;
- Craniofacial reconstruction;
- Limb reconstruction, regeneration or transplantation;
- Compartment syndrome, a condition related to inflammation after surgery or injury that can lead to increased pressure, impaired blood flow, nerve damage and muscle death.

**Project Name:** Institute for Regenerative Medicine

**Recipient:** Institute for Regenerative Medicine at Wake Forest University

**Recipient Street Address:** 391 Technology Way  
Winston-Salem, NC

**Requested Amount:** \$5,000,000

**Explanation of the request (must include purpose and why it is a valuable use of taxpayer funds):** The Institute for Regenerative Medicine at Wake Forest University seeks \$5,000,000 to develop a detection system to identify pathogens afflicting military personnel in combat zones within a three hour time frame and to develop protocols and necessary data to create a universal donor cell resource system to obtain and utilize stem cells from amniotic fluid and placental tissue to treat military casualties.

The identification of a pathogen type from microbiological cultures taken from wounded soldiers now takes at least 3 to 5 days. Soldiers are normally started on a broad spectrum antibiotic which, if inappropriate, can lead to a systemic inflammatory response that resembles sepsis and costs the taxpayers extraneous dollars that could be better spent. It is often more than a week after injury before a soldier receives the correct antibiotic type. During this period, patients can transmit infections to other soldiers unless they are isolated. New diagnostic tools are critically needed that can quickly identify the type of infection in wounded soldiers in forward stations so that the appropriate antibiotic therapy can be started promptly.

The Institute has been approached by military officials to develop a pathogen detection test which would permit rapid identification of bacterial infections typically afflicting U.S. soldiers in combat zones. Investigation to date suggests the possibility that a small, disposable "lab-on-a-chip" device would allow the specific identification of pathogenic organisms in less than two hours under battlefield conditions. The device would directly isolate, count and concentrate pathogenic bacteria from the affected soldier and compare its DNA characteristics to those of roughly 15 known bacterial pathogens of military significance. This would permit the appropriate antibiotic to be given promptly, minimize risk of exposure to other soldiers and reduce overuse of broad spectrum antibiotics which has led to emergence of dangerous antibiotic resistant "super bugs."

**Project Name:** High Performance Computing in Biomedical Engineering and Health Sciences Benefitting the War Fighters and the Public

**Recipient:** North Carolina A&T State University

**Recipient Street Address:** 1601 East Market Street  
Greensboro, NC 27409

**Requested Amount:** \$4,000,000

**Explanation of the request (must include purpose and why it is a valuable use of taxpayer funds):** New emerging technologies are required to facilitate revolutionary transformations and improvements in the health care and life quality of the US population while reducing the sky rocketing health care costs. The rapid developments in computational science, engineering and high performance computing are now making

high fidelity modeling, simulations and visualization essential tools in several scientific and engineering disciplines. Such techniques have significant potential for applications in biomedical and health sciences towards improving the quality of health care and life through physics based modeling of human physiological systems. For example, the principles of computational fluid dynamics and structural mechanics have applicability for the research, design and developments in medical implants, safe and effective surgical processes and in other health science areas that can result in benefiting the rehabilitation of disabled veterans and the public and significantly improve their quality of life. The work will require developing simulation based virtual environments of human physiological systems to facilitate intelligent and effective medical advancements based on a synergistic merger of interdisciplinary principles of medicine, human and biological sciences, engineering, computational sciences and enabling computing technologies.

**Project Name:** High Performance Computer Assisted Advanced Multi-Scale Material Design

**Recipient:** North Carolina A&T State University

**Recipient Street Address:** 1601 East Market Street  
Greensboro, NC 27409

**Requested Amount:** \$1,900,000

**Explanation of the request (*must include purpose and why it is a valuable use of taxpayer funds*):** The initiative would focus on computational science engineering technologies and enabling high performance computing techniques with emphasis on the high resolution, multi-scale, multi-dimensional modeling for the computer assisted material design of advanced material systems; accurate computational techniques bridging the different conservation models and constitutive behavior for the computational design and analysis of multi-component advanced material systems. The request is for the development of research expertise, human resources, computational equipment and labor for faculty members, three to four Computational Science and Engineering graduate students (especially underrepresented minorities) and two undergraduate students.

A fundamental and thorough technical understanding of the physical characteristics, appropriate mechanics, mathematical principles and their modeling is critical for the accelerated development and insertion of multi-component material systems that provide the superior functionality for engineering applications in both civilian and defense sectors into next generation applications envisioned in the fields of aerospace, energy, transportation, medicine and health in this critical technology area of computer assisted advanced multi-scale material design. Computational modeling and high performance computing are essential to provide the strong foundation for such leadership.

**Project Name:** ARNG Soldier/Family Support: NCNG Family Assistance Centers

**Recipient:** North Carolina National Guard

**Recipient Street Address:** 4105 Reedy Creek Road  
Raleigh, NC 27607

**Requested Amount:** \$1,600,000

**Explanation of the request (*must include purpose and why it is a valuable use of taxpayer funds*):** Since 9/11, the North Carolina National Guard (NCNG) has experienced an unprecedented operational pace that includes mobilizing over 95% of the force. Current indications are that this pace will continue for the foreseeable future. These mobilizations have a significant effect on our families and children. One of the most vital lessons learned is that they experience this impact not only during the deployment but prior to and especially after the service member returns. Family Assistance Centers (FACs) provide essential support and services to families of members of the NCNG and of all the other Armed Services. These services would include counseling, health care information, financial advice, employer support, legal support and guidance, crisis referral, community outreach, veteran affairs and more. Unlike the active component, NCNG families are not geographically centered near installations like Fort Bragg, Seymour Johnson or Camp Lejeune, all of which provide these services to their members. Instead, NCNG families are spread throughout the state and in most cases cannot get to these installations on a routine basis or without some hardship. Establishing FACs across the state allows the NCNG to provide consistent and continuous vital support and services to the families of members of the NCNG and the Armed Services. Funding this program will significantly reduce the impact on families and will directly contribute to sustaining a strong North Carolina National Guard. Support of families has a direct strategic impact upon the National Guard as families play a major role in a service member's decision on whether to remain in the National Guard. Trained, experienced service members, who remain in the military, save recruiting and training costs and enhance unit readiness.

**Project Name:** C-130 Squadron Operations Facility

**Recipient:** North Carolina National Guard

**Recipient Street Address:** 145<sup>th</sup> Airlift Wing  
5225 Morris Field Drive

Charlotte, NC 28208

**Requested Amount:** \$8,000,000

**Explanation of the request (*must include purpose and why it is a valuable use of taxpayer funds*):** The 156<sup>th</sup> Airlift Squadron, North Carolina Air National Guard, Charlotte, North Carolina, performs the vital mission of training, testing, certifying, planning and scheduling C-130H aircrews in support of State and Federal missions. The current facility does not meet mission needs, life safety standards, environmental standards, administrative, training and operational space. The facility was built 35 years ago and designed to support an Airlift Squadron that had 60 crewmembers. Due to mission increase, that same unit has 120 crewmembers with a corresponding growth in all support personnel. Limited administrative space, inadequate heating and air conditioning and a constrained work environment makes for adverse working conditions. Insufficient aisle/movement space between desks and office equipment presents serious fire and safety hazards. Substandard to non-existent fire suppression systems place all assets at risk. Existing infrastructure supporting the facility is at maximum capacity, with no additional phone or network connections available and limited ability to stand-up computer based training programs and forcing the aircrew readiness trainer to be located in another facility. Due to growth in female crewmembers, there is inadequate female restroom and aircrew locker space. All the above issues make it necessary to replace the existing facility. An efficient, safe work environment promotes effective mission training and planning, boosts morale, promotes teamwork and improves command and control resulting in enhanced mission readiness in conducting global airlift operations.