


**Board of Trustees
University Affairs Committee
Overview of Research Accomplishments**

Dr. Barry L. Burks
Vice Chancellor for Research and Economic Development
September 16, 2016



North Carolina Agricultural and Technical State University

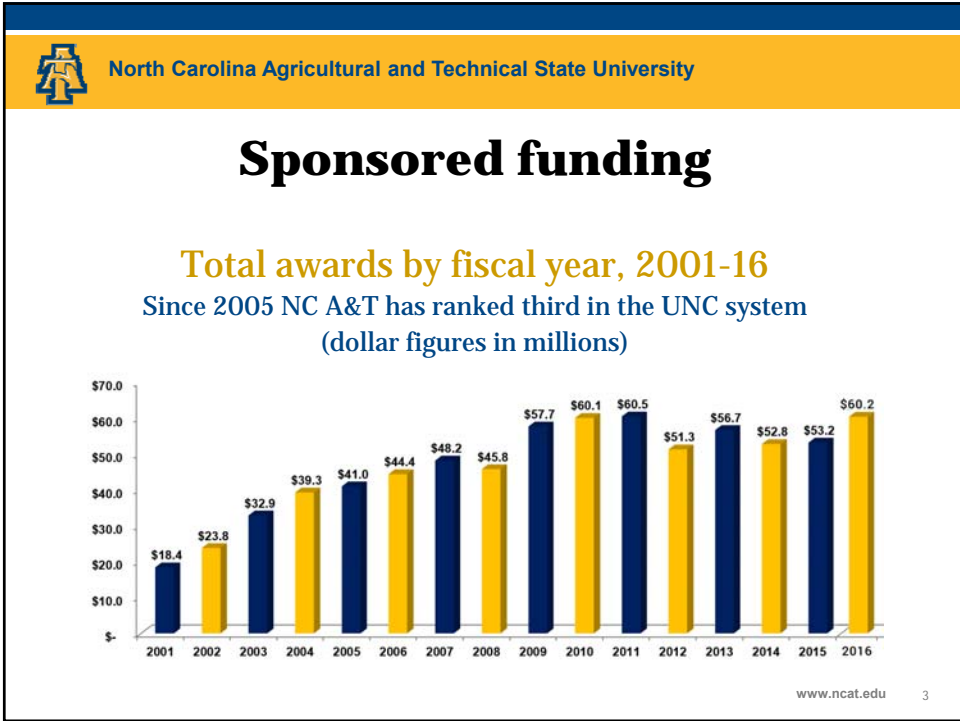


North Carolina Agricultural and Technical State University

Snapshot: Sponsored Research

- Ranked 3rd in the UNC system in research funding since 2005
- Funding in FY 2016 was \$60.2 million
- Awards at end of August 2016 totaled \$3.6M more than August 2015
- Average funding of \$57 million over past eight years
- Robust research environment is primarily focused on the STEM disciplines

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Agency	Awards	Amount
National Science Foundation	41	\$ 18,391,168.00
Department of Defense	32	\$ 4,621,279.24
NASA	10	\$ 505,636.15
US Department of Agriculture	36	\$ 20,361,101.68
US Department of Energy	6	\$ 767,222.75
US Department of Education	11	\$ 9,961,922.00
US DHHS – NIH	12	\$ 2,151,839.00
UNC Schools	1	\$ 68,000.00
Other Federal	18	\$ 954,412.00
Associations	14	\$ 366,382.00
Business and Industry	13	\$ 296,248.48
Educational Institutions	4	\$ 74,220.44
Foundations	14	\$ 941,787.00
Local Government	1	\$ 21,000.00
Nonprofit Organizations	4	\$ 117,361.06
NC State Government	4	\$ 628,618.00
GRAND TOTAL	221	\$ 60,228,197.80



Intellectual Property - Patents

Seven patents issued in 2015-2016:

- US 9,114,576 (issued 8/25/2015) to *Kelkar et al.*, “Heat vacuum assisted resin transfer molding processes for manufacturing composite materials”
- US 9,151,733 (issued 10/6/2015) to *Sundaresan* “Acoustic emission sensor array”
- US 9,190,222 (issued 11/17/2015) to *Zhang et al.* “Production of carbonaceous nano-fibrous materials with ultra-high specific surface area from alkali (Kraft) lignin”
- US 9,187,402 (issued 11/17/2015) to *Sang* “Aspirin derivatives and uses thereof”
- US 9,185,984 (issued 11/17/2015) to *Henke* “Folded sheets of material for use as a structural member and assembly thereof”



Intellectual Property – Patents, cont.

- US 9,272,994 (issued 3/1/2016) to *Sang et al.* “Ginger Metabolites and Uses Thereof”
- CA 2,703,051 (issued 2/23/2016) to *Luster-Teasley* “Controlled Release Remediation System and Composition”

Patents to issue in FY2017

- USSN 13/838,725 (allowed 6/27/2016; will issue ~12/2016) to *Yang et al.* “Micropropagation of Alexandrian Laurel (*Danae Racemosa*)”

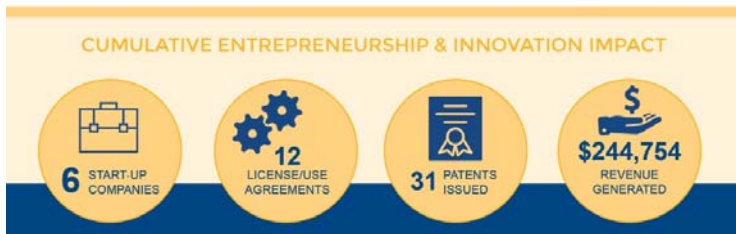


Recent Licensing Efforts

- **Sarisa** - term sheet signed. Negotiating license agreement for use of aspirin conjugate technology to create a cancer chemotherapy drug.
- **AxNano** - term sheet signed. Negotiating license agreement for use of bio-degradable polymer technology for soil remediation and water purification.
- **ROD Inc.** – negotiating term sheet for use of laser based technology for steering metallic droplets for 3D additive manufacturing.
- Preliminary discussions
 - › 2 different companies about licensing nano-battery technology
 - › with a company about licensing mushroom based animal feed supplement technology



Snapshot: Economic Development





Significant New Contracts and Agreements

- Anticipate signing a 5 year multi-million dollar ID/IQ contract with Lockheed Martin for technical support on the NASA Orion project
 - » Materials and software engineering
 - » Contract will be awarded in September
- Educational Partnership Agreement signed with the Air Force Research Laboratory
 - » Benefit to the university will be approximately \$3M over 5 years plus research funding generated through collaboration with AFRL
- Notified on August 30 that Dr. Homaifar will receive \$5.3M from the Army Test Resource Management Center for autonomous systems research



- ❖ **Testing, Evaluation and Control of Heterogeneous Large-scale Autonomous Vehicles (TECHLAV) – Awarded and received \$5 Million for 5 years (Funded by DOD, OSD)**
 - Multi-disciplinary Center for Testing, Evaluation and Control of Heterogeneous Large-scale Autonomous Vehicles (TECHLAV)
 - Collaborative, integrated research and education programs with a focus on Large Scale Autonomous System of Vehicles (LSASVs)
 - Vehicles can be deployed in an uncertain and dynamical environment through effective interaction with human operators.





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