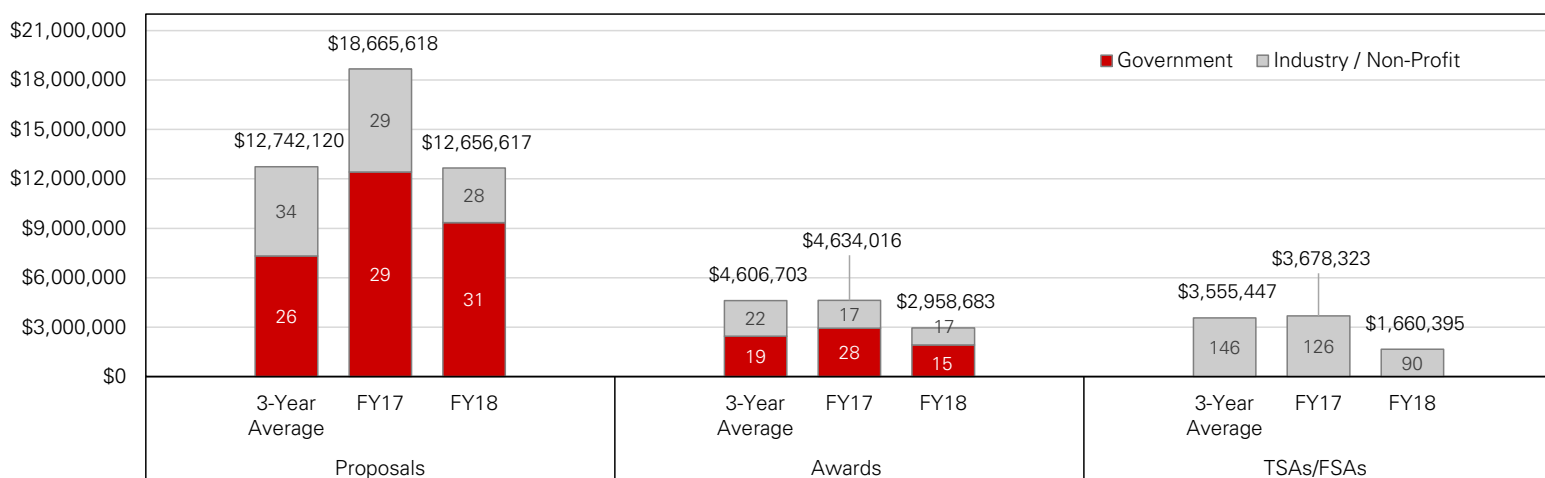


The research programs in the College of Textiles at NC State University are innovative, life-saving, creative, global and thriving. The College also provides tech service to all stakeholders and supports the economic development of the State and beyond. This newsletter gives a brief overview on the research and tech service activities of the faculty, staff and students during the third quarter of Fiscal Year 2018.

## FY18 vs. FY17 vs. Three-Year Average (Q1 - Q3)

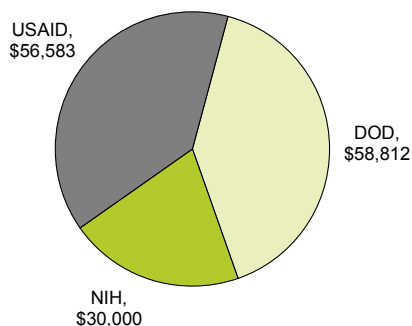


## NUMBERS TO DATE (FY18 Q3)

### Research Awards Received (\$586,217)

- Federal: \$145,395 | DOD, USAID
- Industry: \$440,822 | Circulex, Cotton Inc., Cotton Research and Development Corporation, Eastman Chemical, KWJ Engineering, Lawter, Luna Innovations, MORSE Corp, Tyton BioEnergy

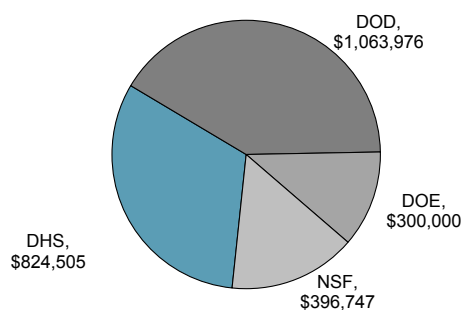
FY18 Q3 Federal Awards by Agency



### Research Proposals Submitted (\$3,816,785)

- Federal: \$2,785,228 | DHHS, DHS, DOD, NIJ, NSF
- Industry: \$1,031,557 | Advanced Cooling Technologies, Australian Wool Innovation Limited, Cotton Inc., Cutty International, Fortified Textiles, Lawter, Luna Innovations, Storaenergy Technologies, Tyton BioEnergy Systems

FY18 Q3 Federal Proposals by Agency



## NUMBERS TO DATE (FY18 Q3) Cont.

### Inter-college Research Proposals (3)

- COT share: \$415,559
- With CALS, COE, CNR

### Inter-college Research Awards (2)

- COT share: \$18,812
- With CALS, COE, CNR

### Inter-department Research Proposals (3)

- \$932,555

### Graduate Student Support

- 56 Ph.D. Student RAs (Avg Stipend: \$17,082 / year)
- 22 M.S. Student RAs (Avg Stipend: \$15,386 / year)

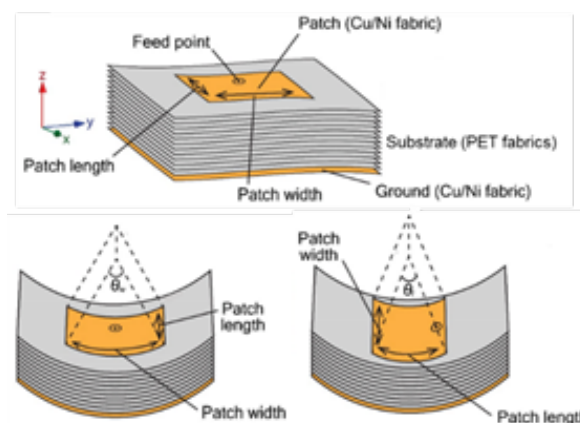
## RESEARCH AWARDS ABOVE \$50,000 (FY18 Q3)

1. Wei Gao, Richard Kotek, \$143,936, Eastman Chemical Company.
2. Jesse Jur, \$70,000, Circulex Inc.
3. Samuel Hudson, \$56,583, National Academy of Sciences (US Agency for International Development).

## RESEARCH HIGHLIGHTS

The COT Research Opportunity Seed Fund (ROSF) was launched in 2017 to promote interdisciplinary, faculty-initiated research projects with potential for extramural support. ROSF awards are not intended to support on-going projects. Instead, they support new projects (not a supplement to current research) and/or new collaborative partnerships. The following two projects (\$10,000 each) were selected by the COT Research Committee for funding in Spring 2018.

**Wearable Medical Device for Thermotherapy (Minyoung Suh and Jacob Adams).** The research team aims to develop clothing-like applicators for thermotherapy. Textile patch antennas are made of a conductive patch, a ground plane, and a dielectric insulator in between. Focusing on an accurate characterization of the dielectric layers, a theoretical model is established with Ansys High Frequency Structure Simulator (HFSS), and a series of prototype antennas is fabricated. Based on validation of antenna design and production in a planar state, 3D features will be incorporated into the system design and the antenna will be redesigned for form-fitting devices. This research will contribute to a more uniform heat distribution in thermotherapy as well as an enhancement of device wearability.



**Biocatalytic Textiles for CO<sub>2</sub> Capture (Sonja Salmon and Wei Gao).** Further development of CO<sub>2</sub> Capture technology is crucial in the portfolio of approaches needed to mitigate increases in atmospheric CO<sub>2</sub> levels that contribute to climate change. Novel, reactive filtration materials will be developed for use in CO<sub>2</sub> gas separation applications by combining the high surface area attributes of micron and submicron fibers with fast CO<sub>2</sub> absorption enhancement catalyzed by carbonic anhydrase enzyme. Dr. Salmon and her collaborators will explore methodologies for entrapping enzymes within the polymeric matrix of fibers using different polymer chemistries and fiber-formation approaches to develop a new class of biocatalytic textiles for use in CO<sub>2</sub> scrubbing and other advanced textile applications.

