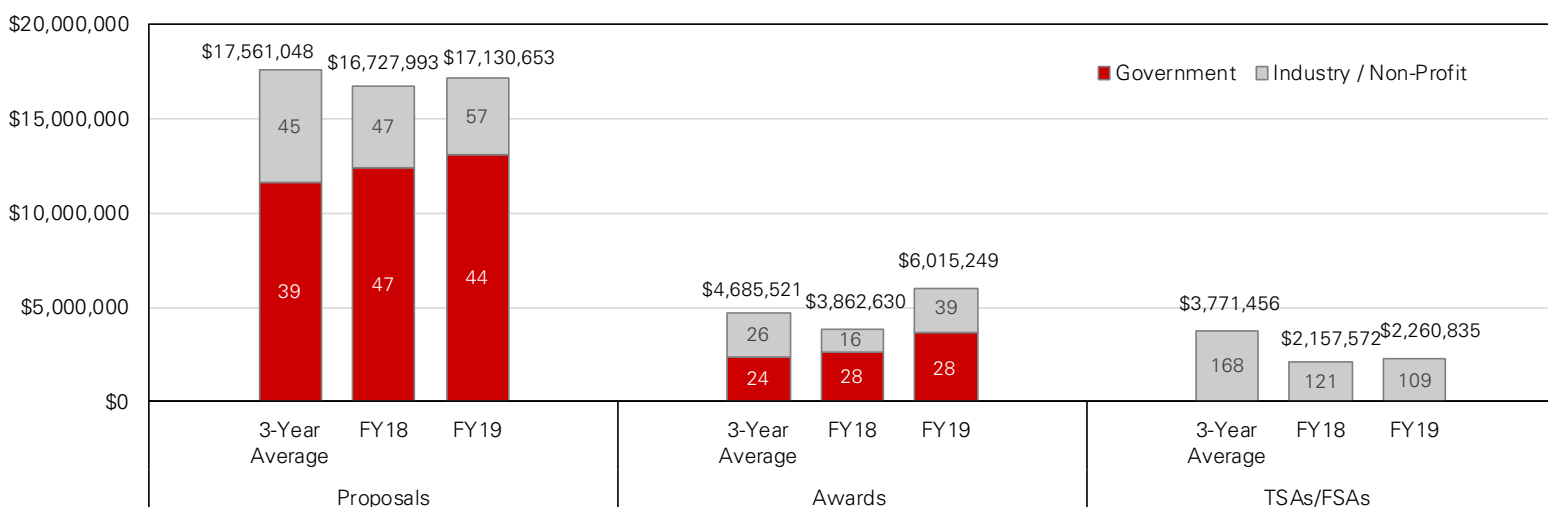


The research programs in the Wilson College of Textiles at NC State University are innovative, life-saving, creative, global and thriving. The College also provides tech service to all stakeholders and supports the economic development of the State and beyond. This newsletter gives a brief overview on the research and tech service activities of the faculty, staff and students during the fourth quarter of Fiscal Year 2019.

## FY19 vs. FY18 vs. Three-Year Average (Q1 - Q4)

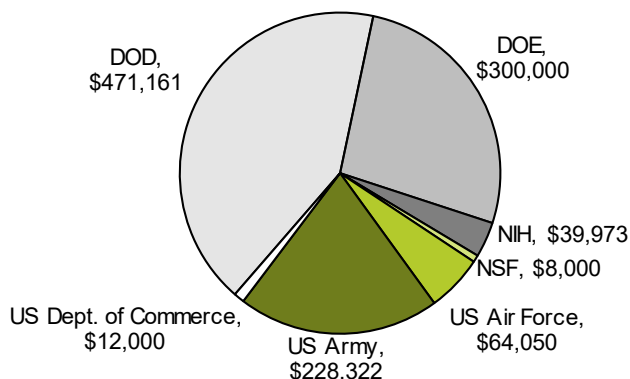


## NUMBERS TO DATE (FY19 Q4)

### Research Awards Received (\$1,789,993)

- Federal: \$1,123,506 | DOD, DOE, NIH, NSF, US Air Force, US Army, US Dept. of Commerce
- Industry/Non-Profit: \$666,487 | Eastman Chemical Company, HP Inc., Lion Group, Inc., NWI, Operations Technology Development, SCEYE SARL

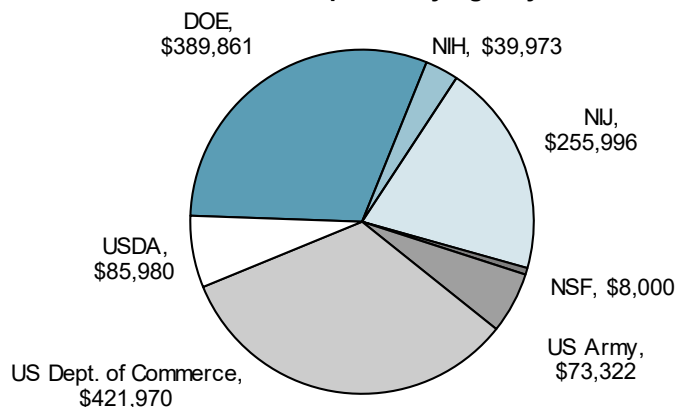
#### FY19 Q4 Federal Awards by Agency



### Research Proposals Submitted (\$2,176,725)

- Federal: \$1,275,102 | DOE, NIH, NIJ, NSF, US Army, US Dept. of Commerce, USDA
- Industry/Non-Profit: \$901,623 | Academy of Finland, EPRO Advanced Technology, Cotton Inc., HP Inc., Lion Group, Inc., SCEYE SARL

#### FY19 Q4 Federal Proposals by Agency



## NUMBERS TO DATE (FY19 Q4) Cont.

### Inter-college Research Proposals (6)

- Wilson College share: \$313,996
- With COE, COS, CNR

### Inter-college Research Awards (4)

- Wilson College share: \$112,049
- With CALS, COE

### Inter-department/unit Research Awards (3)

- \$646,161

### Graduate Student Support

- 55 Ph.D. Student RAs (Avg Stipend: \$15,689 / year)
- 20 M.S. Student RAs (Avg Stipend: \$14,441 / year)

## RESEARCH AWARDS ABOVE \$50,000 (FY19 Q4)

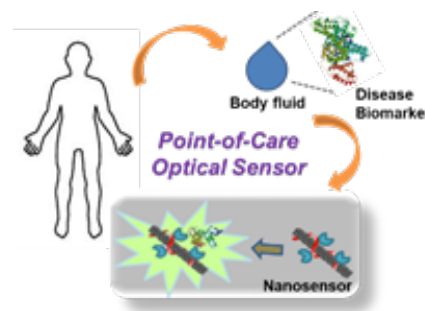
1. Roger Barker, Emiel Den Hartog, Cassandra Kwon, Donald Thompson, Marc Mathews, \$437,197, Advanced Technology International (DOD).
2. Sonja Salmon, \$300,000, National Renewable Energy Laboratory (DOE).
3. Roger Barker, Anthoney Deaton, Robert Ormond, \$249,999, Operations Technology Development.
4. Ericka Ford, Behnam Pourdeyhimi, \$175,000, Flame ResistantLuna Innovations, Inc. (US Army).
5. Wei Gao, Richard Kotek, \$147,634, Eastman Chemical Company.
6. Abdelfattah Seyam, \$132,562, SCEYE SARL.
7. Yuntian Zhu, Philip Bradford, \$64,050, Triton Systems, Inc (US Air Force).
8. Philip Bradford, \$53,322, Advanced Functional Fabrics of America (AFFOA) (US Army).

## RESEARCH HIGHLIGHTS

The Faculty Research and Professional Development (FRPD) program is a funding partnership between the Office of Research, Innovation and Economic Development (ORIED) and the 10 academic Colleges. The program was established to assist faculty in initiating research and professional development activities. The primary objective of this program is to provide individual investigators seed funding to pursue larger awards and grants from outside agencies. The following two projects (\$8,000 each) were selected for funding in FY 2020.

### Optical Nanosensor Development for the Detection and Monitoring of Diseases

**(Januka Budhathoki-Uprety).** Chronic illness such as diabetes, heart diseases and cancer require frequent health monitoring. Non-invasive detection methods for monitoring of diseases would facilitate disease management and help mitigate socio-economic burden. Towards this, the goal of the project is to develop nanosensors to measure subtle disease biomarkers found in the body fluids such as urine, sweat, tears, and saliva among others. Dr. Budhathoki-Uprety's team is currently developing carbon nanotube-based optical biosensors, functionalized with custom-designed polymers and small molecules, to quantitatively measure disease biomarkers present in body fluids.



### Investigation of Skin-textile Interaction to Prevent Incidence of Friction Blisters (Kavita Mathur)

Friction blisters on the feet are the most common injuries among athletes and soldiers. They are formed on the uppermost layer of the epidermis, where thick skin connected to underlying layers receive excessive and repetitive increase in shear forces and friction coefficient arising from the tribological interaction of the skin with external materials during walking, running, exercising or sport activities. Since socks being the primary material in contact with the skin, this research focuses on the skin-fabric interaction by investigating the factors from fiber, yarn and fabric structures in combination with the effect of mechanical parameters (sliding distance between the skin and the fabrics, pressure, frequency and time), heat and moisture. The results of this project will be the foundation for future research and will lead to design tailored materials and textile structures to prevent any friction-induced incidence caused by skin-textile interaction.