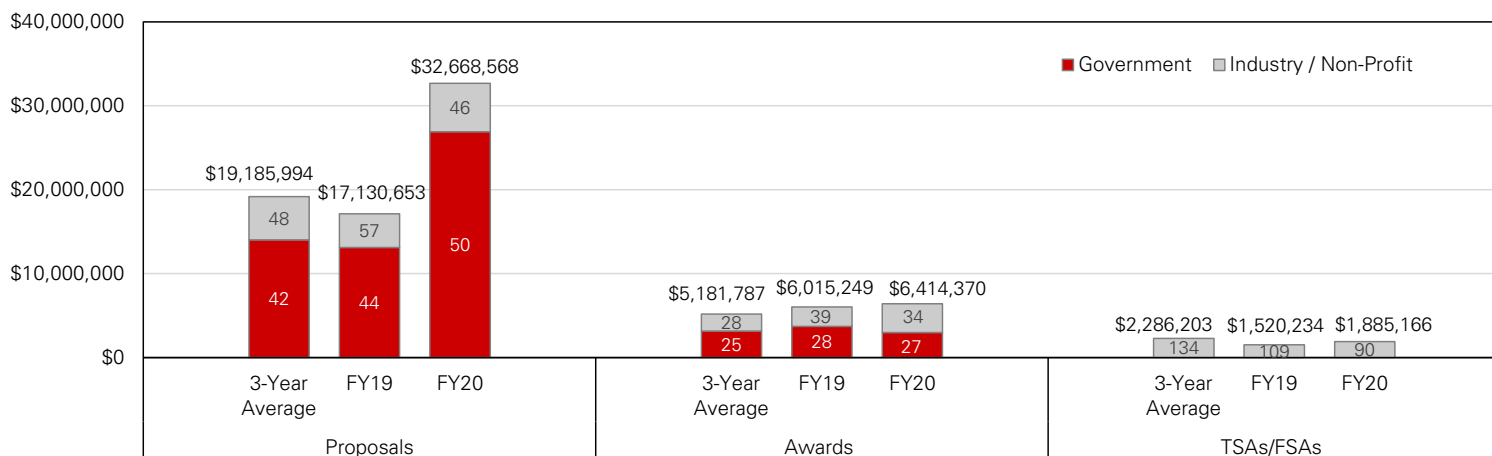


The research programs in the Wilson College of Textiles at NC State University are innovative, life-saving, creative, global and thriving. The college also provides tech service to all stakeholders and supports the economic development of the State and beyond. This newsletter gives a brief overview on the research and tech service activities of the faculty, staff and students during the fourth quarter of Fiscal Year 2020.

FY20 vs. FY19 vs. Three-Year Average (Q1 - Q4)



NUMBERS TO DATE (FY20 Q4)

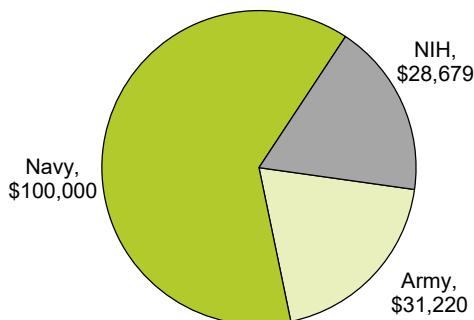
Research Awards Received (\$321,368)

- Federal: \$159,899 | Army, Navy, NIH
- Industry/Non-Profit: \$161,469 | Applied Research Associates Inc., Australian Wool Innovation Limited, COMPETE, NWI, Procter & Gamble

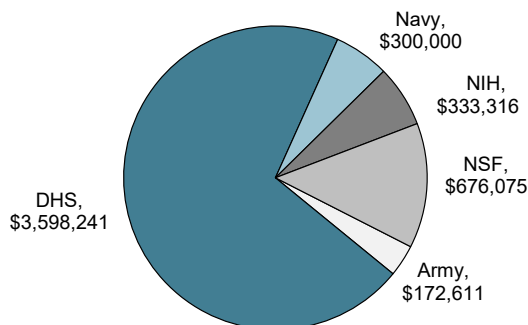
Research Proposals Submitted (\$5,557,063)

- Federal: \$5,080,243 | Army, DHS, Navy, NIH, NSF
- Industry/Non-Profit: \$476,820 | Bill and Melinda Gates Foundation, Faculty Research & Professional Dev't Fund, Istanbul Technical University, NC TraCS, Procter & Gamble, Washington University

FY20 Q4 Federal Awards by Agency



FY20 Q4 Federal Proposals by Agency



NUMBERS TO DATE (FY20 Q4) Cont.

Inter-college Research Proposals (5)

- Wilson College share: \$748,232
- With CED, CNR, COE, COS

Inter-college Research Awards (6)

- Wilson College share: \$60,008
- With CALS, COE, COS

Inter-department/unit Research Proposals (1) \$100,000

Graduate Student Support

- 89 Ph.D. Student RAs (Avg Stipend: \$15,941 / year)
- 21 M.S. Student RAs (Avg Stipend: \$14,671 / year)

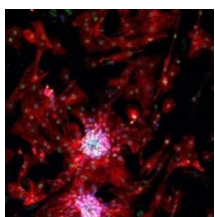
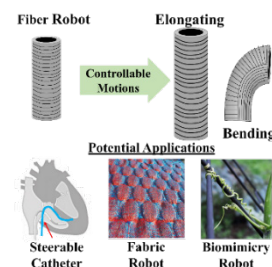
RESEARCH AWARDS ABOVE \$50,000 (FY20 Q4)

1. Philip Bradford, Kara Jo Peters, US Navy-Office of Naval Research, \$100,000.
2. Nelson Vinueza Benitez, Denis Fourches, Procter & Gamble, \$60,008.

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 three projects (\$8,000 each) were selected for funding in FY 2021.

Fiber-Shaped Robot with Controlled Motions (Xiaomeng Fang and Philip Bradford). The ongoing curiosity in development of fiber robots originates from a profound interest in finding artificial means to mimic the flexible and fibrous mammalian muscles that are superbly resilient, yet meanwhile can generate fast, strong, and repeated locomotion. Fiber robots composed of electroactive polymers are inherently advantageous because they combine flexibility of the textile structure with the smart feature. Drs. Fang and Bradford are collaborating to develop miniaturized fiber robots using novel electroactive polymers and aligned carbon nanotubes. Such developed devices are capable of generating multidirectional motions which have great potential in microrobotics, biomedical devices, haptic devices and responsive prosthetics.



Stem cells becoming heart cells (7 days post differentiation) red= α -actinin, green=HCN4, blue=nucleus

Guiding Cardiac Differentiation via Decellularized ECM Electrospun Scaffolds (Jessica Gluck). The microenvironment of the heart is extremely important to support the specific heart functions and is different throughout the heart. The microenvironment includes both the architecture and the natural proteins and biopolymers present within the extracellular matrix (ECM). Dr. Gluck plans to investigate how the microenvironment influences cardiac development. Native cardiac tissue will undergo a process called “decellularization” which is the removal all cells from the tissue, leaving the natural proteins and biopolymers. This will be electrospun to recreate the heart’s microenvironment. A stem cell model will be used to analyze how the microenvironment influences differentiation to specific heart cells.

The Integration of Textiles in Assisted Living Art Programs (Kate Nartker). It is estimated that there are 1.5 million older adults residing in assisted living facilities in the U.S. today. As this demographic grows, there is a pressing need to develop novel, sustainable and cost-effective approaches to improve the lives of older adults in long-term care. While research on the benefits of art participation in older adults is growing, there is a need to look beyond creative expression and examine the specific mediums, activities and processes that most effectively impact health and well-being. This research will focus on how textiles are currently integrated in arts enrichment programs in assisted living facilities and the degree to which they contribute to the well-being of the resident seniors.

