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

Research Proposals Submitted ($3,816,785)
- Federal: $2,785,228 | DHHS, DHS, DOD, NIJ, NSF
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)

2. Jesse Jur, $70,000, Circulex Inc.

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 ongoing 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 CO₂ Capture (Sonja Salmon and Wei Gao). Further development of CO₂ Capture technology is crucial in the portfolio of approaches needed to mitigate increases in atmospheric CO₂ levels that contribute to climate change. Novel, reactive filtration materials will be developed for use in CO₂ gas separation applications by combining the high surface area attributes of micron and submicron fibers with fast CO₂ 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 CO₂ scrubbing and other advanced textile applications.