

Research Development Fund – FALL FY17 Cover Page Template

Application Title: ESTABLISHING a MULTIDISCIPLINARY SOFT MATTER FACILITY (SoMF)

Lead contact for RDF Application:

Name: Svetlana Sukhishvili and Duncan Maitland

Department: MSEN and Biomedical Engineering

Email address: svetlana@tamu.edu; djmaitland@tamu.edu

Phone number: 979 458 9840

Key Participating Units: Materials Science and Engineering, Biomedical Engineering, Chemical Engineering, Mechanical Engineering, Chemistry, Biological and Agricultural Engineering, College of Agriculture (confirmed); College of Veterinary Medicine, College of Pharmacy, Texas A&M Health and Science Center and Life Sciences (to be confirmed)

Co-PIs: Karen Wooley	Jaime Grunlan	Elizabeth Cosgriff-Hernandez
HJ Sue	Terry Creasy	Micah Green
Melissa Grunlan	David Bergbreiter	Jonathan Felts
Yossef Elabd	Carmen Gomes	Mohammad Naraghi
Jodie Lutkenhaus	Sarbajit Banerjee	Matthew Sheldon

Anticipated Request Amount (\$): \$1,200,000

Executive summary of the intended application to utilize Research Development Funds.

A team of PIs from colleges of Engineering, Science, Agriculture and Life Sciences requests funds to establish a shared Interdisciplinary Soft Matter Facility (SoMF). Multifunctional polymer-based and soft materials become a key enabling technology in healthcare, energy, transportation, nutrition and consumer products. Motivated by high-tech applications such as nanocarriers for drugs, degradable implants inducing the regeneration of tissues, flexible electronics, soft robotics and shape-morphing aircrafts, current design of multifunctional soft materials integrates several, almost independent functions, such as structural performance, stimuli sensitivity or degradability, in one material system. A detailed knowledge of structure of these hierarchically organized materials on different length scales and the capabilities to build them are strongly dependent on the soft-material-specific characterization tools.

With TAMU's SoMF, a state-of-the-art multiuser facility shall be established, in which on one hand existing equipment for the chemical and physical characterization of soft matter shall be made available to the TAMU community and interested external users including other research organizations, industry, and hospitals, especially from Brazos County. On the other hand, SoMF will acquire specialized instrumentation for mechanical, thermal and nanostructural analysis of materials upon application of external stimuli and during material degradation. Hereby, SoMF will adapt the management structure, user fee, and billing system of MCF. The multidisciplinary character of soft matter research is apparent by the variety of departments of the SoMF's Co-PIs. The SoMF facility will form a nucleus fostering the interaction between TAMU scientists in the soft matter field. This will result in numerous cooperative research proposals, enhance the collaboration with the industry and international visibility of TAMU polymer research, as well as largely benefit the education of undergraduate and graduate students.