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Faculty of Textile Technology (TTF) and AMCA TTF

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SCIENTIFIC LECTURE

entitled

„Self-fitting, Shape Memory Polymer Scaffolds for Bone Defect Repair“

by

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on Monday, 20th March 2023 at 12:30
lecture hall **A - 301**, Prilaz baruna Filipovića 28a, Zagreb

Abstract:

Shape memory polymer (SMP) scaffolds were prepared having the capacity to conformally “self-fit” into and heal irregular bone defects. Initially, porous scaffolds were fabricated via photo-crosslinking of linear-poly(ε-caprolactone) (PCL) diacrylate using a solvent casting/particulate leaching (SCPL) method employing a fused salt template. Following exposure to warm saline at $T > T_{trans}$ (T_{trans} = ~T_m of PCL), the scaffold became malleable and could be pressed into an irregular model defect. Subsequent cooling caused the scaffold to lock in its temporary shape within the defect. In this this talk, strategies to create a tissue-safe fitting temperature, accelerate the rate of degradation, and to enhance bioactivity will be discussed. These approaches include the use of a star PCL architecture, a semi-interpenetrating polymer (semi-IPN) design that incorporates poly(L-lactic acid) (PLLA), and the addition of Bioglass to form composites.

Biography:

Melissa Grunlan is a Professor of Biomedical Engineering at Texas A&M University (TAMU) and Holder of the Charles H. and Bettye Barclay Professorship in Engineering. She is also a TAMU Chancellor EDGES Fellow and Presidential Impact Fellow. She holds courtesy appointments in the Department of Materials Science & Engineering and the Department of Chemistry. Prof. Grunlan obtained a B.S. in Chemistry and M.S. in Polymers in Coatings from North Dakota State University and a Ph.D. in Chemistry from the University of Southern California. Her work is focused on the development of synthetic polymeric biomaterials for implanted medical devices and for regenerative engineering. She is a Fellow of the American Institute for Medical and Biological Engineering (AIMBE), the American Chemical Society (ACS), the ACS PMSE Division, and the Biomedical Engineering Society (BMES). Prof. Grunlan is also a Senior Member of the National Academy of Inventors. http://grunlanlab.tamu.edu/