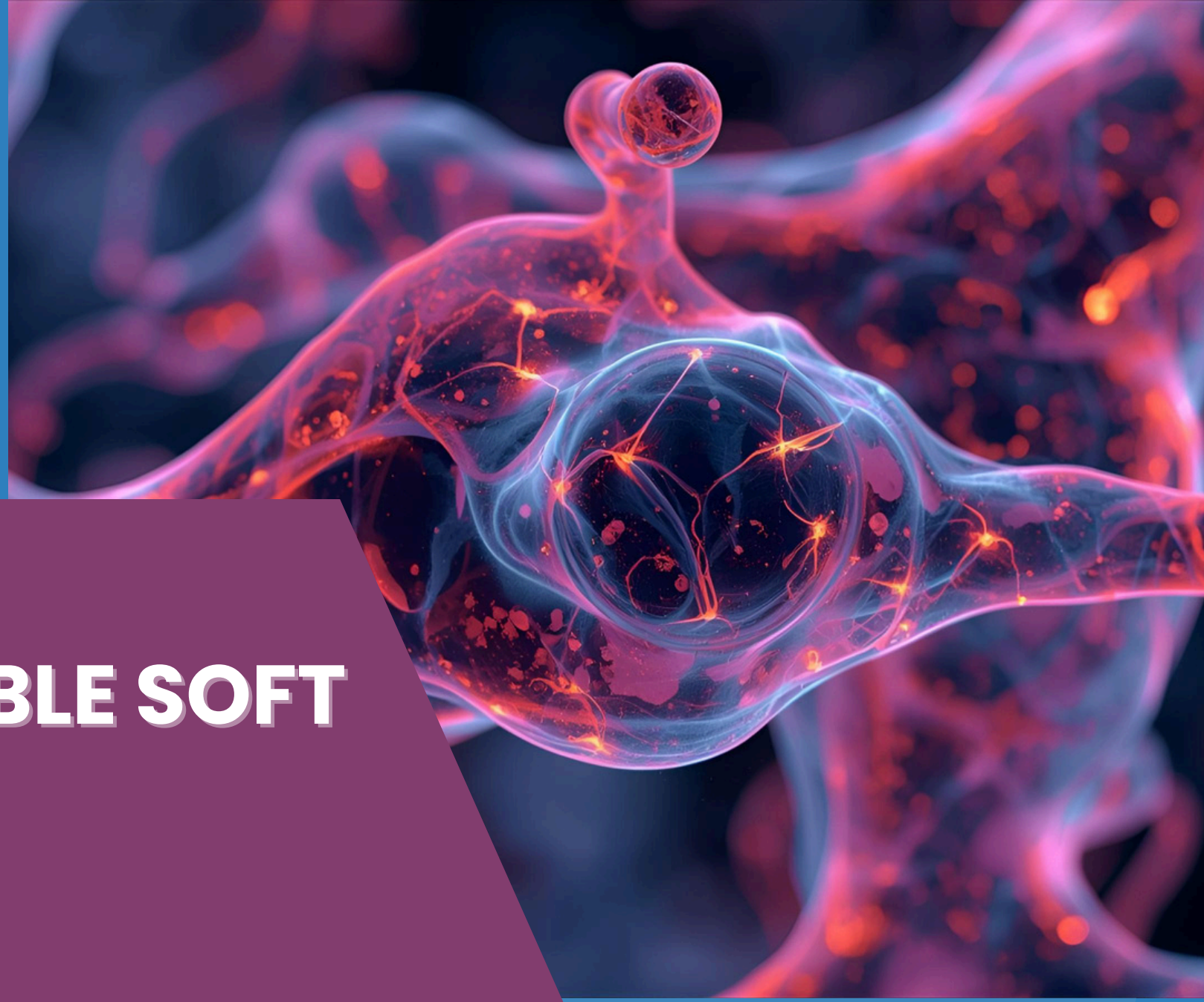




Politecnico
di Torino



DIMEAS SEMINAR

ELECTRICALLY DEFORMABLE SOFT SCAFFOLDS FOR TISSUE ENGINEERING

SPEAKER



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Thursday, October 16 2025
12.00 am



Meeting room, III floor,
DIMEAS – Politecnico di Torino

Abstract

Cellular scaffolds are a critical component of any system for tissue engineering and regenerative medicine. So far, poor attention has been focused on scaffolds that can mimic the extracellular matrix not only statically, but also dynamically, especially for tissues that have to experience large variable deformations (e.g. muscular, cardiac and lung tissues). This talk will introduce ElectroActive Polymers (EAPs) as a promising technology in order to provide cellular scaffolds with intrinsic actuation capabilities. EAPs consist of synthetic materials capable of changing dimensions and/or shape in response to an electrical stimulus. They show useful actuation properties, such as sizable active strains and/or stresses, large compliance, low density, low power consumption and ease of processing. Ongoing research in our group will be described, showing soft electromechanically activated scaffolds capable of controllable deformations. They are investigated to deliver dynamic mechanical stimuli to cell cultures, to regulate their developmental processes. The talk will show how the greatest promise of the proposed technology relies on its high versatility, compact size, low weight and scalability, as well as low cost.

BIO

Federico Carpi is an Associate Professor in Biomedical Engineering at the University of Florence. He received from the University of Pisa the Laurea degree in Electronic Engineering in 2001, the Ph.D. degree in Bioengineering in 2005 and a second Laurea degree in Biomedical Engineering in 2008. His main research interest concerns smart material-based biomedical and bioinspired mechatronic devices. From 2013 to 2017 he has served as the first President of the 'European Society on Electromechanically Active Polymer Transducers and Artificial Muscles'. His publications include about 80 articles in international journals, 3 edited books and several contributions to books and conferences.