EML WEBINAR

ZOOM DISCUSSION: 271 079 684
YOUTUBE LIVE: HTTPS://TER.PS/EMLYOUTUBELV
WEDNESDAY, 8 JULY 2020
10 AM BOSTON, 3 PM LONDON, 10 PM BEIJING

STÉPHANIE LACOUR

EPFL

FROM ENGINEERING ELASTICITY TO NEURAL IMPLANTS FOR TRANSLATIONAL RESEARCH

The design, manufacturing and implementation of neural interfaces is an interdisciplinary venture by essence. Functional neuroanatomy guides the topology of the interface. Neuronal communication drives transducers modalities and interconnections. Clinical conditions ultimately lead interfaces' functions and lifetime.
Current medical implants often offer a unique shape and "one-size fits all" definition. The introduction of microfabrication together with the concept of mechanical "invisibility" are transforming the approaches used to design and manufacture neural interfaces. In this talk, I will review how we engineer the next generation of soft, implantable neural interfaces using thin films, microfabrication and programmed elasticity.
Next, I will report on a methodical framework we have conceived to translate these soft technologies towards use in pre-clinical and clinical models. Manufacturing scalability, device reproducibility and stability, and compatibility with the therapeutical environment are essential. We devised a biomimetic and multimodal in vitro platform tailored to the anatomical information and mechanical statics and dynamics for the target neural tissue to advance the technological readiness of the soft interfaces. I will illustrate these concepts with designs from the lab and in context of neuroprosthetic medicine.

Stéphanie P. Lacour holds the Bertarelli Foundation Chair in Neuroprosthetic Technology at the School of Engineering at the Ecole Polytechnique Fédérale de Lausanne. She received her PhD in Electrical Engineering from INSA de Lyon, France, and completed postdoctoral research at Princeton University (USA) and the University of Cambridge (UK). She joined EPFL in 2011. Since January 2017, she is full professor in Microengineering and Bioengineering at EPFL. She is a co-founding member and current director of EPFL Center for Neuroprosthetics, located at EPFL satellite – Campus Biotech in Geneva. She is the recipient of the 2006 MIT TR35, the 2011 Zonta award, and she was selected as one of the 2015 WEF Young Global Leaders. She was awarded the ERC Starting Grant (2011), ERC POC Grants (2016 & 2018) and the SNSF Consolidator grant (2016).

Discussion leader: **Professor Sigurd Wagner**, Princeton University

Extreme Mechanics Letters (EML) seeks to publish research of immediacy, depth, and originality.