Institute of Biomedical Engineering Seminar

Microneedles for Drug Delivery: Introducing Nonlinear Route for Advanced Delivery

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03 DEC TUE at 1:00 PM (GMT+3)
Boğaziçi University Kandilli Campus, BME Building AZ19

About the Seminar: Microneedles are small needles organized on a patch designed for a wide range of biomedical applications, and have garnered considerable attention within the realm of drug delivery, owing to their noteworthy characteristics, particularly the ability to administer substances in a painless and minimally invasive manner. Emerging nano- and micro-fabrication methods are revolutionizing conventional needle technologies by enabling the creation of microneedles that minimize penetration pain and tissue damage while providing precise channels for administering bioagents. The integration of 3D printing in microneedle design offers significant advantages, including customization, cost-efficiency, rapid design iteration, and enhanced accessibility. This technology has facilitated the development of pain-free, controlled-release drug delivery systems and point-of-care diagnostic devices in personalized medicine. Additionally, microneedle arrays can be engineered in nonlinear manner with varying needle heights and base diameters to target different skin layers and provide tailored drug delivery for various skin diseases, such as cancers, inflammatory conditions, and bacterial infections. The use of biocompatible and biodegradable polymers in these microfabricated microneedles further enhances their application in healthcare, offering a novel approach to treating skin diseases at multiple depths. The advanced technology of nonlinear microneedles will pave the way for sophisticated and personalized treatment procedures.

About the Speaker: Misagh Rezapour Sarabi has dedicated his Ph.D. studies period in Koç University and Max Planck Institute for Intelligent Systems for research on the application of microscale and wearable technologies, including microneedles, and microfluidics, in the personalized biomedical area. His research has been recognized with publications in prestigious journals including Nature Communications, Advanced Materials Technologies, Trends in Biotechnology, Biosensors, and iScience. He aspires to research for development of personalized healthcare platforms.