THE CHINESE UNIVERSITY OF HONG KONG
Department of Electronic Engineering
Seminar

Polymeric Mixed Conductors for Bioelectronic Interfaces

Prof. Sahika INAL
Associate Professor
Department of Bioengineering
King Abdullah University of Science and Technology

Date: 21 October 2025 (Tuesday)
Time: 10:00 a.m.
Place: Rm 222, Ho Sin Hang Engineering Building, CUHK

Abstract

Organic mixed ionic and electronic charge conductors offer a unique toolbox for establishing electrical communication with biological systems. In this talk, I will introduce this rising class of materials for bioelectronic interfacing and explain how their multifunctionality can be harnessed to develop next-generation bioelectronic devices operating at aqueous electrolyte interfaces. I will highlight one application where these devices are used to detect biochemical molecules. I will introduce our transistor design for protein detection at the physical limit. Drawing from our experience with patient samples, I will address potential shortcomings of proof-of-concept biosensor platforms and explore strategies for overcoming these challenges.

Biography

Sahika Inal is an Associate Professor of Bioengineering at King Abdullah University of Science and Technology (KAUST), where she also holds affiliations with the Electrical Engineering and Materials Science and Engineering programs. She currently serves as Chair of the Bioengineering Program.

She earned her B.Sc. in Textile Engineering from Istanbul Technical University (Turkey), followed by an M.Sc. in Polymer Science, a joint program offered by Humboldt University, Free University, Technical University of Berlin, and the University of Potsdam (Germany). In 2013, she completed her Ph.D. in Experimental Physics at the University of Potsdam (Germany), focusing on electronic polymer-based optical sensors for pathogen detection. Following her doctoral studies, she conducted postdoctoral research at the Center of Microelectronics of Provence, École Nationale Supérieure des Mines de Saint-Étienne (France), where she developed microelectronic devices for bioelectronic applications.

Since 2016, Dr. Inal has led the Organic Bioelectronics Lab at KAUST. Her research explores the mixed ionic and electronic charge transport in organic materials and the development of electronic devices that interface with biological systems for biosignal recording and stimulation. She is a Fellow of the Royal Society of Chemistry and has received numerous accolades, including the ACS Kavli Lectureship Award (2025), the Beilby Medal and Prize (2022), and the Journal of Materials Chemistry Lectureship (2022). Dr. Inal has authored over 135 publications, which have collectively garnered more than 15,000 citations.

***** ALL ARE WELCOME *****

For enquiries: Prof. ZHAO Ni (nzhao@ee.cuhk.edu.hk), Tel: +852 3943 4347