University of Bristol IEEE Student Branch AND IEEE UK and Ireland Nanotechnology Council Chapter Distinguished Lecturer Talk *(Virtual, Zoom)*

Thursday, 28th November 2024, 08:45 - 09:30 GMT

Agenda:

08:45 – 09:15 **Distinguished Lecturer Talk**

09:15 – 09:30 **Q&A**

Title: Nanocarbons for Biology and Medicine: Sensing, Imaging, and Drug Delivery

Abstract: Nanocarbons with different dimensions have attracted enormous interest in numerous applications due to their unique properties. Among them, theranostics (i.e., therapeutics and diagnostics) is one of the most intensely studied applications, as these nanocarbon materials serve as excellent biosensors, versatile drug/gene carriers for specific in vivo targets, effective photothermal nanoagents for cancer therapy, and promising fluorescent nanolabels for cell and tissue imaging. We first introduce the different carbon allotropes usable for theranostic applications, their physical and chemical properties, and their respective preparation and surface functionalization approaches. The protocols for both in vitro and in vivo theranostic applications are then described, followed by toxicity and biodegradability implications. The design considerations will outline the key unifying set of foundational first principles for investigating and realizing effective, biocompatible, and nontoxic nanocarbon materials-based models for cancer theranostics applications. Finally, the challenges and novel theranostic protocols for hard-to-treat cancers and other diseases will be summarized.

Speaker: Prof. Ken-Tye Yong, School of Biomedical Engineering, The University of Sydney.

Bio: Professor Ken-Tye Yong serves as the Associate Dean for External Engagement in the Faculty of Engineering at the University of Sydney and is a Professor in the School of Biomedical Engineering. He leads external engagement activities and sits on the management committee of the Warren Centre, which promotes engineering innovation in industry, government, and academia. Previously, he held roles as Provost's Chair in Electrical and Electronic Engineering, Director of the Centre of Bio-Devices and Signal Analysis, and Program Director of the Nanoelectronics Centre of Excellence at Nanyang Technological University (NTU). With over 250 published journal papers and recognition as a highly cited researcher, Ken-Tye's work spans nanomaterials for biophotonics and nanomedicine, nanosensors, microdevice fabrication, triboelectric nanogenerators, RNA delivery platforms, and wearable technologies. He is a Fellow of several prestigious societies, including the Optical Society of America, SPIE, and the Royal Society of New South Wales, among others, and served as Chair of the Environmental Sensing Technical Group for OSA.

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For more information, please contact: Dr Arab Hassani: faezeh.arabhassani@bristol.ac.uk