Center for Minimally Invasive Therapeutics

Seminar series

University of California, Los Angeles (UCLA), U.S.A.

Wednesday, Feb. 13, 2019 at 12:00pm-1:00pm

289 Engineering VI Conference Room

Hosted by Prof. Ali Khademhosseini

"The foundation of molecular medicine: A chemical biology approach"

Prof. Weihong Tan

Abstract:

A full understanding of the molecular basis of diseases depends on the development of molecular probes able to recognize disease targets of interest. Until very recently, such tools have been absent from the clinical practice of medicine. The newest molecular probe, and one that holds most promise, is a new class of designer nucleic acids, termed aptamers, which are single-stranded DNA/RNA able to recognize specific targets, such as single proteins and even small molecules. Recently, we applied a simple, fast and reproducible cell-based aptamer selection strategy called Cell-SELEX which uses whole, intact cells as the target for aptamer selection. This selection process then generates multiple aptamers for the specific recognition of biological cells, but without the need for prior knowledge about the signature of target cell-surface molecules. The selected aptamers have dissociation constants in the nanomolar to picomolar range. Thus far, we have selected aptamer probes for many different diseases, and used them to carry out studies at the vanguard of biomedical science, including ultrasensitive detection of tumors, molecular imaging, targeted drug delivery, and, most critically, cancer biomarker discovery. Taken together, these molecular level tools form a solid scientific platform from which to pursue advanced studies in molecular medicine. We will report our most recent progress in this exciting research area, especially in molecular engineering, nanomedicine and molecular elucidation of cancer biomarkers and theranostics.

Biography:

Weihong Tan earned his Ph.D. in Physical Chemistry at the University of Michigan in 1993. In addition to his current position as the Director of the State Key Laboratory of Chemo/Biosensing and Chemometrics and Distinguished Professor of Chemistry and Biology at Hunan University, he is also a University Distinguished Professor and a V.T. and Louis Jackson Professor at the University of Florida. He stared his academic position in 1995 at UF after doing a Distinguished Postdoctoral Fellow at Ames Lab, US-DOE. He was promoted to associate professor in 2001 and full professor in 2003. He started his research activity at Hunan University in 2010. Prof. Tan's research is in the general area of Bioanalytical Chemistry, Chemical Biology, Biomedical Engineering and Molecular Medicine. He specializes in aptamer research and DNA nanotechnology as well as cancer theranostics. He has published over 600 peer-reviewed scientific papers. According to Thomson Reuters, he is among the small, prestigious group of Highly Cited Researchers for the period between 2014-2018. His H index is 130. He is currently an Associate Editor for JACS (Journal of American Chemical Society). He has received over thirty awards and honors, including Beckman Young Investigator Award in 1997, the Pittcon Achievement Award in 2004, the AAAS Fellow in 2005, the ACS Florida Award in 2012, Academician of the Chinese Academy of Sciences in 2015, Academician of the World Academy of Sciences in Developing Countries in 2016, and the Award in Spectrochemical Analysis from American Chemical Society in 2018, the He Liang He Li Foundation Award in Science and Technology in 2018, the Ralph Adams Award for Bioanalytical Chemistry in 2019 and The Pittsburgh Analytical Chemistry Award in 2019.

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