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Biorecognition and biosensing: From big to small

Biosensors have drawn much attention because of their great potential to facilitate biomedical research, drug discovery, environmental monitoring and diagnosis of diseases. A powerful bio-detection requires highly specific bio-recognition probes and sensitive elements. Several techniques, such as gold nano-particles (AuNPs), quartz crystal microbalance (QCM) and surface plasmon resonance (SPR), silicon nanowire field-effect transistor (SiNW-FET) and others have been extensively studied to improve the sensitivity of biosensing. Antibody is commonly used to conjugate with a sensing chip for a large molecule detection. Yet, for small molecule detection, new strategies need to be developed. We'll demonstrate a conventional method, based on protein engineering, to produce a bio-recognition probe and to construct an effective device for quantitatively sensing

steroids. We'll further exhibit an open-sandwich immuno-recognition system containing VH and VL of a scFv for small molecules detection. The powerful technique for screening scFv from phage display library will also be discussed.

Speaker Biography

Yaw-Kuen Li received his PhD degree from Tulane University, USA, in 1991. After his postdoctoral research in School of Medicine of Johns Hopkins University, he moved back to Taiwan to start his academic career in 1993. He was promoted to the full professor in 2002. Further, he became the chair of the department (2004-2006) and the dean of college of science of National Chiao Tung University (2014-2017). His primary research interests include three major fields: Enzyme-based catalytic biological reactions, bio-recognition and bio-sensors and solid-state/biological interface chemistry.

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