

Harnessing Liquid Biopsy-Derived Molecular Signatures for Management of Solid Tumor and Alzheimer Disease

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Abstract: The current gold standard for cancer diagnosis relies on pathologists' examination of tumor tissues, which are typically obtained through invasive procedures like surgical excision or needle biopsy. In recent years, "liquid biopsy" has emerged as a promising, minimally invasive alternative. This approach analyzes blood-derived components, particularly circulating tumor cells (CTCs) and tumor-derived extracellular vesicles (EVs), which capture molecular information reflective of the original tumor. By studying CTCs and tumor EVs, we gain valuable insights into cancer biology, which can guide treatment decisions and monitor disease progression. At the UCLA Liquid Biopsy Laboratory, our team has pioneered technologies over the past decades that utilize nanostructured substrates coated with immuno-affinity agents to isolate and analyze CTCs and tumor EVs. These advances in liquid biopsy also hold potential for neurodegenerative diseases such as Alzheimer's, where diagnosis traditionally depends on cerebrospinal fluid biomarkers and PET imaging. In this presentation, I will discuss the development and clinical validation of our latest technologies, showcasing applications for both solid tumor diagnosis and Alzheimer's disease surveillance.

Short Bio: Professor Hsian-Rong Tseng, who earned his PhD in Chemistry from National Taiwan University (1993-1998), completed his postdoctoral research at UCLA (2000-2003) under the guidance of Professor Sir Fraser Stoddart, the 2016 Nobel Prize laureate in Chemistry. After joining the faculty of UCLA's David Geffen School of Medicine in 2003, he rose to become a tenured full Professor of Molecular & Medical Pharmacology in 2012. His tenure at UCLA includes significant affiliations with various research institutes such as the California NanoSystems Institute, Crump Institute for Molecular Imaging, and Jonsson Comprehensive Cancer Center. As a leader at the UCLA Liquid Biopsy Laboratory, Prof. Tseng has contributed greatly to advancements in in vitro diagnostics (IVD) in oncology and neurodegenerative diseases. He is the founder of CytoLumina Technologies Corp. and Eximius Diagnostics, companies focused on bringing these innovative technologies to market. The NanoVelcro Chips, a product of CytoLumina, were recognized as a Success Story by the National Cancer Institute's Innovative Molecular Analysis Technologies program in October 2019. Adding to his accolades, in December 2022, the FDA awarded Breakthrough Device Designation to the Liver Cancer Test developed by Eximius Dx, a step that will fast-track its FDA approval process.