

Self-clearing implantable biosensors for neurodegeneration research

Abstract

Developing a chronically reliable implantable biosensors is an enormous challenge in biomedical engineering with significant economic and clinical implications. Soon after implantation, biosensors often suffer from substantial performance degradation and premature failures due to various abiotic and biotic failure modes. Enabling technologies that improve the lifetime of these implantable biosensors can have an enormous impact on many debilitating chronic neurodegenerative diseases that are difficult to diagnose and treat. In this presentation, I will discuss our latest efforts to utilize nano and microscale transducers to fabricate self-clearing implantable biosensors. We utilize both passive and active anti-biofouling approaches to improve the reliability and functionality of these implantable biosensors. As a proof-of-concept, I will share our efforts to create chronically implantable glutamate biosensor to enable neurodegeneration research.