Dr Parry Hashemi
Bioengineering Departmental Seminar: 4th November 2020

Title: Micro-engineered Analytical Platforms to Probe the Fundamental Chemistry of Mental Illness

Abstract: Mental illnesses, such as depression, represent the largest disease burden in the world, while carrying profound stigma and shame. The stigma stems primarily from the fact that mental illnesses do not have visible traits, nor do they have quantifiable biomarkers. There is profound difficulty in studying psychiatric illnesses because of the complexity, inaccessibility and fragility of the brain, thus our understanding of the basic chemistry that underlies the behavioral phenotypes of mental illness is limited. As such it is extremely challenging to accurately diagnose and effectively treat disorders of the brain and drug discovery efforts for mental health are essentially at a stand-still. In this talk I will talk about how we developed a revolutionary analytical method, capable of measuring neurotransmitters in real time *in vivo*. This electrochemical method involves implantation of carbon fiber microelectrodes into living brain tissue (in anesthetized and awake, behaving animals) and directly analyzing electroactive neurotransmitters. I will discuss how this technology is allowing us to piece together the fundamental chemistry of the brain in health and disease. Finally, I will highlight how our findings will pave the way to engineer clinical devices for mental health diagnosis, help improve current treatments and re-invigorate drug discovery.