

**NON -TECHNICAL ABSTRACT:** *(State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)*

Sexual differentiation during the early development has significant impact on human health throughout the life. This developmental process is important for the establishment of sex differences in brain function and behaviors. Using the mouse as a model, many studies have revealed an essential role of sex steroids in the control of sexual differentiation. However, the genetic and molecular mechanisms underlying the actions of sex steroids on differential gene transcription, as relevant to sex differences, are still unclear. Recently, the scientific community has become aware of the powerful actions of histone modifications on chromatin structure to regulate gene expression, particularly during development. Thus, the current project is proposed to study the role of histone acetylation in sexual differentiation by identifying the novel sexually dimorphic genes in the male mouse cortex and hippocampus that contain increased acetylation of histone H3 on the promoters. Our results will not only demonstrate differential histone acetylation occurring on specific sexually dimorphic genes, but also serve the foundation for us to elucidate the functional link between these genes and sexual differentiation in our future studies. Besides normal function, sexual differentiation is highly speculated to be linked to the different incidence and severity of many neurobehavioral diseases and mental illnesses between the sexes. Understanding the epigenetic mechanisms of these gender differences will ultimately lead to better treatments for sexually distinct diseases.