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Online Proceedings

POSTER SESSION 4

MGH 241, Easel 150

4:15 PM to 5:45 PM

Mapping *Kiss1* Gene Expression in the Mouse Brain

Paige Haas, *Sophomore, Biology (Molecular, Cellular & Developmental)*

Mentor: Robert Steiner, Obstetrics And Gynecology

Mentor: Don Clifton, Obstetrics And Gynecology

Mentor: Simina Popa, Molecular and Cellular Biology

Mentor: Caroline Cho, OB/GYN

The *Kiss1* gene encodes a neurotransmitter whose expression in the brain is essential for reproduction. Previous studies with *in situ* hybridization and immunocytochemistry have identified *Kiss1* expression in several hypothalamic nuclei, including the arcuate. To determine whether *Kiss1* expression is limited to the hypothalamus, we developed a transgenic mouse that expresses a marker gene (*tdTomato*) if and only if *Kiss1* expression is turned on. *tdTomato* encodes a red marker protein that is constitutively expressed, labeling the cell forever as having once expressed *Kiss1*. We looked for tdTomato labeling in brain sections to identify areas that reveal expression of *Kiss1* at some time during development. Surprisingly, we found tdTomato labeling outside of the hypothalamus. Possible causes include *Kiss1* expression early in development or low-level *Kiss1* expression in adulthood. Distinguishing between these possibilities has important implications for developing tools to genetically manipulate *Kiss1* neurons in adult animals. We will test the hypothesis that *Kiss1* is widely expressed at low levels in the adult brain. *Kiss1* transcription will be mapped in two ways. First, brain sections will be examined for the presence of green fluorescent protein (GFP). GFP is expressed under the *Kiss1* promoter, but it may not mark low levels of *Kiss1* transcription. Therefore, *Kiss1* expression in adulthood will also be tested by *in situ* hybridization. *In situ* hybridization radioactively marks *Kiss1* mRNA, illuminating even low levels of transcription. Comparing *in situ* hybridization between wild-type and *Kiss1* knockout mice may reveal low levels of *Kiss1* mRNA outside the adult hypothalamus— and open new possibilities for a physiological role of *Kiss1* signaling that extends beyond reproduction.