Plan II Master's Defense

Date: Thursday, July 24, 2014
Time: 12:00 noon
Location: SEC 2435

"Assessing the Possibility that Misregulation of Myo-Inositol-1-Phosphate Synthase (MIPS) Biosynthesis in *Curly-Tail* Mice is the Result of Epigenetic Modification of RFX1 Transcription Factor Binding to the MIPS Promoter"

Mr. Jack Hammontree
University of Alabama

Abstract -Regulatory Factor X1 (RFX1) is a known transcriptional repressor that is predicted to bind the myo-inositol-1-phosphate synthase (MIPS) promoter. MIPS catalyses the formation of free inositol phosphates – important second messengers involved in a variety of cellular processes. Previously, it has been shown in the curly-tail mouse strain that at least two cysteines within the MIPS promoter are directly methylated. In addition, this strain is also known to misregulate MIPS expression when compared to its straight-tail littermates, constitutively expressing it due to a failure of the normal down-regulation process. This paper examines the possibility that RFX1 may directly bind this promoter segment (methylated in curly-tail) and, thus, down regulate MIPS expression in normal, wild-type mice. The ability of RFX1 to bind this segment of the MIPS promoter in wild-type mice could possibly imply 1) RFX1 plays an important role in the regulation of MIPS expression in healthy strains and 2) methylation of the RFX1 binding site in curly-tail mice directly impedes normal regulation, causing the aberrant MIPS expression phenotype. In order to assess these possibilities, a super shift assay was performed with DNA oligos containing the purported RFX1 binding site of the MIPS promoter, wild-type nuclear extract containing the RFX1 transcription factor, a selective antibody against RFX1, unlabeled RFX1 DNA, and an RFX1 antibody inhibitor. Repeated super shift assays conducted under various exposures and reagent concentrations failed to show binding of RFX1 to this promoter segment.