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Kathleen's project will explore protein-protein interactions mediated by the zinc finger domains of the ZNF133, REST and zfp90 transcription factors. These proteins are proposed to function as either activators or repressors of transcription of eukaryotic genes. ZNF133 is a member of the KRAB domain family of transcription factors and is notable as being a member of a small class of zinc finger proteins that consist of 8 or more tandem zinc fingers. The zinc finger domain of ZNF133 consists of 14 tandem zinc fingers that mediate interactions with the protein PIAS1, and presumably a specific binding site in DNA. The zfp90 protein mediates the neuronal-specific repressor activity of the zinc finger protein REST by forming a heterodimer through interactions of the zinc finger domains of both proteins. Kathleen will explore the specificity and nature of the ZNF133-PIAS1 and zfp90-REST protein-protein interactions using site directed mutagenesis in conjunction with yeast two hybrid and quantitative α -galactosidase assays in order to more clearly define the region of the zinc finger domains and specific amino acids involved in forming these interactions.