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Research interests

My research interests focus on the epigenetic regulation of normal cellular differentiation and its dysregulation in cancer, cardiovascular, and metabolic diseases. One area of research is focused on mechanisms by which SWI/SNF ATP-dependent chromatin remodeling enzymes regulate gene expression during cellular differentiation. SWI/SNF is a multi-subunit complex that utilizes the energy from ATP hydrolysis to disrupt histone-DNA contacts and alter nucleosome structure and positioning. We recently discovered that the SWI/SNF subunit, BRG1 interacts with BetaM to promote active chromatin and expression of a key muscle specific transcription factor, MyoD. BetaM, encoded by ATP1B4 genes, is a Na, K-ATPase  $\beta$ -subunit in lower vertebrates. However, during evolution of placental mammals, the functions of BetaM significantly changed. BetaM became a skeletal muscle and cardiac-specific protein of the inner nuclear membrane. Disruption of BetaM in mice alters transcriptional programs in muscle and impacts whole body metabolism. We are currently investigating how BetaM in skeletal muscle interacts with SWI/SNF and other epigenetic regulators to influence metabolic health.