Abstract

The regulation of chromatin structure is fundamental to a wide range of cellular processes, including transcriptional regulation, cell division, differentiation and DNA damage repair, and ATP-dependent chromatin remodeling complexes have been established as essential components of this regulatory network. Smarca5, as an ATPase/Helicase enzyme, has been shown to regulate chromatin structure by interacting with bromodomain and DDT-WHIM domain-containing partners to control the binding of chromatin-associated proteins and transcription factors to their specific DNA target sequences. In this work we identify a previously uncharacterized protein with a conserved N-terminal bromodomain and ISWI protein binding DDT-WHIM domain through co-immunoprecipitation and mass spectrometry in mammalian cell lines and establish it as a novel interaction partner of chromatin remodeling ATPase Smarca5. Furthermore, we have pinpointed the region required for Smarca5 interaction that corresponds to DDT-WHIM domain. We have furthermore attempted to identify additional interaction partners which may hint on the potential function of this novel chromatin complex and validated its expression in embryonic and postnatal tissues. This discovery represents a unique opportunity for further investigation into its potential function in interaction with ATPase Smarca5, and expansion of current roles of Smarca5 in the regulation of cell homeostasis.

Keywords

chromatin remodelling, Smarca5, bromodomain, western blot, co-immunoprecipitation, mass spectrometry