Abstract

The chromatin structure, consisting of DNA and histones, changes dynamically during the cell cycle and cell differentiation. DNA can only be transcribed and replicated when it is packaged loosely, whereas tight packaging allows for more efficient storage. Chromatin remodelling is therefore one of the tools of gene expression control. The chromatin remodelling factors recognise chromatin with varying specificity and have an effect on the interaction between DNA and the histones. One of these factors is the Smarca5 protein. This study investigates the role of Smarca5; its goal is to create a mouse model with the ability to trigger Smarca5 overproduction in specific tissues. This model will be used to study the effect of a high, unregulated dose of Smarca5 on the physiological function of the protein. Previous studies have shown that non-physiological expression of a chromatin-remodelling factor can lead to malignant transformation. Our model can help to understand this process. Another goal of this study is to investigate some phenotype aspects of the mouse model with conditional deletion of Smarca5 in T and B cells, in particular the effects of this deletion on progenitor cell differentiation. Our results show that Smarca5 has an important role in lymphocyte development, and we have observed that Smarca5 deletion causes errors in differentiation and blocks lymphocyte development.

Keywords

Chromatin remodeling, ATP-dependent chromatin-remodeling complexes, Smarca5, Snh2h, mouse model, T-cell and B-cell development