

1. Abstract

Sterol sensing domain (SSD) is a putative transmembrane region consisting of 5 helices and in few cases it was shown that it interacts with cholesterol. Proteins containing this domain play a role in many cellular pathways connected to cholesterol. It was first described in a study of 3-hydroxy-3-methylglutaryl-CoA reductase (HMG-CoA reductase). It is an enzyme playing role in cholesterol biosynthesis and its transcription is regulated by sterol regulatory element binding protein cleavage activating protein (SCAP). HMG-CoA reductase and SCAP were the first proteins where SSD was recognized. After that, other proteins were described; one more protein functioning in cholesterol biosynthesis was described as containing SSD – 7-dehydrocholesterol reductase. Also two proteins playing role in cholesterol endocytosis – Niemann-Pick type C 1 like 1 – and in its efflux from lysosomes – Niemann-Pick type C 1 – were recognized. Furthermore, proteins playing role in Hedgehog signalling Patched, Patched-related and Dispatched were found as SSD containing structures. In the end, tumour-suppressor gene TRC8 was also recognized as member of SSD family. In this text, structure and function of these proteins is summarized.

Key words: sterol sensing domain, Hedgehog signalling pathway, sterol binding protein, cholesterol synthesis, cholesterol trafficking