

## Abstract

Plasma membrane is not a static, but rather a dynamic structure that constantly changes its form and local properties. Interactions between building blocks of plasma membrane and external factors are responsible for those changes. In this thesis, I summarize the literature which describes interactions between transmembrane proteins and lipid membranes as well as its consequences. I discuss membrane thickness, respectively thinning, protein sorting and clustering shown to be dependent on the properties of transmembrane domains. Furthermore, the role of proteins in various model of the plasma membrane organization are indicated. Finally, I report on currently discovered impact of the surface roughness of TMDs on local mobility and organization of lipids. All these data indicate importance of detailed understanding of TMDs, their properties and relation to surrounding lipid membranes.

**Key words:** membrane, protein, transmembrane domain, hydrophobic mismatch, protein sorting, models of the plasma membrane