

The protein recoverin, localized in the eye in the rod outer segment of the retina, is a neuronal calcium sensor involved in vision adaptation. Recoverin reversibly associates with cellular membranes via its calcium-activated myristoyl switch. This reversible interaction is vastly dependent on the concentration of calcium ions in the cytosol and on conformation of recoverin. By using methods of molecular dynamics simulations and free energy calculations this work presents a detailed analysis of the energetics of myristoyl insertion into a lipid bilayer and interactions of non-myristoylated recoverin with the membrane. These results are in a perfect agreement with experimental data. The thesis provides a piece of puzzle to the so far unexplored mechanism of myristamide insertion into the membrane and also to recoverin conformational change. It gives an important insight into binding of recoverin to a membrane, which has a significant biological role.