

Signalling through EGF receptor is crucial both for ontogenesis and for maintaining homeostasis in adult organisms. It is involved in controlling cellular behaviours such as proliferation, migration or differentiation. This thesis provides an insight into evolution of the regulatory mechanisms of EGF receptor activation by discussing their principles in *C. elegans*, *D. melanogaster* and *H. sapiens sapiens*, on the basis of which conclusions about their evolutionary tendencies are made. Attention is focused on the roles of the rhomboid family of proteins, whose activity is tightly associated with EGF receptor signalling. Dysregulation of the EGF receptor unnegligibly contributes to the development of various diseases, mainly many types of cancer, but also schizophrenia, psoriasis and cardiovascular disorders. Experimental results obtained on this field of research therefore have the potential to be applied in drug design.