

Formin homology 2 (FH2) domain-containing proteins (formins) have, since their discovery in 1990, been observed in all analyzed species of eukaryotic kingdoms. Our knowledge of structure and function of the defining FH2 domain has greatly increased over the last couple of years. Its function in nucleation, polymerization and processive capping of actin filaments designates formin protein family an important cytoskeleton-remodelling factor. But FH2 domain is just one part of the puzzle – additional conserved peptide structures surrounding it, as well as concrete variation of the FH2 domain itself, greatly influence the functional properties and cellular localization of the resultant formin protein. Formins have been implicated in variety of cellular processes, which often (but not always) involve the cytoskeleton e.g. F-actin network management, crosstalk of F-actin filaments and microtubules or plasma membrane. They also partake in processes integral to cell division, function in conserved signalling pathways and much more. This thesis explains the structure and function of FH2 and FH1 domains, outlines the main formin phylogenetic clades in multicellular eukaryotes and reviews various roles that formins fulfill or are thought to fulfill. Such goal, however, is very bold and (considering the spatiotemporal constraints of this thesis) unattainable in the extent, which topic such as this needs.