

1. Abstract

ARP2/3 complex is well studied in case of animals, it plays key roles in motility of cells and intracellular organelles. Its malfunctions result in severe growth disorders and even lethality of affected cells. On the contrary, plant cells do not exhibit such dramatic phenotype of ARP2/3 complex mutations like it is by animals. It is possible that just the different life strategies of plants and animals contribute to differences in a way how animal and plant cells use their cytoskeleton, where ARP2/3 complex is its part as well. It is highly conserved 7 protein complex from yeast to human. Its main functions are creation of new "de novo" actin filaments, actin branched filaments network. Some of the parasite organisms are capable of misusing its nucleator activity to actively move inside of host cell. Because of the plant cells are surrounded by the cell wall, which give them support in creating various shapes and also hinders active movement of the whole cell body, it is likely that ARP 2/3 complex could be possibly involved in novel plant specific functions as well. If we think about the different life strategy of plants and animals we can not ignore all the things these two kingdoms have in common regarding to cytoskeleton processes. That is the need both for vesicular transport and endomembrane processes integrity maintenance. These processes could not exist without actin and tubulin filamentous network. Though because of the evolutionary separation of plants from animals, there can be some of the proteins (including those in ARP2/3 complex) partially or fully functionally substituted by other proteins. Besides of the ARP2/3 complex there are several other proteins with ability to nucleate actin filaments "de novo", for example formins. It is known the plants have much more formins in their disposal than the animals have. That could be another clue why mutants in plant ARP2/3 complex do show only mild phenotype. These mild phenotype features include aberrant morphology of puzzle-like epidermal cells, twisting and shortening of trichomes, discontinuous hypocotyl cell layers and shortening or twisting of root hairs. Subject of this diploma thesis is to analyze selected ARP2/3 complex subunits in a matter of its localization and possible binding partners.

Key words: actin, cytoskeleton, ARP2/3 complex, Nicotiana tabacum, BY-2