

## Abstract

Wnt signalling pathway is indispensable for a proper development and homeostasis in most of the multicellular organisms. Its evolutionary conservation and wide spectrum of diseases caused by its improper regulation only underscores its importance. Wnt signalling pathway can be conveniently divided into two halves. The first one covers processes that take place in Wnt ligand producing cells and the second one includes Wnt signal transduction in Wnt receiving cells. One of the vital steps in both types of cells is the process of endocytosis. Via regulation of this process, outcome of Wnt signalling itself is regulated.

In this work, nematode *Caenorhabditis elegans* was used as a model organism to characterize new regulator of the Wnt signalling pathway which acts at the level of endocytosis. This new regulator described here is SEL-5 protein kinase. SEL-5 protein kinase belongs to a NAK kinase family and its function seems to be conserved throughout evolution. Its role in Wnt signalling of *C. elegans* was estimated by mining database information about its human homolog AAK1 and based on these information experiments were designed that would allow detailed investigation of its involvement in this pathway.

Genetic interaction of *sel-5* with components of the retromer complex was uncovered and it was established that *sel-5* is not required for maintenance of MIG-14/Wls levels. Results of this work helped to draw preliminary hypothesis of SEL-5 function specifically in Wnt receiving cells. Even in nematode *C. elegans* that is much less complex compared to mammals, Wnt signalling regulators and effectors create a very complicated network. This work tried to explain at least some aspects of this network.

### Keywords:

*C. elegans*, Wnt signalling pathway, endocytosis, neuronal development, SEL-5