

POPULAR SUMMARY

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Project Title: The role of RhoD and RhoD-binding proteins in the regulation of cancer cell adhesion and migration

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The human body requires that all our muscles, bones and ligaments work hand in glove, allowing a perfect harmonization between our movements and the environment. Analogously, cells possess three filament systems, which are collectively named cytoskeleton, and give cells the capacity to develop a variety of functions, like the ability to move, to rearrange their shape and internal components, and ultimately to divide. One of these filament systems is named the actin cytoskeleton and is directly involved in determining cell shape and in cell migration. Actin filaments are made up of small actin subunits that assemble together in a head-to-tail manner creating two long parallel filaments arranged in a double helix. These filaments are highly dynamic, assembling and disassembling constantly in order to satisfy the needs of each cell. Whether actin filaments need to assemble or to disassemble is dependent of additional regulatory proteins.

Rho GTPases are a family of proteins that have been intensively studied during the past years, mainly due to their role in the regulation of the actin cytoskeleton. This thesis focus on a less studied member of this family, named RhoD. So far, it is known that RhoD regulates cell migration, cell adhesion and the trafficking of vesicles inside cells. However, how these processes are regulated remains unresolved.

We start by analysing some proteins as potential binding partners to RhoD. At a later stage, we try to put known signalling networks involving RhoD and other proteins in context with the surrounding signalling pathways within a cell. Our data strongly suggests that RhoD is an important regulator of the actin cytoskeleton, therefore being actively involved in cell adhesion and cell migration via its binding proteins. Rho GTPases upregulation, *i.e.* increased quantity, is found in several types of cancer. Since RhoD is known to be involved in the regulation of cell adhesion and cell migration, it might play an important role in processes such as metastasis in cancer. Consequently, it will be of great future interest to clarify the role RhoD in cancer progression.