

Abstract

This bachelor thesis addresses antagonism of Rho and Rac signaling in the regulation of the actin cytoskeleton during cell migration. Rho and Rac are small GTPases, which are signaling proteins that regulate and control many important processes in the cell. For this thesis, their complex signaling network is particularly important as it influences dynamic changes in the actin cytoskeleton, which are crucial during cell migration. Rho and Rac signaling not only have distinct effects on the actin cytoskeleton but are also often associated with the phenomenon where the activation of one type of signaling inhibits the other type. Furthermore, this thesis demonstrates how antagonistic interactions between Rho and Rac signaling shape cellular responses to environmental stimuli. This antagonistic mechanism ensures precise spatial and temporal coordination of cell movement, which is key for processes such as wound healing and immune response. Understanding the antagonism mechanism of these two proteins is important from identifying potential therapeutic target within these pathways to control abnormal cell migration observed in diseases such as cancer.

Key words: Rho, Rac, GAP, GEF, GDI, F-actin, myosin