Abstract:

Small GTPases of the RAB protein family are key regulators of numerous cellular pathways, including membrane trafficking and autophagy. With the control of membrane processes are also associated phosphorylated phosphatidylinositol derivatives, known as phosphatidylinositol phosphates (PIPs). Our focus lies on the RAB1A and RAB1B GTPases and the processes of early protein secretion they regulate. The enzymes that control specific phosphorylated forms of phosphatidylinositol seem to be functionally related to this pathway, indicating that these lipids also regulate at least some aspects of protein secretion. However, the mechanism by which they do so remains unclear. This bachelor thesis therefore summarises the current knowledge of phosphatidylinositol phosphates on RAB1A and RAB1B associated membranes, including their role on the endoplasmic reticulum (ER) and its export sites (ERES), on the intermediate compartment between the ER and the Golgi apparatus (ERGIC), and on the Golgi apparatus itself. This thesis also specifically examines direct interactions between RAB1 GTPases and phosphatidylinositol phosphates or their related enzymes. In summary, it can be concluded that phosphatidylinositol phosphates play a significant role in the early stages of protein secretion.