The polarization of exocytosis in yeast and animals is assisted by the exocyst – an octameric vesicle tethering complex and an effector of Rab and Rho GTPases. Recently, the exocyst was described as a functional complex involved in morphogenesis also in plants. Hála et al. (2008) described involvement of exocyst complex in pollen tube growth and hypocotyls elongation in dark grown seedlings, Fendrych et al. (2010) uncovered key role of exocyst in cell plate formation, Kulich et al. (2010) emphasized the participation of exocyst in seed coat generation and Pečenková et al. (2011) described the contribution of exocyst subunits in plant defense towards the pathogens. All these processes are intimately linked to polarized secretion. Here we show involvement of exocyst in auxin efflux carriers PINs recycling.

Using direct auxin transport measurement and GFP-tagged proteins, we showed that the exocyst is involved in recycling and polarization of PIN proteins and polar auxin transport regulation. Rootward polar auxin transport is compromised in loss-of-function mutants in exocyst subunits EXO70A1. On the cellular level we have detected small portion of PIN2:GFP in the “BFA-like” FM4-64 labelled compartments distinct from VHAa1 labeled endosoms. Moreover recycling of PIN1 and PIN2 is retarded in roots of *Arabidopsis* loss-of-function mutants in exocyst subunits EXO70A1 and SEC8 after brefeldin A treatment. Even more severe secretory defect is observed after prolonged BFA treatment. This approach normally provokes transcytosis – i.e. relocalization of PINs from BFA compartment to the apical PM in the WT plants. However in *exo70A1* and *sec8-m1* mutants PINs remain internalized in the BFA compartment. We observed that also recycling of the brassinosteroid receptor BRI1 is disturbed in similar manner as PIN recycling indicating more general PM proteins recycling defect.

Plasma membrane localization of GFP-tagged EXO70A1 and other exocyst subunits studied (SEC8, SEC10) are resistant to brefeldin A treatment suggesting that studied exocyst subunits traffic BFA-insensitive pathway. On the contrary, localization of these subunits are sensitive to wortmannin – an inhibitor that modifies membrane phospholipids. These findings indicate that binding of studied exocyst subunits to the PM might depend on the phospholipide membrane composition. Using co-immunoprecipitation we revealed that EXO70A1 is present in a complex with ICR1 – an adaptor protein mediating interaction of activated RHO/ROP GTPases with the SEC3 exocyst subunit (Lavy et al., 2007). Recently ICR1 was proved to contribute to the regulation of polar auxin transport through PIN1 polarization (Hazak et al., 2010).

Whereas EXO70A1 along with other exocyst subunits display uniform distribution on the PM (Fendrych et al., 2010), EXO70G1 shows enrichment on the apical and basal cell sides in the root tip cells. This localization pattern might point to the role in recycling of polarly localized protein such as PINs. Since *exo70G1* mutant did not show any discernible phenotype (Synek et al., 2006) we will have to prepare double or triple mutant of *exo70G1, exo70G2* and *exo70A1* to uncover its function.