The role of NBR1 and the LSU (RESPONSE TO LOW SULFUR) proteins in stability of *Arabidopsis thaliana* catalases

The main objective of this project is to characterize the role of the selective autophagy cargo receptor NBR1 and the proteins from the LSU (RESPONSE TO LOW SULFUR) family in the control of stability and activity of Arabidopsis catalases during plant response to sulfur (S) deficiency.

Catalases (CATs) are highly active antioxidants which are important for all the organisms. Regulation of CAT activity plays a significant role in different stress signaling. Plants are exposed to numerous stresses like drought, salinity or nutrient depravation. Sulfur (S) deficiency is an increasingly common cause of low crop productivity. That's why there is a great need to understand the mechanisms that could help plant to adapt to the unfavorable conditions. Many aspects of plant response to S deficit are already known, however little research has been focused on the oxidative stress induced by this deficit. We want to investigate the mechanisms of regulation of CAT during S limitation using *Arabidopsis thaliana* as a model plant. Our preliminary data indicate involvement of selective autophagy in this process. NBR1, a receptor of selective autophagy, delivers damaged proteins for degradation. Whether NBR1 directs inactive CAT for degradation hasn't been established yet. In this project we want to address this question. Among NBR1 partners there is a plant-specific LSU protein family. These small proteins are involved in plant response to diverse stresses, including S starvation. The members of LSU protein family interact also with CAT. This interaction may protect CAT from being degraded, facilitate inactive CAT removal, activate CAT or provoke another change in CATs properties. Deciphering the role of NBR1 and LSU proteins in this regulation of CAT will help us understand the signaling pathway which triggers plant response to S deficiency. This knowledge may be useful in improving plant productivity in the field.