Abstract

The thesis is focused on the role of regulator of G-protein signaling NtRGS1 in control of growth and cell proliferation of tobacco cell line BY-2. The protein NtRGS1 is an important candidate for being plant G-protein coupled receptor.

Heterotrimeric G-proteins are involved in key signaling mechanisms in eukaryotic cells. Basic principles of this type of signaling are well conserved between plants and animals and related higher taxa. Outstanding difference of plant G-protein system is altered enzymatic activity of Gα subunit of the G-protein heterotrimer. These alterations correlate with chimeric structure and function of investigated NtRGS1 protein. The interaction of Gα and NtRGS1 is absolutely essential for running of heterotrimeric G-protein signaling in plants.

Truncated versions of NtRGS1 fused to GFP were crated in the aim of protein characterization. The truncated proteins were investigated in respect of analysis of the role of NtRGS1 domains in protein targeting. Dynamic changes in NtRGS1 and selected truncated versions induced by experimental application of nutrition, especially sugars were described. Expression if *Gα* and *NtRGS1* were investigated simultaneously. Influence of modulation of *Gα* and *NtRGS1* expression on growth parameters of tobacco cell line BY-2 were described.

Key words: tobacco cell line BY-2, sugars, cytology, G-protein, Gα subunit, localization, NtGPA1, NtRGS1, regulator of G-protein signaling