

PLANT PHYSIOLOGY

Biotic stress and endopolyploidy in plant cells

supervisor: prof. RNDr. Pavol Mártonfi, PhD.

study form: full time

Annotation: Endopolyploidy in plant tissues is quite common phenomenon occurring in taxonomically different plant groups. Causes of endoreduplication of DNA in plant cells have not been sufficiently clarified. They depend upon different internal and external factors, among them also biotic stress. This can be caused e. g. by nematodes from the genus *Meloidogyne*. Endoreduplication of DNA is detected in the infested tissues, however, it is not clear if the endoreduplication is induced by the nematodes or rather it represents a stress reaction of plant organism. The aim of the PhD. thesis is to clarify the factors and the mechanisms which play role in the endoreduplication process in stressed cells.

Biosynthesis of phenolic compounds and its induction and regulation in model plants

supervisor: doc. RNDr. Peter Paľove-Balang PhD.

study form: full time

Annotation: The work is focused to the biosynthesis of phenolic compound in *Lotus japonicus*, namely to understand the principles of the regulation of the formation of several groups of phenolic compounds. The important milestone is testing the biologically active compounds that may coordinate their metabolic processes. Exogenous application of active compound will be used, or mutant lines will be used that differ in the accumulation of such compounds.

Lichenism as environmental adaptation of cyanobacteria to environment with increased intensity of UV radiation

Supervisor: prof. RNDr. Martin Bačkor, DrSc.

Study form: full time

Annotation: Cyanobacteria (blue green algae) are capable to live in environment with high intensity of UV radiation. One from the adaptation to this environment is lichenism, symbiosis of algae, or cyanobacteria with fungi. The aim of this study will be assessment of selected parameters of metabolism (assimilation pigment composition, chlorophyll fluorescence, secondary metabolism) in cyanobacteria *Nostoc commune* and cyanolichen *Leptogium menziesii* exposed to short-term and long-term exposition to UV radiation.