

## GENETICS

### **Biosynthetic genes coding for bioactive anthraquinones in *Hypericum* plants and *Hypericum*-borne endophytic microorganisms – „a possible crosstalk“**

supervisor: prof. RNDr. Eva Čellárová, DrSc. (eva.cellarova@upjs.sk)

study form: full time

Annotation: Endophytic fungi belong to the most important producers of bioactive anthraquinones. Their occurrence in plants is scarce, however, there is one exception represented by some species of the genus *Hypericum* which are the only producers of bioactive anthraquinones, especially hypericin with enormous pharmacodynamics potential in the plant kingdom. The aim of this work is to ascertain whether biosynthetic genes of the polyketide pathway leading to production of anthraquinones are present in both, *Hypericum* plants and *Hypericum*-borne endophytic isolates and how their products communicate in the course of biosynthesis.

### **Bioprocess optimisation for biomass production of fungal endophytes grown in bioreactor for pharmaceutical purposes**

supervisor: prof. RNDr. Eva Čellárová, DrSc. (eva.cellarova@upjs.sk)

study form: full time

Annotation: Some *Hypericum*-borne endophytic isolates are producers of important bioactive anthraquinones but their growth under *in vitro* conditions is slow. Insufficient biomass increase limits genetic and metabolomics studies and their perspective use for biotechnological production. The aim of this thesis is focused on optimisation of bioprocesses for biomass production of some *Hypericum*-borne endophytic microorganisms with biosynthetic potential for production of bioactive anthraquinones in a small-scale bioreactor.