acetyltransferases catalyze the acetylation of the ε-amino groups of internal lysine residues by transferring acetyl-groups donated by the metabolite acetyl-CoA. Whereas lysine acetylation of histone proteins has been extensively studied, the role of non-nuclear lysine acetylation is so far only poorly understood. With the help of modern high-resolution mass spectrometry it has been found that lysine acetylation is particular abundant on photosynthesis-related proteins. The aim of this project is the identification of putative plastidial lysine acetyltransferases (KATs) by localization assays and *Arabidopsis* knockout mutant analysis as well as by testing recombinant proteins concerning their KAT activity.

P.06-019-Mon
What are the effects of protein nutrition on photosynthetic parameters and stress markers in tobacco plants?

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Despite of plant mineral nutrition being a well-studied topic, organic-bound nitrogen has only recently attracted more attention as a part of plant N nutrition for sustainable agriculture. The aim of our study was to find out how protein casein as a sole N source affected photosynthetic performance and stress level of tobacco grown *in vitro*. Casein, similarly as inorganic N limitation, reduced plant growth. Photosynthetic parameters evaluated by chlorophyll *a* fluorescence induction using the JIP test confirmed also decreasing photochemical efficiency during the primary light phase of photosynthesis. Casein-supplied plants showed a significantly lower performance index (PI_{ABS}), which characterizes the function of the whole electron transport. In casein-grown plants, specific parameters showed also an increasing portion of energy dissipated by various mechanisms, not used for photochemistry in PSII. The N-limited plants exhibited the same trend, but their parameters were less declining. In order to determine the level of stress caused by casein as a N source, we measured the content of phenolic compounds, reactive forms of oxygen and the activity of superoxide dismutase. In the plants supplemented with casein, the content of hydrogen peroxide was comparable and the superoxide radical was slightly lower than in the inorganic N-abundant plants. Moreover, the plants grown with casein possessed beside Cu/Zn isoform of superoxide dismutase also Mn-isoform. The content of phenolic compounds was correlated with the antioxidant capacity. This project was supported by Charles University (UNCE 204025/2012).

P.06-020-Tue
The interplay of light, cytokinins and cytokinin receptors during induced senescence of *Arabidopsis* leaves

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Plant hormones cytokinins have been studied for many decades and their ability to slow down or postpone the process of leaf "ageing" (senescence) belongs to their well-known effects. Senescence is essentially connected with a decrease in chlorophyll content and photosynthetic activity and with an increase in lipid peroxidation. Cytokinins are known to retard all these changes. However, we show that cytokinins can have the opposite effect – they can accelerate senescence if their concentration exceeds a certain threshold. Our studies further revealed that not only cytokinin concentration, but also the light intensity radically affects the result of cytokinin activity. In order to understand the interplay between cytokinin and light more deeply, we applied cytokinins exogenously (0, 10^{-7}, 10^{-6} or 10^{-5} M 6-benzylaminopurine, BAP) on detached leaves of *Arabidopsis*. For these experiments we have used three *Arabidopsis* mutants which have functional only one of the three known cytokinin receptors (AHK2, AHK3 or AHK4). These leaves were kept under various light conditions and changes in photosynthetic performance, lipid peroxidation and levels of endogenous cytokinins were analysed after six days. While AHK3 was the main receptor mediating the effect of cytokinins on chlorophyll content and photosynthetic function, AHK4 primarily mediated the cytokinin effect on lipid peroxidation. AHK2 was able to mediate both of these effects, but only partially. We found that the threshold concentration of BAP that leads to slowdown/acceleration of senescence-induced changes was different for different parameters and was also affected by light.

P.06-021-Wed
The mutation disrupting the wax layer formation impact on soluble sugars and total phenolics content of rye near-isogenic lines under soil drought

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Rye has a number of positive attributes, excellent drought tolerance would be the most interesting one considering the increased summer temperatures and limited rainfall periods. This trait may be connected with the intense waxy bloom on the stem and leaf sheath. In our study the connection between wax covering green parts of rye and biochemical responses to soil drought stress was investigated. The aim of the study was to determine the differentiation of rye near-isogenic lines (NILs) in terms of soluble sugars content (SSC) and total phenolics content (TPC) as a result of the mutation disrupting the wax layer formation impact. The research material consisted of two pairs of rye inbred lines