

Supervisor's report on Thesis

**Mgr. Ondřej Smetana „Molecular and cellular aspects of programmed cell death in response to genotoxics in plants“
Charles University Prague/University of Strasbourg 2010**

The thesis by Mgr. Ondřej Smetana „Molecular and cellular aspects of programmed cell death in response to genotoxics in plants“ represents a solid research work. Its originality lies in the focus on the study of the relationship of the two fundamental biological mechanisms which are significant for all eucaryonts. An organism can take two avenues in handling the genotoxic damage of its cells: either their repair or a targeted removal of cells damaged beyond repair. Besides, both mechanisms are not only used in the defense against pathogens and stressors. They also participate in maintaining of a 'normal' ontogenesis in contrast to perturbances caused by tumorous diseases.

To investigate them under conditions of genotoxic stress was the target of the topic of this thesis drawn up four years ago. The form of the management of the thesis was rather non-standard: It should use a French governmental scholarship for joint tutoring of the doctorand (cotutelle internationale) from his original home workplace (prof. Opatrný, Fac. Sci. Charles University) and by the French partner (Dr. Chabouté, University of Strasbourg).

An obvious starting advantage for this collaboration was Mgr. Smetana's excellent command of both the French and English language, an methodic and theoretical experience of the studies on programmed cell death (PCD) in plants, obtained during his graduate work. Mgr. Smetana also got and perfect knowledge of handling with one of supposed key experimental models – plant cell lines. On the contrary, the French partner offered all necessary know-how for the study of genotoxic substances, expertise in the field of genetic repair and excellent experimental support. And, last but not least, various mutant strains of *Arabidopsis thaliana*. The possibility of comparison of the two models of various degree of complexity (cell lines vs. whole organisms and/or their organs) is a significant contribution of this work.

The three years work initially agreed project called “Vision intégrée de la mort cellulaire programmée aux cytokinines et stress toxiques chez les plantes: Implication de E2F,RNR et de ses partenaires” consisted of six approximately half year periods during which Mgr. Smetana worked in turn in Prague and Strasbourg.

From my point of view this work brought a lot of very interesting results as well it shows the ability of Mgr. Smetana to manage successfully a broad array of experimental techniques and to absorb an extensive amount of knowledge. The submitted thesis is of a high grade from both the formal and the contents viewpoint. It proves the ability of the author to write independently a more extensive treatise. Without doubt Mgr. Smetana proved his scientific competence. His personal traits, among which are friendly attitude to people, optimism, enthusiasm about pursuing research work and finding new knowledge, will certainly help him in his scholarly carrier

Nevertheless I wish to mention, in somehow critical tone, some aspects of the roadmap and the evolution of this „co-tutelle“ study. I would start by reminding the title and the topic of the work. As mentioned above, the name (Project de these) was „Vision intégrée de la mort cellulaire programmée aux **cytokinines** et stress toxiques chez les plantes: Implication de E2F,RNR et de ses partenaires“. It was done by the fact, that both the direct and indirect role of cytokinins in PCD was in the centre of the interest of the Czech partner. Similarly, recent activities of the Prague team have been deeply focused to not only molecular, but also cytological studies on the plant PCD mechanisms. Unfortunately, the theses contains almost no new data concerning cytokinines – and also relevant PCD cytology has been pronouncedly underestimated. I hope that some new experimental data and also more complex and fresh information from the literature will appear in the just finalized publications.

Conclusion:

The submitted manuscript is a solid research work bringing new knowledge in the field of PCD. It proves the scholarly capabilities of the author and fulfils the requirements of a PHD thesis.

Prague, September 21, 2010

Prof. Dr. Zdeněk Opatrný
supervisor

