



Supervisor's evaluation of PhD thesis "Role of the Psb28 proteins in the biogenesis of the Photosystem II complex in the cyanobacterium *Synechocystis* sp. PCC 6803" by Martina Bečková

Photosystems are key photosynthetic membrane complexes of cyanobacteria and chloroplasts that drive the photosynthetic electron transport chain producing highly reduced compounds and ATP for synthesis of carbohydrates. At the start of the chain is Photosystem II (PSII), which acts as water:plastoquinone oxidoreductase releasing molecular oxygen as byproduct. Although the knowledge of the PSII structure and function is now quite extensive thanks to recent advances in methods of structural biology and ultrafast spectroscopy, we know much less details about biogenesis of this complicated oxygen evolving machinery. In this context, the PhD thesis of Martina Bečková provides new original data contributing to the knowledge about this process. The thesis is written as a commented collection of four articles, three of them published in the period 2012-2016, and one accepted manuscript which is now in the stage of corrected proof. The thesis focuses on the structure, localization and function of so called Psb28 proteins which are considered assembly factors of PSII. In agreement with this, Martina Bečková detected them in specific PSII assembly subcomplexes and Psb28 tagging allowed isolation and partial characterization of these rare complexes. In my opinion, the isolation and partial characterization of PSII-PSI supercomplexes and support for their involvement in the photosystem biogenesis is the most valuable result of the thesis which opens new ways for further research in this research field. As the Psb28 proteins are also present in plants, the described methodologies can be used as a guideline for verification of the validity of obtained results for the plant kingdom.

The thesis documents high quality of results obtained by Martina Bečková, which was essential for their publishing in very good journals. It also shows that she excellently handled a large number of methods ranging from biophysics and biochemistry to molecular biology and physiology and that she was able to correctly perform experiments, evaluate their results and interpret them. She was working very hard, carefully and independently although more frequent integration of her own ideas and invention would have been welcome. The thesis is written carefully in reasonable English, nevertheless in my view it is clear that writing of the scientific texts is not the most favorite scientific activity of Martina and she still needs further training to do it more effectively.

In summary, scientific achievements of Martina Bečková clearly meet the criteria for the PhD degree as she is the first author of one paper and the co-author of other three, all published in journals with a high impact factor.

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+420 384 340 431

Prof. Josef Komenda, DSc.

Fax +420 384 340 415