

## Příloha 6: Posudek oponenta habilitační práce / Review of the habilitation thesis

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| <b>Masaryk University</b>               |   |
| <b>Faculty</b>                          | Faculty of Science MU   |
| <b>Habilitation discipline</b>          | Molecular biology and genetics  |
| <b>Applicant</b>                        | RNDr. Jan Hejátko, Ph.D.  |
| <b>Workplace</b>                        | Faculty of Science and CEITEC, Masaryk University   |
| <b>Title of the habilitation thesis</b> | Hormonal regulations of Plant Development   |
| <b>Reviewer</b>                         | Prof. Dr. Klaus Harter  |
| <b>Pracoviště</b>                       | Zentrum für Molekularbiologie der Pflanzen<br>Pflanzenphysiologie<br>Universität Tübingen |

### **Text of the review (extent according to the reviewer's consideration)**

The present habilitation thesis documents Jan Hejátko's impressive scientific achievements in the area of the hormonal control of plant development since 2003. His focus was and still is the function of cytokinin and auxin in organ development, embryogenesis and gametophyte development and the functional interaction of these two crucial plant hormones.

If one takes a more closer look on his work, he published impressive and very important work on the function of the canonical *Arabidopsis* histidine kinase CKI1 with respect to gametophyte development, its role in cytokinin signal transduction and link to multi-step two-component(MSP) signaling.

Regarding the MSP he and his colleagues initiated experimental steps to describe and understand the determinants of specificity and  $Mg^{2+}$  and phosphorylation-dependent structural changes of MSP components using crystallography and X-ray analysis. This is a major challenge as, with the exception of AHPs, plant MSP components elements are extremely difficult to express to high amounts in the standard expression organisms such as *E.coli*. However, the scientific turn to the molecular and even atomic level is the only way to actually understand MSP signaling in plants.

Jan Hejátko published 7 original papers in good to very good peer-reviewed journals. Very well recognised by the plant science community are the manuscripts published in PNAS (2009) and Plant Cell (2009) addressing CKI1 (and AHK2, AHK3) function and auxin-cytokinin interaction during organogenesis, respectively. Similar important was the MGG paper from 2003, where he and his colleagues report the function of CKI1 in female gametophyte development (due to competition this manuscript was submitted to a journal with a relative low impact; however, the review process was fast. The paper itself has a very high scientific value).

Three of the enclosed publications are reviews. Here Jan Hejátko and his co-authors demonstrate that they are experts on the area of MSP signaling and cytokinin-auxin interaction in plant development. I personally like the Horak et al. (2011) review most as the authors provide inspiring conceptional ideas where the MSP research has to go in the near future.


**Reviewer's questions for the defense of the habilitation thesis (the number depends on reviewer's consideration)**

1. One would like to ask Jan Hejatko how he will further address the specificity problem in MSP signaling, especially as full-length AHKs and ARRs are hard to express for biochemical studies, and the plant MSP actually form a kind of signaling network.
2. Furthermore, one could ask whether he has any conceptual idea about these unknown regulators that could link MSP with other signaling pathways and how they could function.

**Conclusion**

Habilitation thesis of Dr. Jan Hejatko "Hormonal regulations of Plant Development" undoubtedly meets the standard demands placed on habilitation thesis in the discipline Molecular biology and genetics.

In Tübingen, 04.11.11

  
Prof. Dr. Klaus Harter  
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