



# BIOLOGY CENTRE ASCR

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### **Supervisor's evaluation of Ph.D. thesis by Mgr. Jan Perner – “Nutritional requirements of ticks – Biology of haem in the tick *Ixodes ricinus*”**

(Petr Kopáček, Institute of Parasitology, Biology Centre, Academy of Sciences of the Czech Republic)

Jan Perner joined our lab about a decade ago and carried out under my supervision his bachelor diploma work on tick cystatins, defended in 2008. Then he disappeared for about one year in frame of Erasmus program and worked in the laboratory of Prof. Sylke Muller at the University of Glasgow on the characterization of *Plasmodium falciparum* glutamate dehydrogenase. His master degree diploma defended in 2011 was based on the work that Jan performed in Glasgow and was published the same year in the Malaria Journal. I still remember the excellent performance and impression Jan made during his Master thesis defense and the words of Julius Lukeš saying that he just hopes that Jan's gift for scientific work will not be vanished in our tick lab.

The idea to send Jan to the lab of Patrick Guerin at the University of Neuchatel to learn there tricks and skills behind artificial feeding of hard ticks was possibly one of the most fortunate decisions made in the history of our laboratory. Soon after his return, he was able to show me the fully engorged black and white *I. ricinus* females fed on the whole bovine blood or serum, respectively. Based on this impressive picture (which later became an eLife homepage or Biomedical picture of the day), I wrote and received a five years' grant from GACR for a project addressing the simple question – what is hemoglobin good for in tick diet? Without exxageration, this project was almost entirely dependent on Jan's ideas, experimental skills and creativity. It is common, that the supervisor gives the PhD. student ideas, advices what to read and what kind of experiments to perform to bring solid publishable data. The relation between Jan and myself as supervisor was rather the opposite. He usually first came with the results, than showed what experiments he carried out and after that he explained to me the ideas behind the work.

Publishing his flag-ship paper in the highly prestigious but exceptionally engaging open access journal eLife took us at least one year of endless discussions how to get all the obtained data together to make a coherent story out of this. One more year of additional hectic experimental work was needed to meet the reviewers' comments and suggestions and this is the reason why we decided to show this publically available part of the eLife publication in the appendix of Jan's thesis. It is also worth to mention that the credit for publishing the paper in eLife goes mainly to the courage of Jan and other young co-authors who persuaded me not to slice the story like salami and publish it as three separate papers in the journals of lower rank just to stay on the safe site.

A follow-up transcriptomic paper published recently in Scientific Reports revealed that a surprisingly low number of genes expressed in the tick midgut is affected by the presence/absence of hemoglobin in tick diet. Among the rare genes that clearly respond to hemoglobin is one out of forty glutathion-S-transferases present in the tick genome. Again, completely independently, Jan contacted Prof. Peter



Brophy in Wells and went to his laboratory to spend there summer 2015 to carry out a substantial part of the work needed for characterization of this heme-scavenger. At present, Jan is just finishing the remaining experiments in our lab and I believe that we will be able to complete and publish the work presented as a Manuscript in preparation soon. Besides this work, the high quality midgut transcriptome sequences from the Scientific Reports paper provides us with an excellent platform to further focus on the molecules and processes potentially involved in a nutritional signaling and regulation of blood meal digestion and vitellogenesis.

During the work on the eLife paper and midgut transcriptome paper I could witness and admire Jan's ability to scientifically communicate at highly professional level with Prof. Pedro L. Oliveira (University Rio de Janeiro) or Prof. Jose M. Ribeiro (NIH). At the moment a similar communication is ongoing between Jan and Dr. Sukanya Narasimhan to carry out a membrane feeding experiment in the Erol Fikrig's lab at the Yale.

Other preliminary and unpublished data presented in Jan's thesis demonstrate the current state of art of tick membrane feeding in our lab, indicate the way we plan to continue and also provide a proof of Jan's capability to lead and supervise the younger undergraduate students.

I may mention only one case when Jan's high self-reliance made me upset. It was when he wrote a pre-submission letter to the chief-editor of Plos Biology without letting me know about that. Jan's English is obviously much better than mine, but in paper writing I had sometimes problem to cope with his unusual phrasing apparently affected by his long stay in Scotland.

To conclude my evaluation: With all the respect to my previous PhD. students I have had the pleasure to supervise, Jan Perner has been so far the most creative, influential and diligent young person in my lab. He is endowed by an exceptional gift for scientific work and I have no doubt that his scientific career will further successfully continue.

I am fully convinced that Jan Perner's PhD. study and thesis fulfill all the criteria requested by the Faculty of Science, University of South Bohemia in České Budějovice to be awarded by a title Ph.D.

In České Budějovice, March 8, 2017

**Petr  
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