

RNDr. Zdeněk Lánský, Ph.D.
BTÚ AV ČR, BIOCEV
Průmyslová 595, 25250 Vestec

325-873-772
zdenek.lansky@ibt.cas.cz

Praha, 18.8 2022

PhD thesis review

Author: Mgr. Peter Gorilák

Title: Identification and characterization of ciliary tip proteins

The tip region of cilium is important for ciliary structure and function; however, its composition is unclear. In this thesis, the author developed a localization pipeline and advanced imaging methods to identify proteins that localize to the tip domain of cilium in various organisms and identified several proteins that localize therein. The thesis is clearly written and presented, introducing the topic extensively, summarizing concisely the methods used by the author and clearly presenting and discussing the achieved results. The work is accompanied by papers published by the author, including one preprint.

The work presented in this thesis is timely and relevant and, importantly, brings up many questions, which will be exciting to follow up in further research. The quality of presented results is reflected by author's papers, which are published in respectable journals. I would especially congratulate the author on beautiful high-resolution imaging that the author achieved, such as presented in Figs. 23 and 24, which are absolutely stunning. On the other hand, a minor criticism from my side would be the author's frequent use of abbreviations (DAP, TZ, PC, ...), which sometime make the text hard to read, especially for an outsider. I am also left with a couple of questions, which are outlined below.

Overall, this thesis clearly shows that the author mastered a range of experimental techniques and approaches, that he is able to interpret his results and bring them in context with the existing literature, and that he is capable of independent scientific work. It is thus my pleasure to approve the thesis and recommend Peter Gorilák for further proceedings of the thesis defence.

Questions for the author:

- 1) The author mentions intralumenal plug often observed in electron micrographs. What is the role of the plug (can you at least speculate)?
- 2) Looking at EB1 distribution in primary cilium, I'm wondering what is the dynamics of the EB1 protein on these microtubules? And, more generally, is it known how dynamic these microtubules are?
- 3) I'm intrigued by the ZNF1C/IFT pausing sites. Could the author hypothesize on the identity of the IFT pausing sites and what could be the role of ZNF1C in these sites?
- 4) The author shows filamentous actin in primary cilium. How are actin filaments distributed within the primary cilium and what could be the role of actin in this structure?

Zdeněk Lánský