Lékařská fakulta
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Neurologická
klinika

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Sirs,

here is my external examiner´s review of the dissertation thesis of Soňa Baranová, MSc., with the title "Intravital diagnostics of neurodegenerative diseases":

The presented dissertation thesis is represented by the dossier of (alltogether) 99 pages. It is customary divided into accustomed parts, and the extension of the particular thesis parts corresponds to its format and matter. The Introduction part, Abstracts (both in the Czech and English languages) and Table of Contents are on the first eleven pages of the thesis. The literary text of thesis is introduced by the chapter "Literature overview" on 10 pages (2 – 22); this part is followed by the description of Aims on page 23.

The Material and Methods sections extensively occupies pages 23-33, the detailed description of this is therefore given on 9 pages. The results of author´s experiments are described into detail on pages 34 – 74, it means that the results description is given on 40 (!) pages. There is a rather short discussion on pages 75 – 83 (8 pages) and one-page long Conclusion. There are 9 pages of References (86 – 95), the supplement material can be found on the pages 96 – 99, there are supplementary figures 6 and 7 and 3 supplementary tables.

This is a nice example of "upper standard" dissertation thesis. The author (and her tutor) have thoroughly consider the topic, and finally they decide to go into the new unmapped one, i.e. the RT-QuIC essay in the diagnosis and differential diagnosis of prionopathies and α-synucleinopathies. The experiments which the author has performed during her Ph.D. period were published in the peer-reviewed journals, so these papers underwent a demanding publication/review process. There were 3 papers published, two original and one review paper. The original papers were published in the Q1/Q2 journal Scientific Reports (Detection of prions in matching post-mortem skin and cerebrospinal fluid samples using second-generation real-time quaking-induced conversion assay) and in the Q2 journal Pathogens (Detection of prions in brain homogenates and CSF samples using a second generation RT-QuIC assay: a useful tool for retrospective analysis of archived samples). The author of the dissertatrion thesis is listed as first author in the first paper, in the second paper is she a second author, her contribution is described as „caried out the experimental work". The review paper (Nové možnosti laboratornej diagnostiky ochorení spojených s tvorbou amyloidov) was published (in Slovakian) in the Czech Q4 journal Česká a slovenská neurologie a neurochirurgie, and the author of the dissertation thesis is listed as the first and corresponding author.

The formal level of the dissertation thesis is high, I have found few mistyping or grammatical errors, the language level is good, above average. The description of methods which were used in the experiments is detailed and competent. The results are described in the well-comprehensive manner; they are extensively illustrated, there is alltogether 44 figures in the core text of the thesis. The Discussion, which occupies 8 pages of the core text is competent and relevant albeit a bit verbosy. In the Conclusion author highlights the most important achievement of her doctoral work. I guess it is fair to state here that the results which the author, her tutor and whole their team have achieved, i.e. the introduction of the new diagnostic method and its

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implementation into the process of nerodegenerative disoders differential diagnosis, are fundamental and of highest priority.

I do not have any major concerns except about the "description" of the synucleinopathies on page 19 of the thesis, which is full of inconsistencies, allegations and outdated statements. I would suggest the author to present during the thesis defence an updated classification model of neurodegenerative disorders, namely synucleinopathies.

Finally, I would strongly recommend the defence of this thesis. Subsequently, in the case of successful thesis defence, I would recommend to grant the Ph.D. (Doctor Philosophiae) title to Soňa Baranová, MSc.

Olomouc, June 4, 2024

Petr Kaňovský

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