



Confidential

Supervisor's Review of USB RIFCH PhD Thesis

Surname of the PhD student: Bláhová	Name of supervisor: Martin Pšenička
Title of PhD thesis: Long-chain polyunsaturated fatty acid biosynthesis regulation in fish	

OVERALL COMMENTARY ON THE PhD THESIS

The thesis entitled "Regulation of long-chain polyunsaturated fatty acid biosynthesis in fish" consists of a general introduction, one published review, one published original article, a general discussion and other required parts. The introduction has a logical structure including a description of fatty acid biomolecule architecture, nomenclature, and synthesis, and the author has expanded the introduction to include long-chain polyunsaturated fatty acids (LC-PUFAs) in food chains and warmer worlds, and LC-PUFA biosynthesis genes as key players in environmental adaptations.

Chapter 2 of this thesis summarizes the current knowledge and evaluates the structure-function properties of FADS2 desaturase in fish in the context of environmental adaptations. It also outlines some genetic engineering solutions in the form of genetically modified organisms and acknowledges that if such solutions are put into practice, it will have a positive effect on LC-PUFA supply while maintaining wild fish populations.

Chapter 3 of this thesis investigated the direct functional relationship between the fads2 gene and some reproduction-related traits in zebrafish (*Danio rerio*). In this thesis, the author used a knockout of the fads2 gene and then determined the fatty acid profile of eggs laid by adult females. This work resulted in the description of an alternative $\Delta 8$ desaturation pathway.

The discussion summarizes previous research on long-chain polyunsaturated fatty acid biosynthesis with the author's research.

The author has demonstrated the ability to work independently in the laboratory, creativity, critical thinking and the ability to express her conclusions in the form of scientific publications. Therefore, I can recommend this thesis with a clear conscience for defense and candidate for PhD title.

FINAL RECOMMENDATION

- ☒ can be recommended for defence of PhD Thesis
☐ can be recommended with reservations for defence of PhD Thesis
☐ can not be recommended for defence of PhD Thesis

23.5.2022
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Date and place

PŠENIČKA
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surname and signature