



Review of USB FFPW PhD thesis

First name(s), surname, titles of the PhD student: Zuzana Bláhová, Dipl.-Ing.	First name(s), surname, titles of supervisor: Assoc. Prof. Dipl.-Ing. Martin Pšenička, Ph.D.
Title of PhD thesis: Regulation of biosynthesis of LC-PUFA in fish	

REVIEWER:

Surname: Jin	Institution: Department of Embryology, Carnegie Institution for Science, Baltimore, Maryland, USA
Name: Yang	
Titles: Dr.	E-mail: yjin@carnegiescience.edu
Please describe your professional relationship to the PhD student:	Please describe your field of expertise: Lipids metabolism regulation in fish

QUESTIONNAIRE

Originality, scientific importance, perspectives and impacts of results presented in the PhD thesis for basic and/or applied research

Evaluate competitiveness of the PhD thesis in the international context and compare its level with the current state of the art in the field (**extent ¼ – ½ page**):

Long chain poly unsaturated fatty acids (LC-PUFA) are essential components for human nutrition as it shows beneficial effect on many diseases such as cardiovascular disease and inflammation. Fish is a major source of LC-PUFA as compared to other food source, and most fish are able to synthesize LC-PUFA from alpha-linolenic acid and linoleic acid. However, the LC-PUFA synthesis capacity varies between fish species.

The thesis written by Zuzana Bláhová described the LC-PUFA synthesis pathway and its regulation in zebrafish. They have chosen an appropriate model for studying LC-PUFA regulation, not only because zebrafish is a widely used animal model for lipid research, but also because zebrafish only have one fatty acid desaturase gene (*fads2*) which have dual function of delta-5 and delta-6 activities. By partially knockout *fads2* gene in zebrafish, Zuzana et.al. have identified an alternative delta-8 pathway in zebrafish and connected the LC-PUFA synthesis to reproduction of zebrafish. Her thesis has shedded the on the importance of endogeneous LC-PUFA synthesis for fish fatty acid homeostasis and reproduction. More interestingly, the thesis has confirmed an alternative delta-8 pathway in zebrafish which being activated after disruption of classical delta-5/6 pathway.

The results from this thesis have successfully built basal knowledges of LC-PUFA synthesis and regulation pathways in zebrafish. These knowledges are invaluable for future basic and applied studies such as overexpressing LC-PUFA synthesis pathways or studying the connection between LC-PUFA and reproduction in fish.



Elaboration of the PhD thesis, objectives of the work and deliverables

Evaluate the overall level of elaboration of the PhD thesis (structuring of the main text, comprehensibility, logicity of the chapters and their ordering) and the originality of the selected approaches to solve the objectives; evaluate publications and whether the results described correspond to objectives of the PhD thesis (extent $\frac{1}{4}$ – $\frac{1}{2}$ page):

The thesis written by Zuzana Bláhová is well-structured and well-written in English. The thesis first started with introduction of fatty acids and their importance, then continued introducing LC-PUFA and their biosynthetic pathway. As the results of the thesis, Zuzana first reviewed the structure and function of fads2 gene in fish, then did a followed-up experiment of fads2 gene knockout in zebrafish. The results of the thesis were published in two well-known scientific journals. The overall objective of the thesis was clear and the author has used the correct approach and animal model to solve the objectives.

OVERALL COMMENTARY ON THE PhD THESIS

Please write in the box specific comments concerning the PhD thesis in extent of 1-2 pages:

In general, the thesis is well-written and I only have a few comments:

1. The thesis used many URL instead of scientific journals for reference. For example, in first paragraph, the author used URL to cite a IPCC report. I would suggest to use less URL, but cite more journals or books.
2. As described in the thesis, there are several ways to name a fatty acid, either nomenclature is correct. However, I would suggest to use consistant name system to describe your fatty acids in the thesis. For example in your thesis, sometimes I saw C18:2w6, sometimes I saw linoleic acids.
3. Please see attached thesis for other small comments.



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a ochrany vod
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Jihočeská univerzita
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University of South Bohemia
in České Budějovice
Czech Republic

FINAL RECOMMENDATION

- ☒ PhD thesis can be recommended for defence
☐ PhD thesis can be recommended for defence with reservations
☐ PhD thesis cannot be recommended for defence

2022-07-04 Baltimore, USA

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Date and place

Yang Jin

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Name and signature