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Jihočeská univerzita  
v Českých Budějovicích  
University of South Bohemia  
in České Budějovice

## OPPONENT'S REVIEW ON BACHELOR THESIS

**Name of the student:** Vanja Miroslavjevic

**Thesis title:** Effect of high fat diet feeding on resistance to bacterial infection in *Drosophila melanogaster*

**Supervisor:** Adam Bajgar, Ph.D.

**Referee:** RNDr. Alena Krejci, Ph.D.

**Referee's affiliation:** University of South Bohemia, Faculty of Science

	Point scale <sup>1</sup>	Points
<b>(1) FORMAL REQUIREMENTS</b>		
<b>Extent of the thesis</b> (for bachelor theses min. 18 pages, for masters theses min. 25 pages), <b>balanced length of the thesis parts</b> (recommended length of the theoretical part is max. 1/3 of the total length), <b>logical structure of the thesis</b>	0-3	3
<b>Quality of the theoretical part (review)</b> (number and relevancy of the references, recency of the references)	0-3	3
<b>Accuracy in citing of the references</b> (presence of uncited sources, uniform style of the references, use of correct journal titles and abbreviations)	0-3	3
<b>Graphic layout of the text and of the figures/tables</b>	0-3	3
<b>Quality of the annotation</b>	0-3	3
<b>Language and stylistics, complying with the valid terminology</b>	0-3	2
<b>Accuracy and completeness of figures/tables legends</b> (clarity without reading the rest of the text, explanation of the symbols and labeling, indication of the units)	0-3	3
<b>Formal requirements – points in total</b>		20
<b>(2) PRACTICAL REQUIREMENTS</b>		
<b>Clarity and fulfillment of the aims</b>	0-3	3
<b>Ability to understand the results, their interpretation, and clarity of the results, discussion, and conclusions</b>	0-3	3
<b>Discussion quality – interpretation of the results and their discussion with the literature</b> (absence of discussion with the literature is not acceptable)	0-3	3
<b>Logic in the course of the experimental work</b>	0-3	3
<b>Completeness of the description of the used techniques</b>	0-3	3

Experimental difficulty of the thesis, independence in experimental work	0-3	3
Quality of experimental data presentation	0-3	3
The use of up-to-date techniques	0-3	3
Contribution of the thesis to the knowledge in the field and possibility to publish the results (after eventual supplementary experiments)	0-3	3
Practical requirements – points in total		27
<b>POINTS IN TOTAL (MAX/AWARDED)</b>		
	<b>47</b>	<b>(0-48)</b>

### Comments of the reviewer on the student and the thesis:

In her thesis, Vanja Mirosavljevic investigates the interesting connection between high-fat diet (HFD) and immune response to bacterial infection in *Drosophila*. The fact that HFD causes harm to the body and triggers metabolic diseases such as diabetes, atherosclerosis or metabolic syndrome, is a well know amongst the increasingly obese human population. However, the molecular connection between the high fat intake and the diseases is often poorly understood even in the case of a human. The phenotype of HFD feeding to *Drosophila* has until recently been quite poorly described despite the similarity in phenotypes between *Drosophila* and human. Vanja's work therefore brings new and important information in this field. During the work on her thesis she learned and applied many techniques and generated an impressive amount of data.

The thesis is very well written. The introduction is comprehensive, maybe with some slightly awkward grammatical formulations which however do not prevent understanding of the text. I would however appreciate if the list of abbreviations would be in alphabetical order. The method section is sufficiently detailed but not owerwhelming. The results are very well presented, showing the individual values for each measurements, and with proper and full description of the data that allow the reader to understand it without having to refer to the text. The only downside are the very last pictures from the confocal microscope (p.30) where the bright field and DAPI images are not shown and therefore the limits of the cells and nuclei can not be identified, making it difficult for the reader to interpret the picture. The discussion is partly scattedred in the Result section (which I think was a good decision) but it goes deeper in the last section of the thesis, comparing Vanja's results to the published literature not only from the *Drosophila* field but also looking for parallels to the mammalian systems and asking important questions for future conntinuations of the project.

In summary, Vanja did huge amount of work covering many experimental techniques, exceeding the expectations for a bachelor thesis. She also managed to present it in a nice way, leaving the hands of the referee nearly empty. I do not hesitate to allow her thesis to pass with the grade excellent.

### Question and comments for the defence:

- You state that the composition of the HFD was calculated to have the same energetic content per gram of food as control diet. How did you make these calculations?
- Why do you put catalase into the media used to grow *Streptomyces penumoniae*? It is not obvious from the description of the methods if you

washed the exponential culture of S.p. before using it for injection. If not, could the co-injection of catalase have an effect on the immune response?

- in the Method section you say that at least three independent infection experiments were conducted, but then in the Result section it looks that only a representative result of one repetition is used. Could you explain how many times were each of the experiments done?
- in the cited work of Trinidad de Paula (2016) the authors show a significant increase in ROS generation and mitochondrial dysfunction during HFD feeding of Drosophila. Do you think this could play a role in the decrease of life span you observed or in the low resistance to infection?

**Conclusion:**

In conclusion, I

**r e c o m m e n d**

**the thesis for the defense and I suggest the grade excellent .**

In Ceske Budejovice      date      5th September 2019



signature