



Přírodovědecká
fakulta
Faculty
of Science

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

OPPONENT'S REVIEW ON BACHELOR THESIS

Name of the student: Audra Salburg

Thesis title: 3D SBF-SEM analysis of inner organisation of unicellular protist cell

Supervisor: RNDr. Jiří Týč, Ph.D.

Referee: Jan Perner, PhD

Referee's affiliation: Institute of Parasitology, Biology Centre, AVČR

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

¹ Mark as: 0-unsatisfactory, 1-satisfactory, 2-average, 3-excellent.

Quality of experimental data presentation	0-3	2
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		
POINTS IN TOTAL (MAX/AWARDED)	48	(47) ²

Comments of the reviewer on the student and the thesis:

Audra Salburg constructed a high-quality bachelor thesis. It is very clearly visible that Audra is a very talented and/or hard-working individual as her thesis, in both form and content, could have been easily thought to be produced by a PhD student.

The introduction into her thesis is a high-level reading, not short of any key detail of current knowledge.

Aims are clearly formulated and stuck to throughout her work.

Results are fairly comprehensive, remotely resembling a form of a laboratory protocol, rather than a manuscript/thesis layout, but for me, this was easy to follow and thus functional and ok. The quality of the images and their legends was not always perfect. For example, in Fig. 6, it was not clear to me what the difference was between the arrow and "B" denoting. Other subcellular parts are unlabeled completely, preventing full appreciation. In subsequent images, while it is obvious, Audra should explain again what individual symbols used in the image mean.

Discussion was a pleasingly-sized portion at the end. In its content, it partly replicates the intro, possibly some mechanistic speculations could have been embarked on.

Suggestions and questions, to which the student has to answer during the defense.

Mistakes, which the students should avoid in the future:

1. I missed details on the phase before your cells became samples. Are these freshly collected cells, multiply-passaged (how many times), what temperature does this organism live and/or is cultured at,....

2. Fig.16 I guess should be the strongest evidence for full enclosion. For this to work that way, a 360° model should be shown or at least a front and rear visualisation, so that the reader is not left with doubt that he/she is looking at backwards denting.

3. On TEM images, eg Fig13, the presence of the "white ring" around the symbiont, indicates the formation of a "mitophorous vacuole". If the full enclosion really does occur, this vacuole membrane may form a full barrier for readily-flourishing metabolite trade. Could Audra speculate if she can conceive (finds more pros than cons) that such an intra-mitochondrial symbiosis would be propelled by physicality, that is for example that the symbiont would benefit from mitochondrial close proximity because of heat dissipation from mitochondria (eg: doi.org/10.1371/journal.pbio.2003992). That is, such a close-to-mitochondria residency would provide a warmer micro-niche that would facilitate faster catalysis/metabolism of the symbiont and be thus a trait to be positively selected for? It would be the first example of such

² Enter the number of points awarded.

"thermosymbiosis" I know of.

4. Sorry if I missed that, but is there any statistics to Table 5, ie can you see any pattern in the size distribution of symbiont close to and far from mitochondria?

5. A few typos (bacterias) and not a fully unified reference list, but these are all minorities....

6. I will finish off with a friendly request, if Audra can give us some more insights into the biology of the tick *Chlamydia psittaci* (p30, second paragraph, first sentence) :)

Conclusion: great work

In conclusion, I

r e c o m m e n d

the thesis for the defense and I suggest the grade excellent .³

In **České Budějovice** date **15.9.2023**

.....

signature

³ You can suggest a grade, which can be modified during the defense based on the presentation. However, if the reviewer is not present at the defense, the grade will not be counted. Grades: excellent (1). Very good (2), Good (3), Unsatisfactory/failed (4).