



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:** Jacqueline Bittner

**Thesis title:** Validation of mitochondrial localization and essentiality of prioritized proteins assigned to the tripartite attachment complex in the protozoan parasite *Trypanosoma brucei*

**Supervisor:** Ignacio Miguel Durante, Ph.D.

**Co-supervisor:** Mgr. Vendula Rašková

**Referee:** Corinna Benz, Ph.D.

**Referee's affiliation:** Institute of Parasitology, Biology Centre, Czech Academy of Sciences, České Budějovice, Czech Republic

|                                                                                                                                                                                                                                                                    | 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                      | 2         |
| <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                      | 2         |
| <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                      | 3         |
| <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>                                                                                                                                                                                                                       |                          | <b>19</b> |
| <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                      | 2         |

<sup>1</sup> Mark as: 0-unsatisfactory, 1-satisfactory, 2-average, 3-excellent.

|                                                                                                                                               |     |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------------|
| 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                 |
| 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<br>(after eventual supplementary experiments) | 0-3 | 2                 |
| Practical requirements – points in total                                                                                                      |     | 25                |
|                                                                                                                                               |     |                   |
| POINTS IN TOTAL (MAX/AWARDED)                                                                                                                 | 48  | (44) <sup>2</sup> |

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

Overall, the thesis is well written and describes the experiments performed in great detail. Jacqueline clearly understands the aims of the project and is capable of interpreting her results independently. The figures are clearly labelled and experimental procedures are thoroughly explained (which has resulted in a very long Materials and Methods section in respect to the rest of the thesis, but this is only a minor point of criticism). The introduction provides a good summary of what is currently known about the trypanosome TAC structure and the references therein are mostly on point.

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

#### **Mistakes, which the students should avoid in the future:**

Jacqueline should be a bit more careful when using citations and when stating numbers (90,000 genes in the *T. brucei* genome; tagging of 15,297 proteins; there is a total of about 9,000 genes, and the 15,297 referred to N- and C-terminally tagged proteins), but these are minor issues and don't affect the overall quality of the thesis.

Questions:

- In your restriction digests for the RNAi vectors, there is an additional band of about 200 bp in two of them (14750 and 4540) – can you please comment on this?
- The TAC is stably associated with cytoskeletal elements. Bearing this in mind, can you suggest another immunofluorescence technique/approach to verify your proteins' exact localisation?
- Most of your proteins are hypothetical; some of them however possess certain domains hinting at a potential function. Can you speculate about why these proteins would be part of the TAC/found in this part of the trypanosome cell?
- If you had confirmed a TAC localization for any of your proteins, what would your next set of experiments have looked like? Which RNAi phenotype(s) would you have expected?

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<sup>2</sup> Enter the number of points awarded.

**Conclusion:**

In conclusion, I

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

**the thesis for the defense and I suggest the grade 1.5 .<sup>3</sup>**

In **Česke Budějovice** date **3<sup>rd</sup> of June 2022**

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signature

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<sup>3</sup> 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).