



OPPONENT'S REVIEW ON BACHELOR THESIS

Name of the student: Lorenz Karl

Thesis title: Characterization of the recombinant proteins SER 3 and BARN

Supervisor: Michal Žurovec, prof. RNDr. CSc.; Václav Brož, Mgr. Ph.D.; Yu-Hsien Lin, MSc.

Referee: Mgr. Lenka Malinovská, Ph.D.

Referee's affiliation: CEITEC Masaryk University

	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	2
Graphic layout of the text and of the figures/tables	0-3	2
Quality of the annotation	0-3	2
Language and stylistics, complying with the valid terminology	0-3	2
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		17
(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	2
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	2
Practical requirements – points in total		24

POINTS IN TOTAL (MAX/AWARDED)	48	(41)²
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Comments of the reviewer on the student and the thesis:

The bachelor thesis by Lorenz Karl focuses on production of recombinant proteins with potential utilization as bioadhesive substances. The extent of the thesis is more than sufficient and the theoretical part is well written, nicely introducing the research topic. The citing of the references, language and stylistics are generally of good quality; figure legends are accurate and complete. The graphic quality of the figures could be improved (For example, some bands on Figure 9 are practically invisible).

The aims of the thesis are clearly defined and the number of experiments is more than sufficient for the bachelor thesis. The variety of used methods is quite wide, ranging from recombinant proteins production to scanning electron microscopy. Results are well presented and extensively discussed, including possible future solutions to problems encountered during experiments.

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

Mistakes, which the students should avoid in the future:

Suggestions:

- 1) Pay attention to the correct names of organisms – the Latin names must be in italics.
- 2) The thesis suffers from confusing (random?) usage of capital letters (Bacterial Cell cultivation vs. Bacterial Cell Lysis, Mass spectrometry vs. Electron Microscopy, etc.). Try to unify the capitalization.
- 3) Avoid the term “protein expression”. The *genes* are expressed as *proteins*. Proteins could be prepared or produced.

Questions:

- 1) Chapter 1.3 Surface treatment – Wood is mentioned as one surface which could be coated by bioadhesives. Where are wood surfaces with bioadhesives used? What are their applications?
- 2) Chapter 3.3 Bacterial culture – The concentrations of ampicillin and chloramphenicol are given as 0.6 µL/mL and 0.3 µL/mL, respectively. Could you provide more informative form of concentrations?
- 3) Chapter 3.2 Recombinant DNA encoding adhesives – “Ser 3 was derived from the *Bombyx mori* Sericin 3 protein (NP_001108116.1) (Geer et al. 2010).” Provided reference of Geer et

² Enter the number of points awarded.

al. leads to the general paper describing NCBI database system. Therefore, could you explain how was the Ser 3 derived from Sericin 3 protein?

4) Page 18 – “Throughout the elution fractions, the single band shifts upwards (from 37 kDa to 49 kDa).” Do you mean that the protein was gaining weight during the elution process? What was the reason for this behavior?

5) Page 22, in Table 2 is presented a “List of contaminants found by mass spectrometry analysis of Ser 3. The list shows the name of each database that was used to determine the identity of each contaminant.” The Table contains several proteins from *Bombyx mori* listed as contaminants of Ser 3. Are you sure they are real contaminants, i.e. unwanted additional proteins in low concentrations?

6) Page 32 – “The low number of cells counted for the BSA coated area suggests good spreading of the protein.” Does low number of adhered cells generally correlate with good spreading of proteins?

Conclusion:

The theoretical part of the thesis is of good quality and the methodologically rich experimental part is supported by extensive discussion.

In conclusion, I

recommend / do not recommend*

the thesis for the defense and I suggest the grade **2**.³

In Brno date 21. 1. 2020



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Lenka Malinovská

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).