



Přírodovědecká
fakulta
Faculty
of Science

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

SUPERVISOR'S STATEMENT ON BACHELOR THESIS

Name of the student: Jakob Schmelzer
Study program: biological chemistry
Department/Institute: Chemistry
Thesis title: Expression and purification of tick-borne encephalitis virus capsid protein

Supervisor: Zdeněk Franta
Supervisor's affiliation: UCH

	Point scale ¹	Points
(1) FORMAL REQUIREMENTS		
Formal and graphical quality of the thesis	0-3	2
Ability to work with literature	0-3	2
Language and stylistics	0-3	2
Formal requirements – points in total		6
(2) PRACTICAL REQUIREMENTS		
Fulfillment of the aims	0-3	2,5
Ability to understand the results, their interpretation, and clarity of the results, discussion, and conclusions	0-3	2
Discussion quality – interpretation of results and their discussion with the literature	0-3	2
Experimental difficulty of the thesis, independence in experimental work	0-3	2
Contribution of the thesis to the knowledge in the field and the possibility to publish the results (after eventual supplementary experiments)	0-3	2
Practical requirements – points in total		10,5
POINTS IN TOTAL (MAX/AWARDED)		
	24	(16,5)²

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

² Enter the number of points awarded.

Comments of the supervisor on the student and the thesis:

Jakob joined our lab in fall 2019. He started to work on the project involving cloning and recombinant production of capsid protein from Tick borne encephalitis virus (TBEV). Jakob started to optimize the protein production using whole capsid protein including the membrane anchor, however despite the tremendous efforts the project did not lead to desired recombinant protein. After some time, we decided to remove the membrane anchor and clone only the cytosolic part of the protein into the pET expression vector. Jakob managed to clone the truncated capsid protein into the pET19b vector and started with the pilot experiments. Unfortunately, also this approach did not lead to very successful production. Even though the capsid protein does not have any disulfide bridges or glycosylation, protein proved itself to be a challenge. Jakob systematically tried various cell lines, conditions until he managed to get some protein production in the cytoplasmic fraction of *E. coli*. Although we know the protein production is not the highest, we decided to try a pilot purification, not only to get the protein, but also to show to Jakob that the lab work is not only about *E. coli* cultivation and SDS page analysis. The project took quite long, due to the combination of covid restrictions, challenging protein, and a bit relaxed Jakob's attitude. Another criticism goes to thesis writing, which could be in my eyes done earlier and more conscientiously. Jakob start writing about a year after he finished the lab work, and it took quite some time and effort until he gets back into the topic.

Despite the fact we did not get decent production of capsid protein, I think that Jakob learned several methods and approached of molecular biology, which he could use during his master study. I am convinced that Jakob fulfilled (at least partially) all the goals of his thesis, which meets all the criteria of USB.

Conclusion:

In conclusion, I
r e c o m m e n d
the thesis for the defense.

In České Budějovice date 23.01.2023

signature