SUPERVISOR'S STATEMENT ON BACHELOR/~~DIPLOMA~~[*] THESIS

Name of the student:	Isabella Guger
Study program:	Biological Chemistry
Department/Institute:	Institute of Chemistry and Biochemistry
Thesis title:	Crystallization and modelling studies of human oxydosqualene cyclase hOSC wild type and 521W mutant variant
Supervisor:	Tatyana Prudnikova, Mgr. Ph.D.
Co-supervisor:	Doc. Mgr. Ivana Kuta Smatanova, Ph.D.
Supervisor`s affiliation:	Institute of Chemistry and Biochemistry

	Point scale[1]	Points
(1) FORMAL REQUIREMENTS		
Formal and graphical quality of the thesis	0-3	3
Ability to work with literature	0-3	2
Language and stylistics	0-3	3
Formal requirements – points in total		8
(2) PRACTICAL REQUIREMENTS		
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 results and their discussion with the literature	0-3	3
Experimental difficulty of the thesis, independence in experimental work	0-3	3
Contribution of the thesis to the knowledge in the field and the possibility to publish the results (after eventual supplementary experiments)	0-3	3
Practical requirements – points in total		14

POINTS IN TOTAL (MAX/AWARDED)	24	22

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[*] Choose one

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

Comments of the supervisor on the student and the thesis:

Protein crystallography is one of the key techniques of structural biology and is focused on determination of three-dimensional structure of proteins or nucleic acids by the means of single crystal x-ray diffraction. As proteins are both structural and functional units of living organisms the knowledge of their structure helps our understanding of their mechanisms and functionality and also enables targeted modifications with effects on their activity. The critical step in the protein structure determination is the crystallization as the process of formation of a protein crystal. To develop protein crystals is very difficult, as the process is influenced by many factors, including pH, temperature, ionic strength in the crystallization solution, and even gravity.

Bachelor thesis describing in the introduction part the process of macromolecular crystallization, the factors, that influence the process, several crystallization techniques and methods, the protein samples she worked with and so on. The methodological part includes all the methods, she used at her bachelor work. The last part of the thesis is consist of obtained results on the model protein with known structure and the protein samples of the interest.

Isabella Guger started to work at our lab of Structural Chemistry at the Biological Faculty of South Bohemia University at the end of 2016 year with the protein crystallization and 3D structure prediction. Isabella during 2.5 years was able to produce scientific results that will be used for further human oxydosqualene cyclase structure determination. After relatively short period of time she was able to work independently on crystallization of human oxydosqualene cyclase. She started her work to learn the protein crystallization on a base of the model protein with known structure. Further she applied her knowledge on wild type and mutant variant of human oxydosqualene cyclase. Finally, she was able to optimize the preliminary results of crystallization experiments. To obtain the diffraction quality crystals is often very time-consuming and complicated process, therefore the prediction the 3D structure by homology modelling was applied. Isabella by herself was able to predict the wild type structure of the protein and the mutant form by homology modelling. And finally, to compare the structures with already known deposited structures and to prepare the figures in PyMol.

Isabella is hardworking and well-educated student. In a short period of time was able to work self-sufficiently with all the crystallization experiment and learn all the basic and advanced techniques and methods. During her study she was able to predict and analyze 3D structures of the hOSC proteins. She efficiently worked with the literature and was able to find a lot of the information by her-self.

Conclusion:

Isabella Guger was able to learn all the crystallization techniques and methods and 3D structure prediction. By her work participated at the research project as the junior scientist in the field of protein crystallography. Finally, she was able to work independently on the protein crystallization and optimization of the obtained results to be able to grow the crystals of diffraction quality.

In conclusion, I

r e c o m m e n d / ~~**do not recommend**~~*

the thesis for the defense.

In **Ceske Budejovice**   date   **6.6.2019**

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signature