

Posudek školitele na diplomovou práci

školitelský posudek

Jméno školitele: Petr Novak

Datum: May 26th, 2024

Autor: Aleksandr Melikov

Název práce: Investigation of HSP70 oligomerization by structural mass spectrometry

Zadané cíle práce, včetně tématu literárního přehledu:

It was such a coincidence when Aleksandr Melikov entered my office at the BioCeV two years ago. He told me he wants to sort out the homodimerization of human HSC70 protein by chemical cross-linking and mass spectrometry. Then, he added I'm leaving Prague for Heidelberg to learn the recombinant expression of proteins and he was back at the end of summer with human HSC70 and JB1. Surprisingly, very similar topic represents one task of my grant proposal I'm working on. During the discussion, it was impossible to overlook his passion, deep insight into the problem and enthusiasm to break through. So, it was easy to define the goals of his thesis since he had already designed the entire project. He returned at the end of September with both proteins and plasmids. The fun begun.

Přístup studenta k práci s literaturou:

Aleksandr joined my group well prepared for his scientific endeavor. It was easy to notice he received these skills during his bachelor's study. He went through many papers describing the oligomerization of human HSP70 proteins and he dug deep in those utilizing mass spectrometry techniques. Further, he immediately tried to compare his experimental results with published data especially when his experiments did not proceed well.

Přístup studenta k práci v laboratoři (přístup při učení se nových metod, aktivita, samostatnost, systematická práce i docházky do laboratoře):

During the master thesis, Aleksandr adopted several techniques of molecular biology, protein chemistry, biochemistry and structural proteomics. In Heidelberg, he was trained to transform E. coli cells by plasmids, propagate them and perform the final extraction and purification of regular and isotopically depleted recombinant proteins. Subsequently, he learnt the mass photometry to track the oligomerization status of his protein system, chemical cross-linking and sample preparation for mass spectrometry analysis including the data interpretation to uncover regions of HSC70 protein responsible for homo-oligomerization. Finally, he made an attempt to create in-silico structural model of his biological system utilizing homology modelling and molecular dynamics. It was easy to motivate him for everyday labor and learning new techniques and technologies. Moreover, he was also well accepted by many lab mates because of his feeling of the team spirits and educating new coming fellows.

Přístup studenta při sepsování práce:

It is not that hard to evaluate this part as well. Alex discussed the layout of the thesis, and he sent back the introductory part. After minor revision, the introduction reached the criteria of master thesis. Further he wrote the methods and results. Only minor corrections were necessary. During writing the results, Alex already pointed out the data that deserve further discussion in the last part of the thesis.

Splnění cílů práce a celkové hodnocení:

Finally, the content of the thesis clearly demonstrates that the broad repertoire of skills was

adopted by the MSc candidate for studying biomolecules with extension to non-covalent complexes. The presented data represent significant achievements on studied biological systems and thus satisfies a novelty requirement for the master thesis. In my opinion, the thesis is easy to understand, the problem is clearly defined, and the primary data are correctly interpreted. The used experimental workflow is appropriate in the context of the thesis goals and all applied methods are correctly described allowing to repeat all experiments. Further, the results are presented in a logical way, there is not any signs of overestimating primary data. The summary section addresses all important discoveries and observations and discusses them in the context of current knowledge.

In conclusion, I support the defense of the MSc candidate thesis entitled “Investigation of HSP70 oligomerization by structural mass spectrometry”.

Návrh hodnocení školitele:

výborně velmi dobře dobře nevyhověl(a)

Podpis školitele:

