Posudek na bakalářskou práci

☐ školitelský posudek ☒ oponentský posudek	Jméno posuzovatele: Christos Feidakis
	Datum:25/05/2024

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Název práce: Degree of protein structure disorder in prokaryotic and eukaryotic organisms

☒ Práce je literární rešerší ve smyslu zveřejněných požadavků (pravidel).
☐ Práce obsahuje navíc i vlastní výsledky.

Cíle práce (předmět rešerše, pracovní hypotéza…)
In this work the author explores the properties and role of intrinsically disordered proteins (IDPs) and regions (IDRs), their involvement in biological processes and the pathology of disease, as well as their abundance across different environments. The work is based on existing literature.

Struktura (členění) práce: The work features an overview of predictors of IDPs and IDRs, including both machine learning and expert systems. It highlights inconsistencies in their collective performance and underlines the performance gap against predictors that operate on structured regions.
The second part of the thesis focuses on the degree of observed disorder across different taxa, organisms and cellular compartments, pointing out the higher abundance of disorder in eukaryotes, but also highlighting a potential contradiction, that disorder does not seem to simply increase with organism complexity, particularly within eukaryotes.

Jsou použité literární zdroje dostatečné a jsou v práci správně citovány?
Použil(a) autor(ka) v rešerši relevantní údaje z literárních zdrojů?
The author used sufficient sources of literature with respect to their amount, relevance and how recently they were published. They covered most of the well-known disorder predictors to my knowledge.

Pokud práce obsahuje (nadstandardně) i vlastní výsledky, jsou tyto výsledky adekvátním způsobem získány, zhodnoceny a diskutovány?

Formální úroveň práce (obrazová dokumentace, grafika, text, jazyková úroveň):
The visual documentation and graphics were satisfactory. The text had a few errors (syntax and spelling) but was comprehensible and the work itself was well structured. I have added comments pertaining to spelling and syntax throughout the PDF file of the thesis, that the author can use for applying corrections if they choose to do so. I recommend a simple spell checker in the future to avoid simple mistakes like the lack of articles (e.g., "a", "the") and avoiding contractions in formal writing (joining words with apostrophes).

Splnění cílů práce a celkové hodnocení:
I consider that this work is of good overall quality and engages an interesting and relevant topic. I enjoyed reading it and I recommend it for defense.

Otázky a připomínky oponenta:
1.   How are IDRs and IDPs defined and identified in the following contexts: 1)X-

ray data and 2)NMR data. More specifically, how are these regions harvested from experimental data, in order to be used for training ML-predictors for example (what is the basic pipeline)?

2.   "Long sequences of disorder", and disordered regions in general, seem to be defined as sequences of continuous amino acids. In your opinion, is the lack of structure in a disordered region strictly attributed to the entire sequence of amino acids being disordered, or could it be that small intermittent fragments – or even single residues – within these regions may be enough to trigger disorder over an entire region?

3.   Could you develop a hypothesis explaining the higher abundance of disorder within certain cell compartments (nucleus, cytoskeleton), relative to others (lysosome, peroxisome), considering the different functions between them or any other factors that you consider relevant? Can you name a potential reason that compartment-exclusive proteins tend to be more disordered than multi-compartmental proteins?

Návrh hodnocení školitele nebo oponenta (bude zveřejněn)
☒ výborně   ☐ velmi dobře   ☐ dobře   ☐ nevyhověl(a)

Podpis školitele/oponenta: