

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Mikhail Moldovan

PhD Program: Life Sciences

Title of Thesis: Heritable modifications of transmitted biological information as possible sources of adaptation

Supervisor: Professor Mikhail Gelfand

Name of the Reviewer:

<p>I confirm the absence of any conflict of interest</p> <p>(Alternatively, Reviewer can formulate a possible conflict)</p>	<p>Date: 07-08-2022</p>
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The purpose of this report is to obtain an independent review from the members of PhD defense Jury before the thesis defense. The members of PhD defense Jury are asked to submit signed copy of the report at least 30 days prior the thesis defense. The Reviewers are asked to bring a copy of the completed report to the thesis defense and to discuss the contents of each report with each other before the thesis defense.

If the reviewers have any queries about the thesis which they wish to raise in advance, please contact the Chair of the Jury.

Reviewer's Report

Reviewers report should contain the following items:

- Brief evaluation of the thesis quality and overall structure of the dissertation.
- The relevance of the topic of dissertation work to its actual content
- The relevance of the methods used in the dissertation
- The scientific significance of the results obtained and their compliance with the international level and current state of the art
- The relevance of the obtained results to applications (if applicable)
- The quality of publications

The summary of issues to be addressed before/during the thesis defense

In the presented PhD thesis “HERITABLE MODIFICATIONS OF TRANSMITTED BIOLOGICAL INFORMATION AS POSSIBLE SOURCES OF ADAPTATION” Mikhail Moldovan investigated the role of adenine-to-inosine RNA editing and phosphorylation of proteins in evolution.

The three chapters devoted to the description of the results (Chapters 3-5) comprise a core of the thesis. The other chapters contain Introduction (Chapter 1), Review of the literature (Chapter 2) and Conclusion (Chapter 6).

Chapter 3 is devoted to the exploring of adaptive evolution at mRNA editing sites in soft-bodied cephalopods. It was found that editing in the cephalopods sometime masks beneficial A-to-G substitutions.

Chapter 4 is devoted to the building of cluster hierarchy of cephalopod mRNA editing sites. Mikhail found that clustered editing contributes up to a half to the total transcript and proteome variability generated by editing.

Chapter 5 is devoted to the analysis of phospho-islands and the evolution of phosphorylated amino acids in mammals. It was found that phosphorylation sites in mammalian proteomes tend to mutate to negatively charged amino acids and clusters of phosphosites have more acidic neighborhood.

The results of the presented works are scientifically significant and comply with the international level and current state of the art. The work is valuable for fundamental research. The publications are of high quality, the number of publications suits the requirements for the publication-based PhD thesis.

The dissertation conforms to international standards. It has a clear structure; the topic corresponds to the actual content.

To summarize, I rate the PhD thesis of Mikhail Moldovan as very interesting and important, of a high quality and scientifically significant.

Provisional Recommendation

I recommend that the candidate should defend the thesis by means of a formal thesis defense

I recommend that the candidate should defend the thesis by means of a formal thesis defense only after appropriate changes would be introduced in candidate's thesis according to the recommendations of the present report

The thesis is not acceptable and I recommend that the candidate be exempt from the formal thesis defense