

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Evgeniia Alekseeva

PhD Program: Life Sciences

Title of Thesis: Evolutionary analysis of intrahost interaction between pathogens and adaptive immunity

Supervisor: Professor Georgii Bazykin

Name of the Reviewer:

I confirm the absence of any conflict of interest (Alternatively, Reviewer can formulate a possible conflict)	Date: 03-07-2023
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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 “Evolutionary analysis of intrahost interaction between pathogens and adaptive immunity”, Evgeniia Alekseeva investigated the process of evolution in selected host-pathogen systems.

Two chapters of the PhD thesis devoted to the description of the results (Chapters 3 and 4) comprise a core of the thesis. The other chapters contain Introduction (Chapter 1), Literature Review (Chapter 2) and Conclusions (Chapter 5).

In Chapter 3, Evgeniia found positive selection in both HBmem and LBmem lineages on the way from the germline sequence from the most recent common ancestor. Evgeniia showed that the observed evolutionary pressure was more pronounced in LBmem lineages than in HBmem ones.

In Chapter 4, Evgeniia studied intrahost SARS-CoV-2 evolution in exceptionally interesting case during 318-days-long SARS-CoV-2 infection in one patient. Evgeniia found that SARS-CoV-2 underwent 40 changes in its genome, 34 of which were present by the end of study.

Thus, the process of arm race of host-pathogen co-evolution was studied both from the host point of view (Chapter 3) and from the pathogen point of view (Chapter 4), which makes the work of Evgeniia Alekseeva concise and elegant. 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 Evgeniia Alekseeva 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