

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Daria Artamonova

PhD Program: Life Sciences

Title of Thesis: Comparative Analysis of the Action of Eubacterial Class 1 CRISPR-Cas Systems.


Supervisor: Professor Konstantin Severinov

Chair of PhD defense Jury: Professor Yuri Kotelevtsev

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Date of Thesis Defense: October 24, 2017

Name of Reviewer: Timofei Zatsepin

I confirm the absence of any conflict of interest	Signature:
(Alternatively, Reviewer can formulate a possible conflict)	
	Date: 20-09-2017

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 forward a completed copy of this report to the Chair of the Jury 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 relevancy of the topic of dissertation work to its actual content
- The relevancy 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

This thesis is a study of peculiarities in CRISPR-Cas systems functioning. Thesis consists of two sections devoted to I-F subtype system and to III-A and III-B subtypes. Darya studied I-F subtype system and demonstrated that all components of CRISPR-Cas machinery are required for adaptation. She found out that the distribution of spacers in the region around the priming point in I-F system is opposite to well-studied I-E system. In second part Darya studied less known III-A and III-B CRISPR-Cas systems in *T. thermophilus*. She observed only interference - no adaptation was found even using rather sophisticated approaches. This system is not as simple as type I, so seed was not determined in this study. This thesis is valuable for understanding the mechanisms and diversity of CRISPR-Cas systems. I want to emphasize logic and consistency of the study.

However, there are some issues that should be fixed before defence. The literature overview is extremely hard to follow due to the absence of any illustrations. Parts 1.3, 2.2, 3.2, 3.3 should be illustrated with the figures from original publication or reviews with appropriate citing to simplify reading. Partial crystal structure of Cas1-Cas2 complex with DNA with marked regions discussed in the text will also improve thesis.

Main parts of the thesis work were published in hi-rank journals and also presented at International Conferences (e.g., CRISPR-2016).

In summary, I consider this excellent thesis work.

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