

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Sergey Shmakov

PhD Program: Life Sciences

Title of Thesis: Computational approaches for discovery of novel CRISPR-Cas systems

Supervisor: Professor Konstantin Severinov

Chair of Ad hoc Jury: Professor Mikhail Gelfand

Email: mikhail.gelfand@gmail.com

Date of Thesis Defense: October 16, 2017

Name of Reviewer: Udi Qimron

I confirm the absence of any conflict of interest

(Alternatively, Reviewer can formulate a possible conflict)

Signature:
Prof. Udi Qimron
Clinical Microbiology and Immunology
Sackler School of Medicine
Tel Aviv University
6/9/2017
Date: DD-MM-YYYY

The purpose of this report is to obtain an independent review from the members of Ad hoc Jury before the thesis defense. The members of Ad hoc 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 *mind*

Superb work. Led to significant findings, very well written. see comments in a separate ~~file~~ document.

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

September 6th 2017

Review of the PhD thesis of Mr. Sergey Anatolyevich Shmakov

The PhD thesis submitted by Mr. Shmakov focuses on Identification of new CRISPR-Cas systems through bioinformatics. The work indeed successfully accomplished its aims of identifying several novel systems. Novel CRISPR systems may constitute significant advance in both the understanding of CRISPR-Cas mechanisms, and in providing advanced tools for applications. Such tools may overcome several shortcomings in applications using current CRISPR-Cas systems.

The thesis is articulately written. The introduction is thorough with all the relevant paragraphs necessary to understand the work, and more importantly, without unnecessary paragraphs. It explains what the existing knowledge was, and emphasizes the gaps in knowledge. It explains the logic for carrying out the study, and provides the relevant background. This demonstrates high level of writing capability and clear scientific thinking. The methods are presented clearly, with enough details to reproduce the results and to understand the workflow. The results and discussions are also presented clearly and logically. It summarizes all the data and relates it to existing knowledge. Significantly, the results of the thesis were published in high-impact journals – such as Molecular Cell and Nature Reviews Microbiology, which also points out their importance.

The topic of the dissertation fully matches the results presented in the thesis. As indicated, the results are highly significant, and are in the forefront of science, as also demonstrated in their publication. The results may also facilitate applications of these newly discovered CRISPR systems, with advantages over current ones, as indicated above.

Overall, the thesis submitted reflects very high capabilities of a PhD student, in terms of writing, scientific thinking, and potency to reveal new findings. I therefore wholeheartedly recommend to recognize this thesis as fulfilling the requirements for granting a PhD degree.

Sincerely,

A handwritten signature in blue ink, appearing to read "U. Qimron", is written over a light blue rectangular background.

Prof. Udi Qimron, Tel Aviv University