Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Elena Kurilovich

PhD Program: Life Sciences

Title of Thesis: The role of genome maintenance proteins in primed CRISPR adaptation by the type I-E CRISPR-Cas system

Supervisor: Prof. Konstantin Severinov

Name of the Reviewer: Prof. Mikhail Gelfand

I confirm the absence of any conflict of interest	**Date: 08-08-2023**

Reviewer's Report
The review is concise but sufficiently detailed, as it introduces all necessary concepts and biological facts, as well as some open problems. The review lays a setting for the objectives of the study.
The methods are diverse, adequate and well-described.
Three paragraphs of Chapters 4 "Results" are based on three published papers. The organization of this chapter is somewhat paradoxical: the first paragraph is not directly related to the main project, although is loosely linked to it; moreover, its results are not reflected in the conclusions. Probably, in a more natural order, it would have been the last one.
Large portions of the text report the results of others, incorporated into the dissertation for completeness and better understanding, but this is not a problem, as the author's contributions are explicitly stated at the beginning of each paragraph. At that, in the main papers/paragraphs the role of the author was mainly to perform DNA purification, prepare NGS libraries for sequencing, and analyze the sequencing results. In one of the projects the author has participated in construction of mutants.
The results of the study are interesting, as they demonstrate and partially dissect the mechanism of repair machinery on CRISPR-Cas adaptation process. They are convincingly integrated in the Discussion and summarized in the Conclusions. The latter should have been more transparent — for instance, what is the intended sense difference between "involvement <…> of RecBCD and SbcCD pathways in spacer acquisition" (1) and "2. RecBCD and SbcCD affect the pattern of acquired spacers"?
The candidate has published three papers of the 1st quartile (two) and 2nd quartile (one, first-author), all with IF>3. Hence, Skoltech publishing requirements have been formally met. However, the first-author paper is not the one that reports the main results of the study, but rather is tangential to it, see above.
Nothing is said about reports at conferences, so this needs to be addressed during the defense.

Provisional Recommendation
☒ *I recommend that the candidate should defend the thesis by means of a formal thesis defense*