Skoltech
Skolkovo Institute of Science and Technology

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Mariia Vlasenok

PhD Program: Life Sciences

Title of Thesis: Transcriptomic analysis of the interaction between pre-mRNA splicing and intronic polyadenylation

Supervisor: Associate Professor Dmitri Pervouchine

Name of the Reviewer: Oleg Gusev

I confirm the absence of any conflict of interest (Alternatively, Reviewer can formulate a possible conflict)	**Date: 20-11-2023**

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

The thesis of Mariia Vlasenok focused on the complicated and yet to be explored in detail: tissue-specific genome-wide distribution of alternative polyadenylation sites in both coding and non-coding areas, and its function. The dissertation is well-organized with deep immersion in the topic in the literature review, including comprehensive illustrations. The topic of the dissertation is relevant to its key content, and the aspects where Mariia put the most effort: linking mechanisms of pre-mRNA splicing and intronic polyadenylation. The thesis is based on pure in-silico work on the open databases (mostly GTEx project), but lack of experimental data is well-balanced by the development an original approach in enhanced identification and analysis of polyadenylation. In my impression, the quality of analysis, based in the original contribution to the bioinformatics approaches put the dissertation to the proper international level, especially considering the complicated nature of the analysis of polyadenylation based on NGS data. Nevertheless, the candidate successfully completed the main tasks associated with the study. The publication list reflects actual results and well-match the topic of the publication. In my opinion, especially considering the current situation, Mariia fulfilled all needed publication requirements for the thesis defense.

One part I really missed in the dissertation is an idea about data represented in Table 5.1. The number of PAS in protein-coding sequences greatly exceeds the number of genes, and there are hundreds of thousands of cases of PAS in intergenic regions. What are they? Is it the polyadenylation “noise”, like one we see in transcription starting sites modules, or something functional? Maybe it an evidence of new overlooked mini-genes? I hope to be able to discuss it during the defense Q&A session.

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*