Skoltech
Skolkovo Institute of Science and Technology

# Jury Member Report – Doctor of Philosophy thesis.

**Name of Candidate:** Rim Gubaev

**PhD Program**: Life Sciences

**Title of Thesis:** Genetic association mapping for agronomically important traits in rapeseed and sunflower

**Supervisor:** Professor Philipp Khaitovich

**Name of the Reviewer:** Georgii A. Bazykin

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| I confirm the absence of any conflict of interest | **Date: 30-09-2022** |

*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

Mr. Gubaev's thesis represents a high-quality study of association between genotype and several important phenotypic traits for agriculturally important species. The study uses state-of-the-art approaches, and its results are novel and relevant for genomic selection, an important avenue for future improvement of major crops.

The structure of the thesis is traditional, with a "Literature review" and "Materials and Methods" chapters common to all results, followed by three results chapters and a brief common conclusions chapter. Such a structure is appropriate for this material which applies consistent approaches to two different systems. The text of the thesis is lengthy, elaborate, but very clear and transparent, on which I congratulate the author. In the introduction, clear and systematic explanations are given for complex concepts.

The results focus on identification of genetic architecture of three traits in two species: the content of glucosinolate, a metabolite responsible for bitter taste, in rapeseed; and the oil-quality traits and seed morphology in sunflower. Using state of the art methods for identification of genetic associations and mapping of QTLs, the author is able to identify novel loci responsible for these traits.

The obtained results are robust; for example, the SNPs detected as significant in a GWAS analysis in Chapter 4 are cross-validated with data from several consequent seasons. The detected loci are also confirmed via functional annotation.

The results of the work are published in five papers in renowned journals, on two of which Rim is the first author. These publications are sufficient for defense at Skoltech. I was unable to find information on presentation of these results at international meetings; this should be clarified at the defense.

**Provisional Recommendation**

X *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*