

## Jury Member Report – Doctor of Philosophy thesis.

**Name of Candidate:** Aleksei Mikhailchenko

**PhD Program:** Life Sciences

**Title of Thesis:**

COMPARATIVE BIOLOGY OF AGING THROUGH THE LENS OF INDUCED PLURIPOTENT STEM CELLS

**Supervisor:** Prof. Philipp Khaitovich

**Co-Supervisor:** Prof. Vadim Gladyshev

**Chair of PhD defense Jury:** Prof. Olga Dontsova

**Email:** o.dontsova@skoltech.ru

**Date of Thesis Defense:** 23 October 2018

**Name of the Reviewer:**

<p>I confirm the absence of any conflict of interest</p> <p>(Alternatively, Reviewer can formulate a possible conflict)</p>	<p><b>Signature:</b></p>  <p><b>Date: 17-10-2018</b></p>
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*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

The author has developed a technique to establish an IPS cell line of the naked mole rat (NMR), which to me seems to be quite an achievement. NMR is a model species in aging research, and existence of such a line should facilitate and simplify the study of the causes of its remarkable longevity, and ultimately, of aging in general.

Issues:

Since each of the two papers to which Aleksei has contributed is a multi-author paper, I would have appreciated a statement identifying what exactly his contribution to each of them has been. Still, Aleksei is listed as a co-first-author on both these papers, so this contribution was high.

Most of the figures are unacceptably low resolution (e.g., Fig. 3), sometimes to the point of the text being unreadable (e.g. Fig. 7).

The argument on the higher similarity between the DEGs in NMR and human vs NMR and mouse iPSCs is based on a comparison in Fig. 17D. However, the text overstates this difference. In fact, apparently  $369/3852 = 0.0957$  genes are DE'ed in NMR, among those DE'ed in human, while the corresponding number for mouse are  $242/2799 = 0.086$ . It would be nice to point out the statistical significance of this difference (probably using the Fisher's exact test).

**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*