Skoltech
Skolkovo Institute of Science and Technology

Jury Member Report – Doctor of Philosophy thesis.

Name of Candidate: Pavel Proshin

PhD Program: Materials Science and Engineering

Title of Thesis: Films with pattern-placed drug for use in personalized medicine

Supervisor: Professor Gleb Sukhorukov
Co-supervisor: Professor Alexander Korsunsky

Name of the Reviewer: Sergey Chvalun

I confirm the absence of any conflict of interest _____	**Date: 15-10-2024**

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 PhD thesis presents a coherent structure with well-organized chapters that contribute to the overall quality of the work. The topic is relevant, addressing important aspects of drug-eluting films and controlled release systems, and aligns well with the actual content, demonstrating a clear research focus.

The methods used in the thesis are relevant and standard for this type of work, including solvent casting polymer films forming and drug release modeling. These approaches are widely accepted in the field of drug delivery systems, ensuring the reliability of the experimental data and aligning with established research protocols for studying controlled release dynamics.

The dissertation aligns with the current state of the art, providing valuable insights into the manufacturing of drug-eluting coatings and addressing challenges related to burst release in such systems. The findings contribute to the global discussion on drug delivery technologies. The proposed method of additive manufacturing is original, and from an application standpoint, the research offers significant results, particularly for medical devices coatings. Additionally, the scalability of the production methods for drug-eluting films suggests strong potential for real-world applicability.

The quality of publications linked to the thesis is solid, with notable contributions to scientific discussions in the field.

However, some areas could benefit from improvements, including figure clarity, broken references, and more detailed justifications for method selections. Addressing these points before the defense would enhance the overall quality of the dissertation.

The summary of issues to be addressed before/during the thesis defense:

1) The thesis should briefly mention the potential to apply the proposed method for proteins and non-water soluble drugs. This would expand the relevance of the work.
2) Including SEM images of the film cross-sections in the porogens chapter could improve the thesis, offering clearer insights into the structure and performance of the system.

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*