

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:

<p>I confirm the absence of any conflict of interest</p> <p>(Alternatively, Reviewer can formulate a possible conflict)</p>	 <p>Date: 06-10-2024</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

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 dissertation focuses on drug-eluting films (DEFs) made of bioresorbable polymers for personalized medicine, which aligns well with the title and stated objectives. The content covers the development of a new technology called PLACE (Printed Layered Adjustable Cargo Encapsulation) for producing DEFs, which is directly relevant to the topic.

The dissertation appears well-structured, following a logical flow from introduction to conclusion. It includes a comprehensive literature review, experimental methods, results, and practical applications. The work is of high quality, with multiple publications in peer-reviewed journals supporting the research.

The methods appear to be appropriate and state-of-the-art, including 3D printing, SEM, GPC measurements, and drug release investigations. The use of laser microperforation and e-beam sterilization demonstrates the application of advanced techniques in the field.

The development of the PLACE technology for producing large-area DEFs with precise drug loading and multilayering capabilities appears to be a significant contribution to the field. The investigation of accelerated release methods and the stability of polymers after e-beam sterilization adds valuable knowledge to the area of drug delivery systems.

The research has clear applications in personalized medicine, particularly in the development of drug-eluting coatings for medical devices. Chapter 5 specifically addresses practical aspects of the technology, including methods for creating patterns and securing coatings on various surfaces, demonstrating a strong focus on real-world applications.

The thesis-related publications appear in reputable journals such as *Pharmaceutics* and *Polymers*, indicating high-quality research. The candidate has multiple publications as the first author, demonstrating significant contribution to the field. The work has also resulted in a patent, further highlighting its innovative nature and potential for practical application. Overall, this dissertation seems to present a significant contribution to the field of drug-eluting films for personalized medicine, with a strong focus on practical applications and supported by high-quality publications.

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