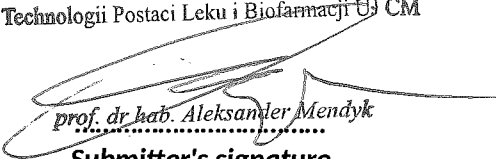


Annex no 1 to the Rules for submitting research topics for admission to the Doctoral School of  
Medical and Health Sciences programmes for the academic year 2023/2024

Research topic submission form for the doctoral programme	
Doctoral programme <i>Please indicate</i>	<input type="checkbox"/> interdisciplinary, 6-semester, taught in English
Discipline <i>Please indicate</i>	<input type="checkbox"/> pharmacology and pharmacy
Submitter - a person willing to act as a supervisor	
Title/degree Full Name	Prof. dr hab. Aleksander Mendyk
Category <i>please select the relevant category according to the DSMHS Regulations</i>	<input type="checkbox"/> JU Medical College employees with a professor or post-doctoral habilitation degree who have declared that their academic achievements correspond at least in 75% with the doctoral programme discipline in which the topic is submitted
Date of obtaining a) doctoral degree	2004
b) post-doctoral habilitation degree	2016
c) professor degree	2023
Place of employment	Chair and Department of Pharmaceutical Technology and Biopharmaceutics
Email address	<a href="mailto:aleksander.mendyk@uj.edu.pl">aleksander.mendyk@uj.edu.pl</a>
Contact phone	126205601
Academic achievements List of max. five publications from the last three calendar years	<ul style="list-style-type: none"> <li>• Czub, N., Paclawski, A., Szlęk, J., &amp; Mendyk, A. (2022). Do AutoML-based QSAR models fulfill OECD principles for regulatory assessment? A 5-HT<sub>1A</sub> receptor case. <i>Pharmaceutics</i>, 14, 1415. <a href="https://doi.org/10.3390/pharmaceutics14071415">https://doi.org/10.3390/pharmaceutics14071415</a></li> <li>• Pyteraf, J., Paclawski, A., Jamróz, W., Mendyk, A., Paluch, M., &amp; Jachowicz, R. (2022). Application and multi-stage optimization of daylight Polymer 3D printing of personalized medicine products. <i>Pharmaceutics</i>, 14, 843. <a href="https://doi.org/10.3390/pharmaceutics14040843">https://doi.org/10.3390/pharmaceutics14040843</a></li> <li>• Srebro, J., Brniak, W., &amp; Mendyk, A. (2022). Formulation of dosage forms with proton pump inhibitors : state of the art, challenges and future perspectives. <i>Pharmaceutics</i>, 14, 2043. <a href="https://doi.org/10.3390/pharmaceutics14102043">https://doi.org/10.3390/pharmaceutics14102043</a></li> <li>• Kulinowski, P., Malczewski, P., Pesta, E., Łaszcz, M., Mendyk, A., Polak, S., &amp; Dorożyński, P. (2021). Selective laser sintering (SLS) technique for pharmaceutical applications - development of high dose controlled release printlets. <i>Additive Manufacturing</i>, 38, 101761</li> </ul>

	<ul style="list-style-type: none"> <li>Mendyk, A., Paclawski, A., Szafraniec-Szczęśny, J., Antosik, A., Jamróz, W., Paluch, M., &amp; Jachowicz, R. (2020). Data-Driven Modeling of the Bicalutamide Dissolution from Powder Systems. <i>AAPS PharmSciTech</i>, 21, 111. <a href="https://doi.org/10.1208/s12249-020-01660-w">https://doi.org/10.1208/s12249-020-01660-w</a></li> </ul>
Impact Factor summary	155.02
Web of Science Core Collection index	611 citations (532 without self-citations)
Hirsch index	14
Number of promoted doctoral degree holders	1
Number of promoted MA degree holders	12
Proposed research topic	Artificial intelligence modeling of in vitro tablets performance and tableting process.
Please provide reasons for the topic-discipline compliance (max. 100 words)	Tablets (Ph.Eur.: Compressi) are the most common oral solid dosage forms available worldwide. As such, they are pivotal subject of every pharmaceutical technology course and pharmaceutical industry R&D activities. Due to the large variety of the manufacturing technologies and excipients, a systematic and quantitative modeling with classical statistical tools to model tableting processes is difficult. This may be solved by implementation of artificial intelligence for pharmaceutical development.
Brief description of research methods (max. 250 words)	<ul style="list-style-type: none"> <li>webscrapping, data extraction from publications and databases curation</li> <li>data cleaning</li> <li>feature selection and engineering</li> <li>modeling with various AI tools: decision trees, artificial neural networks, AutoML, genetic programming, etc.</li> <li>implementation of explainable AI approaches</li> <li>numerical representation of API and excipients</li> <li>grid computations</li> </ul>
Expected place for the project implementation	Chair and Department of Pharmaceutical Technology and Biopharmaceutics JUMC in Kraków
Tasks description for the PhD student	<ul style="list-style-type: none"> <li>building project-related databases: data preparation and curation</li> <li>modeling with AI systems</li> <li>preparation, submission and retrieval of grid-based computations</li> <li>analysis of AI models: performance and explainable AI</li> <li>writing scientific papers</li> <li>writing and implementation of the in-house software for modeling and data analysis</li> </ul>
Expectations towards the PhD student: specific skills and experience ( <i>the description of expectations cannot indicate a particular candidate</i> )	<ul style="list-style-type: none"> <li>publications-confirmed knowledge in pharmaceutical technology</li> <li>publications-confirmed knowledge and skills in AI modeling in pharmaceutical sciences</li> <li>practical knowledge and skills in Python and R languages</li> </ul>
Temporary availability of the PhD student (number of hours/weeks) necessary for the project implementation	2hrs x 5 days a week, partially remotely

<p>Does the research project require PhD student's independent performance of medical procedures? <i>Underline the applicable</i></p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">NO</div>	<p style="text-align: center;"><b>YES</b> <i>explain briefly below why and what sort of professional licence is required</i></p>
<p>Date: 24.05.2023</p>	<p>Katedra i Zakład Technologii Postaci Leku i Biofarmacji UJ CM</p>  <p><i>prof. dr hab. Aleksander Mendyk</i> <b>Submitter's signature</b></p>	

\*\* Following the admission conditions (Annex n<sup>o</sup> 1 and 2 to Resolution no 6/II/2023 of the JU Senate of 22 February 2023), if the research topic requires the independent performance of medical procedures by a PhD student, the candidate must hold a professional licence, which should be proved and indicated (license to practise as a medical doctor/nurse/physiotherapist, etc.). In the DSMHS admission procedure, the license to practice as a medical doctor or dentist for the duration of the postgraduate internship will be treated as equivalent to the license to practice as a medical doctor or dentist in the Republic of Poland.

The submitted research topic must not duplicate thematically or conceptually with any current project prepared by a PhD student under the submitter's supervision.

The completed form must be printed, signed in appropriate places, scanned, and sent by electronic mail **by 30 April 2023 to:**

**in the discipline of medical sciences:** [rekrutacja.nmedyczne@cm-uj.krakow.pl](mailto:rekrutacja.nmedyczne@cm-uj.krakow.pl)

**in the discipline of pharmacology and pharmacy:** [rekrutacja.nfarmaceutyczne@cm-uj.krakow.pl](mailto:rekrutacja.nfarmaceutyczne@cm-uj.krakow.pl)

**in the discipline of health sciences:** [rekrutacja.nozdrowiu@cm-uj.krakow.pl](mailto:rekrutacja.nozdrowiu@cm-uj.krakow.pl)

The email should include **the title of the proposed research topic.**