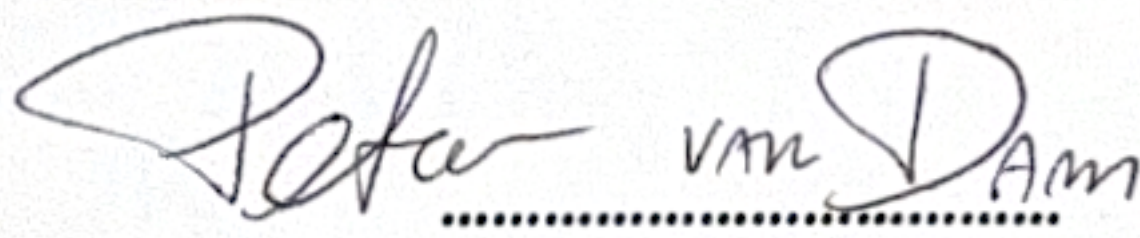


Annex No. 1 to the Rules for Submitting Research Topics for the Admission to the Interdisciplinary Education Programme in the Doctoral School of Medical and Health Sciences for the academic year 2025/2026

Research Topic Submission Form for the Interdisciplinary Education Programme	
Discipline <i>Please indicate</i>	<input checked="" type="checkbox"/> medical sciences <input type="checkbox"/> pharmacology and pharmacy <input type="checkbox"/> health sciences
Submitter - a person willing to act as a supervisor:	
Title/degree Full Name	Dr. hab. Petr van Dam
Category <i>please select the relevant category according to the DSMHS Regulations</i>	<input checked="" type="checkbox"/> A person employed at the Jagiellonian University Medical College (JU MC), holding a post-doctoral habilitation degree or professor's degree, who has submitted a declaration of at least 75% affiliation with the discipline in which the research topic is being proposed <input type="checkbox"/> A person employed in Poland at a university or another entity listed in Article 7(1) of the Act – Law on Higher Education and Science, who holds the title of professor or a post-doctoral habilitation degree, has submitted a declaration of at least 25% affiliation with the discipline in which the research topic is being proposed, and has presented the written consent of a person meeting the conditions specified in item 1 to assume the role of supervisor, following a positive opinion of the School Board <input type="checkbox"/> A person employed at a foreign university or academic institution, provided that the relevant research discipline board recognises that the person has a significant record of achievement in the academic field to which the research topic pertains
Date of obtaining a) doctoral degree	10 February 2010
b) post-doctoral habilitation degree	10 December 2024
c) professor's degree	NA
Place of employment	Jagiellonian University Medical College, Center for Digital Medicine and Robotics
E-mail address	Peter.dam@uj.edu.pl
Contact phone	+31-622198396
Academic achievements: List of max 5 publications from the last three calendar years	<ul style="list-style-type: none"> Sedova K, Azarov JE, Van Dam PM, Necasova L, Kukla J, Sramko M, Kryze L, Kautzner J. CineECG Repolarization Gradients Predict Acute Hemodynamic Response in CRT Patients. <i>Journal of Cardiovascular Electrophysiology</i>. 2024;n/a. doi: https://doi.org/10.1111/jce.16525 Kloosterman M, van der Schaaf I, Boonstra MJ, Oostendorp TF, Meijborg VMF, Coronel R, Loh P, van Dam PM. Genesis of the T-wave through various modes of ventricular recovery patterns using the equivalent dipole layer model. <i>Comput Biol Med</i>. 2025;189:110016. doi: 10.1016/j.compbimed.2025.110016

	<ul style="list-style-type: none"> Sedova KA, van Dam PM, Sbröllini A, Burattini L, Necasova L, Blahova M, Bocek J, Sramko M, Kautzner J. Assessment of electrical dyssynchrony in cardiac resynchronization therapy: 12-lead electrocardiogram vs. 96-lead body surface map. <i>EP Europace</i>. 2023;25:554–560. doi: 10.1093/europace/euac159 Al-Zaiti SS, Martin-Gill C, Zegre-Hemsey JK, Bouzid Z, Faramand Z, Alrawashdeh MO, Gregg RE, Helman S, Riek NT, Kraevsky-Phillips K, et al. Machine learning for ECG diagnosis and risk stratification of occlusion myocardial infarction. <i>Nature medicine</i>. 2023. doi: 10.1038/s41591-023-02396-3 van der Schaaf I, Kloosterman M, Gorgels APM, Loh P, van Dam PM. CineECG for visualization of changes in ventricular electrical activity during ischemia. <i>Journal of Electrocardiology</i>. 2024. doi: https://doi.org/10.1016/j.jelectrocard.2024.01.007
Impact Factor summary	
Web of Science Core Collection index	124 Publications 1,179 Sum of Times Cited
Hirsch index	H18
Number of promoted doctoral degree holders	1
Number of promoted MA degree holders	2
Current number of PhD students in the Doctoral School of Medical and Health Sciences	3 (2 in the UMCU Utecht, the Netherlands, 1 in Ancona, Italy)
Proposed research topic	Functional remodelling in cardiac resynchronization patients
Reasons for the compatibility of the proposed research topic with the selected discipline (maximum 100 words)	<p>Within the department Center for Digital Medicine and Robotics various research lines are involved in estimating the electrical cardiac activation and recovery from electrocardiographic (ECG) signals measured on the body surface. The so called inverse ECG field involves the modelling of the patient specific heart bounded by the laws of physics and the electrophysiological knowledge of the heart. In the past 5 years these methods have been further optimized in collaboration with the group in Utrecht, Nijmegen, and Amsterdam (Netherlands) and IKEM (Prague, Czech-Republic).</p>
Brief description of research methods (max. 250 words)	<p>In this project the latest methods in estimating the cardiac activation and recovery in pacemaker patients. Especially the latest developed electrical recovery estimation algorithm (“BackRep”) is of interest in patients with advanced heart failure that receive a so called cardiac resynchronization pacemaker. These pacemakers aim to electrically optimize the activation of the heart by stimulating one or multiple sites of the heart. In recent research we discovered that not only the electrical activation should be used for optimizing the CRT devices, but also the recovery sequence of the heart. The recovery of the heart might be closer related to the mechanical (contraction) of the heart. In this project aims to use both the estimate of electrical activation and recovery of the heart as well as the mechanical function of the heart. For this research a solid understanding of the inverse methods will be needed, to further optimize the</p>

	estimation of the activation, recovery and mechanic of the heart. To test the algorithms patients will need to be measured before and after the CRT implant to determine the efficacy of the algorithms and test the clinical prognostic value of these methods.	
Expected location of project implementation:	Jagiellonian University Medical College, Center for Digital Medicine and Robotics, and the University hospital in Krakow	
Description of tasks for the PhD student	<ul style="list-style-type: none"> • Data collection • Data preprocessing • ECGI techniques application • Develop protocol in collaboration with electrophysiologist • Algorithm developments in quantifying the electrical and mechanical functioning of the heart non-invasively 	
Expectations towards the PhD student: specific skills and experience (the description of expectations cannot indicate a specific candidate)	<ul style="list-style-type: none"> • Knowledge of medical data formats (e.g. DICOM) • Experience with medical imaging processing methods: <ul style="list-style-type: none"> • Image-based tissue segmentation of the heart • Ability to do 3D reconstruction of heart • Experience with 3D objects: <ul style="list-style-type: none"> • Knowledge of 3D model structure and formats (vtk, obj, stl, ...) • Ability to manipulate the model segmentations(e.g. decimation or editing materials) • Programming Experience: <ul style="list-style-type: none"> • Knowledge of programming languages (C++, Phyton, Matlab,...) • Ability to analyze medical data (ECG, clinical background) • Fluent in English, verbal and in writing • Physics background is preferable 	
Temporary availability of the PhD student (number of hours per week) required for the implementation of the project	<p>If the project requires working non-standard hours (e.g. late afternoons, Saturdays) - please describe here</p> <p>40h/week</p>	
Does the research project require PhD student's independent performance of medical procedures? <i>Underline the applicable</i>	<u>NO</u>	YES Please specify the required professional licence and provide a brief justification
Date 22 April 2025	 Submitter's signature	

* If the research topic requires the PhD student to independently perform medical procedures, then in accordance with the admission procedures (Annexes 1 and 2 to Resolution No. 14/II/2024 of the Jagiellonian University Senate, dated 28 February 2024), the candidate must hold the appropriate professional licence. The type of licence (e.g. licence to practise as a doctor, nurse, physiotherapist, etc.) must be clearly indicated and justified. In the DSMHS admission procedure, a licence to practise as a medical doctor or dentist issued for the duration of a postgraduate internship shall be considered equivalent to a full licence to practise as a medical doctor or dentist in the Republic of Poland.

The research topic submitted must not overlap thematically or conceptually with any current project being undertaken by the PhD student under the supervision of the submitter.

The completed form should be printed, signed in the appropriate sections, scanned together with the signed annexed statements into a single PDF file, and submitted electronically **by 30 April 2025** to:

in the discipline of medical sciences: rekrutacja.nmedyczne@cm-uj.krakow.pl

in the discipline of pharmacology and pharmacy: rekrutacja.nfarmaceutyczne@cm-uj.krakow.pl

in the discipline of health sciences: rekrutacja.nozdrowiu@cm-uj.krakow.pl

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

Declaration of the Person Submitting the Research Topic

I confirm that I am familiar with the rules for admission to the Doctoral School of Medical and Health Sciences at the Jagiellonian University for the academic year 2025/2026 as set out in Resolution No. 15/II/2025 of the Senate of the Jagiellonian University, dated 26 February 2025.

In particular, I acknowledge that:

If two or more candidates indicate the same research topic in the admission procedure, the research topic will be awarded to the candidate with the highest score. Other candidates will be offered a selection of the remaining research topics not assigned to admitted candidates.

22 April 2025
/date/

Peter van IJm
/signature of the person submitting the research topic/

Declaration of the Person Submitting the Research Topic

I declare that the research topic entitled

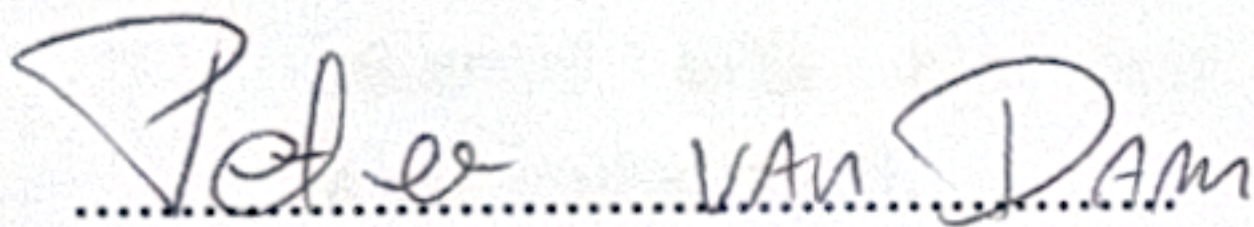
Functional remodelling in cardiac resynchronization patients

conducted by the PhD student

of the Doctoral School of Medical and Health Sciences

relates to/does not relate to* the protected activity, as defined in Article 21 of the Act of 13 May 2016 on Counteracting the Risk of Sexual Offences and the Protection of Minors (Journal of Laws of 2023, item 1304, as amended), involving the upbringing, education, recreation, treatment, provision of psychological counselling, spiritual development, sports, the pursuit of other interests by minors, or their care.

*Delete as appropriate



/Signature of the person submitting the research topic/