

MSCA PF/GF 2025: LIST OF TOPICS DESCRIPTIONS AND SUPERVISORS (HEALTH)

FACULTY	INSTITUTE/DEPARTMENT	RESEARCH TOPIC (PROJECT)	DESCRIPTION OF RESEARCH TOPIC (approx. 60 words)	SUPERVISOR (+ e-mail)	CONTACT PERSON (+e-mail)
Faculty of Medicine in Hradec Králové	Department of pneumology	Assessment of inhaled medication adherence in bronchial asthma (BA) and chronic obstructive pulmonary disease (COPD) - multicenter prospective observation-interventional interdisciplinary study (medicine, pharmacy, artificial intelligence)	<p>Therefore, we aimed to conduct such study demonstrated via this project which has these objectives:</p> <ol style="list-style-type: none"> 1.Validation of the Five Steps Assessment (FSA), a simple, universal tool for assessing adherence to inhalation technique in patients with BA/COPD. 2.Multicenter and multimodal analysis of adherence to BA/COPD treatment, including assessment of inhalation technique in patients at all stages of both diseases in outpatient settings as well as nursing homes. 3.Multicentre analysis of critical knowledge, skills, and attitudes related to the management of BA/COPD, including the assessment of inhalation technique in three groups of HP (physicians, nurses, pharmacists) caring for patients with these diseases in different healthcare settings. 4.Development and implementation of interventions to promote medication adherence in patients with BA/COPD. 5.Development of educational tools for HP aimed at strengthening their knowledge and skills related to management of BA/COPD treatment, including inhalation techniques. 6.Using artificial intelligence (AI) tools to design, develop, and validate a mobile/web application for assessing and supporting adherence to inhaled therapy in BA/COPD applicable to both patients and HP. 7.Evaluating the impact of interventions to promote adherence to BA/COPD treatment in patients. 8.Evaluating the impact of educational tools aimed at strengthening knowledge and skills of HP related to management of BA/COPD treatment, including inhalation techniques. <p>The planned role of the postdoc includes the design and development of a meta-analysis related to the research topic, participation in the statistical processing of data, and participation in the other parts of the project mentioned above (where language barriers will not be an issue).</p>	Vladimír Koblížek (KoblizekV@lfhk.cuni.cz)	Vladimír Koblížek (KoblizekV@lfhk.cuni.cz)
Faculty of Medicine in Hradec Králové	Department of dentistry	dental pulp regeneration	The goal of this project is to develop a cellular carrier (scaffold) that supports the natural regeneration of dental pulp without the need for externally supplied stem cells, following the principle of cell-free regenerative endodontics (CF-RET). Additionally, the project aims to enable complete dental pulp regeneration with externally supplied stem cells, following the principle of cell-based regenerative endodontics (CB-RET).	prof. MUDr. Jakub Suchánek, Ph.D. (suchanekj@lfhk.cuni.cz)	prof. MUDr. Jakub Suchánek, Ph.D. (suchanekj@lfhk.cuni.cz)
Faculty of Medicine in Hradec Králové	Department of Medical biology and genetics	Tumor microenvironment in pancreatic ductal adenocarcinoma	Pancreatic ductal adenocarcinoma (PDAC) presents a major oncological challenge, with <10% 5-year survival. Unfortunately, current treatments face resistance, underscoring the need for improved diagnostics, therapies, and monitoring. PDAC has a pronounced stromal microenvironment with remarkable cellular and spatial heterogeneity which show a growing role in PDAC's therapy resistance. This project explores potentials of tumor microenvironment components for novel therapeutic and diagnostic strategies.	Emil Rudolf (rudolf@lfhk.cuni.cz)	Emil Rudolf (rudolf@lfhk.cuni.cz)
Faculty of Pharmacy	Department of Organic and Bioorganic Chemistry.	Molecular Crosstalk in the Skin: How Antimicrobial Peptides Modulate Lipid Self-Assembly	How do antimicrobial peptides shape the skin's permeability barrier beyond their microbial defense role? This project investigates their potential impact on lipid self-assembly and remodeling, bridging skin biophysics with molecular interactions. Ideal for researchers interested in lipid biophysics, membrane biology, or skin research, with opportunities to apply diverse other approaches.	Prof. Kateřina Vávrová, PhD. (Katerina.vavrova@faf.cuni.cz)	Anna Opitz (opitza@faf.cuni.cz)
Faculty of Pharmacy	Department of Social and Clinical Pharmacy	Pharmacoepidemiological studies of real outcomes of medications in complex older adults	The project will test based on AI/ML methods developed in the I-CARE4OLD H2020 project the real impact of various medications (statines, proton pump inhibitors, psychotropic medications etc.) on hospitalization rates, morbidity, mortality, quality of life and other outcomes in complex older adults. The utilized models will enable to test real outcomes of medications in complex older patients under consideration of various complex confounders, such as multimorbidity, frailty, polypharmacy and other risk factors. The interRAI datasets of millions of older patients' comprehensive geriatric assessments conducted in different EU countries will be used for these research analyses. Research Unit: Ageing, Polypharmacy and Changes in the Therapeutic Value of Medications in the AgeD (https://portal.faf.cuni.cz/Groups/Ageing-Polypharmacy-Research-Unit/)	Assoc. Prof. Daniela Fialová, PharmD., Ph.D. (fialovad@faf.cuni.cz)	Anna Opitz (opitza@faf.cuni.cz)
Faculty of Pharmacy	Department of Pharmacognosy and Pharmaceutical Botany	Plant indole and quinolizidine alkaloids and their neuroprotective and antiinvasive activities	Isolation of active plant metabolites from selected plants by common chromatographic methods (Flash chromatography, preparative HPLC, TLC), their structural identification (LC/GC-MS, NMR, CD) and subsequent testing for evaluation of neuroprotective and anti-invasive activity (cytotoxicity, antimycobacterial activity). This research fellowship will be focused on discovery of natural substances with potential therapeutic activity, or lead structures for subsequent the development of more potent compounds - preparation of semisynthetic derivatives (analogues).	Assoc. Prof. PharmDr. Jakub Chlebek, Ph.D. (chlej2aa@faf.cuni.cz)	Anna Opitz (opitza@faf.cuni.cz)

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Faculty of Pharmacy	Department of Social and Clinical Pharmacy	Testing of real outcomes of various non-pharmacological interventions in complex older patients	This project will use AI/ML methods developed in the I-CARE4OLD H2020 project for testing of real outcomes of various non-pharmacological interventions (such as psychotherapy, physical training, spiritual interventions etc.) on various health outcomes of complex older adults (e.g. quality of life, cognitive functioning, social engagement, psychosocial wellbeing etc.). Utilized models will enable testing of these outcomes under consideration of various confounding factors, such as multimorbidity, frailty, polypharmacy and other complex factors. The interRAI datasets of millions of data of older patients' obtained from regular comprehensive geriatric assessments in various EU countries will be used for these analyses. Research Unit: Ageing, Polypharmacy and Changes in the Therapeutic Value of Medications in the AgeD (https://portal.faf.cuni.cz/Groups/Ageing-Polypharmacy-Research-Unit/)	Assoc. Prof. Jitka Pokladníková, PharmD., Ph.D. (pokladnikova@faf.cuni.cz)	Anna Opitz (opitza@faf.cuni.cz)
Faculty of Pharmacy	Department of Pharmacology and Toxicology	Understanding the mechanisms of drug resistance in lung and breast tumors and their modulation to develop novel therapies	Lung and breast cancers are the most prevalent cancer types. Using innovative techniques and advanced models, we will unravel the intricate mechanisms of resistance against the drugs used for these malignancies. Subsequently, the possibility of hitting these novel therapeutical targets will be explored. In turn, the project will open new avenues for the therapy of pharmacoresistant patients.	Assoc. Prof. Jakub Hofman, Ph.D. (jakub.hofman@faf.cuni.cz)	Anna Opitz (opitza@faf.cuni.cz)