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Researchgate:	
Personal website / Working group website:	
Participation in projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	2024-2027 – (PI) Principal investigator in grant LIDER XIII; NCBiR (DPWP/LIDER-XIII/34/2023). Title: Gas hyperthermia and dehydration combined with pressurized intraperitoneal aerosol chemotherapy as an innovative method of peritoneal carcinomatosis treatment. Optimization of procedure and device prototype construction. Founding: NCBiR; 1 499 698,75 PLN Research Units: Department of Biochemistry and Molecular Biology; Department of Veterinary Surgery; Wroclaw University of Environmental and Life Sciences 2022 - 2024 – (RF) research assistant professor in grant GRIEG; (UMO-2019/34/H/NZ1/00674) Title: "Novel mechanisms of PAD activity regulation. Substrate specificity and activation of peptidyl arginine deiminase in the context of rheumatoid arthritis." Founding: Norway Grants 2014-2020 - GRIEG-1; NCN; 6 125 205 PLN Research Units: Jagiellonian University in Kraków; Wroclaw University of Science and Technology; University of Bergen
PhD topic:	Study of the feasibility of using hyperthermia and gas dehydration in combination with intraperitoneal aerosol chemotherapy for the treatment of peritoneal carcinomatosis using a porcine model (sus scrofa domestica).
Research discipline in Doctoral School:	Veterinary Science

Short description of the research problem to be solved in the PhD (minimum 1000 characters):	Intraperitoneal carcinomatosis is a challenging problem in human medicine and an increasingly diagnosed entity in veterinary medicine. Patients diagnosed with peritoneal carcinomatosis have a poor prognosis. Current treatment modalities in the form of direct chemotherapy (HIPEC, PIPAC) are still suboptimal due to limited penetration of chemotherapeutic agents into neoplastic tumours and uneven distribution of drugs within the peritoneal cavity, resulting in low efficacy of therapy. Therefore, there is a great need to develop new therapeutic strategies. Recently, our research group proposed a new concept of using gas hyperthermia to modify the peritoneal cavity environment, which could be unfavourable for cancer progression and induce its regression. The feasibility of this new method was confirmed in vivo in a porcine model. To further develop this concept, a combination with aerosol chemotherapy was proposed. An in vitro study confirmed that gas-based hyperthermia combined with chemotherapy significantly reduces viability and increases cytotoxicity of HT-29 colon cancer cells. Therefore, this project is a logical consequence of previous preliminary research and aims to investigate the feasibility of using hyperthermia and gas dehydration in combination with intraperitoneal aerosol chemotherapy for the treatment of peritoneal carcinomatosis using a porcine model (sus scrofa domestica). The planned work in the PhD project includes 1) An experiment in healthy pigs using gas hyperthermia together with direct aerosol chemotherapy (optimisation of the procedure) (tolerance, pharmacokinetics of oxaliplatin in tissues and blood morphology, gasometry and biochemistry, histopatology). 2) Establishment of a porcine model of peritoneal carcinomatosis using a porcine colon epithelial cell line overexpressing the G12D mutated KRAS protein (this cell line will be developed separately from this PhD project). 3) Evaluation of the therapeutic effect of gas-based hyperthermia combined with aerosol chemotherapy on porcine peritoneal carcinomatosis. (Validation of protocols with assessment of reduction in peritoneal cancer index, oxaliplatin penetration into cancerous nodules, histopatology and immunohistochemistry).
Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques, minimum 500 characters):	The PhD candidate should be at least in the 5th year of their veterinary studies (or have completed them) and should be able to work with laboratory animals and in a laboratory environment. The candidate should have an interest in oncology research and translational medicine and be academically active during their studies. The candidate should show commitment to the tasks given, be open to working in a team and be able to analyse and interpret the results obtained. The minimum level of English required is B2.
a) Project title:	Gas hyperthermia and dehydration combined with pressurized intraperitoneal aerosol chemotherapy as an innovative method of peritoneal carcinomatosis treatment. Optymalization of procedure and device prototype construction.
b) Agreement number:	LIDER13/0209/2022
c) Number of months in the project to support PhD student (in months; starting from 1st of October 2024):	26
Project website:	