Name and surname:	**Agnieszka Partyka**
Academic Degree:	dr hab. (DSc.)
Institute/Department:	Department of Reproduction and Clinic for Farm Animals
e-mail address:	agnieszka.partyka@upwr.edu.pl
ORCID:	0000-0001-9131-3552
UPWr Base of Knowledge - link:	https://bazawiedzy.upwr.edu.pl/info.seam?id=UPWr7d40858b78634e0490bcefc6fcd0ab48
Researchgate:	https://www.researchgate.net/profile/Agnieszka-Partyka
Personal website / Working group website:	
Participation in projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	NCN OPUS - The mechanism of action of pesticides and their impact on rooster's fertility. 2021/43/B/NZ9/01550. 2022-2025. PI NAWA - International multicentric platform as a key element for the effective scientific research. PPI/APM/2019/1/00044/U/00001. 2020-2022. RF NAWA - international project with France. Development of tools to create and analyze new extenders for semen cryopreservation. PPN/BIL/2018/1/00146/U/00017. 2019-2021. PI Complex project of european bison protection by Lasy Panstwowe - Mulivariate Monitoring of bison population" -Research Task „Gen Bank in Bison" - Project financed from "Fundusz Leśny" Ministerstwo Ochrony Środowiska pt.UMOWA NR OR.271. 3.10.2017, from 07.08.2017 r. – 2020. RF NCBiR - Improvement of innovation and effectivity of programs of rescue of genetic resources in wild felidae by establishment of cell bank and implementation of in vitro embryo production into practice. NCBiR NR PBS3/B8/16/2015. 2014 – 2018. RF
PhD topic:	New insight into mechanisms of cryodamages in sperm - the new way of chicken semen cryopreservation
Research discipline in Doctoral School:	Veterinary Science
Short description of the research problem to be solved in the PhD (minimum 1000 characters):	Cryopreservation is undoubtedly a harmful process and induces many unfavorable changes in the spermatozoa. During this process, spermatozoa are exposed simultaneously to damage caused by thermal shock, freezing and thawing, which consequently cause osmotic changes in the cell membrane and reorganization of its lipids and proteins. Cryopreservation requires protection of intracellular structures and biomolecules, and hence requires protective agents that are able to pass the cellular membrane. Permeating cryoprotective agents (CPAs), such as glycerol, DMSO (dimethyl sulfoxide) or DMA (dimethylacetamide) help lower the freezing point of the solution, minimize osmotic shock and reduce formation of lethal intracellular ice, but also cause damage to cells due to their chemical toxicity. Glycerol has contraceptive activity in poultry, and prior to insemination has to be removed. Because of this, DMA has been proposed as an alternative CPA, however, in chicken, sperm fertilizing ability of sperm cells cryopreserved with both glycerol or DMA is the same lower. Freezing solutions may also include non-permeable CPAs. These compounds, such as polymers, sugars or proteins, modulate intracellular ice-crystal formation and stabilize intracellular solute concentrations during vitrification. In recent years, we can observe a growing interest in non-permeating cryoprotectants used alone for preservation of mammalian sperm. The main goal of proposed PhD topic is an improvement of thawed chicken semen quality and fertility results by reduction of cell cryodamages avoiding the use of permeating cryoprotectants. We hypothesize that incorporation of non-permeable CPAs in vitrification medium and additionally using French straws, may protect sperm during freezing-thawing. It is planned to carry out four main research tasks, divided into several experiments. In Task 1 the impact of use of different molarities of some sugars and a polymer for chicken sperm vitrification will be checked. In Exp. 2 the best vitrification medium (from Exp. 1) will be supplemented with different concentrations of BSA and FBS. In Exp. 3, we will check 3 protocols of warming to achieve the best results of semen quality. In Task 2 we will use some amino-acids (valine, isoleucine, leucine, lysine), which can scavenge free radicals and protect the cells. In Task 3 we will try to respond to the most important question: how does the molecular damage caused by the freezing–thawing process affect chicken sperm structure and function? In this regard we will analyze expression of genes related to apoptosis, oxidative stress, antioxidant enzymes and sperm quality. Moreover we will check lipid membrane characteristic on the ultrastructural level and also assess its physicochemical properties. Project will be completed by final analysis of hens artificial insemination results with the use of vitrificated semen. (Task 4). Thus, we will be able to assess and validate the new way of chicken sperm vitrification. Our proposed way of semen vitrification meets the need for simplification of the more efficient method of chicken sperm cryopreservation, in order to make it available to large environmental and breeding conditions. In terms of potential contamination risk to a variety of cryogenic pathogens, this method meets the conditions of asepticity and could became reference procedure to be implemented in a bird semen cryobank.
Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques, minimum 500 characters):	A prospective candidates should be a graduate in veterinary, medical or biological studies. Candidates should be specialized in reproductive medicine, veterinary and in reproductive biology. High fluency in English is demanded. High, positive motivation to execute the research in the field of advanced methods of assisted reproductive technologies is expected. Ability to perform clinical and laboratory part of the research. Techniques demanded: semen collection and semen assessment - CASA system, flow cytometry. Knowledge of RT-PCR techniques and Western blots is appreciated.
a) Project title:	
b) Agreement number:	
c) Number of months in the project to support PhD (in months; starting from 1st of October 2022):	
Project website:	