

Name and surname	Agnieszka Partyka
Academic Degree	dr hab. (DSc.)
Institute/Department	Department of Reproduction and Clinic for Farm Animals
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ORCID	0000-0001-9131-3552
UPWr Base of Knowledge - link	https://bazawiedzy.upwr.edu.pl/info/seam?id=UPWr7d40858b78634e0490bcefc6fd0ab48&affil=&lang=pl
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))	<p>NAWA - International multicentric platform as a key element for the effective scientific research. PPI/APM/2019/1/00044/U/00001. 2020-2022. RF</p> <p>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</p> <p>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</p> <p>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 – 2017. RF</p>
Do you plan to engage support of second supervisor or auxiliary supervisor?	YES
	Second supervisor (from other discipline, polish or international research unit)
Name and surname	Manuel Hidalgo Prieto
Academic Degree	Prof.
Faculty, Institute/Department	University of Cordoba, Faculty of Veterinary Medicine, Department of Animal Medicine and Surgery
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UPWr Base of Knowledge - link or most important publications from last 3 year (JCR) / patents from last 3 years (maximum 5)	<p>Diaz-Jimenez, M., Dorado, J., Pereira, B., Consuegra, C., Hidalgo, M. Vitrification of donkey sperm using straws as an alternative to conventional slow freezing. <i>Reproduction in Domestic Animals</i>, 2022, 57(S1), pp. 3–6</p> <p>Diaz-Jimenez M, Wang M, Wang W, Isachenko E, Rahimi G, Kumar P, Mallmann P, von Brandenstein M, Hidalgo M, Isachenko V. Cryobanking of human spermatozoa by aseptic cryoprotectants-free vitrification in liquid air: Positive effect of elevated warming temperature. <i>Cell Tissue Bank</i>. 2022 Mar;23(1):17-29. doi: 10.1007/s10561-021-09904-0.</p> <p>Diaz-Jimenez M, Rota A, Dorado J, Consuegra C, Pereira B, Camillo F, Panzani D, Fanelli D, Tesi M, Monaco D, Hidalgo M. First pregnancies in jennies with vitrified donkey semen using a new warming method. <i>Animal</i>, 2021, 15(1), 100097</p> <p>Hidalgo, M., Diaz-Jimenez, M., Consuegra, C., Pereira, B., Dorado, J. Vitrification of donkey sperm: Is it better using permeable cryoprotectants? <i>Animals</i>, 2020, 10(9), pp. 1–11, 1462</p> <p>Diaz-Jimenez M, Dorado J, Pereira B, Consuegra C, Ortiz I, Hidalgo M. Is sperm cryopreservation in absence of permeable cryoprotectants suitable for subfertile donkeys? <i>Reprod Domest Anim</i>. 2019 Oct;54 Suppl 4:102-105. doi: 10.1111/rda.13539.</p>
Researchgate	https://www.researchgate.net/profile/Manuel-Hidalgo-4
Personal website / Working group website:	
Participation projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca))	<p>Influence of equine semen freezing and vitrification extenders on the inflammatory response of the endometrium of mares and donkeys: analysis of the uterine proteome and effect on fertility in vivo. 2022-2024. PI</p> <p>Nanotechnology applied to improving the quality and fertility of equine semen: semen purification and antimicrobial effect (PID2020-116090RB-100). 2021-2025. PI</p> <p>Comprehensive station for the production and in vitro micromanipulation of domestic animal embryos by follicular aspiration and intracytoplasmic sperm injection (EQC2018-0005182-P). 2019-2020.RF</p> <p>Nanotechnology applied to assisted reproduction techniques in equines. 2018-2020.PI</p> <p>Fine-tuning of techniques for nanosexing sperm from bulls of the Cárdena Andaluza breed, including integration studies in the separation diluents, cytotoxicity and efficacy in obtaining sexed doses. 2018-2019. RF</p> <p>Optimization of the vitrification technique for equine gametes and embryos (AGL2013-42726-R). 2014-2018.PI</p>
PhD topic	New insight into mechanisms of cryodamages in sperm - the new way of chicken semen cryopreservation
Research discipline in Doctoral School	Veterinary Science

<p>Short description of the research problem to be solved in the PhD (minimum 1000 characters)</p>	<p>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.</p> <p>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.</p> <p>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 vitrified semen. (Task 4). Thus, we will be able to assess and validate the new way of chicken sperm vitrification.</p> <p>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 become reference procedure to be implemented in a bird semen cryobank.</p>
<p>Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques, minimum 500 characters)</p>	<p>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.</p>
<p>Details of the project to support PhD research</p>	<p>None</p>
<p>a) Project title</p>	<p>None</p>
<p>b) Agreement number</p>	<p>None</p>
<p>c) Number of months in the project to support PhD (in months; starting from 1st of October 2022)</p>	<p>0</p>
<p>d) Project website</p>	<p></p>