Name and surname:	**Katarzyna Wróblewska**
Academic Degree:	dr hab. inż. (DSc.)
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UPWr Base of Knowledge - link:	https://bazawiedzy.upwr.edu.pl/info.seam?id=UPWr2a7ecf7bf5554633830720d48e3eb4ff&affil=&lang=pl
Researchgate:	https://www.researchgate.net/profile/Katarzyna-Wroblewska-4
Personal website / Working group website:	
Participation in projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	1. "Hydrobox 2.0 – innovative technology supporting water saving and vegetation", contract number: POIR.04.01.01-00-0061/16 Task Manager 9. "Validation of the effects of growth and health of perennials and shrubs used in the areas of the urban planning' Completion: 2017-2020 2. "Implementation and adaptation to the climatic and soil conditions of Polish innovative technology of fruit production with a closed irrigation system and biofortification with iodine and selenium on the example of cranberries", Rural Development Programme 2014-2020; Action 16. Cooperation; contract no. DDD.6509.00036.2017.09 a. Coordinator of Task 1. "Evaluation of the effect of strigolactone inhibitors on rooting and growth of side shoots on cuttings 'large cranberries' and b. Coordinator of Task 2. "The use of innovative substrate components to increase water retention in cultivation cranberries'. Completion: 2018-2020
PhD topic:	Development of methods intensifying production of secondary metabolites in ferns in in vitro cultures
Research discipline in Doctoral School:	Agriculture and Horticulture
Short description of the research problem to be solved in the PhD (minimum 1000 characters):	Ferns Polypodiopsida are the oldest vascular plants on Earth. In carbon, the period of fern dominance there were about 1 million of fern species. Most of them died, those that survived evolved into the modern ferns. Comparing to the past richness, there is a limited numer of fern species, about 11,000. To adapt to miscelaneous habitats, from calcerous rocks to acid peatbogs fern species must have developed various metabolites to pretect themselves against pests and abiotic stress. It brought about many properties used by people in folk medicine in different regions of the world. Present studies have confirmed some of medicinal and edible uses of ferns, due to the presence of (among others) sweeteners (Pteris aquilinum, Polypodium vulgare, Microgramma vaccinifolia), phenolics (e.g. in genera Pteris, Blechnum, Dryopteris and Adiantum), flavonoids (Dryopteris sp., Woodwardia japonica), terpenes and terpenoids (Pteridaceae, Dennstaedtiaceae and Cibotaceae). In spite of the mentioned properties, ferns have not been subjected to thorough consideration as a source of secondary metabolites. What is more, the biological activities of ferns, e.g. antioxidant, are difficult to validate. They do not seem to be correlated with systematic origin of species. For this reason, cultivation and multiplication of fern tissues in cultures in vitro can be useful for medicine as well as food and cosmetic industry. It allows for entire control of factors, like temperature, PPDF, light spectrum, the composition of medium, plant hormones etc. The first aim of the research is to choose the most promising fern species and organs producing useful metabolites. The second aim is to find the compositions of factors causing the most intensive production of chosen metabolites and to work on their possible cultivation of fern tissues in bioreactors.
Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques, minimum 500 characters):	1. Completed Master's studies in horticulture or related specialization (biotechnology, agriculture, landscape architecture and others); 2. good knowledge of English enabling communication and use of English-language literature; 3. Interest in scientific work and creativity, commitment; 4. Ability to work both independently and in a team, communication skills; 5. Laboratory work experience; 6. Ability of statistical analysis and interpretation of research results. 7. Experience in HPLC analysis recommended.
a) Project title:	None
b) Agreement number:	None
c) Number of months in the project to support PhD student (in months; starting from 1st of October 2024):	0