

Name and surname:	Edyta Kostrzewska-Susłow
Academic Degree:	prof. dr hab. inż. (Prof.)
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ORCID:	0000-0002-9259-0161
UPWr Base of Knowledge - link:	https://bazawiedzy.upwr.edu.pl/info.seam?id=UPWre96b42809d8b4cf5b1ba570f836015cc&affil=&lang=pl
Researchgate:	
Personal website / Working group website:	
Participation in projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	2016-2019 Projekt badawczy SONATA 9, nr 2015/17/D/NZ9/02060, pt.: „Otrzymywanie naturalnych flawonoidów o zwiększonej biodostępności metodami biotechnologicznymi”, wykonawca. 2017-2018 Projekt badawczy dla młodych naukowców nr STM.A050.17.051, pt.: „Aktywność przeciwnowotworowa chalkonów o różnej strukturze chemicznej w komórkach raka jelita grubego LoVo oraz raka wątrobowo-komórkowego HepG2, główny wykonawca. 2021-2023 Projekt badawczy w ramach konkursu „PRELUDIUM-20”, nr 2021/41/N/NZ9/01195, pt.: „Nowe glikozydy flawonoidowe z atomem chloru o potencjalnej aktywności przeciwdrobnoustrojowej”, opiekun naukowy 2024-2026 Projekt badawczy w ramach konkursu „LIDER-14”, nr 0106/L-14/2023, pt.: „Glikozydy flawonoidowe z atomem chloru jako wielofunkcyjne, naturalne substancje konserwujące w formułacjach kosmetycznych”, opiekun naukowy
Do you plan to engage support of second supervisor or auxiliary supervisor?	YES
	Auxiliary supervisor
Name and surname:	Paulina Strugała-Danak
Academic Degree:	dr (Dr.)
Faculty, Institute/Department:	Department of Physics and Biophysics
e-mail address:	paulina.strugala@upwr.edu.pl
ORCID:	https://orcid.org/0000-0001-5949-4736
UPWr Base of Knowledge - link or most important publications from last 3 year (JCR) / patents from last 3 years (maximum 5):	https://bazawiedzy.upwr.edu.pl/info.seam?id=UPWr814f93501803494e8f01ba2839322d82&affil=&lang=pl
Researchgate:	https://www.researchgate.net/profile/Paulina-Strugala-Danak
Personal website / Working group website:	
Projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	2018-2022 Projekt finansowany przez NCN pt. „Aktywność biologiczna antocyjanów acylowanych oraz ich oddziaływanie z mimetyczną błoną lipidową i albuminą ludzką” projekt badawczy nr 2017/25/N/NZ9/02915 (Konkurs Preludium 13), kierownik projektu. 2023-2024 Projekt finansowany przez NCN pt. „Zastosowanie sztucznej inteligencji w poszukiwaniu nowych substancji leczniczych pochodzenia naturalnego o mechanizmach działania ukierunkowanych na zmniejszenie stężenia wolnych rodników w organizmie” projekt badawczy nr 2022/45/N/NZ7/02264 (Konkurs Preludium 21), Liderem jest Uniwersytet Medyczny (kierownik dr Maciej Spiegiel), wykonawca i kierownik projektu z ramienia UPWr
PhD topic:	Biological activity of flavonoids obtained by biotransformation and their interaction with biomolecules
Research discipline in Doctoral School:	Biological Sciences
Short description of the research problem to be solved in the PhD (minimum 1000 characters):	The research task carried out within the framework of the proposed PhD thesis will consist of the microbial transformation of a number of natural bioactive substances from the flavonoid group. Enzymatic systems of entomopathogenic filamentous fungi of the genus <i>Isaria</i> and <i>Beauveria</i> will be used for biotransformation. Compounds for biotransformation will be obtained by chemical synthesis and extraction from plant material. Substrates and biotransformation products will be separated and purified by chromatography, while the chemical structure of the compounds will be determined spectroscopically. In the next stage of the research, the biological potential of the new compounds will be determined in a broad sense, which will concern the determination of antioxidant, anti-inflammatory, anti-diabetic and anti-ageing activities. Within the framework of structure-activity correlation, the influence of the structural structure, type and position of substituents in the aromatic ring on shaping the biological activity of the newly obtained flavonoids will also be examined. Due to the fact that the first site of contact between a biologically active compound and a cell is its cell membrane, an innovative approach will be to determine the interaction of the newly obtained flavonoids with lipid mimetic membranes simulating those of normal and cancer cells. The mode of protective action of flavonoids on model membranes will also be demonstrated. In addition, the binding mechanism of flavonoids to albumin, the main blood protein, will be investigated, yielding important results due to the transport function of albumin to target tissues in the body. With the help of an extensive research facility and extensive methods including chromatography, fluorimetry, infrared spectroscopy and NMR spectroscopy, it will be possible not only to obtain a number of new compounds from the flavonoid group, but also to investigate their biological activity and propose the molecular mechanism responsible for the demonstrated activities.
Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques, minimum 500 characters):	<ul style="list-style-type: none"> • Master's degree in biotechnology or a related field • commitment and availability for research work • very good knowledge of Polish and English • experience in working with microorganisms • experience in biotransformation and organic synthesis • ability to use modern chromatographic techniques (HPLC, UPLC, automated Flash chromatography system) • ability to determine the structure of natural compounds and their derivatives based on spectroscopic techniques (NMR) • communication skills, ability to work in a team
a) Project title:	0
b) Agreement number:	0
c) Number of months in the project to support PhD student (in months; starting from 1st of October 2024):	0
Project website:	