Name and surname:	**Zbigniew Lazar**
Academic Degree:	prof. dr hab. inż. (Prof.)
Institute/Department:	Department of Biotechnology and Food Microbiology
e-mail address:	zbigniew.lazar@upwr.edu.pl
ORCID:	0000-0001-7315-1983
UPWr Base of Knowledge - link:	https://bazawiedzy.upwr.edu.pl/info.seam?id=UPWrb66e319982544adb95168459bd28c6e9
Researchgate:	
Personal website / Working group website:	https://upwr.edu.pl/en/research/leading-research-group/biotechnology-for-life-and-industry-biotechlife
Participation in projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	Preludium Bis 4 - 2023-2027 - Yeast from the Yarrowia clade - a new efficient platform for the simultaneous biosynthesis of lipids and extracellular heterologous proteins - project manager SYMBIOREM - Symbiotic, circular bioremediation systems and biotechnology solutions for improved environmental, economic and social sustainability in pollution control - contractor OPUS19 - 2021-2024 - Utilization of volatile fatty acids for the biosynthesis of waxes by the yeast Yarrowia lipolytica - project manager OPUS19 - 2021-2024 - Biotechnological potential and antimicrobial activity of new biosurfactant-lipase conjugates immobilized on the surface of biopolymers - contractor POIR - 2019-2021 - Development of an innovative technology for the production of dietary supplements based on alpha-ketoglutaric acid obtained biologically with the participation of Yarrowia lipolytica yeast - contractor
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:	Cécile Neuvéglise
Academic Degree:	dr hab. (Dr. Sc.)
Faculty, Institute/Department:	French National Institute for Agriculture, Food, and Environment (INRAE)
e-mail address:	cecile.neuveglise@inrae.fr
ORCID:	0000-0001-5017-7830
UPWr Base of Knowledge - link or most important publications from last 3 year (JCR) / patents from last 3 years (maximum 5):	In-depth analysis of erythrose reductase homologs in Yarrowia lipolytica Szczepańczyk, M., Rzechonek, D.A., Neuvéglise, C., Mirończuk, A.M. Scientific Reports, 2023, 13(1), 9129 Comparative Analysis of the Alkaline Proteolytic Enzymes of Yarrowia Clade Species and Their Putative Applications, Ciurko, D., Neuvéglise, C., Szwechłowicz, M., Lazar, Z., Janek, T. International Journal of Molecular Sciences, 2023, 24(7), 6514 Development of a Vector Set for High or Inducible Gene Expression and Protein Secretion in the Yeast Genus Blastobotrys Boisramé, A., Neuvéglise, C. Journal of Fungi, 2022, 8(5), 418 A 37-amino acid loop in the Yarrowia lipolytica hexokinase impacts its activity and affinity and modulates gene expression Hapeta, P., Szczepańska, P., Neuvéglise, C., Lazar, Z. Scientific Reports, 2021, 11(1), 6412 Developing Methods to Circumvent the Conundrum of Chromosomal Rearrangements Occurring in Multiplex Gene Edition Borsenberger, V., Croux, C., Daboussi, F., Neuvéglise, C., Bordes, F. ACS Synthetic Biology, 2020, 9(9), pp. 2562–2575
Researchgate:	https://www.researchgate.net/profile/Cecile-Neuveglise
Personal website / Working group website:	https://www.linkedin.com/in/c%C3%A9cile-neuv%C3%A9glise-33555b260/?originalSubdomain=fr
Participation projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	2023-2026 OenoVard'Occ: Studies of the oenological properties of resistant varieties in Occitania. Financed by the French Occtinia region. Work package manager 2023-2026 IDOK: Impact of Domestication on the evolution of two Kazachstania yeast species, a comparative analysis. ANR-22-CE21-0002. Task manager 2021-2023 SPOILCONTROL: Management and control of spoilage microorganisms in the production of fermented beverages. MRSEI (Grant for Setting up European or International Scientific Networks). Participant 2020-2022 MicroVarioR: Oganic wines of resistant variéties : analyse du microbiote des baies et de sa capacité à conduire des fermentations spontanées en bio et zéro phyto. Financed by INRAE MataBio métaprogramme. Coordinator 2017-2023 MetaPDOcheese: Nature and role of biotic drivers in the assembly of microbial communities from traditional PDO cheeses. Financed by France-génomique, CNIEL and CNAOL. Task manager 2016-2019 MetabarFood: Metabarcoding and shot-gun of food microbiota. Financed by INRA MEM Metaprogramme 2016 targeted action. Participant
PhD topic:	Vishniacozyma victoriae as a new platform for the production of carotenoids from lignocellulosic biomass
Research discipline in Doctoral School:	Biotechnology

Short description of the research problem to be solved in the PhD (minimum 1000 characters):	Subject and scope of research: The subject of the research is the biosynthesis of colored compounds and hydrolytic enzymes using the yeast Vishniacozyma victoriae for the utilization of lignocellulosic waste. The yeast V. victoriae is a psychrophilic yeast isolated from cold environments. They have been known for over 20 years now, and their spread on Earth and rapid growth attract more and more attention of scientists. This microorganism has many features, including: production of psychrophilic hydrolytic enzymes, exopolysaccharides, limiting the development of plant pathogens e.g. Botritis cinerea, as well as carotenoid synthesis. Production of carotenoids is constantly growing branch of the biotechnology industry, due to their important impact as antioxidants, in medicine - in cancer treatments, and in everyday life - as dyes. Furthermore, also the identification and production of new hydrolytic enzymes is science's response to the growing industrial demand and increased public awareness of the importance of ecological waste management, including lignocellulosic waste from the oil industry. Goal of research: The aim of the project is to construct a new platform in the form of the yeast Vishniacozyma victoriae for the production of colored compounds using lignocellulosic biomass and to study the yeast secretome in order to overproduce hydrolytic enzymes. The main goal is divided into several specific goals. First - sequencing of the yeast genome and transcriptome along with genome annotation and genomic analysis. Second - examination of the yeast secretome, selection of enzymes that improve the breakdown of lignocellulosic biomass, along with determining the glycan profile of the produced glycoproteins (potential production of heterologous enzymes with therapeutic properties). Third - analysis of the biosynthesized carotenoids (types and quantity). Fourth - construction of genetic engineering tools (Golden Gate, CRISPR-Cas), enabling genetic manipulation and increasing the efficiency of production of compounds from the carotenoid fraction as well as hydrolytic enzymes. The last specific goal is the construction of Vishniacozyma victoriae strains with improved lignocellulosic waste utilization capabilities and increased carotenoid production.
Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques, minimum 500 characters):	The candidate for a doctoral student should have completed studies in biotechnology or a related field. The required criterion for work in the project is the knowledge of bioinformatic techniques of genome assembly, its annotation and RNAseq data analysis. Additionally, it is necessary to have very good knowledge of synthetic biology techniques, including the construction of entire metabolic pathways using the Golden Gate Assembly method, as well as genetic engineering techniques, especially yeast transformation, and the ability to verify the obtained transformants. The species that constitutes the core of the project is yeast from the genus Vishniacozyma, therefore the criterion required to start working on the project is the ability to cultivate yeast, especially psychrophilic yeasts belonging to the Basidiomycota division. Due to the fact that the project involves the production of extracellular proteins with hydrolytic activity, knowledge of enzymatic activity analysis techniques will be a great advantage. Cooperation with INRAE, Montpellier in France as well as presentation of results at international conferences means that the candidate should have a very good level of English (at least B2).
a) Project title:	none
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:	