




POLISH NATIONAL AGENCY  
FOR ACADEMIC EXCHANGE



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PROGRAMME

<b>name of the unit:</b> <b>DEPARTMENT OF ENVIRONMENTAL BIOTECHNOLOGY</b> Department of Biotechnology and Food Sciences, Lodz University of Technology		<b>symbol:</b> <b>K-51</b> <a href="https://www.binoz.p.lodz.pl/pl/Katedra-Biotechnologii-Srodowiskowej/Struktura-Katedry-Biotechnologii-Srodowiskowej">https://www.binoz.p.lodz.pl/pl/Katedra-Biotechnologii-Srodowiskowej/Struktura-Katedry-Biotechnologii-Srodowiskowej</a>
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<b>scope of activities:</b> <ul style="list-style-type: none"><li>• Industrial and environmental applications of microorganisms.</li><li>• Processing of waste from the agri-food industry and energy in biological, chemical and thermal processes.</li><li>• Environmental biofilms.</li><li>• Biopreparations in agriculture and the environment with pro-ecological and/or pro-health activity, e.g. ecological preparations for animals, preparations for removing odours.</li><li>• Renewable energy sources.</li><li>• Ecotoxicological studies.</li></ul>	<b>graphic material</b>  Katedra Biotechnologii Środowiskowej 	
<b>present activities:</b> <ul style="list-style-type: none"><li>• Production of methane and hydrogen from organic waste.</li><li>• Microalgae and activated sludge biomass for the treatment of wastewater and post-digestion effluents.</li><li>• wastewater treatment and post-fermentation leachate.</li><li>• Industrial application of yeast.</li><li>• The application of ozone in biotechnology.</li><li>• Microorganisms as biocontrol factors.</li><li>• Assessment of harmful biological factors in work environments.</li><li>• Biodeterioration analysis of technical materials, including historic ones.</li><li>• Circular economy.</li><li>• Biological and chemical methods of biogas purification..</li></ul>		
<b>Future activities:</b> <ul style="list-style-type: none"><li>• Optimization of the sporulation process for industrial purposes.</li><li>• Assessment of biodeterioration mechanisms based on new instrumental methods.</li><li>• Algae - a source of valuable chemicals, a biodeterioration factor.</li><li>• Analysis of metabolites of microorganisms of industrial importance with the application of MALDI-TOF MS.</li></ul>		
<b>Publications/patents, awards, projects:</b> <ul style="list-style-type: none"><li>• Development of an innovative pulp drying process using waste heat and obtaining functional feed components as a part of the circular economy of sugar plants."Agrotech" POIR.01.01.01-00-2140/20.</li><li>• Borowski S., Boniecki P., Kubacki P., Czyżowska A. (2018) Food waste co-digestion with slaughterhouse waste and sewage sludge: digestate conditioning and supernatant quality. <i>Waste Management</i> 74, 158–167.</li><li>• Nowicka-Krawczyk P., Komar M., Gutarowska B. (2022) Towards understanding the link between the deterioration of building materials and the nature of aerophytic green algae. <i>Sci. Tot. Environ.</i> 8021, 149856.</li></ul>		



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- Szulc, J., Okrasa, M., Majchrzycka, K., Sulyok, M., Nowak, A., Szponar, B., Górczyńska, A., Ryngajłło, M., Gutarowska, B. (2022). Microbiological and toxicological hazard assessment in a waste sorting plant and proper respiratory protection. *J. Environ. Manag.* 303, 114257.

**Keywords:**

chemical and environmental engineering, biopreparations in agriculture, environmental application of microorganisms, energy and environmental engineering, feed preparations, starter cultures

**List of internship proposal in this research team:**

- Metabolic activity of environmental yeast isolates cultured at low temperature.
- Innovative feed components
- Construction of a database of mass spectra to identify microorganisms of industrial importance.
- Mechanisms of biodeterioration of technical materials and new methods of protection.
- Application of microalgae for the treatment of post-digestion effluents and production of the 3-rd generation biofuels .