



POLISH NATIONAL AGENCY  
FOR ACADEMIC EXCHANGE



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PROGRAMME

<p>name of the unit:</p> <h2>ASYMMETRIC ORGANOCATALYSIS AND NMR SPECTROSCOPY GROUP (A-TEAM)</h2> <p>Institute of Organic Chemistry, Faculty of Chemistry, Lodz University of Technology</p>		<p>symbol:</p> <p>I-32</p> <p><a href="http://www.chorg.p.lodz.pl">http://www.chorg.p.lodz.pl</a></p>
<p>head of the unit:</p> <p>Prof. Łukasz Albrecht, PhD, DSc</p>	<p>potential promoters:</p> <p>Prof. Łukasz Albrecht, PhD, DSc</p>	<p>contact person:</p> <p>Prof. Łukasz Albrecht, PhD, DSc phone: 42-631-31-57 <a href="mailto:lukasz.albrecht@p.lodz.pl">lukasz.albrecht@p.lodz.pl</a></p>
<p>scope of activities:</p> <p>The main scientific topics realized in our group include:</p> <ul style="list-style-type: none"><li>• development of new methods of asymmetric synthesis, with particular emphasis on organocatalysis,</li><li>• design of novel reactivities providing access to relevant building blocks</li><li>• utilization of photocatalysis in organic synthesis</li><li>• studies on the reaction mechanisms with application of modern analytical methods</li><li>• application of NMR targeted and untargeted methodologies for food authentication and detection of counterfeit products</li><li>• metabolic profiling of biological samples by means of NMR spectroscopy</li></ul>		<p>graphic material</p>
<p>present activities:</p> <ul style="list-style-type: none"><li>• Studies on the dearomative organocatalytic approaches providing functionalization of aromatic systems</li><li>• Design of the new organocatalytic higher-order cycloadditions, paving way for the better understanding of those processes</li><li>• Utilization of N-heterocyclic carbene catalysis in dearomative reactions</li><li>• Development of new methods for the activation of organic compounds</li><li>• Analysis of the metabolic profile of varietal honeys by NMR</li><li>• Application of <sup>1</sup>H NMR spectroscopy for the assessment of the authenticity of perfumes</li><li>• Metabolic profiling of gestational diabetes in women during pregnancy</li><li>• Investigation of the qualitative and quantitative composition of selected species of pepper and their biological properties</li></ul>		
<p>Future activities:</p> <p>Development of NMR methods for overcoming modern civilization problems related to health as well as food and drugs fraud.</p>		
<p>Publications/patents, awards, projects</p> <p>Publications:</p> <ul style="list-style-type: none"><li>• Przydacz, A.; Skrzynska, A.; Albrecht, Ł. Breaking Aromaticity with Aminocatalysis: A Convenient Strategy for Asymmetric Synthesis. <i>Angew. Chem., Int. Ed.</i> <b>2019</b>, 58, 63–73.</li><li>• Skrzynska, A.; Frankowski, S.; Topolska, A.; Dyguda, M.; Gao, X.-Y.; Xu, C. J.; Chen, Y.-C.; Albrecht, Ł. Enantioselective H-bond-directed vinylogous iminium ion strategy for the functionalization of vinyl-substituted heteroaryl aldehydes. <i>Chem. Commun.</i> <b>2021</b>, 57, 1667–1670.</li><li>• Romaniszyn, M.; Gronowska, K.; Albrecht, Ł. Remote Functionalization of 4-(Alk-1-en-1-yl)-3-Cyanocoumarins via the Asymmetric Organocatalytic 1,6-Addition, <i>Adv. Synth. Catal.</i> <b>2021</b>, 22, 5116–5121.</li></ul>		





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- Pacholczyk-Sienicka, B.; Ciepielowski, G.; Albrecht, Ł. The application of NMR spectroscopy and chemometrics in authentication of spices. *Molecules* **2021**, 26, 382.

Research projects:

- "Game of electrons: new organocatalytic higher-order cycloadditions in organic synthesis" OPUS 21 from the National Science Centre, Poland.
- "Lewis Base Catalyzed Asymmetric Reactions of Aromatic Carbonyl Substrates" Sheng programme (Grant No. UMO-2018/30/Q/ST5/00466) from the National Science Centre, Poland.

**Keywords:**

catalysis, chirality, asymmetric organocatalysis, cycloaddition reactions, organic synthesis, photocatalysis, products authentication by NMR, metabolic profiling

[List of internship proposal in this research team:](#)

Postdoctoral and doctoral fellowships related to scientific topics stated above are available in the group.