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Paweł Borowiecki

Position, Location: Associate Professor and Head of Laboratory of Biocatalysis and Biotransformation, Faculty of Chemistry, Warsaw University of Technology (WUT), Warsaw (Poland)
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ORCID: orcid.org/0000-0001-5355-7281
Education: 2010, MSc in Biotechnology with Prof. Jan Plenkiewicz, Warsaw University of Technology (Poland)
2016, PhD in Biotechnology with Prof. Maria Bretner, Warsaw University of Technology (Poland)
2016 to date, Assistant Professor and Group Leader at Warsaw University of Technology (Poland)
Research: Biocatalysis, bioorganic chemistry, asymmetric synthesis, medicinal chemistry
Hobbies: Biking, traveling with my family, reading books, playing chess, writing manuscripts

Chemistry is fun because it combines knowledge, experience, and creativity with the ability to cross-pollinate ideas from different fields and apply refined manual skills. Besides, solving synthetic challenges brings me immense satisfaction and exhilaration, inspiring me to pursue new goals and projects.

The most exciting thing about my research is exploring the remarkable catalytic potential of enzymes and witnessing the passion and motivation in the eyes of students and young co-workers, as they engage with scientific discovery.

My science "heroes" are: Louis Pasteur, for his groundbreaking contributions to understanding biochemical processes, achieved despite the significant technical obstacles of his time; Maria Skłodowska-Curie, for her unwavering dedication to science and pioneering research in radioactivity; and Paul Janssen, for his extraordinary intuition in the prolific discovery of new pharmaceuticals.

The greatest scientific advances of the next decade will be: revolutionary AI tools and quantum computing for synthesis planning, drug discovery, materials science, and healthcare applications; next-generation sustainable energy technologies (e.g., nuclear fusion and quantum batteries); synthetic biology and genetic engineering (e.g., CRISPR and other gene-editing technologies); breakthroughs in space exploration and colonization; and advancements in regenerative medicine (e.g., lab-grown organs and treatments for neurodegenerative diseases).

My first experiment was developing analog photographs in a darkroom I set up in the basement of my parents' house. Later, in the laboratory, my first serious scientific experiment was the nitration of bromobenzene.

I chose my current career path because I have always wanted to pursue something creative that stimulates my thinking and imagination while also being useful to humanity. Additionally, I have always been passionate about the mystery of the biological activity of chemical compounds and the methods for synthesizing them in the laboratory. The more mundane reason is that I simply loved working with laboratory glassware.

A turning point in my career was attending a live lecture by Prof. Kurt Faber during his visit to our faculty while I was an undergraduate student. From that moment, I knew that biocatalysis would become a central part of my life, and I was determined to follow its path. The real breakthrough came when I started collaborating with Prof. Wolfgang Kroutil, whose unwavering support and trust in my ideas have been instrumental in finding innovative applications for his cherished biocatalysts. Without his mentorship, none of my significant achievements would have been possible. At the same time, I received two prestigious grants (Sonata 15 and Opus 24) funded by the National Science Center (NCN), which gave me the wind beneath my wings and allowed to establish my own research group.

I would like to discover a sustainable and ultra-efficient bioprocess that could be applied in various industrial settings, including the synthesis of pharmaceuticals, bioactive compounds, and other specialty chemicals.

My favorite molecules are two remarkable enzymes that have enabled me to achieve numerous successful transformations: lipase B from *Candida antarctica* (CAL-B) and a variant of alcohol dehydrogenase from *Lactobacillus kefir* (Lk-ADH-Prince).

My long-term goal is to establish a well-coordinated research group whose members start each day with enthusiasm, dedication, and an open mind for new endeavors.

I advise my students to remain curious, patient, persistent, and diligent, as hard work always pays off in the end.

When I was a kid I wanted to be a doctor, but I quickly realized I couldn't stand the sight of blood or needles stuck in veins. So, I left that profession to my wife.

I can never resist a good cup of coffee in the morning or the joy of being greeted by my three young children at the doorstep when I get home from work.

What I appreciate most about my friends is that even if we don't see each other for months, when we do meet, we always feel like the last parting was just yesterday.

My favorite place on earth is Southern Europe, with Mallorca holding a special place in my heart.

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Behind the Science

Dynamic kinetic resolution has always been a fascinating synthetic concept, even though we were aware of its limitations. While exploring the substrate scope of a variant of ADH from *Lactobacillus kefir* (Lk-ADH-Prince), we observed a lack of stereoselectivity in the transfer hydrogenation of various ketones. When we discussed this issue with Prof. Kroutil, he suggested investigating whether the enzyme could racemize the corresponding chiral alcohols. And guess what—we discovered that it could! The final challenge in completing the study was to avoid the undesired oxidation of alcohols. By selecting a suitable acyl donor, we successfully addressed this issue, and from then on, the remaining tasks were pure pleasure!

*The author presented on this page has published his **first article** as a submitting corresponding author in Angewandte Chemie:*

"Bienzymatic Dynamic Kinetic Resolution of Secondary Alcohols by Esterification/Racemization in Water": A. Rudzka, T. Reiter, W. Kroutil, P. Borowiecki, *Angew. Chem. Int. Ed.* **2025**, *64*, e202420133.

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Introducing...

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Find out more about Paweł Borowiecki in his Introducing... Profile.

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