

Open Plastic Lecture Series

Open Plastic is a Genome Canada funded program that endeavours to accelerate Canada's efforts to achieve zero plastic waste by 2030. The Open Plastic research program focuses on the development of novel microbiological and enzymatic technologies to support breakdown of plastic waste into marketable recycled products. This work will support diversion of plastics away from landfills, saving Canada over \$500 million/year and create 40,000 jobs in the clean technology industry. The major impact of this work will be in the reduction of greenhouse gas emissions globally. <https://www.openplastic.com/>

The **Shirley and Bruce Edwards Better World Fund** was established in 2022 to support the research, design, and development of the Open Plastic Research program led by members from the Departments of Chemistry, Biology, and Chemical Engineering at Queen's University.

SELECTED RECENT PUBLICATIONS

- Büchler, J., Malca, S.H., Patsch, D., Voss, M., Turner, N.J., Bornscheuer, U.T., Alleman, O., Le Chapelain, C., Lumbroso, A., Loiseleur, O., Buller, R. (2022), Algorithm-aided engineering of aliphatic halogenase WelO5* for the asymmetric late-stage functionalization of soraphens, *Nature Commun.*, **13**, 371.
- Schenkmyerova, A., Pinto, G.P., Toul, T., Marek, M., Herychova, L., Planas-Iglesias, J., Liskova, V., Pluskal, D., Vasina, M., Emond, S., Dörr, D., Chaloupkova, R., Bednar, D., Prokop, Z., Hoffelder, F., Bornscheuer, U.T., Damborsky, J. (2021), Engineering protein dynamics of an ancestral luciferase, *Nature Commun.*, **12**, 3616.
- Wei, R., Tiso, T., Bertling, J., O'Connor, K., Blank, L.M., Bornscheuer, U.T. (2020), Possibilities and limitations of biotechnological plastic degradation and recycling, *Nature Catal.*, **3**, 867-871.
- Wei, R., Song, C., Gräsing, D., Schneider, T., Bielytskyi, P., Böttcher, D., Matysik, J., Bornscheuer, U., Zimmermann, W. (2019), Conformational fitting of a flexible oligomeric substrate does not explain the enzymatic PET degradation, *Nature Commun.*, **10**, 5581.
- Reisky, L., Préchoux, A., Zühlke, A.K., Bäumgen, M., Robb, C.S., Gerlach, N., Roret, T., Stanetty, C., Larocque, R., Michel, G., Song, T., Markert, S., Unfried, F., Mihovilovic, M.D., Trautwein-Schulz, A., Becher, D., Schweder, T.*, Bornscheuer, U.T.*, Hehemann, J.H.* (2019), A marine bacterial enzymatic cascade degrades the algal polysaccharide ulvan, *Nature Chem. Biol.*, **15**, 803-812.



The Department of Chemistry,
Queen's University and the
Shirley and Bruce Edwards
Better World Fund

is honoured to host the
Inaugural Open Plastic Lecture:

Uwe T. Bornscheuer
University of Greifswald

"Recent Progress in the
Enzymatic Degradation of
Plastics and Especially PET"



GenomeCanada

Friday, November 11, 2022
11:30 AM

Room 117, Chernoff Hall

UWE T. BORNSCHEUER



Uwe T. Bornscheuer

Institute of Biochemistry
Dept. of Biotechnology & Enzyme Catalysis
Greifswald University
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Professor Uwe T. Bornscheuer is the Head of the Department of Biotechnology & Enzyme Catalysis at Greifswald University, Germany. He was formerly the Vice Dean of the Faculty of Mathematics and Natural Sciences at Greifswald University and is currently Head of the University Senate.

Prof. Bornscheuer obtained his PhD (1991-93) in Chemical Engineering at the University of Hannover with Profs Karl Schügerl and Thomas Scheper, followed by a JSPS postdoctoral fellowship (1993-94) with Prof. Tsuneo Yamane at the University of Nagoya, Japan. Following his Habilitation with Prof. Rolf D. Schmid at the Institute of Technical Biochemistry, University of Stuttgart (1994-99), Prof. Bornscheuer began his independent academic career at Greifswald University in 1999. His research program is at the forefront of enzyme biocatalysis, with interests in screening for new enzyme activities from microbes and engineering enzyme activities through *in silico*, rational, or directed evolution techniques.

The Bornscheuer lab explores a wide range of enzyme classes for new biocatalysts, including carbohydrate active enzymes, transaminases, Baeyer-Villiger and P450 monooxygenases, esterases, and lipases. Applications include the synthesis of optically pure precursors for pharmaceuticals, degradation of algal polysaccharides, modification of fats and oils, and degradation of plastics.

Prof. Bornscheuer's group has published more than 550 journal articles, 50 patent applications, and 40 book chapters. He is the cofounder of Enzymicals AG and the member of several journal editorial boards, including *Scientific Reports*, *Journal of Molecular Catalysis*, *Enzyme and Microbial Technology*, and the *European Journal of Lipid Science and Technology*.

SELECTED HONOURS & AWARDS

- Enzyme Engineering Award (2022)
- European Lipid Technology Award (2021)
- Chemistry Europe Fellow (2020)
- Greifswald Research Award (2018)
- Stephen S. Chang Award from the American Oil Chemists' Society (2015)
- Normann Medal (DGF, Germany) (2014)
- Chevreul Medal (SFEL, France) (2012)
- Biocat2008 Award (2008)