

KEYNOTE SPEAKER



Daniel Otzen

Professor at The Interdisciplinary Nanoscience Center at Aarhus University

Enzymatic plastic degradation: A solution to plastic pollution

Daniel Otzen, Professor at The Interdisciplinary Nanoscience Center at Aarhus University

The world is drowning in plastic waste, both from current production (in excess of 1 million tons per day) and legacy waste in landfills. This calls out for systematic efforts to develop sustainable ways to recycle these vast amounts of material. Productive solutions will require combinations of many different chemical and biological approaches. At EnZync we have since early 2023 developed a comprehensive approach to screen for bacterial plastic-degrading enzymes. We collect bacterial samples from i.a. legacy plastic sites at different places in the world and also seed local composts with different plastics. Bacteria are extracted, incubated with cell-penetrating compounds containing fluorophores attached via cleavable plastic bonds, and then subjected to Fluorescence-Assisted Cell Sorting to collect organisms with the desired cleavage activity. Hits are then grown up in liquid media, identified by 16S rRNA and if necessary genomically sequenced. In parallel, the lysate is fractionated chromatographically and active fractions identified with the fluorophore. Enzyme identity is established by triangulation between mass spectrometry, native gel electrophoresis, bioinformatics and where possible genomic shotgun expression. This has as of March 2025 yielded at least five (and growing) enzymes active towards polyurethane (PU), several of which show promising activity and thermostability and are undergoing additional optimization. We will discuss our latest efforts focused on PU and other plastics, as well as our parallel efforts with fungal enzymes and structural analysis of existing PU-degrading enzymes.

About Daniel Otzen

Since 2007, Daniel Otzen has been a professor of nanobiotechnology at the Interdisciplinary Nanoscience Center (iNANO) at Aarhus University. He holds a degree in chemistry and molecular biology from Aarhus University and a PhD from the University of Cambridge. A member of the Royal Danish Academy of Sciences and Letters since 2010, Since 2023, he has directed the EnZync Center for Enzymatic Deconstruction of Thermoset Plastics to develop scalable bio-based plastic degradation strategies through activity-based discovery of novel plastic-degrading microbial enzymes.

Event Coordinator:

AmCham Denmark - Dag Hammarskjölds Allé 13 - 2100 Copenhagen Ø

ESAC 2025

Executive Seminars in Analytical Chemistry

Tuesday, April 29, 2025 - Scandic Copenhagen



AmCham Denmark's Analytical Instruments Committee is pleased to announce the 24th annual Executive Seminars in Analytical Chemistry: ESAC 2025

ESAC brings together manufacturers, leading scientific researchers, progressive vendors and cutting-edge technology within the field of analytical instruments.

Experiences, methods, results and the latest developments will be presented within four core areas: Life Science / Biotech, Pharmaceutical, Food / Environmental and Clinical / Forensic applications.

ANALYTICAL INSTRUMENTS COMMITTEE COMPANIES



GUEST EXHIBITORS





09:00 - 09:30	Registration & Coffee
09:35 - 09:45	Introduction & welcome remarks by Stephen Brugger, AmCham Denmark
09:45 - 10:15	KEYNOTE: "Enzymatic plastic degradation: A solution to plastic pollution", Daniel Otzen, Professor at the Interdisciplinary Nanoscience Center (iNANO) at Aarhus University

Life Science / Biotech				Pharmaceutical			Applied Sciences		
	Title	Presented by	Technique	Title	Presented by	Technique	Title	Presented by	Technique
10:20 - 10:50	Mass spectrometry analysis of serum dehydro-epiandrosterone sulfat (DHEAS) in 15 seconds	Marianne Lerbæk Bergmann, Biokemiker, Vejle Sygehus	Rapid Fire MS/MS	Early highligths from in depth structure elucidation by timsOMNI of small and large molecules and building AI based structure id/ quantification for high throughput parallel synthesis or reaction products from forced degradation studies	Gustaf Hulthe, Astra Zeneca Pharmaceutical Technology & Development	LC-HRMS - timsOMNI	Urban Runoff's Chemical Fingerprint: It's Not Just Water Under the Bridge	Jan H Christensen, Professor, Environmental Analytical Chemistry, Copenhagen University	LC-HRMS

10:50 - 11:20 Coffee Break

11:20 - 11:50	Characterization of ADCs: Integrating Microflow Sample Fractionation, Automated Digestion, and Nanoflow LC-MS	Dan Bach Kristensen, Ph.D. Scientific Director Analytical Development, Symphogen	LC-MS/MS	Glycosylation – Use biology to change the properties of small molecules	Diana Jæger, Senior Scientist, River Stone Biotech	LC/MS/MS	The versatility of Sliding Window in Ion Mobility-Mass Spectrometry for targeted and non-targeted analysis of chemicals of emerging concern	Prof. Eppe Gauthier, Université de Liège	LC-HRMS timsTOF Pro 2
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11:50 - 12:00 Change Break

12:00 - 12:30	Antibody Characterization and Development using a Time-of-Flight Mass Spectrometer	Olle de Bruin, Senior Analytical Scientist BioInvent International AB	HR-MS	Insights into fragmentation behaviour of sulfur based cyclic peptides by multiple fragmentation techniques using orbitrap mass spectrometer	Ileana Rodríguez León Principal Scientist FERRING	UHPLC-HRMS and MS/MS with HCD, ETD, CID	The potential of comprehensive 2D-LC in non-target screening	Osker Kronik Munk, PhD, University of Copenhagen	LC/MS/MS
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12:30 - 13:20 Lunch Break

13:20 - 14:20 Poster Pitch Session

14:20 - 14:30 Change Break

Life Science / Biotech				Pharmaceutical			Applied Sciences		
	Title	Presented by	Technique	Title	Presented by	Technique	Title	Presented by	Technique
14:30 - 15:00	Visualising microbial interactions using MALDI MSI	Aaron John Christian Andersen Metabolomics Core Manager, DTU Metabolomics Core, Natural Product Discovery	MALDI MSI - timsTOF flex	Automated closed loop U/HPLC method development	Søren Furbo, Process Optimisation Specialist, Novo Nordisk	U/HPLC	Non-target screening in water: Identifying new PFAS in wastewater & contaminant migration from re-usable plastic bottles	Selina Tisler Assistant Professor Copenhagen University Dept. of Plant & Environmental Sciences	SFC / LC
15:00 - 15:30	American Wine and State of the Union	Anne Aamot Stephen Brugger							

15:30 - 17:30 Poster session + Mixer/wine tasting, Wrap up & prize drawing – best poster award