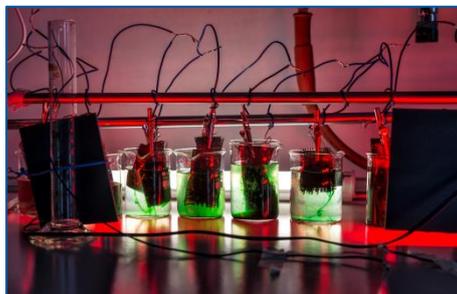


Nature-Based Solutions – sustainable production of materials and energy

New pathways towards a decentralised and integrated use of renewable resources and wastes



All photos A. Künzelmann / UFZ

Biotechnology

Offer no: TOEN-16/09/04

Expertise

- Modern Biotechnology and bio-electrochemistry
- Modular reactor systems
- Bio-catalysts
- Extensive collection of micro-organisms (yeasts, bacteria, fungi)
- Process control and sensors
- Analytics and modelling
- Broad scientific and engineering expertise

References (selected)

- Willrodt *et al.*, *Curr Opin Biotechnol.* 2015 Dec;35:52-62
- Harnisch *et al.*, *ChemSusChem.* 2015 Mar;8(5):739
- Sträuber *et al.*, *Appl Microbiol Biotechnol.* 2016 ;100(1):479-91

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Technology

With a view to global challenges such as climate change and increasing demands for raw materials, the Helmholtz Centre for Environmental Research (UFZ) has established its research focus „Environmental and biotechnologies“, which emphasises a decentralised and integrated use of renewable resources and wastes.

The nature-based solutions we are heading for will facilitate a decentralised production of platform chemicals and energy carriers from renewable resources, e.g. renewable carbon sources, non-food biomass, carbon dioxide, hydrogen, or sunlight and electric power.



Innovation

As a whole, the process modules aim for closed-loop systems of existing materials or, pro-actively, those that may see industrial usage in the future.

Our current research activities involve, amongst others:

- Developing alternative chemical energy sources Novel types of biomass and efficient extraction processes
- Enzymatic electro-chemistry, electrical and photo-calorimetry
- Screening and selection of microbiomes from different sources, and their targeted application in reactors
- Tailor-made, photosynthetic platform microorganisms
- Degradation of lignin / lignocellulose and of contaminants, including those particularly solid and resistant to biological decomposition (plastics)
- Selective sorbents, electro-sorption or wet oxidation to treat and extract products from aqueous material flows
- Diagnosis of disturbances in biogas plants

Property rights (selection)

Production process for organic compounds (DE102014214582, WO2016/012279)
Rig set for bio-reactors to facilitate microbial electro-synthesis (DE102013224673, WO2015082490)
Test kit to determine foaming risks of biogas substrates (DE202013000693.5)
Process to simultaneously produce PHA and compatible solutions in halophilic bacteria (DE102008045237.8)

Offer

We are looking for industry partners in chemistry, biotechnology, agriculture, industrial site managers and stakeholders in the development of future urban infrastructures in order to jointly develop R&D results and processes into marketable products – e.g. in a cooperation supported by public funding.