

FRAUNHOFER INSTITUTE FOR APPLIED POLYMER RESEARCH IAP

FROM MICROORGANISMS TO BIOMATERIALS

WE DO RESEARCH FOR YOU



BIOLOGICAL BUILDING BLOCKS AND BIOPROCESS DEVELOPMENT

New materials, which are biodegradable and based on renewable resources, become more and more important. We produce biobased monomers and polymers, additives and coatings for sustainable and biodegradable materials using biotechnological processes.

For our industrial partners we develop production strains, fermentation processes, enzymatic conversions and new materials, which are designed for the customers applications.

APPLICATION AREAS

Textile industry, food packaging, colors and coatings, cosmetics, chemical industry, medical materials, food, feed, pharma, ...



WE DO RESEARCH FOR YOU:

- Engineering of production strains (bacteria, yeast, fungi)
- Protein engineering and site-directed mutagenesis
- Fermentation process development and optimization
- Scale-up to 100 L (in cooperation up to 10.000 L)
- Utilization of organic waste materials
- DNA, RNA and protein analysis
- Implementation of biological functions into materials
- Transfer of biological concepts to materials
- Concept development/consulting

STRAIN DEVELOPMENT



FERMENTATION / SCALE-UP



PROCESSING



MATERIAL DEVELOPMENT



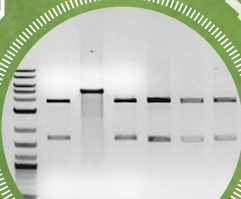
FERMENTATION/ SCALE-UP

- Fermentation of wild type and GMO strains
- Fully automated bioreactor cascade with 2, 10 and 100 L fermenters
- Process analytics (O_2 consumption, pH, vital cells, p, T)
- Utilization of plant biomass



STRAIN DEVELOPMENT

- *In silico* identification of candidate genes
- Protein structure modeling
- Site directed mutagenesis
- Gene and protein expression
- Activity assays (fluorescence, UV-VIS)
- Biocatalytic conversions
- EM, light and fluorescence microscopy
- Analytics (RNA, DNA, protein, organic acids, sugars, fatty acids, biomass composition)

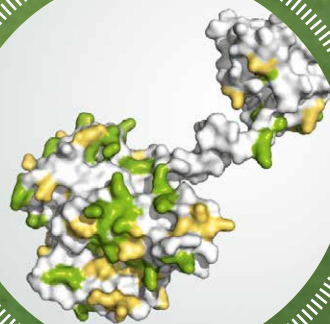


PROCESSING

- Cell separation and lysis
- Product purification and concentration (centrifugation, filtration, freeze drying, evaporation, chromatography)

BUILDING BLOCKS/ PRODUCTS

- Structural proteins for films and coatings
- Channel proteins for membranes
- Antimicrobial peptides
- Enzymes for polymer and monomer modifications
- Biopolymers (e.g. PHA, bacterial cellulose, lignin)
- Poly- and oligosaccharides for food, feed, cosmetics, pharma and coatings
- Biosurfactants
- ...





CONTACT

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