

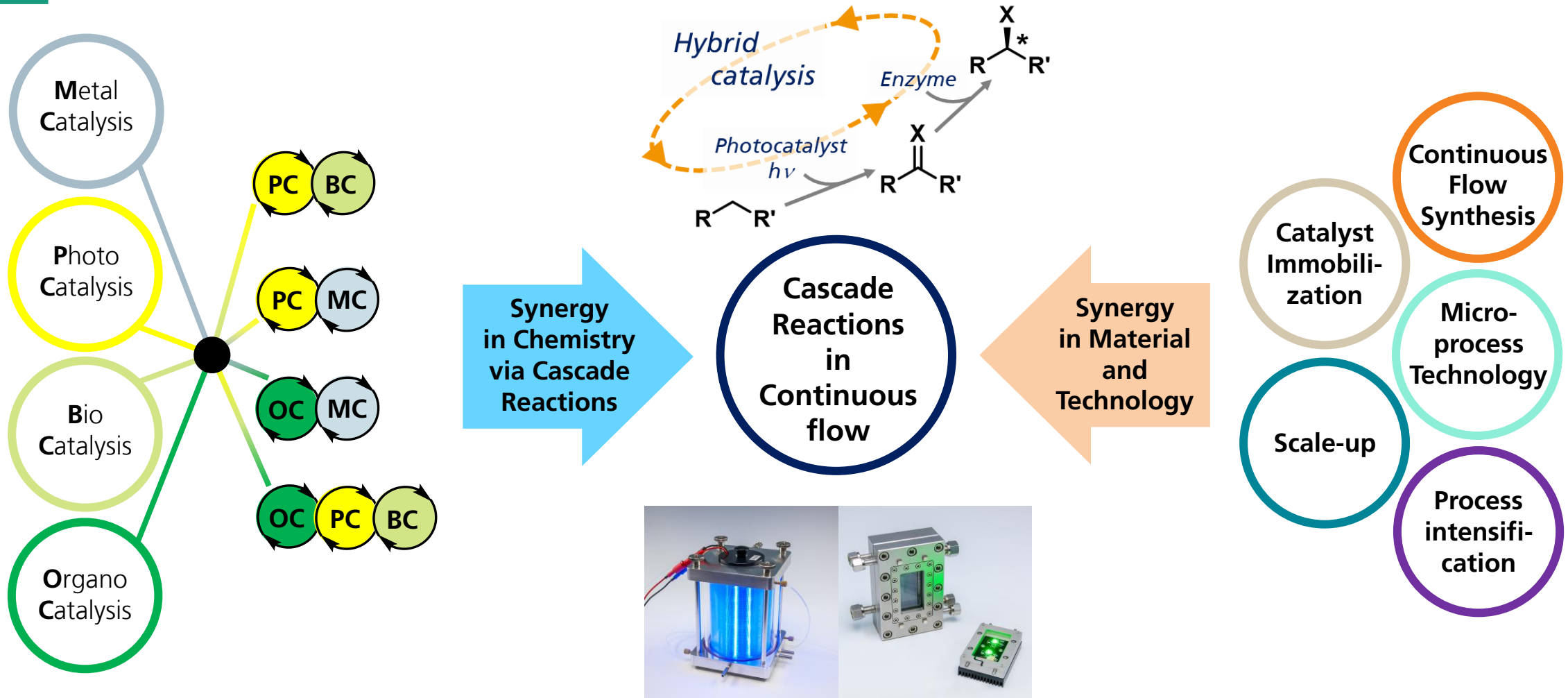
# Cascade reactions for the continuous flow synthesis of fine chemicals

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**Technology and process development**

An innovative technology based on the principles of Green Chemistry

# Cascade reactions applying combined catalysis in continuous flow



Safe TIME, MONEY and ENERGY by going to flow

## Your take home messages by our cascade reactions technology

These advantages	translated into	Your benefit
<b>Mild</b> reaction conditions with photo-, organo- & biocatalysis	maximize	your product <b>quality</b> by less degradation
<b>Orthogonal reactivity</b> in metal-, photo-, organo- & biocatalysis	allows	<b>novel synthesis routes</b> and <b>products</b> for your portfolio
Process-oriented <b>combination</b> and <b>immobilization</b> of catalysts	allows	<b>high flexibility</b> in process design on a <b>small footprint</b>
<b>Clever</b> reactor design	achieves	<b>better</b> process <b>control</b>
Process <b>intensification</b> and heterogeneous catalysis	avoids	<b>needless waste</b> and high efforts for the <b>downstream</b>
<b>Intrinsic scale-up</b> of flow reactors	results in	<b>cost reduction</b> for your processes

Vision, collaboration and expertise of four Fraunhofer institutes

## Team and expertise



- Surface functionalization using plasma technology (PECVD) & wet chemical processes including analysis
- Scale-up of roll-to-roll coating
- Immobilization of catalytically active materials



- Technology platforms for up- and downstream processing of enzymes up to g scale
- Enzymatic assays and enzyme characterization
- Enzyme engineering



- Microprocess engineering of reactors and lab plants for continuous flow syntheses
- Development of continuous flow processes
- Screening of photo-, organo- and metal catalysts

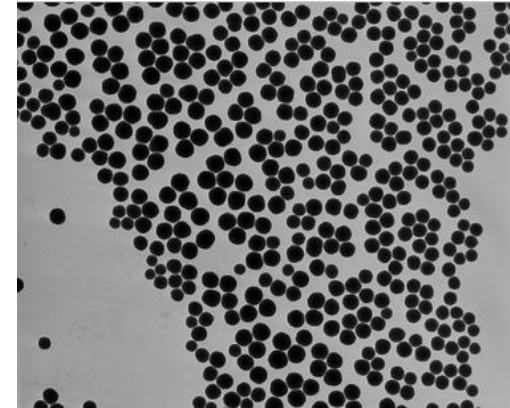


- Synthesis of inorganic particles (catalysts & carriers) and their surface modification
- Assembly of functionalized nanoparticles to superparticles
- Analysis of particle systems

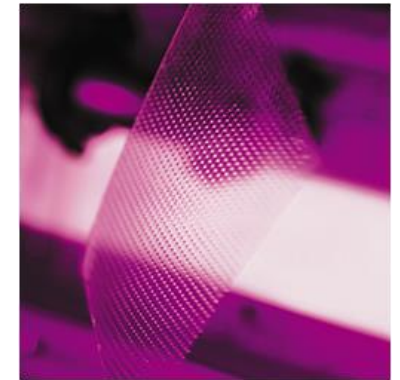
We provide the right solution for you  
**Our service offer**

**Developments and feasibility studies in the following areas**

- Material development and upscaling of catalyst materials
- Reactor development for cascade processes
- Plant and process development



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# Get in contact with us

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