

# Biocatalysis2021 Cluster Initiative



Nachhaltige Biokatalyse auf neuen Wegen

Merging the Boundaries between Science and Innovation

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management coordinator of biocatalysis2021



# Background

- ◆ Since 1992 TuTech is successfully working on knowledge transfer and technology-management
- ◆ In co-operation with Prof. Antranikian (Head of the Institute for Technical Microbiology at University of Technology Hamburg (TUHH)) several research consortia are coordinated:
  - EU Network: „Biotechnology of Extremophiles“ and „Extremophiles as Cell Factories“ (1993-1999)
  - DBU network Biokatalyse (2000-2003)
  - DBU network InnovationsCentrum Biokatalyse (ICBio) 2000-2007
- ◆ In 2005 start of an initiative “Industrial Biotechnology North”
  - to coordinate the activities of Universities and Companies
  - to strengthen the visibility of the “white biotechnology” in Northern Germany
  - to initiate research cooperation between science and industry



# BMBF Competition “BioIndustrie2021”

- ◆ BMBF call “BioIndustrie2021” in May 2006
- ◆ In cooperation with the partners of the “Industrial Biotechnology North” initiative TUHH and TuTech start to form a national, sectoral cluster “Biocatalysis2021” and coordinate the proposals for the first and second phases of the competition
- ◆ In May 2007 the BMBF selects 5 of 19 competitors to be supported by the BMBF in the next five years with a total amount of 60 Mio. €.

The cluster “Biocatalysis2021” wins the first price and will get a support of 20 Mio. €.



# The Consortium

## Clustering of Excellencies with partners from Large Industries SME and Universities

- BASF, Henkel, Degussa, Merck and 11 other global players
- Direvo, SternEnzym, Dr. Rieks and 16 other innovative SME
- 10 Universities and 3 Research Institutes (IFM-Geomar, Institut für Katalyse, EMBL)

**PLUS: 7 Regional Agencies**



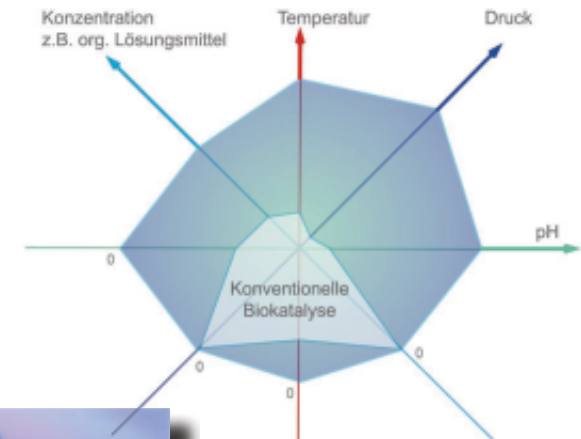
- GROSSUNTERNEHMEN
- KMU
- HOCHSCHULEN
- FORSCHUNGSEINRICHTUNGEN





## Innovative biocatalysis under extreme conditions

- Exploitation of new biotopes as resource of new enzyme systems
- Optimization of biocatalysts
- Using the promiscuity of enzymes
- Establishment of the biocatalysis at:
  - extreme temperatures
  - extraordinary pH-values, solvent- and salt-concentrations
  - high viscosities and pressures
- Process-development and downstream-processing



# Economical Potentials

## Biocatalysis: Motor of the Industrial Biotechnology

- ◆ Innovative processes and products using biocatalysts
  - enzyme market: 3 Bio. € per year
  - white biotechnology: 55 Bio. € per year
  
- ◆ Growth: 10 - 30% per year  
Prognosis: production of 20% of all chemical products using biotechnological processes until 2010
  
- ◆ Markets:
  - fine- and special chemicals
  - flavor, active substances, food
  - detergents, consumer goods

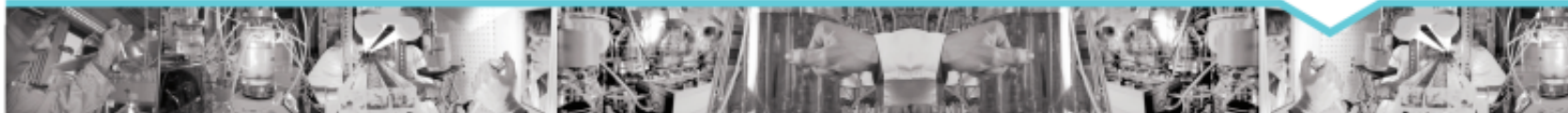


# Chances for the Chemical Industrie

## Industrial Biotechnology - Innovations for the chemical industry

- Opening up new products and markets  
(new molecules, bioprocesses under  
extreme conditions)
- Lower endangering potential
- Strengthening the global competitiveness  
especially against China, Japan and India

➡ **Protection & Adding of New Jobs**



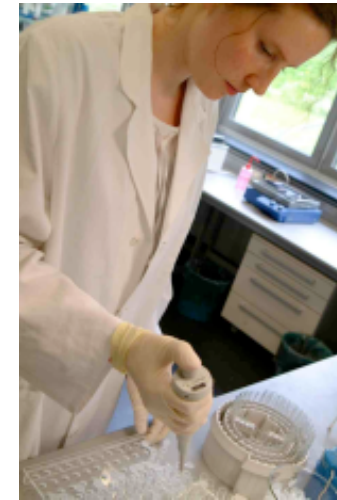
# Value Added Chain

## Cluster activities along the value added chain

- From screening over process development to the end product
- Universities & Institutes...  
...basic research, methods and know-how
- SME & Industry...  
...process development, plant engineering, commercialization



**stabile enzymes, process technologies,  
fine chemicals, special chemicals and  
active substances**





# Connecting the Cluster Activities

## Interdisciplinarity and cooperation within the projects and within the cluster

- ◆ All projects are interdisciplinary co-operations between partners from industry/SME and Universities
- ◆ The different projects will be connected by the cluster- management to generate synergy
- ◆ A central technology- and service platform will be at the disposal of all partners (screening, enzyme- and metagenome banks, fermentation)



# Highlight: Concrete Projects

## The cluster Biocatalysis2021 creates the basis for concrete innovative projects

- 25 concrete project proposals in cooperation of companies and research institutes
- 3 cross projects: ecological and economical evaluation, Consumer project and central project



**open for additional partners and projects**





# Highlight: Central-Project

The project offers  
central services  
and connects the different projects

## ◆ Cross Cluster Service

- automated highthroughput screening
- Enzyme collection (BiocatCollection)
- Metagenome bank (MetaCatCollection)
- Fermentation up to 300-L
- Protein cleaning

Aim: Supply of biocatalysts  
for all projects of the cluster



# Cluster-Management

## Quality management, communication and Know-how Transfer

- Quality management on Basis of ISO 9001:2000 with modern software tools (Agresso Business World)
- Inter- and Intranet [www.biokatalyse2021.de](http://www.biokatalyse2021.de) - a portal for intern and extern communication
- National status seminars, workshops, fairs (BIO, Achema, Biotechnica) and international congresses (biocat 2008, 2010, 2012)



**biocat 2008**  
**HAMBURG**



## Public/private financing

### Implementation of innovative models for funds to mobilize private money

- Industrial partners of the cluster: 24 Mio. €
- BMBF: 20 Mio. €
- Norddeutsche Länder: 2,3 Mio. €

- Private-Fond in cooperation with HSH N Financial Markets Advisory AG and Seed Fond in cooperation with Hamburger Gründungsfonds

**AIM: Mobilization of private capital with an amount of 6 Mio. €**

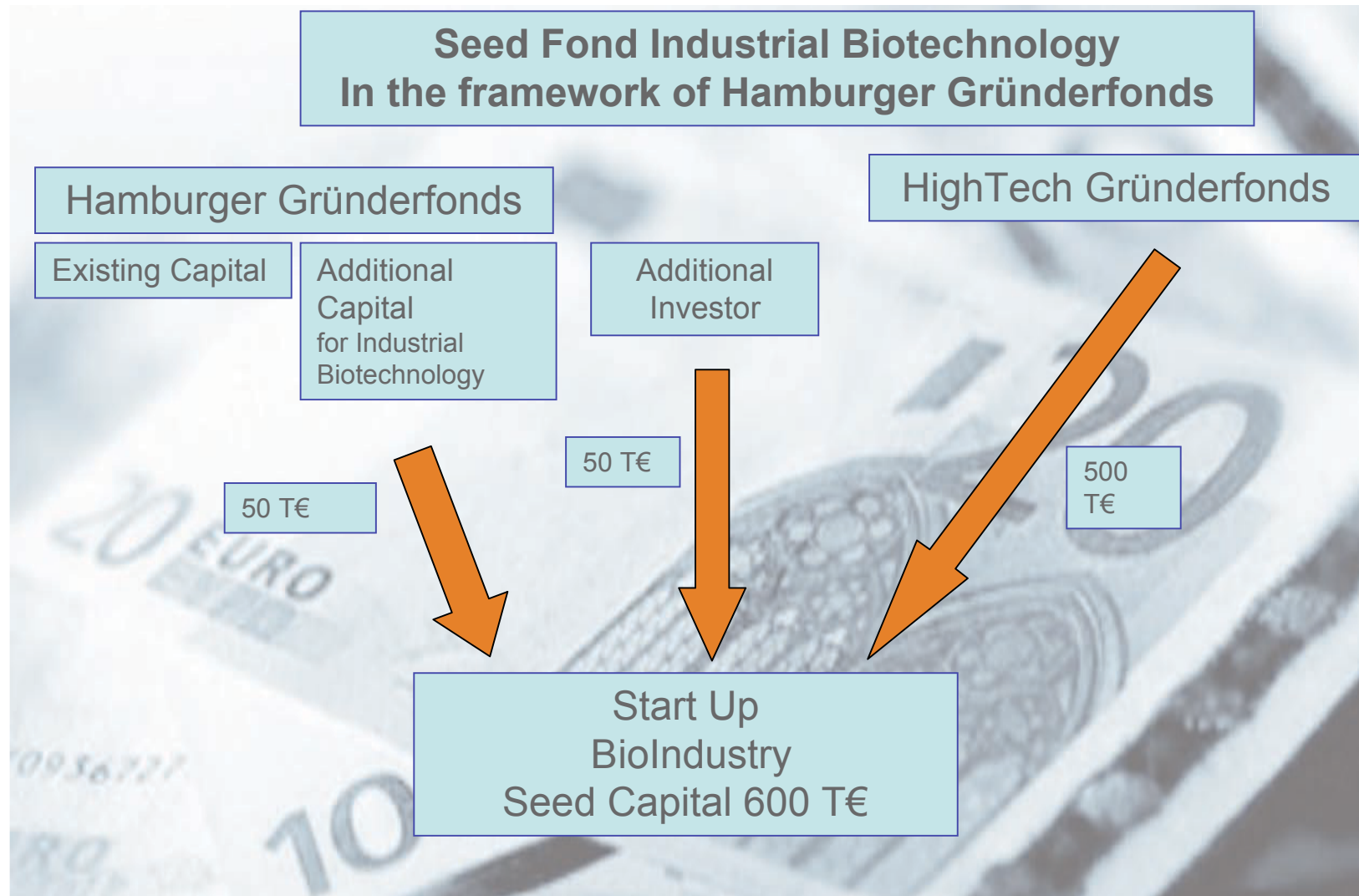


HSH NORDBANK





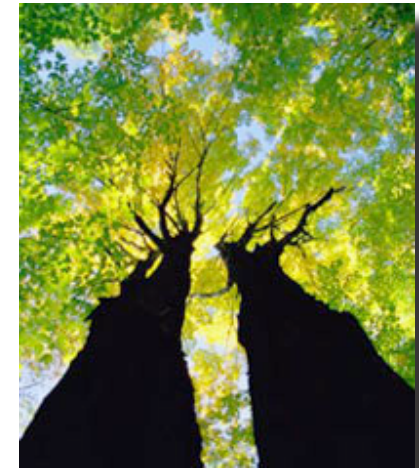
# Biocatalysis2021 Seed Fond



# Sustainability & Continuity

## Actions to continually establish the cluster structures and following activities

- ◆ **Virtual Research Institute**
  - based on IBN a virtual, cooperative research institute will be established with all partners of the cluster
- ◆ **Foundation of Start Ups**
  - BiocatCollection as individual GmbH
  - Start Ups financed by Hamburger Gründerfonds
  - Consultancy through the TuTech programs hep and PVA
- ◆ **Protection and creating of jobs in the cluster companies**





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