

## Disciplinary diversity for integrated research

The Bioeconomy Science Center (BioSC) integrates central branches of science for the provision of biomass and biobased products and processes. With its form of cooperation, its size and its broad scientific basis, the BioSC offers ideal structural and content-related conditions for inter- and transdisciplinary networking by integrating basic and application-oriented bioeconomy research. Depending on the issue, project teams from different disciplines are formed. These include:

Plant sciences, plant production, horticulture, phytomedicine, soil sciences, ecosystem analysis, environmental biology



Molecular biology, biochemistry, microbiology, biotechnology, macromolecular chemistry, polymer chemistry



Technology and innovation management, environmental and resource economics, agricultural policy, market research, sustainability research



Process engineering, enzyme technology, textile technology, technology of energy raw materials, technical chemistry, research biorefinery



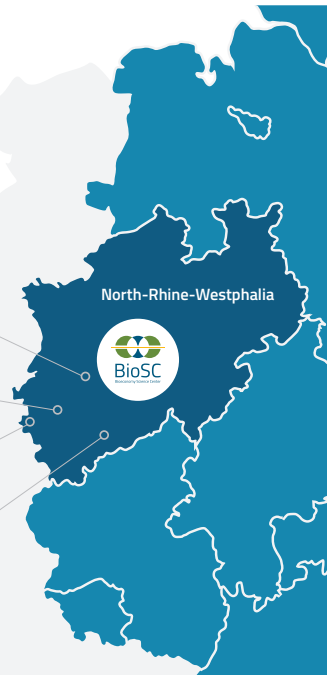
## BioSC partners/ locations

hhu  
Heinrich Heine  
Universität  
Düsseldorf

JÜLICH  
Forschungszentrum

RWTH AACHEN  
UNIVERSITY

UNIVERSITÄT  
BONN



## Wish to learn more?

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### Facts and figures

Established: 2010  
Core groups: 70  
Staff: ≥2000  
Funding: e.g. MKW NRW, BMBF, DFG, EU

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For a sustainable  
bioeconomy

www.biosc.de

## Global challenges

Worldwide, innovative and sustainable solutions are being sought to meet key societal challenges such as food security, climate protection, resource conservation and long-term energy supply.

One approach is offered by the bioeconomy - the generation and integration of knowledge about biological systems for the sustainable production of biogenic resources, their use as food and feed and their conversion into bio-based materials and chemicals as well as in energy.

## Knowledge Hub for national and international cooperation

The BioSC is a competence center that combines scientific expertise, modern infrastructures and education in important areas of the bioeconomy in a system-oriented cross-disciplinary concept. It was founded by the Universities of Bonn, Düsseldorf and Aachen and Forschungszentrum Jülich.

Scientists from the BioSC are involved in numerous international collaborations and networks for the development and implementation of a sustainable bioeconomy, with partners in Europe as well as for example in India, China, Thailand, Brazil, Argentina and various African countries.



## Finding solutions

Based on the competences of the partners, the BioSC focuses its research on four Focus Topic Areas

### Smart Management for Plant Performance

For example:

- New solutions for crop protection
- Sustainable agriculture: closing nutrient cycles, new cropping systems
- Improved resource utilization and higher crop yields

### Modular Biotransformations for High-Value Compounds

For example:

- Hybrid synthesis processes for platform and fine chemicals
- Identification, modeling and synthesis of natural and novel bioactive compounds
- Provision of platform organisms

### Integrated Biorefineries for Sustainable Processes and Products

For example:

- Development of chemical and enzymatic processes for the pulping of lignocellulosic biomass
- New technologies for separation and purification of high-value compounds
- Computer-aided modeling of biorefinery processes

### Technological and Institutional Innovations as Drivers of Bio-Based Social Transformations

For example:

- Markets and value chains in the bioeconomy
- Innovation and technology transfer
- Transformation pathways to a sustainable economy and society

## Regional implementation

One example of how the bioeconomy can open up new opportunities is the structural change in the Rhenish lignite mining region ("Rheinisches Revier"). Together, the regional (agricultural) economy and the bioeconomy research community can develop new and sustainable value creation concepts and business models, for example for the production of innovative bio-based chemicals, fibers and plastics or for food and feed production. Through the cascade use of biobased raw materials and the recycling of residual streams, bioeconomy can also contribute to a circular economy.

## Cross-disciplinary education

Already today, specialists are urgently needed in all areas of the knowledge-based bioeconomy. Graduate education in the BioSC focuses on conveying excellent basic disciplinary knowledge as well as a holistic understanding of the bioeconomy's challenges.

