

## RESEARCH GROUPS@IBG-2

### Shoot Dynamics

Measuring and understanding photosynthesis and dynamic shoot traits at different scales.

### Root Dynamics

Discovering root traits for resource efficient crops to meet the growing demands of agriculture.

### Jülich Plant Phenotyping Center

Quantitative analyses of the plant phenome by high-through-put and non-invasive phenotyping.

### Bioinformatics, Cell Walls & Secondary Metabolites

Integrating multiple omics data to improve plant resilience and performance, material and energetic use of plants.

### Alternative Biomass

Developing alternative biomass resources based on perennial plants and algae.

### Enabling Technologies

Technology development for sustainable and innovative plant production.

## NETWORKS AND PARTNERS



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## HIGHTECH FOR PLANT SCIENCES AND BIOECONOMY

Institute of Bio- and Geosciences  
IBG-2: Plant Sciences

### PUBLICATION DETAILS

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## RESEARCH FOCUS

### Plant Phenotyping

Key technologies for plant breeding and functional genome analysis

### Sustainable Bioeconomy

Plants as basis for food, renewable raw material and energy

### Adaptation of Plants to a Changing Environment

From the efficiency of the use of water, light and nutrients

### Alternative Biomass Sources

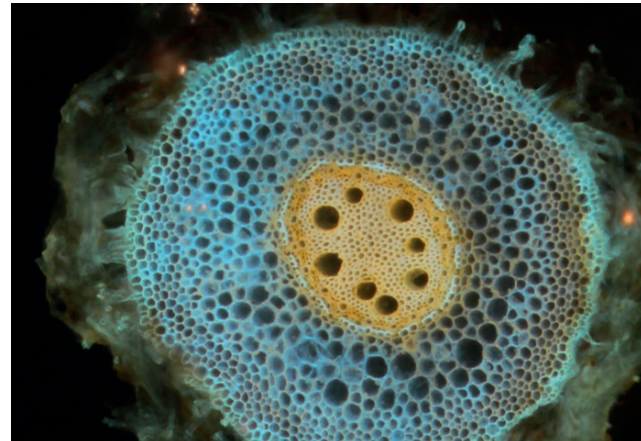
New biomass sources for bioeconomy applications

### Integrated Systems for Bioproduction

Production of algae with waste gas from power plants, energy-efficient production in greenhouses, non-invasive sensors and agronomic management

### Technology and Knowledge Transfer

From basic research to practice and from practice to research



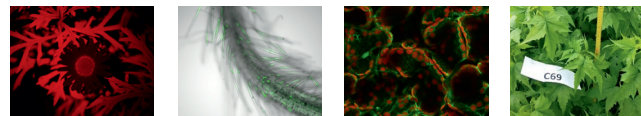
## SUSTAINABLE PLANT PRODUCTION

### Key Technologies for Breeding and Functional Genome Research

Sustainable food security and increasing availability of plant biomass for human nutrition and bioindustries is the key challenge for the coming decades. The analysis of crop performance with respect to structure, function, quality and interaction with the environment remains the bottleneck for the exploitation of crop genetic diversity required for the enhancement of plant productivity and progress in plant reeding.

**Phenotyping** means the quantitative analysis of plant structures and functions. Quantitative knowledge of structure and function enables the transfer of basic research findings to practical agriculture and ecological research.

Thus, improvement in plant phenotyping, pioneered by the IBG-2, is a key factor for success in modern breeding as well as for advancement in basic plant research.



## INFRASTRUCTURE

The application of the increased knowledge of molecular control mechanisms requires multidisciplinary approaches. On the basis of molecular, physiological and ecological expertise, integrated concepts and infrastructures for an intensified and sustainable crop production are being established.

The IBG-2 develops and runs mechanistic, high-through-put and field phenotyping facilities at various scales using non-invasive devices to measure key structural and functional parameters of plants above- and below-ground.

The methods portfolio includes non-invasive quantification of growth, chlorophyll fluorescence, hyperspectral data, and automated plant screening facilities under controlled growth chamber and greenhouse conditions, as well as in field plots.

