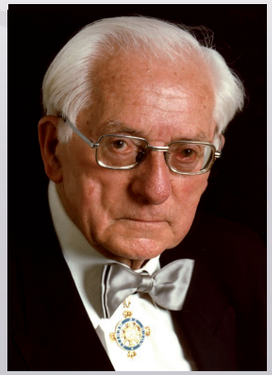
## The Founding Directors

Our institute first sprang into life on the old vineyard (Weinberg) at the outskirts of Halle. The Institute for *Biochemistry of Plants (IBP)* was founded in 1958 by **Kurt Mothes** and joined the Academy of Sciences of then East Germany (German Democratic Republic) as a member institution. Kurt Mothes held the first professorship of Plant Biochemistry in Germany, and his passion for pharmacology, chemistry, physiology, and botany greatly inspired and influenced research at the institute.



After reunification of Germany (1989), the IBP passed the rigorous evaluation process of East German institutes. The institute was newly established in 1992 by **Benno Parthier**, a member of the Mothes School, and renamed to *Institute of Plant Biochemistry (IPB)*. The IPB joined the Leibniz Association, and for another 30 years continued the successful path of interdisciplinary plant research at the interface of biology and chemistry.

Both Founding Directors were long-term presidents of the German Academy of Sciences Leopoldina.

As a member of the Leibniz Association, the IPB is co-funded by the German federal government and the state of Saxony-Anhalt. The institute currently houses about 195 members, including academic staff (55), PhD students (55), technical support staff (60), administrative personnel (15), and vocational trainees (10). One-third of the IPB scientists are from abroad (25 countries).

The IPB maintains close collaborations with the Martin Luther University Halle-Wittenberg, particularly with its institutes in the life sciences on the shared Weinberg Campus. The IPB also maintains close ties to numerous regional, national, and international research institutions and private enterprises. IPB researchers publish about 100 peer-reviewed scientific articles per year.

With its state-of-the-art plant growth and technical facilities, enabling technology platforms and numerous databases, the IPB provides an excellent research infrastructure in the areas of genetics, molecular biology, biochemistry, protein chemistry, and bioorganic chemistry. The IPB is one of the top plant research institutions in Germany, and its scientists participate in a wide network of interdisciplinary projects and activities.

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# 1958-2018

# 60 Years

**Leibniz Institute of Plant Biochemistry**

# 60 Years of Interdisciplinary Research
## at the Interface of

# Biology

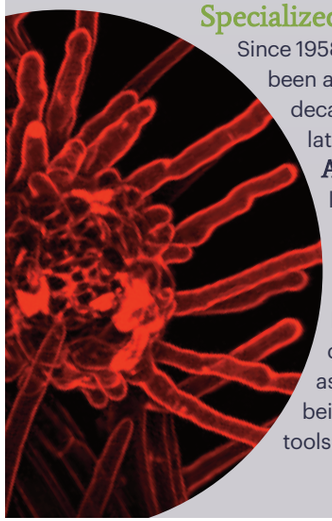
Research at the institute has made major contributions to many fields in the molecular plant sciences, to name a few:

### Chemical Mediators

At the IPB, the metabolism and action of many known plant hormones have been in the focus of investigation: **Cytokinins** and **Gibberellins** in the 1960s, **Brassinosteroids** in the 1990s, **Jasmonates** since the 1980s until today, as well as **Auxins** during the last decade. Research on cellular **Calcium Signaling** has been another line of study with tradition (since the 1990s).

### Environmental Interactions

Plant responses to the environment have been a second major area of research, first initiated by studies on **Senescence** (1960s), followed by **Light-dependent Chloroplast Development** (1970s), and the discovery of plant **Heat Shock Proteins** (1980s). Later, **Heavy Metal Stress** (1990s), **Innate Immunity** and **Mycorrhiza Research** (1990s until today), responses to **Nutrient Deficiency** and **Chemical Communication in the Rhizosphere** (since the 2010s), joined the portfolio of plant research at the IPB.



### Specialized Metabolism

Since 1958, plant secondary metabolism has been at the center of research. For many decades, the biosynthesis and its regulation of bioactive poppy and ergot **Alkaloids** received much attention, later followed by the metabolism of **Phenylpropanoids**, of **Glucosinolates**, and of **Isoprenoids**. Since 2010, **Synthetic Biology** of high-value specialized plant products and **Glandular Trichomes** as a model for plant factories are being developed as biotechnological tools.

# &

### IPB Research Direction

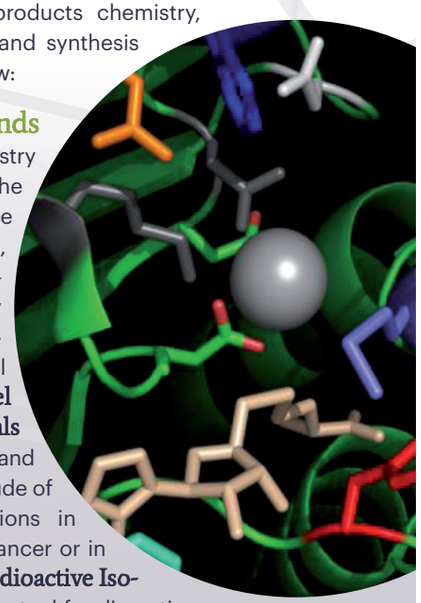
The synergies of biological and chemical expertise under a common roof provide a unique and powerful tool box for exploring the chemical diversity, biosynthesis, biological roles, and mode of action of plant and fungal natural products, with an emphasis on specialized metabolites and signaling molecules. Our aim is to develop a comprehensive molecular understanding of the adaptive and developmental processes plants evolved as a consequence of their dynamic interactions with the environment. We analyze the resulting phenotypic changes by interdisciplinary approaches at the genome, proteome, and foremost metabolome level. The knowledge gained will pave the way to a plant-based bioeconomy; it will facilitate sustainable crop production, innovative biotechnology, and development of bioactive compounds to improve the nutrition and health of humans, animals and plants.

### Enabling Resources

The IPB maintains and continually upgrades its four technology platforms: **Cellular Imaging** (a cluster of state-of-the-art and high-performance microscopes); **Proteome Analytics** (diverse capabilities of discovery and targeted proteomics); **Metabolomics** (integration of all departmental capabilities and instrumentation of NMR and mass spectrometry); and a **Screening** platform. The IPB maintains several **Depositories** (germ plasm, dried/frozen specimen, extracts), **Repositories** (reference substances, data bases), and shares its **Key Expertise** in chemoinformatics and macromolecular modeling, synthesis and structural analysis of small molecules, bioinformatics, metabolic flux analysis, or modular cloning (GoldenGate Technology).

# Chemistry

Bioorganic research at the institute has made major contributions to natural products chemistry, structural elucidation, and synthesis strategies, to name a few:



### Bioactive Compounds

Natural products chemistry has always been at the heart of the institute since its establishment in 1958, ranging from early research on the chemistry of **Alkaloids** to the discovery and structural elucidation of **Novel Bioactive Chemicals** in medicinal plants and fungi with a multitude of potential applications in the fight against cancer or in plant protection. **Radioactive Isotopes** were a decisive tool for dissecting biosynthetic pathways in the first decades, later followed by **Metabolomics** and **Bioinformatics**.

### Compound Synthesis

Development of **Synthetic Bioactives** guided by natural lead compounds represents another major pillar of chemical research at the IPB. The synthesis of gibberellin analogs and synthetic **Plant Growth Regulators**, such as herbicides and fungicides, for field application were the focus of the first decades, followed by the more recent development of **Bioactives against Cancer and Inflammation**. Research at the IPB revolutionized **Multicomponent Reactions** for efficient synthesis of thousands of derivatives and selection of most promising structures. **Biocatalysis** and **Biotechnology** have been introduced and refined for targeted synthesis of compounds with applications in medicine and plant biology.