



Molecular Farming – Transforming Bioproduction for a Sustainable Future

acib provides a state-of-the-art molecular farming platform using plant cells to produce high-value proteins and secondary metabolites. Designed for applications in food, feed, cosmetics, and biotherapeutics, this sustainable technology offers a scalable, cost-effective, and versatile alternative to traditional production systems augmenting the pool of proteins that can effectively be produced.

BACKGROUND

Molecular farming, defined as the production of recombinant proteins and bioactive molecules in plant systems, has evolved substantially since its inception 40 years ago. Recent advances in plant cell cultivation, downstream processing, and regulatory frameworks have brought this technology to a turning point. Modern molecular farming platforms leverage plant cells' unique ability to produce complex glycoproteins and bioactives with customizable attributes, ensuring their relevance across diverse industries, further boosted by the global demand for sustainable and animal-free products.

TECHNOLOGY

acib's molecular farming platform represents a new frontier in sustainable bioproduction, offering:

- **Versatility:** Production of complex proteins (e.g., enzymes, antibodies, toxins, and growth factors) and secondary metabolites (e.g., flavonoids, terpenoids, and alkaloids) for diverse industrial applications.
- **Scalability:** Bioreactor-compatible plant cell systems enable efficient scale-up from laboratory to industrial production.
- **Sustainability:** Reduction in land, water, and energy use, with no reliance on animal-derived components.
- **Safety:** Absence of mammalian pathogens ensures compliance with high safety standards.
- **Customization:** Tailored glycosylation patterns and bioactive profiles for specialized needs in biopharma, cosmetics, and nutrition.

acib integrates high-throughput screening, advanced gene editing, and optimized purification methods to deliver a robust production platform.

OFFER

- **Joint research** to develop custom plant-cell production systems for target molecules.
- **Contract research** leveraging acib's expertise to overcome production challenges.
- **Early access** to scalable molecular farming technologies with full transfer of IP generated in projects.
- **Participation** in techno-economic studies to ensure commercial viability.

EXPERTS

Prof. Dr. Johannes Buyel
Dr. Janos Bindics

DEVELOPMENT STATUS:

Technology Readiness Level 5 (technology validated in relevant environment)

KEYWORDS

- Molecular Farming
- Plant Cell Cultures
- Recombinant Proteins
- Secondary Metabolites
- Sustainable Bioproduction
- Animal-Free Biomanufacturing
- Plant-Derived Bioactives
- Alkaloids
- Flavonoids
- Terpenoids
- Techno-Economic Analysis (TEA)

CONTACT

Dr. Martin Trinker
Director Business Development & Fundraising
Austrian Centre of Industrial Biotechnology (acib)
Krenngasse 37 • A-8010 Graz

martin.trinker@acib.at
[+43 316 873 9316](tel:+433168739316)
www.acib.at