



Industrielle Biotechnologie, die biobasierte Industrie und acib

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acib

Austrian Centre of Industrial Biotechnology

Biotechnology in Austria

is significant and (constantly) growing (2010 – 2014),
and is active by far more in the **red** than the **white** sector.

Companies are mostly small or mid-sized,

relatively young (8 years on average),

and spend significant portion of turnover for R&D.

Industrial biotechnology boosts the development in all sectors of biotechnology. It provides the technology basis and is a key driver of the bio-based industry and the bio-economy.





acib

Austrian Centre of Industrial Biotechnology

A Unique Research Centre in Industrial Biotechnology

*„By applying and adapting the tools
and concepts of nature, acib makes
industrial production processes more
economical and ecological.“*

*„ ... better bioprocesses and products
from them faster.“*



DI Dr. Mathias Drexler
CEO



Prof. Dr. Bernd Nidetzky
CSO

acib – an Austria-based but highly international research centre in industrial biotechnology ...



Graz, Styria, Austria



Vienna, Austria



Tulln, Lower Austria



Innsbruck, Tyrol, Austria



Ljubljana, Slovenia



Linz, Upper Austria

- > 200 employees and project workers
- > 60 % female employees
- 16 Scientific Partners in acib consortium
- > 50 Key Researchers from universities



Rzeszów, Poland



Hamburg, Germany



Bielefeld, Germany



Heidelberg, Germany



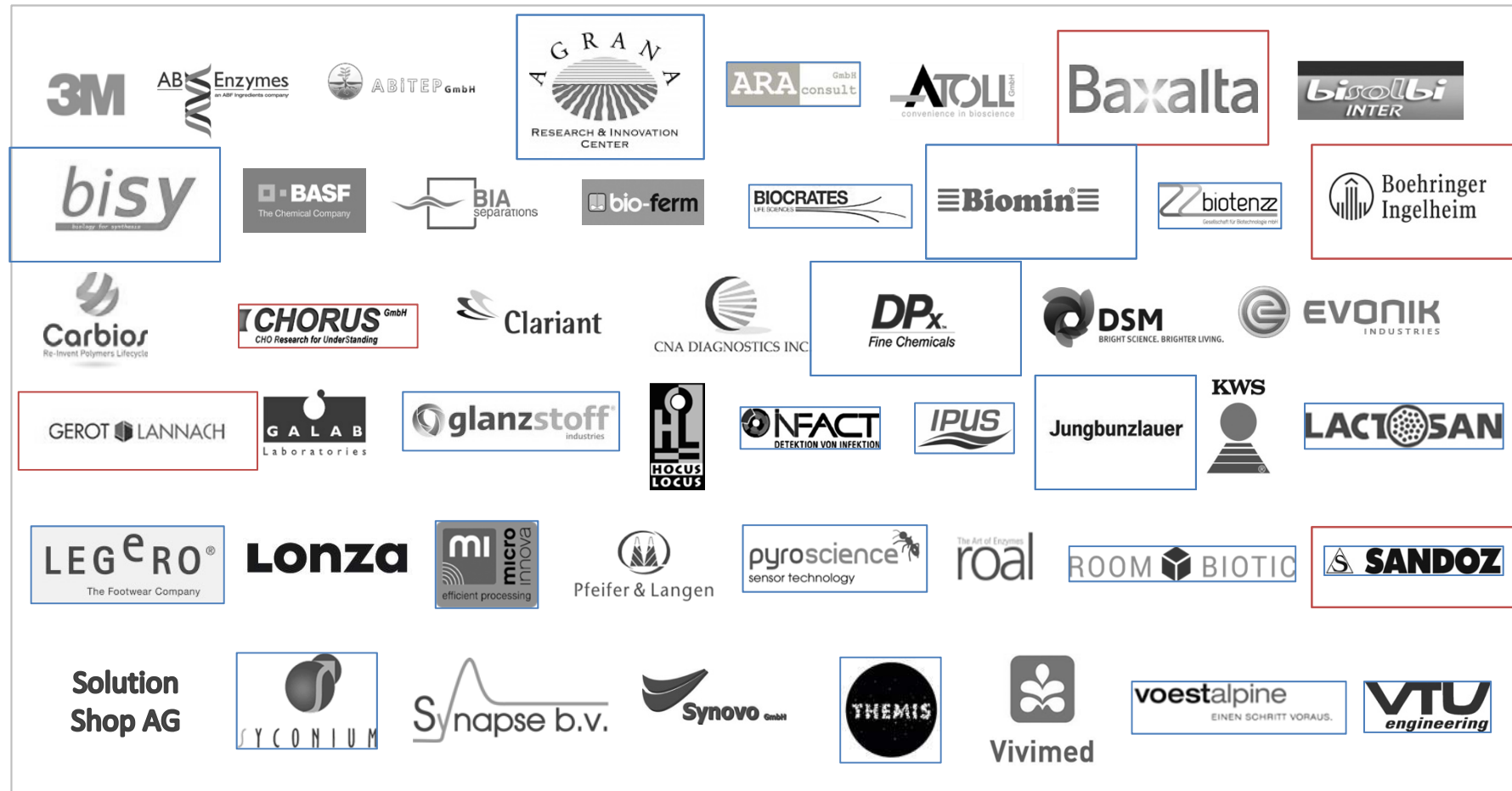
Barcelona, Spain



Pavia, Italy

and several associated partners

... that collaborates with around 50 international small and large industries.



COMET budget 2010 – 2019: 125 Mio €; 2015: 58 company and 17 strategic projects started; about 250 people at 13 scientific partner universities

Science at acib, promoting the bio-based industries and the bioeconomy



Novy et al. *Biotechnology for Biofuels* (2015) 8:46
DOI 10.1186/s13068-015-0232-0



*Biotechnology
for Biofuels*

RESEARCH ARTICLE

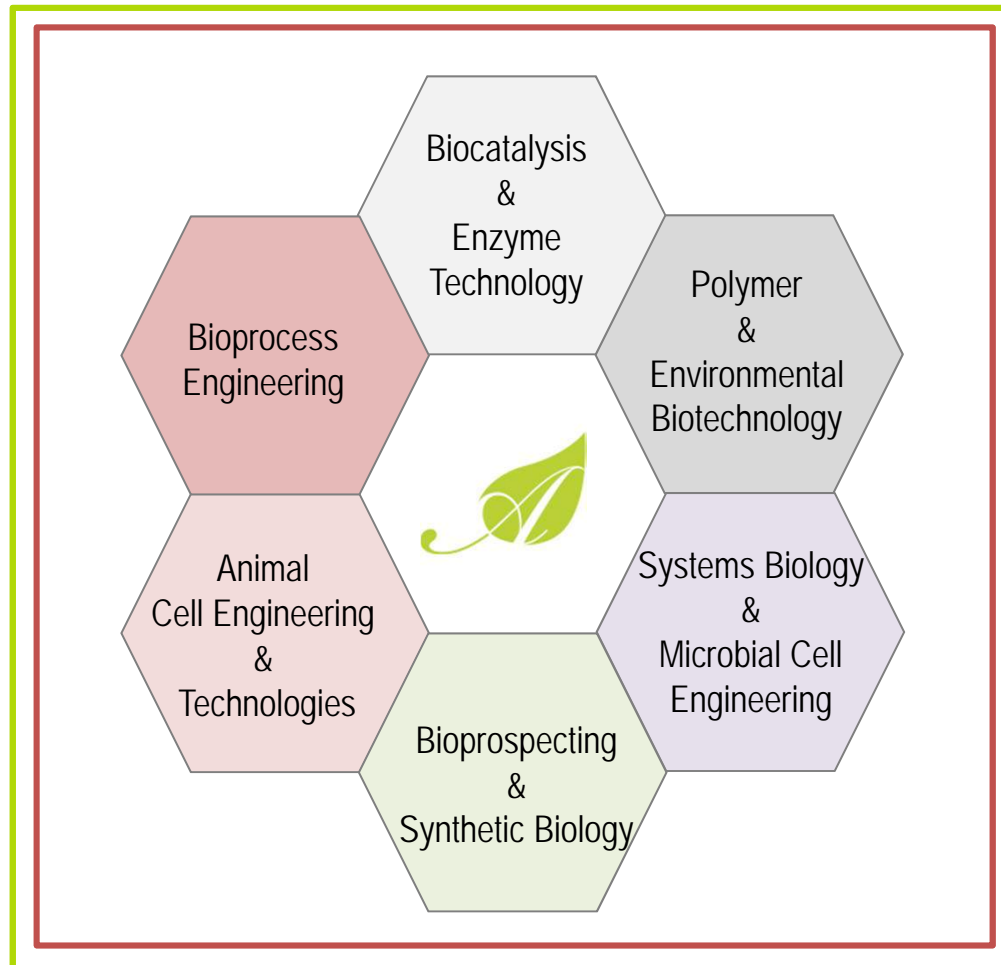
Open Access

From wheat straw to bioethanol: integrative analysis of a separate hydrolysis and co-fermentation process with implemented enzyme production

Vera Novy¹, Karin Longus¹ and Bernd Nidetzky^{1,2*}

Enzymes, microbial cells, and bioprocess engineering: all at their best, but also optimally integrated.

Science at acib, structured into areas



Science at acib, promoting the bio-based industries and the bioeconomy



Some bioprocess issues during cellulase production by fungal fermentation on steam-pretreated wheat straw

Integrated approach within acib offers comprehensive solutions



Towards a bioeconomy in Austria



- **Public funding for development of high-performance microorganisms; downstream processing from bioprocesses and for the recycling of waste streams as well as the recovery of nutrients and valuable compounds; combined chem-bio processes.**
- **Development of integrated concepts of use of biomass for energy/fuels and chemicals/materials**
- **Rigorous assessment of sustainability - integration of techno-economic evaluation with analysis of environmental impact**
- **Strengthening networking and collaboration at national and international levels**
- **Improvement of visibility of Austrian bio-based industries**
- **Development of strategies to improve the competitiveness of bio-based products on current market (e.g. packaging material)**

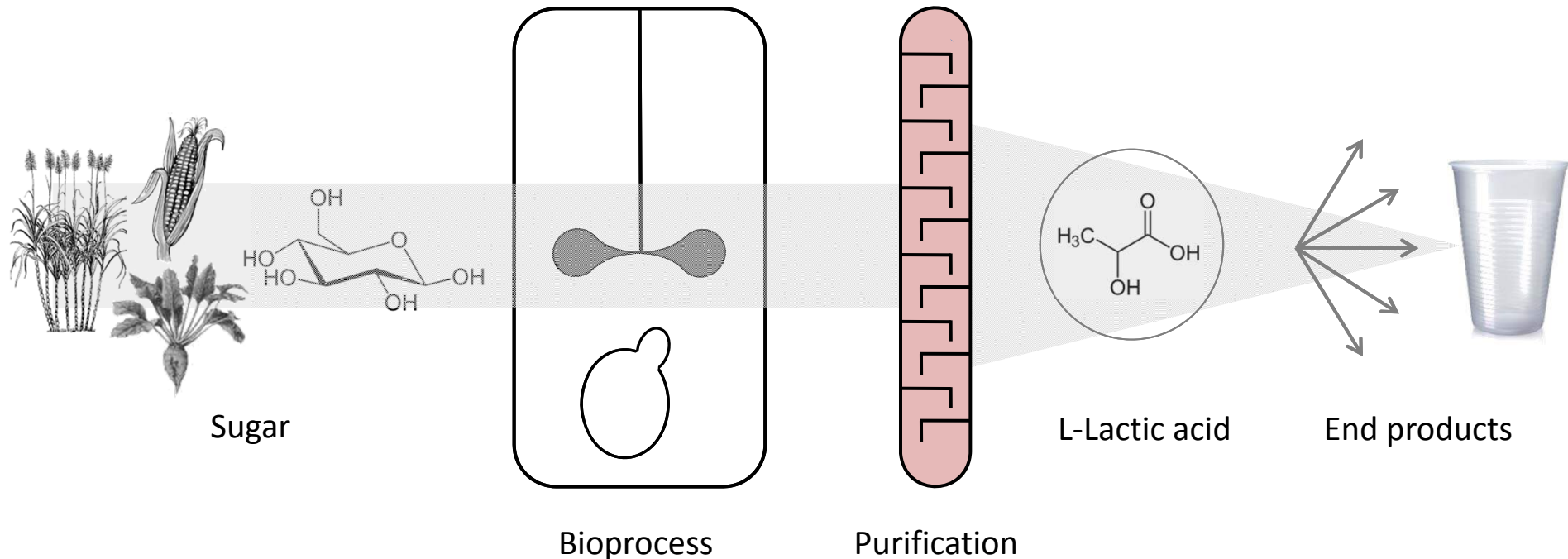
Research at acib within and for the bioeconomy



- **Discovery and development of enzymes and auxiliary proteins for biomass conversion and biorefinery applications**
- **Cell factories (bacteria, yeasts, fungi) for enzyme production**
- **Cell factories for metabolite production (biofuels, chemicals)**
- **Bioprocess science and technology, comprising up- and down-stream processing**

Biotechnology for plastics production

- Lactic acid as prominent product (among others)



- Purification of lactic acid is a main cost factor
- Syconium Lactic Acid GmbH has joined acib to develop a lactic acid process based on baker's yeast as production organism

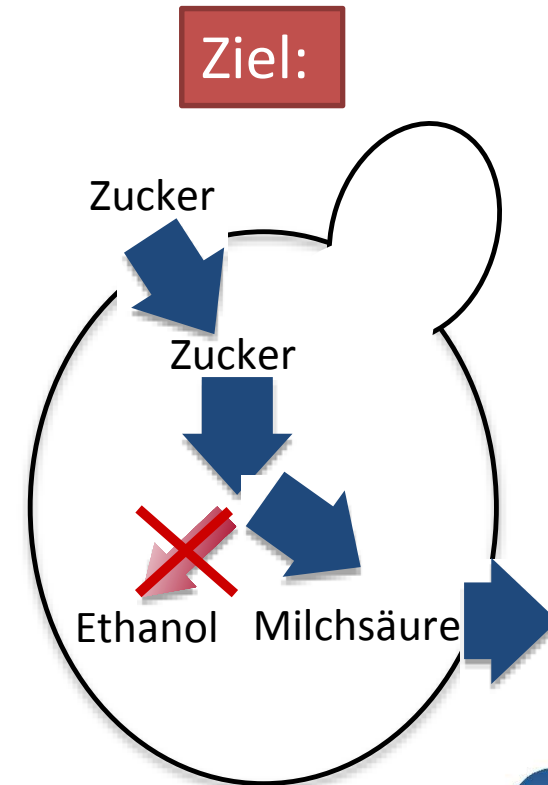
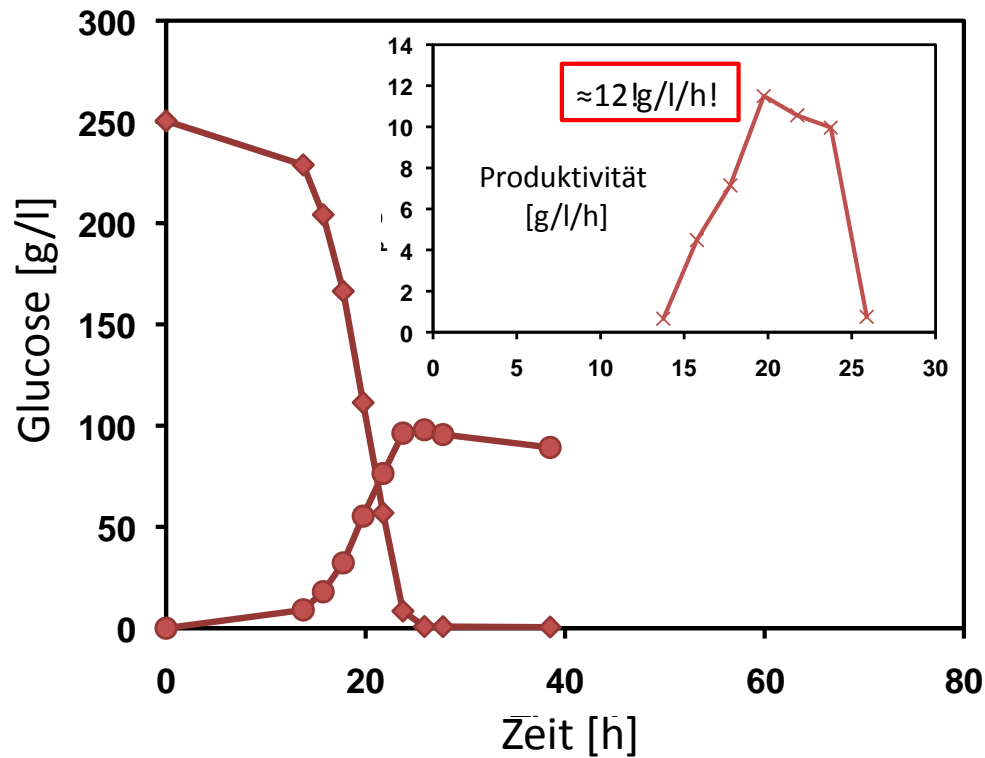


SYCONIUM

Biotechnology for plastics production

– Lactic acid as prominent product

- Production strain isolated from sugar cane juice
- tolerates high sugar concentrations
- tolerates low pH
- grows on mineral media



SYCONIUM

Making use of CO₂



... for chemical synthesis (using enzymes or cells)



... for energy storage via electrosynthesis of methane or methanol

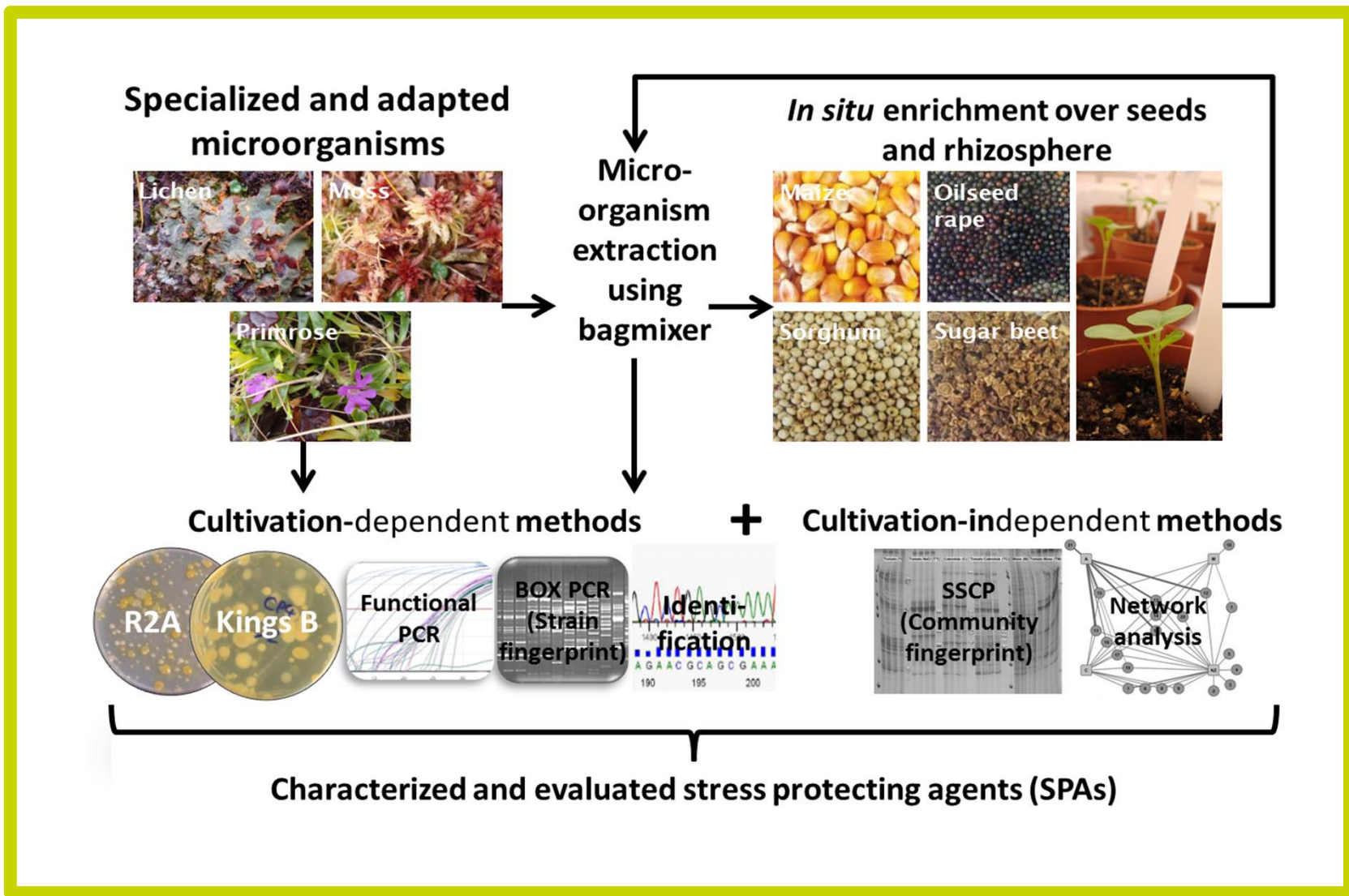
Biological agents for plant protection



Microorganisms used for agricultural purposes:

- + better growth / more biomass**
- + protection from pathogens**
- + protection from stress factors
(e.g. drought, heat, salinity, etc.)**
- + more flavour / better taste**





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**Federal Ministry of
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Styrian Promotion Agency



Government of Styria



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Vienna Business Agency



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