

# Services in Upstream processing

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## LVA – A High Tech Upstream Pilot Plant in Kundl/ Austria

Piloting activities play an essential role in tech transfer and scale up of biotechnological products from Development to Manufacturing scale. The Novartis Upstream Processing (USP) pilot plant LVA is a high tech facility with fermentation scales ranging from small-scale (<1 mL) to pilot-scale (150 L). On more than 900 m<sup>2</sup> and grounded on our long lasting expertise with microbial and mammalian processing, we offer services regarding all aspects of technical or clinical development, tech-transfer and commercial support in all thinkable product categories: from enzymes to nucleic acids, small molecules to biopharmaceuticals.

### Microbial Capabilities

- Small- and lab-scale equipment for screening experiments (e.g. Shake flasks or Deep Well Plates)
- Pilot Plant with **24/7 coverage** to realize a maximum of process oversight
- **50 bioreactors** on over 900 m<sup>2</sup>
- Fermenter scale ranging from lab-scale glass bioreactors (1 L) to **pilot-scale (50/ 150 L)** stainless steel bioreactors
- Options for **solvent based feeding** strategies (e.g. methanol or ethanol), **oxygen** enriched processing or processing of toxic materials in place
- High degree of automation and digitalization (e.g. more than 80 ready to use controllers for process automation)

### Mammalian Capabilities

- Seed train in single use equipment
- **Parallelized screening option in 250 mL-scale** (12x fully automatized miniaturized single use bioreactors in fed-batch or perfusion mode with online, at-line and offline analytics for relevant process parameters)
- **Lab-scale (15 L) glass-Fermenter** for Fed-Batch or continuous operations

### Additional Capabilities

- **Cell Line Development:** Options for non-GMP cell line generation and strain screening available
- **Analytics:** Options for several internal or external analytical services in place (e.g. for analysis of substrates/ metabolites, products and biomass)
- **Downstream Development:** Options for non-GMP lab and piloting of Biopharmaceuticals / nucleic acid available



Fig. 1: Available microbial screening options in lab-scale

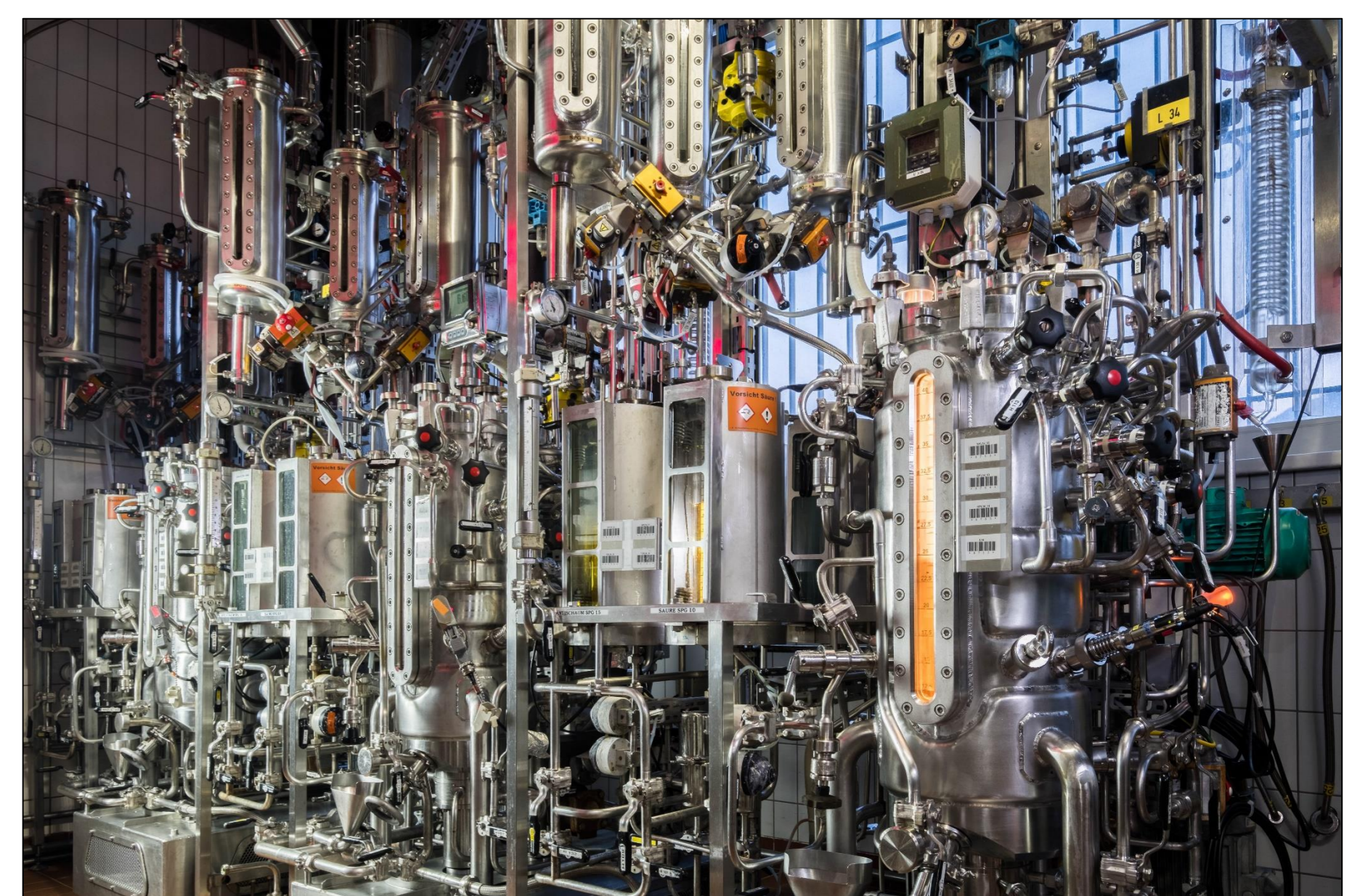


Fig. 2: Microbial pilot-scale (50 L) bioreactors at LVA



Fig. 3: Parallelized mammalian process optimization at LVA