

SMARTROUTE™ TO BIOMANUFACTURING

BIOPROCESS AND DSP DEVELOPMENT

- advanced, controllable and scalable bioprocess
- development of DSP, purification protocols
- industrial DSP validation



SCALE-UP

- from 1L to 10 m³ working volumes, food-grade technology
- product formulation



CONTRACT MANUFACTURING

- production of biomass and target metabolites
- EPA certified
- flexible packaging arrangements



BIOPROCESS R&D CAPACITIES

- 35+ 0.5 - 10L glass benchtop bioreactors (GMO/BSL1)
- separate contained laboratory for sporogenic bacteria (up to eight bioreactors)
- on-line and off-line data collection, sampling (up to 5x/day); mass balances; off-gas possibility

DSP R&D EQUIPMENT

- development of DSP protocols
- optimization of DSP
- custom synthesis
- **DSP equipment:** HPH, ultrasonicator, bead mill, centrifuge, KrosFlo, TFF, dead-end filtration, lyophilizer, vacuum oven, Buchi rotavapor, GeneVac, distillation system, chromatographies

PILOT SCALE BIOPROCESS EQUIPMENT

- 2x 2/6/10L glass bioreactor
- 2x 30L stainless steel bioreactor
- 2x 150L stainless steel bioreactor

DEMO SCALE BIOPROCESS EQUIPMENT

- 6x 50 - 400L stainless steel bioreactor
- 2x 2,000L stainless steel bioreactor
- 1x 6,500L high-OTR stainless steel bioreactor
- 2x 10 kL stainless steel bioreactor; 1x 20 kL holding tank

PILOT SCALE AND DEMO DSP EQUIPMENT

- **Biomass separation:** HPH, sedicanter, centrifuges (batch/tubular, disc-stack) TFF (hollow fiber, ceramic, spiral wound)
- **Drying solutions:** freeze dryer, rotavapor, spray dryer, fluid bed dryer, glass chemical reactors
- **Extraction:** liquid/liquid extraction liquid/liquid separator

ANALYTICAL DEPARTMENT:

Focus on analytical support for the whole company

Liquid chromatography: 41 units (UPLC/HPLC)

Variety of detection methods: MS/MS capable detectors, 1x MS detector, 1x charged aerosol detector, 1x evaporative light-scattering detector, 10x refractive index detector, 15x diode array detectors, 12x UV-VIS detectors, 1x GC-MS instrument, 2x GC-FID instrument, 1x HPAE-capable HPLC coupled with PAD detector

REFERENCES

MORE THAN 20
SUCCESSFULLY SCALED
TECHNOLOGIES FOR
INDUSTRIAL AG BIO
AND FOOD/FED
PRODUCTS

STRAINS: *E. COLI*,
S. CEREVISIAE,
B. SUBTILIS,
Y. LIPOLYTICA,
STREPTOMYCES
SPP.

FERMENTATION
TECHNOLOGY:
BATCH, FED BATCH,
REPEATED BATCH,
CONTINUOUS
FERMENTATION

FOUNDED

- 2006, Ljubljana, Slovenia

KEY NUMBERS

- 100 employees, 1/4 PhD
- 1,500 m² R&D laboratory
- 10 m³ fermentation demo plant

PARTNERSHIPS

- 80 leading chemical and biotech companies
- >30 international patent applications

TECHNOLOGIES

- microfluidics department
- in-house DNA synthesis
- data-based *in silico* media development
- small-scale purification
- automated ALE systems

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