



Pichia pastoris protein expression services

Services for protein expression - accelerate time to market



Profit from a proven and exclusive technology platform applied by a highly skilled team

- Gene design and cloning
- High speed expression strain development
- Unrivaled production levels of more than 20 g/L of secreted protein
- Fermentation and purification process development and optimization ready for scale-up
- Small-scale production of purified non-GMP protein samples
- Unmatched timelines < 10 weeks to purified protein
- Scalable and economically viable production processes
- Outlicensing opportunities for
 - Human serum albumin (HSA)
 - Human serum transferrin (HST)
 - HSA-fusion proteins
 - Cell culture proteins

Cutting-edge technologies for the production of biopharmaceuticals & enzymes



VTU's *Pichia pastoris* toolbox

- VTU's exclusive AOX1 promoter library for tunable, optimum protein expression
 - 1st generation promoter library - MeOH induced processes**
 - Product yields of more than 20 g/L secreted protein
 - 2nd generation promoter library - MeOH free processes**
 - Glycerol or glucose as the sole carbon source
 - Significantly less heat formation and cooling demand
 - Safe and economically viable production processes
- In-house expression platform
- Elaborated gene design and cloning/transformation strategies
- Co-expression of auxiliary proteins for maximization of protein expression
- High-throughput cultivation and screening regime
- Excellent know-how in fermentation and downstream process development

Why use *Pichia pastoris* as an expression host?




***Pichia pastoris* – simple, fast and cost-effective eukaryotic protein expression**

- Eukaryotic protein expression system
- FDA approved host for manufacturing of biopharmaceuticals
- *Pichia pastoris* is ideally suited for the expression of complex proteins (not expressible in *E.coli*)
- Advantages of higher eukaryotic expression systems such as protein processing, protein folding and posttranslational modification
- Short development timelines
- Excellent scalability – scales ranging from 50 to > 100.000 litres
- Simple, defined and animal-component-free media
- High cell densities/high protein yields (more than 20 g/L)
- Product secretion into culture supernatant
- Simplified recovery and downstream processing
- No risk of endotoxin or viral contamination

Recombinant HSA - fusion proteins

Novel biopharmaceuticals with increased half-life



Fusion of therapeutic proteins with intrinsic short half-life to human serum albumin (HSA) represents a proven strategy to increase the half-life of biopharmaceuticals allowing for less frequent administration while maintaining efficacy. Meanwhile recombinant albumin fusion technology has been successfully applied to various proteins and peptides in clinical and pre-clinical development.

Titers of more than 20 g/L of recombinant albumins as achieved with VTU's *Pichia* system, constitute the highest values (reported to date) of recombinant proteins secreted into the culture supernatant of yeast cultivations. 2nd generation AOX1 promoter variants from VTU also deliver double-digit g/L levels of HSA in glycerol-only driven fermentations. In addition, HSA-fusion proteins can be secreted very efficiently resulting in secretion levels of 5-20 g/l.

	Titer secreted [g/L]
HSA-IFNa2a	16
HSA-GCSF	18
GCSF-HSA	20
HSA-GLP-1	14
PYY ₍₃₋₃₆₎ -HSA-GLP-1	13
HSA-Exendin-4	11
PYY ₍₃₋₃₆₎ -HSA-Exendin-4	11
HSA-Chemokine	5
Scaffold-HSA-Fusions	10-15

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