



Alagene Pichia Protect™

Protease-Deficient GS115 Platform for High-Stability Recombinant Protein Production

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Technical Brief

Overview

Alagene Pichia Protect™ is a proprietary protease-deficient derivative of the GS115 yeast production platform. The strain has been engineered to reduce intracellular proteolytic activity, thereby improving the stability of recombinant proteins during expression and fermentation.

The strain is Generally Recognized As Safe (GRAS) for industrial and food applications

Technical Rationale

In yeast-based production systems, intracellular and vacuolar proteases can degrade recombinant proteins, particularly under high-expression or stress conditions. This degradation may result in truncated products, reduced functional yield, and variability between production batches.

Alagene Pichia Protect™ addresses this limitation at the strain level by eliminating a major proteolytic activity within the GS115 background, reducing degradation pressure during cultivation.

Key Features

- Reduced intracellular proteolysis
- Improved preservation of full-length recombinant proteins
- Enhanced batch-to-batch consistency
- Maintained growth performance and genetic stability
- Compatible with constitutive and inducible expression systems
- Suitable for genome-integrated and multi-copy expression formats

Application Scope

Alagene Pichia Protect™ is particularly beneficial for protein biomanufacturing (Industrial, food/ag, or therapeutic)

- Protease-sensitive enzymes
- Multi-domain proteins
- Structurally complex or unstable proteins

Platform Integration

The strain integrates seamlessly within Alagene's broader yeast expression workflows, including methanol-free constitutive systems and scalable fermentation processes.

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Access and Deployment

Alagene Pichia Protect™ is maintained within Alagene's proprietary strain portfolio and is available under defined service or licensing agreements, ensuring controlled use, regulatory traceability, and clear ownership of resulting developments.

Case Study: Production of a recombinant protein using Alagene Pichia Protect™ - Protease Deficient

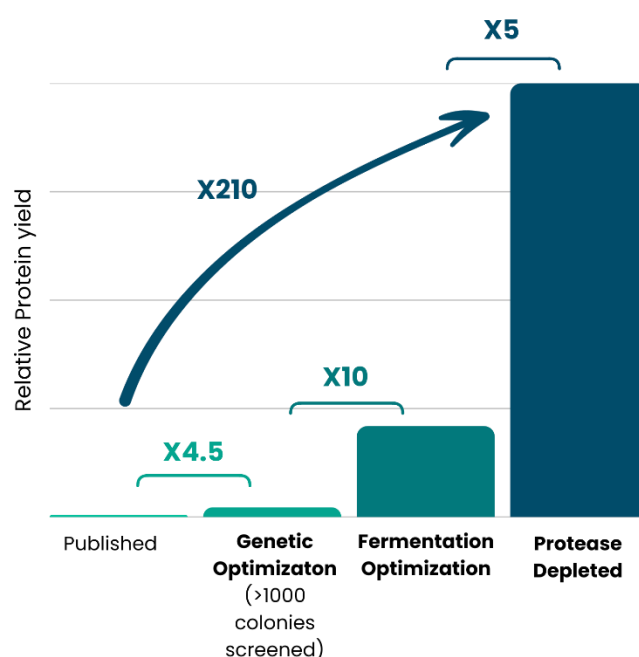


Figure 1. Relative yield of a model recombinant protein produced in Alagene's Pichia pastoris platform. Cumulative process and strain optimization resulted in an overall ~210-fold increase in protein yield compared to the initial baseline strain. Improvements were achieved through sequential development stages: (i) genetic construct optimization and high-throughput clone screening (~4.5-fold increase), (ii) fermentation process optimization (~10-fold increase), and (iii) deployment of the protease-deficient Alagene Pichia Protect™ strain (~5-fold additional increase). The data illustrates the additive impact of integrated strain and process engineering on production performance.