WACKER

CREATING TOMORROW'S SOLUTIONS

WACKER BIOTECH I SECRETION TECHNOLOGY I ESETEC® 2.0

ESETEC® 2.0: HIGH-YIELD AND COST-EFFICIENT PRODUCTION OF ANTIBODY FRAGMENTS

Wacker Biotech has now profoundly refined its patented ESETEC® system for the manufacture of pharmaceutical proteins. The innovative and highly efficient *E. coli* expression system ESETEC® already enabled secretion of native recombinant protein products into the fermentation broth and therefore simplified primary recovery and purification processes. ESETEC® 2.0 now provides you with an optimized, powerful *E. coli* secretion technology, offering a cost-efficient system for manufacturing your products.

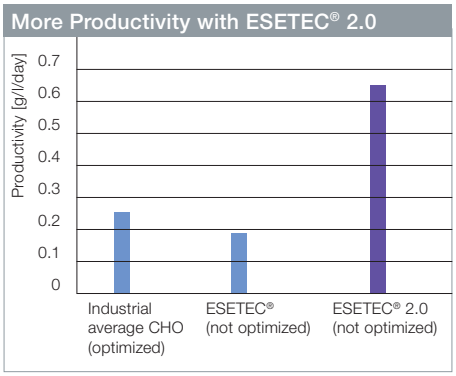
Newly Engineered Host and Optimized Fermentation

Targeted genetic modifications and process optimization measures led to the development of new, extremely productive cell lines and fermentation procedures. Upgraded ESETEC® 2.0 results from a holistic R&D approach to increase yields of secreted antibody fragments (Fab). The following features of ESETEC® were optimized:

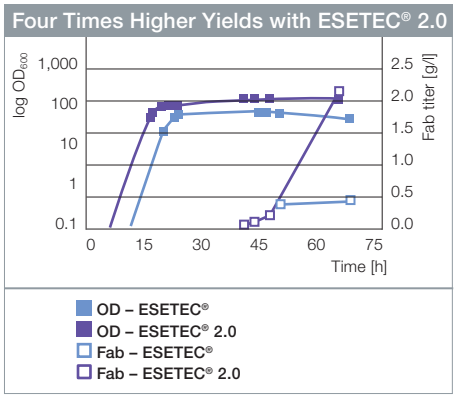
- Expression: DNA sequence, gene arrangement
- Translocation: signal sequence
- Folding: LC as chaperone, co-expressed helper proteins
- Secretion: mutant strains, fermentation process

Higher Quality and Easier Recovery

As a result, complex molecules such as Fab are now produced in yields of several grams per liter and secreted into the culture medium in active form. This has most recently been demonstrated in collaboration with MedImmune, the global biologics research and development arm of AstraZeneca, who contacted WACKER for the manufacture of a difficult-to-produce Fab.



Productivity of CHO, ESETEC® and ESETEC® 2.0 for MedImmune's Fab.



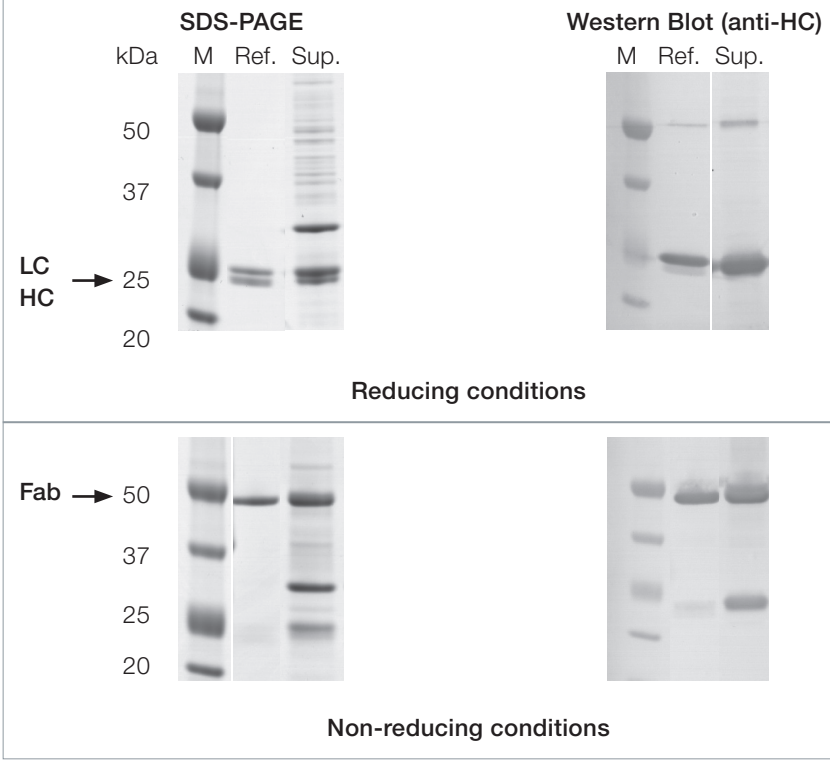
Graphs of bacterial cell growth and Fab production as a function of fermentation time using an ESETEC® 2.0 secretion strain.

4-Fold Increase Compared to Classic ESETEC®

After obtaining the genes, WACKER was able to successfully produce MedImmune's Fab within only six weeks and has achieved significant yields with its established ESETEC® technology. The new ESETEC® 2.0 version managed to even surpass these results: it delivered four times higher yields of correctly folded, fully functional antibody fragments in the culture medium when compared to the established ESETEC® system. MedImmune has confirmed that the secreted Fab was correctly assembled and bound to its target in vitro.

Collaboration partner: MedImmune
A member of the AstraZeneca Group

Exceeding Industry-Optimized Processes



SDS-PAGE and Western Blot data showed high titers of LC, HC and assembled Fab in ESETEC® 2.0 supernatants.

Higher Productivity than Industry-Average CHO Cell Process

The results not only verify that, for the production of antibody fragments that are difficult to manufacture, ESETEC® technology is superior to established technologies. The findings also show that the new ESETEC® 2.0 version – even without full process development – offers advances in productivity that exceed industry-optimized processes with mammalian cell cultures (CHO cells). Alongside the high yields that could be demonstrated for a variety of Fab, the production speed offers considerable advantages. With the new system, it only takes a few weeks to establish an efficient and scaleable fermentation process for the manufacture of a Fab antibody.

Fab Is Suitable for Clinical Use

MedImmune has confirmed that their Fab produced by ESETEC® technology is suitable for clinical use. Up to now, ESETEC® has successfully produced various peptides, enzymes, and proteins such as antibody fragments. ESETEC®-derived products have been approved for clinical trials.

Various Target Molecules

ESETEC® and ESETEC® 2.0 are suitable for the production of:

- Proteins of prokaryotic or eukaryotic origin
- Proteins with a wide range of molecular weights and pI
- Fusion or native proteins
- Proteins with amino acids that differ from methionine at position 1
- Proteins with disulfide bridges

Additional Information

Please also refer to our info sheet “Case Study – ESETEC®: High-Yield Production of an Active Antibody Fragment.”

More Experience for Your Project

Wacker Biotech provides ESETEC® to its clients for manufacturing their products according to cGMP. We bring years of experience with the system to your project.

Please contact us for more information.

ESETEC®

Wacker Biotech GmbH, Hans-Knöll-Straße 3, 07745 Jena, Germany
info.biologics@wacker.com, www.wacker.com/biologics, www.wacker.com/socialmedia

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