



CIAO![™] Comprehensive Integrated Antibody Optimization[™]

Maximizing Protein Expression for Improved Manufacturing

BioAtla's proprietary Comprehensive Integrated Antibody Optimization (CIAO![™]) platform for protein expression and faster downstream process development leading to cost-efficiencies by integrating the features important for manufacturing and process development into the design of the protein.

Historically, antibodies have been increasingly engineered to be more human-like in order to avoid negative immune reactions, *e.g.* chimeric or humanized antibodies. While these advances have improved antibody safety, they are merely a first step toward integrated therapeutic development.

A molecule's characteristics reflect all inherent and environmental influences such as amino acid sequence, secondary modifications (*e.g.* glycosylation), and tertiary characteristics such as folding which is affected by environmental factors including pH, salt, pI, hydrophobicity; generically the host environment. While the power of evolution is the ability to discover molecules with selected characteristics, the inherent challenge is that the selection process is influenced by the selection environment. As an example, selecting a molecule in bacteria and subsequently expressing in mammalian cells risks generating molecules that require extra process development costs to adapt to the different host system and poor pK in *in vivo* results due to the potential of selecting unnatural secondary and tertiary structures. The power of BioAtla's CIAO! process is that it selects molecules in a manner that mirrors both the body's environment and the host that will be used for final manufacturing of the drug.

We begin by evolving for desirable characteristics and discovering new proteins directly in the manufacturing host of interest, allowing us to select the best molecule or collection of lead candidates for downstream manufacturing.

Optimization is also available to rapidly improve characteristics of a variety of genetic system components such as the host genome, vector system, promoters, reduction of gene deletion and rearrangement events, optimization of host glycosylating enzymes, protein pathways, chromosome host cell mutagenesis and selection and media optimization, for superior expression solutions. Remember, you're always get as good as what you select for, CIAO! selects the very best.

FEATURES

- Identify, evolve and manufacture your antibody or other protein therapeutic in the same host.
- Mammalian hosts are optimal (they more closely match the body's processes), however any host system (*e.g.* bacterial or yeast) can be improved by CIAO!
- Unique to BioAtla – patent pending
- Yields one or more molecules with strong intellectual property owned by customer.

BENEFITS

Begin managing downstream drug risk from very early in discovery and optimization process

Choose best candidate(s) early for downstream activities, including formulation

Post-translational modifications to drug, such as folding issues, glycosylation challenges and other modifications to the protein