



Express™ Antibody Humanization

BioAtla's scientific team has developed a novel approach to rapidly humanize antibodies called Express Humanization™ which is different from and superior to other humanization methodologies (see humanization).

The technology entails synthesizing a combinatorial library of a non-human target monoclonal antibodies fused in frame to a validated collection of human frameworks. The combinatorial libraries are screened for binding to your antigen of interest. Unlike more traditional approaches such as CDR grafting, this powerful approach allows for the selection of the most favorable combinations of fully human frameworks in terms of expression and maintaining the binding activity to your parental antibody without the need to make back mutations. Historical affinities for BioAtla humanized antibodies range from 0.5X to as much as 5X higher affinity than the starting antibodies' affinities (Fig. 1). This rapid and powerful process significantly increases the success rate relative to other technologies. These antibodies are some of the highest quality antibodies for human therapeutics since they are simultaneously selected for expression (see CIAO!™) and other targeted characteristics with an elite set of expressed human frameworks.

RESULTS / DATA

Rapid Humanization that Retains Affinity

Binding constants of humanized hits:

- Biacore Analysis
- Antibodies coupled to chip

Clone	k_a (1/Ms)	k_d (1/s)	K_D (M)
Template	1.1×10^6	6.2×10^{-5}	57×10^{-12}
BA001	1.31×10^6	3.05×10^{-5}	23×10^{-12}
BA001h1	0.97×10^6	0.53×10^{-5}	5×10^{-12}
BA001h2	1.20×10^6	4.33×10^{-5}	36×10^{-12}
BA001h3	1.48×10^6	5.88×10^{-5}	40×10^{-12}
BA001h4	1.31×10^6	6.59×10^{-5}	50×10^{-12}
BA001h5	1.01×10^6	2.37×10^{-5}	235×10^{-12}
BA001h6	1.25×10^6	15.80×10^{-5}	126×10^{-12}
BA001h7	7.45×10^6	6.44×10^{-5}	86×10^{-12}
BA001h8	1.44×10^6	5.76×10^{-5}	40×10^{-12}

460% Improvement over BA001

Template: Published data

BA001: chimera; same as template, but BioAtla expression system

BA001h1-h8: Humanized clones, no additional affinity maturation

BENEFITS

Rapid program for generation of superior humanized antibodies

Full length antibodies expressed in mammalian cells

Library of humanized variants:

- High, validated framework diversity
- No back-mutations required to retain original affinity
- No CDR grafting or phage display required

ELISA based screening (antigen binding) and cell-based screening (biological activity) available

Isotype switch can be included

Freedom to operate