

**Fc Engineering Service**

- **Fc engineering service:**
  - ✓ **Fc silence**
  - ✓ **ADCC, CDC, ADCP enhancement**
  - ✓ **Half-life extension**
- **One-stop Fc domain solution from sequence design to pharmacology study**

**Case study 1: STR silencing technology**

A cell-based reporter assay (Fig 6a) showed that the STR variant had no activity on all FcγRs compared to wild-type IgG1, LALA, and aglycosylated variants. A cytokine release assay with PBMCs isolated from healthy donors showed (Fig 6b) that STR exhibited no significant activity above buffer alone for all cytokine measured. **STR silencing technology truly abolishes the Fc domain effector function.**

\* Data comes from mAbsolve

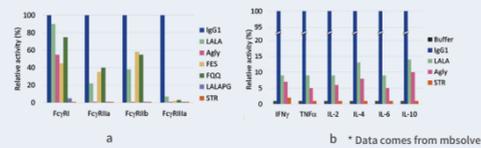


Fig 3. Cell-based assay for different Fc silence mutants

**Case study 2: ADCC and CDC enhancement**

The potency of ADCC and CDC against PA-1 target cells of two mutated Fc constructs was evaluated. As claimed, the published Fc mutation sequences showed enhanced ADCC and CDC activities on PA-1 cells.

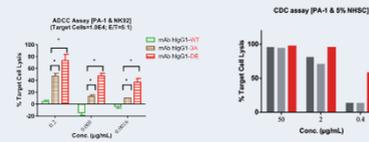
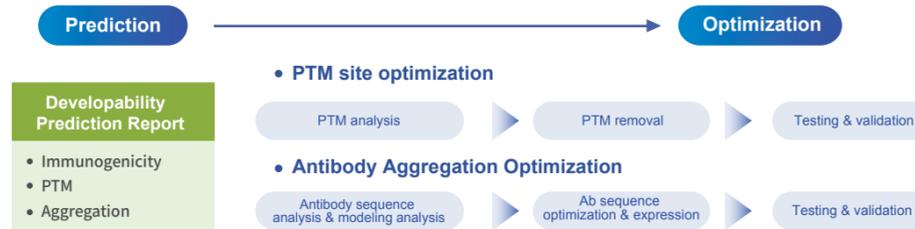


Fig 4. Cell-based assay for different Fc mutants

**Antibody Developability Optimization Service**

- **One-stop developability solution from prediction to optimization**
- **PTM optimization: Guarantee no affinity loss**
- **Antibody aggregation optimization: guarantee at least 5-fold yield improvement**

The developability prediction enables GenScript Probio further to **optimize the sequence of PTM sites and hydrophobic regions** to obtain antibody candidates with better developability.



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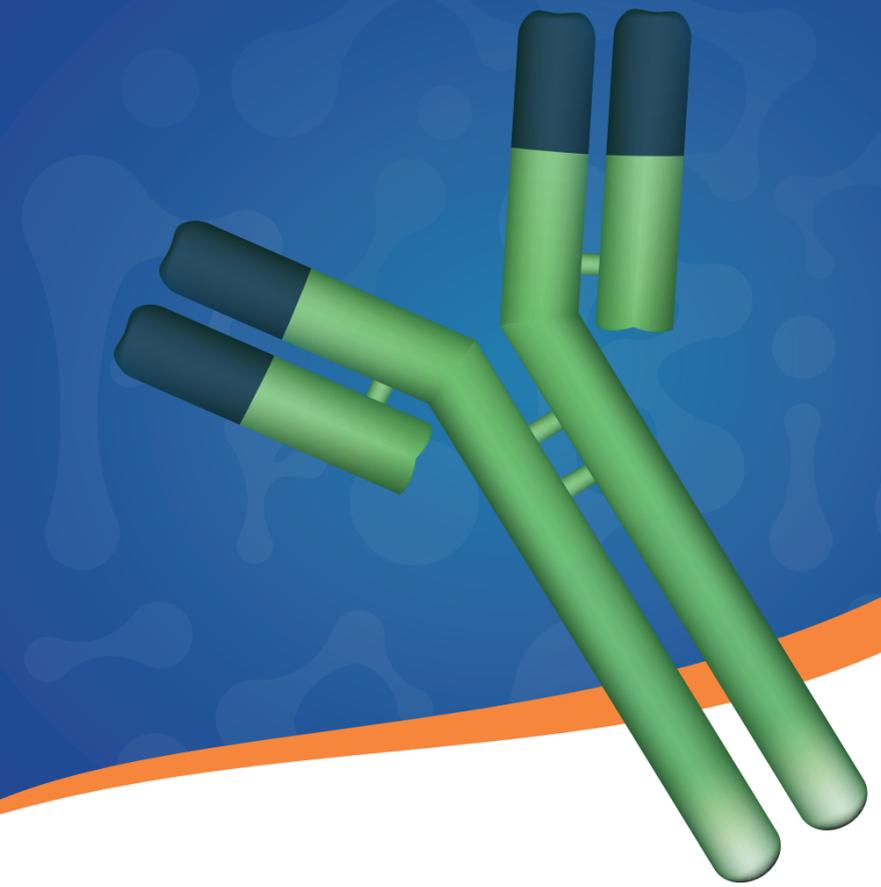
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# Antibody Lead Optimization Service

Accelerating the acquisition of "me-better" antibody candidates



- Antibody Humanization Service
- Antibody Affinity Maturation Service
- Fc Engineering Service
- Antibody Developability Optimization Service



**Antibody Lead Optimization Service**

Accelerating the acquisition of "me-better" antibody candidates

Empowered by a robust bioinformatics platform, GenScript ProBio offers customers comprehensive antibody engineering services, including antibody humanization, affinity maturation, Fc engineering, and developability optimization, to obtain "me-better" antibody leads.



Two primary considerations in the preclinical development of antibody drugs: Functionality and Developability. GenScript ProBio conducts antibody optimization to improve these two properties:

**Developability**

**Antibody humanization**

- Success in delivering **500+** projects
- Guarantee no affinity loss
- Fast turnaround time of 2.5 weeks

**Antibody developability optimization**

- Immunogenicity, post-translational modifications (PTM), and antibody aggregation
- Developability prediction, optimization, and assessment
- Technical support by the CMC team

**Functionality**

**Antibody affinity maturation**

- Experience with **110+** projects
- Guarantee > 10-fold affinity improvement

**Fc engineering**

- ADCC, CDC, ADCP enhancement
- **STR Fc silencing technology**
- Half-life extension.
- One-stop solution from sequence design to pharmacology study

\*By Jan. 2024



**Empowered by Bioinformatics Platform**

Robust bioinformatics tools comprise multiple databases and Molecular Operating Environments (MOE) to build an incorporated computer-aided molecular design platform.



**Antibody Humanization Service**

- Experience with 500+ projects (the most advanced project has been **marketed**).
- Guarantee **no affinity loss**, humanization rate **>95%**
- Multiple detection systems: **SPR, ELISA, FACS**, suitable for **mAb, scFv, and sdAb**
- Developability prediction reports to illustrate **PTM, aggregation, and immunogenicity data**.

**Express Package**

**As Fast as 2.5 Weeks to Get Your Antibody Humanized**

CDR grafting and back mutation technologies enable the express package to produce humanized antibodies with high expression levels, good thermal stability, and comparable affinity with the parental antibodies in 3 weeks.

**Deluxe Package**

**Get Humanized Antibody with No Affinity Loss**

Choice of the deluxe package allows users to obtain the humanized antibodies without affinity loss via CDR grafting, back mutation, and **FASEBA (Fast Screening for Expression, Biophysical-properties, and Affinity) high-throughput screening technology** in 8 weeks.

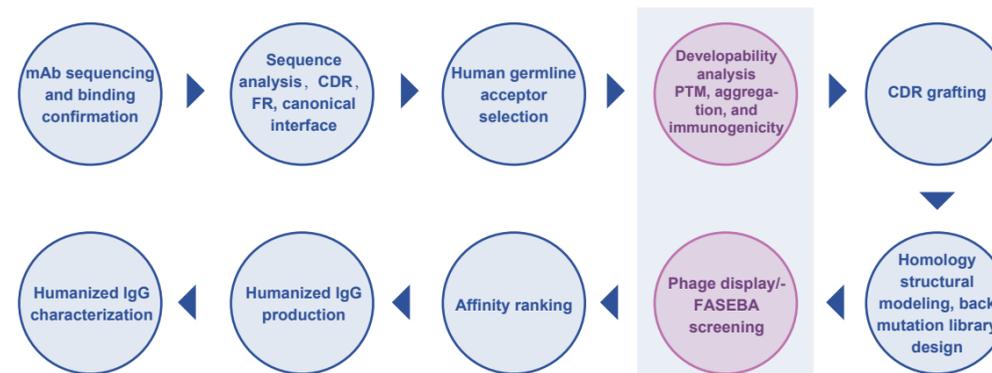


Fig1. workflow of antibody humanization

Steps only deluxe package

**Case study: FACS Determination**

FACS to compare the binding ability between humanized and chimeric antibodies. The same binding profile was observed based on the FACS results.

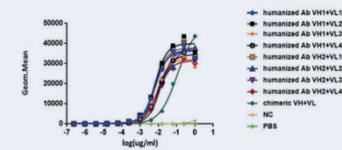


Fig2. Comparison of the affinity of humanized antibodies to parental antibody

**Antibody Affinity Maturation Service**

- A guarantee of **> 10-fold** affinity improvement
- Experience with **110+ projects**
- Suitable for **mAb, scFv and sdAb**
- Proprietary precise mutagenesis library (PML) and FASEBA screening technology

More comprehensive screening strategies, guarantee **10-fold** improvement!



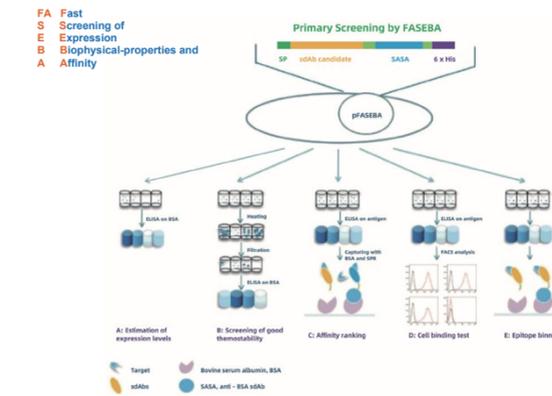
**1 Precise Site-Saturation Mutagenesis Library, PML**



**Exhaustive mutagenesis possibilities**

- Semiconductor-based oligo synthesis technology
- Precise site-saturation mutagenesis to ensure even distribution of 18 mutated amino acids at each residue
- No stop codons and unexpected codons

**2 FASEBA High-throughput Screening Platform**



**Quickly screen out molecules with the highest affinity, expression level and the best biophysical properties.**

- Technology introduced from National Research Council Canada
- Affinity ranking by SPR was performed with prokaryotic expression supernatant, which greatly reduces the cost and cycle of recombinant expression, and ensure the success rate of screening.