Antibodies: Types & Formats

Creative Biolabs® Recombinant Antibody

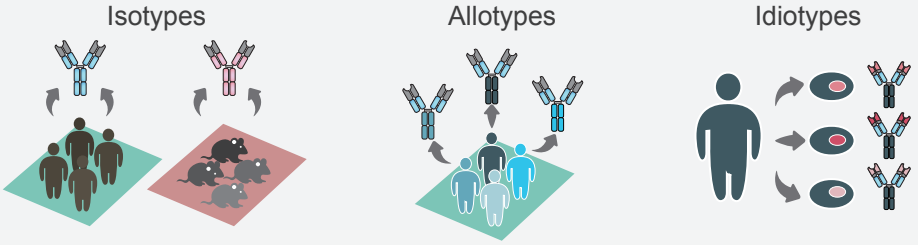
Common antigen-specific markers of Ig molecule of the same species, are called isotypes. Different antigen-specific markers at the constant regions between different individuals of the same species are called allotypes. Beside these two types of antigenic markers, the unique antigen-specific signature of Ig molecules produced by each B cell clone is called idiotypes.

In mammals, there are 5 class of heavy chain (α, δ, ε, γ, and μ), corresponds to 5 different antibodies (IgA, D, E, G, M) in the human body, which are distributed and function differently. A same Ig class can be divided into subclasses such as IgG1,2,3,4, IgA1,2 and IgM1,2 by the slight differences of the amino acid composition and the number or position of disulfide bonds. Their functional properties are summarized in the table.

In common antibodies, the antigen binding region consists of the variable domains of the heavy and light chains (VH and VL). But antibodies consisting only of two heavy chains and lacks the two light chains were also found in camelid and shark, these antibodies are called heavy-chain antibodies (hcAb). Single-chain variable fragment (scFv) and antigen-binding fragment (Fab) are widely used fragments that to generate other antibody formats by biochemical engineering. In these antibody formats, the smallest are VHH/VH of camelid hcAbs or single-domain antibodies (sdAbs).

Creative Biolabs Recombinant Antibodies & Therapeutic Antibodies

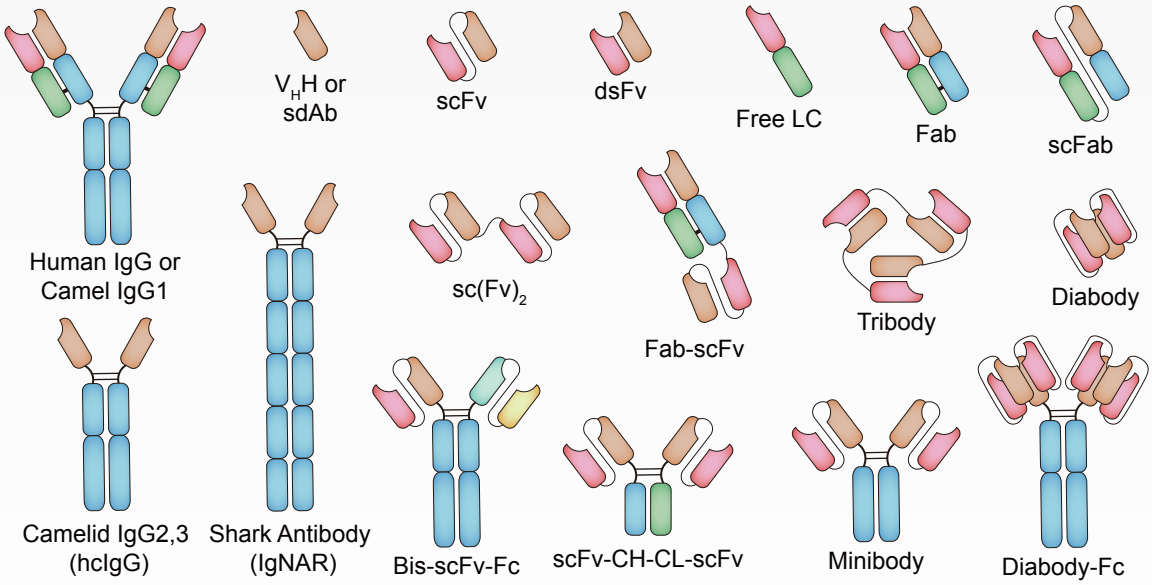
1 Definition of antibody isotypes, allotypes, and idiotypes



2 Isotypes of human antibodies and their functional properties

Isotype	IgA1, 2	IgD	IgE	IgG1, 2a, 2b, 3, 4	IgM
Structure	Monomer, dimer	Monomer	Monomer	Monomer	Pentamer
Heavy chain designation	α1, α2	δ	ε	γ1, γ2, γ3, γ4	μ
Molecular weight	160×2 kDa	184 kDa	188 kDa	146-165 kDa	970 kDa
Percentage in serum	13%	1%	0.002%	80%	6%
Additional properties	Monomer in secretory fluid, active as dimer on epithelial surfaces	Found on surface of mature B cells, signaling via cytoplasmic tail	Mediation of allergic response, effective against parasitic worms	Antibody-dependent cell cytotoxicity	Effective agglutinator of particulate antigens, bacterial opsonization

3 Special and engineered formats of antibodies



What we do:

Recombinant Antibodies Products
Therapeutic Antibodies Products
Antibody-cytokine Fusion Proteins
Single Domain Antibodies (sdAb)
Soluble T Cell Receptor
MHC Tetramer Products
Antibody Glycoengineering Services
High-Exp™ Immunotoxins Production
Gram Scale Antibody Production Service
Magic™ High-throughput Ab Production Service
Glycosylation analysis of therapeutic glycoproteins