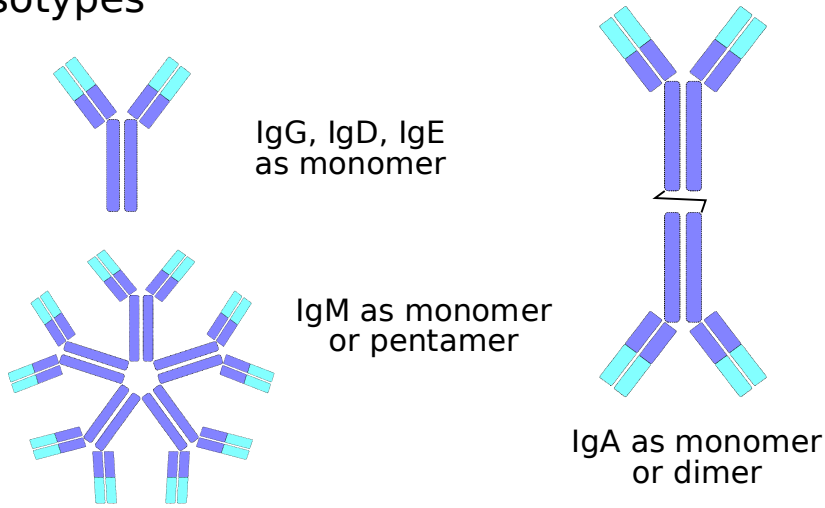


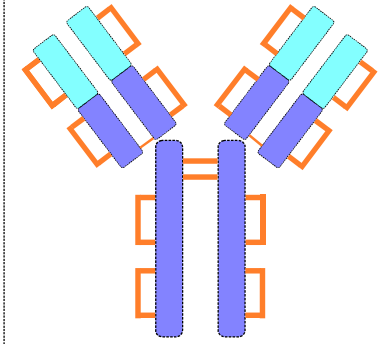
Isotypes



Protein A/G affinity

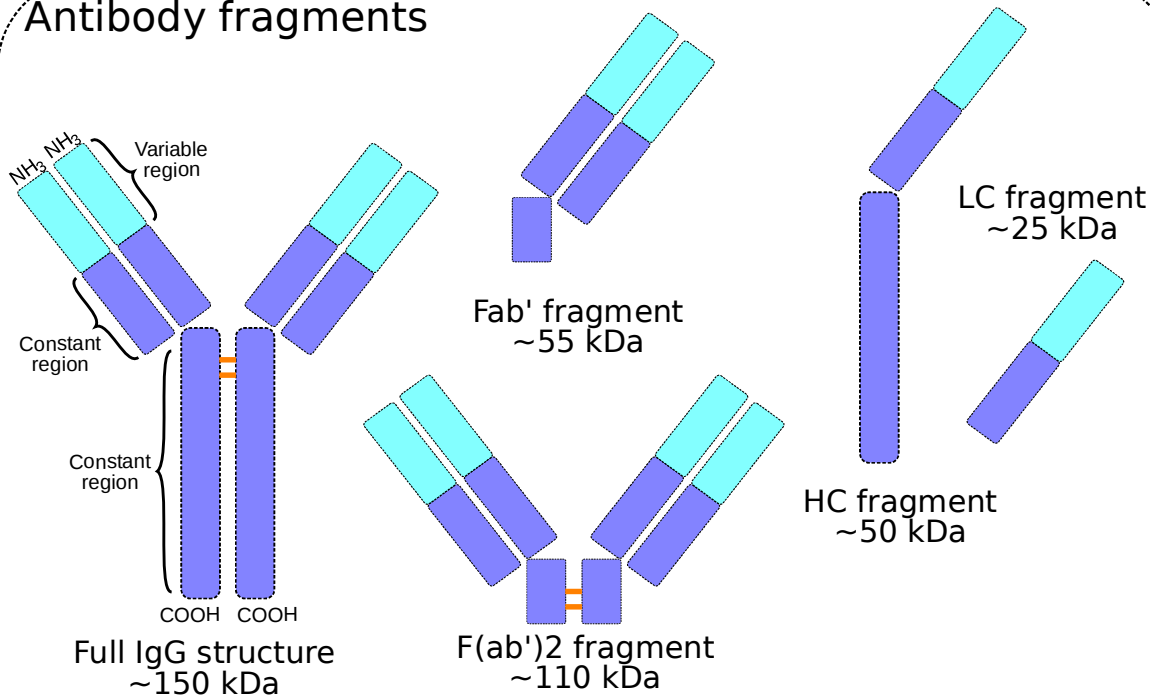
Species	Immunoglobulin	Protein A	Protein G
Human	IgG	++++	++++
	IgG1	++++	++++
	IgG2	++++	++++
	IgG3	-	++++
	IgG4	++++	++++
	IgM	-	-
	IgE	-	-
Mouse	IgG1	+	++++
	IgG2a	++++	++++
	IgG2b	+++	+++
	IgG3	++	+++
Rat	IgG1	-	+
	IgG2a	-	++++
	IgG2b	-	++
	IgG2c	+	++
Rabbit	IgG	++++	+++
Goat	IgG	+/-	++
Sheep	IgG	+/-	++

Disulfide bonds



IgG1 shown, other isotypes differ, particularly in the hinge region.

Antibody fragments



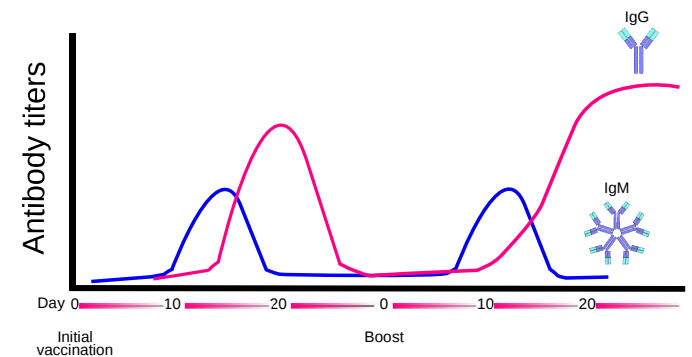
Commonly observed antibody fragments.

Fragment	Mw (Da)	How to obtain	Notes
IgG	150 kDa	protein A/G	Native molecule.
F(ab') ₂	110 kDa	Pepsin	Contains hinge, most of C-region.
Fab'	55 kDa	Reduction of F(ab') ₂	
HC	50 kDa	Reduce HC/LC	Single, reduced, heavy chain.
LC	25 kDa	Reduce HC/LC	Single, reduced, light chain.

Isotype	# subclasses ¹	Description
IgA	2	Found in mucosal areas (eg., gut, respiratory tract), saliva, tears, breast milk.
IgD	1	Ag-receptor to non-exposed B cells.
IgE	1	Binds to allergens, triggers histamine response.
IgG	4	Many locations, including placental crossing. Majority of Ab-based immunity.
IgM	1	Expressed on surface of B cells (monomer) and in a secreted form (pentamer).

¹: number of subclasses in human.

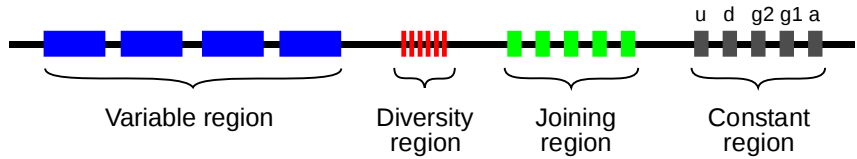
Antibody titer dynamics after immunization and boost. Expected serum titers for IgM and IgG are depicted.



Abterra bio

Discovery from serum
Elucidation by mass spectrometry

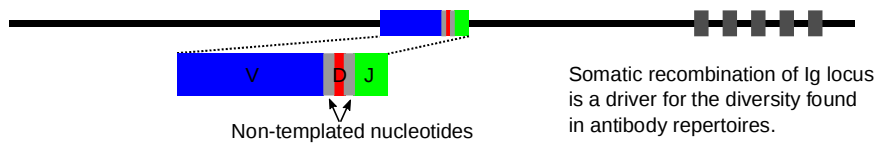
Ig locus structure



Human: 55 genes
 Mouse: 110 genes
 Rabbit: 45 genes

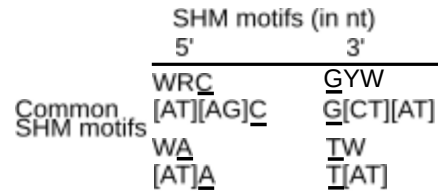
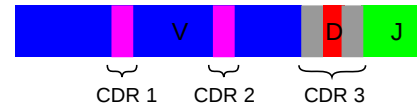
24 genes
 11 genes
 10 genes

6 genes
 4 genes
 6 genes



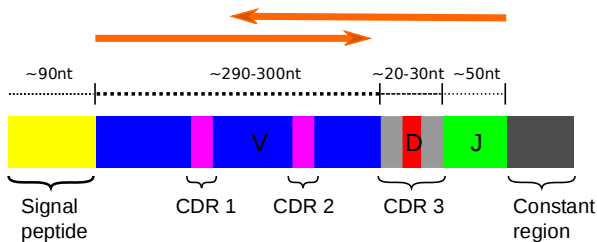
Ig somatic hypermutation

Complementarity determining regions (CDRs) are where diversification is localized, driven by recombination in CDR3 and somatic hypermutation (SHM) in CDRs 1 & 2.

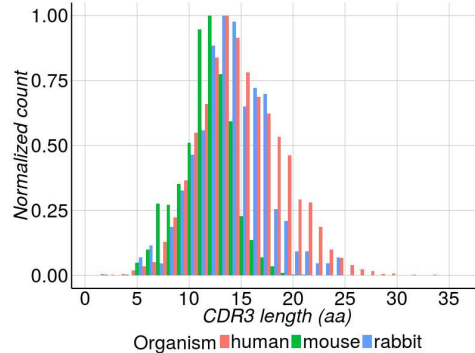


IUPAC code	Base
A	Adenine
C	Cytosine
G	Guanine
T (or U)	Thymine (or Uracil)
R	A or G
Y	C or T
S	G or C
W	A or T
K	G or T
M	A or C
B	C or G or T
D	A or G or T
H	A or C or T
V	A or C or G
N	any base

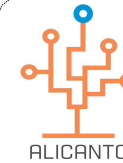
Antibody sequence features



Rearranged antibody transcript can vary considerably in length.

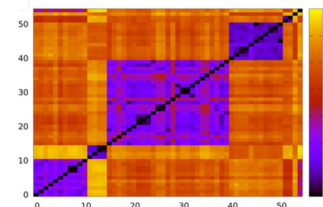


CDR3 length varies across different organisms.



Antibody discovery directly from serum. Discover us at:
www.abterrabiocom/alicanto-overview/

VDJ genes



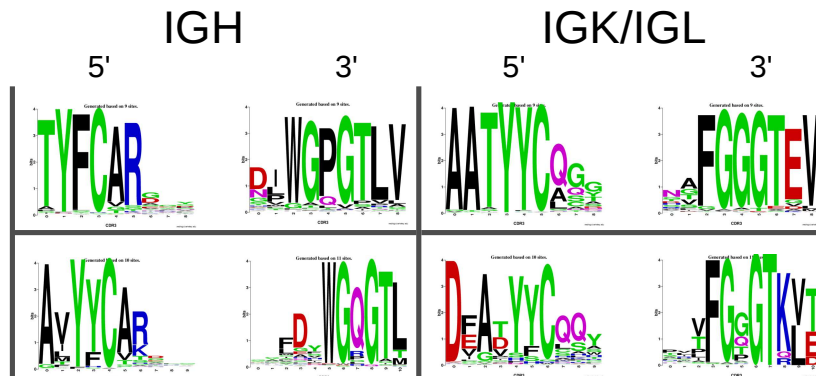
Human V gene edit distance clustering shows a natural separation of V genes into larger families - shown as black/purple boxes off the main diagonal.

Locus	Gene segment lengths		
	V	D	J
Human IGH	296.6364 ± 3.0413	25.2000 ± 7.0351	52.8333 ± 4.8103
Human IGK	291.4634 ± 6.9531		38.3333 ± 0.4714
Human IGL	297.0606 ± 9.0752		38.0000 ± 0.0000
Mouse IGH	295.3268 ± 4.3134	17.4444 ± 3.1662	50.1111 ± 2.8846
Mouse IGK			
Mouse IGL			
Rabbit IGH	289.3333 ± 3.0758	30.1818 ± 5.4409	51.1818 ± 2.0369
Rabbit IGK	297.2353 ± 4.6751		39.0000 ± 1.0000

* all lengths in nt

CDR3 sequences can be identified by their common sequence motifs at the 5' and 3' ends.

These position weight matrices show motifs for rabbit and human.



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