

ANTIBODY

General structure of antibody:

a) Polypeptide chain—Composed of 4 polypeptide chains (two light and two heavy), held together by interchain disulphide bonds. Information on these chains are given in a tabular form as follows—

Chain	MW of each chain	Type	
Light chain	~25000	Variable light chain region or V _L	Constant light chain region or C _L
		i) Composed of variable amino sequences ii) The NH ₂ terminal half of the comprising 100-110 amino acids	Composed either Kappa (κ) or lambda (λ).
			C _L component κ λ
			Sub type: - 3 (in mice- λ ₁ λ ₂ , λ ₃) 4 (in human)
		% In human: 60% In mice: 95%	40% 5%
Heavy chain	~50000	Variable heavy chain region or V _H	Constant heavy chain region or C _H
		Amino terminal part, comprising 100-110 amino acids	i) Corresponding 5 different types of C _H regions ii) Length range ~ 330 aas to 440aas
Each of these 5 different heavy chains is called an isotype			

b) Different types of Constant heavy chains—

Type	Sub type	Length (~aas)	Antibody to be determined
Delta (δ)	-	~330	IgD
Gama (γ)	γ ₁ , γ ₂ , γ ₃ , γ ₄	~330	IgG
Alpha (α)	α ₁ , α ₂	~330	IgA
Mu (μ)	-	~440	IgM
Epsilon (ε)	-	~440	IgE

c) Chemical bonds-

Several covalent and noncovalent interactions are responsible for the stability of immunoglobulin structure as given in the tabular form:

Type of bond	Sub type	Location and function
Covalent	Disulphide bond/ bridge	i) Allow binding of each light chain to H chain ii) Links the 2 identical H and L chain combinations (H-L) to each other to form the 4 chain Ig structure (H-L) ₂
Comments: The exact number and precise positions of these interchain disulphide bonds differs among I _g classes and sub classes.		
Non covalent bond	Salt linkages, hydrogen bonds, hydrophobic bonds	i) Bound each light chain to a H-chain ii) Links the 2 identical H and L chain combinations to each other to form the basic 4 chain Ig structure