



Universidad Autónoma del Estado de Hidalgo



Instituto de Ciencias de la Salud

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**IMMUNOGLOBULINS**

**INMUNOGLOBULINAS**



## Área del Conocimiento: 3 Medicina y Ciencias de la Salud

### Abstract

#### •What is Immunoglobulin?

Immunoglobulins are the critical ingredients of humoral acquired immune response. The immunoglobulins are a group of glycoproteins present in the serum and tissue fluids of all mammals

•**Keywords:** Immunoglobulins, isotypic , allotypic, idiotypic.

## Área del Conocimiento: 3 Medicina y Ciencias de la Salud

### Resumen

Las inmunoglobulinas son los ingredientes fundamentales de la respuesta inmune adquirida humoral. Las inmunoglobulinas son un grupo de glicoproteínas presentes en los fluidos de suero y el tejido de todos los mamíferos

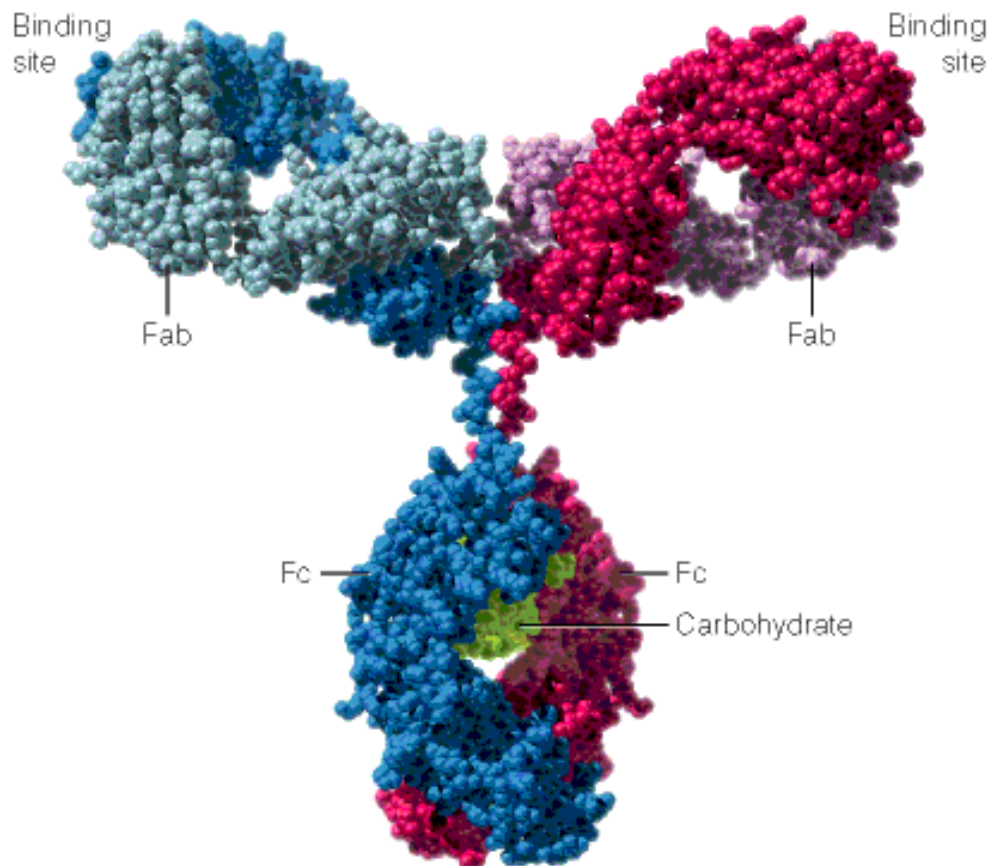
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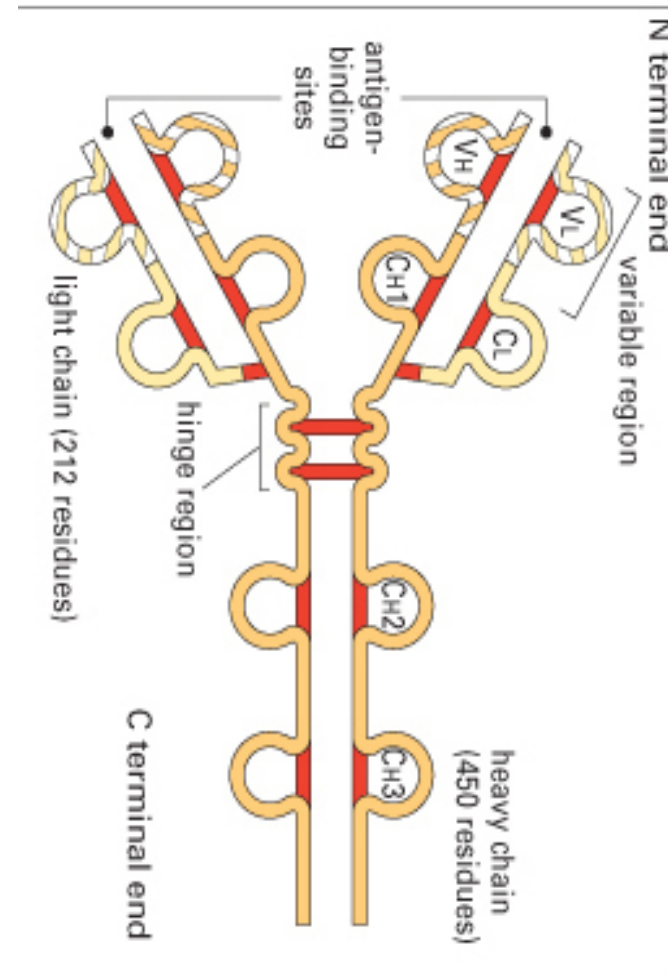
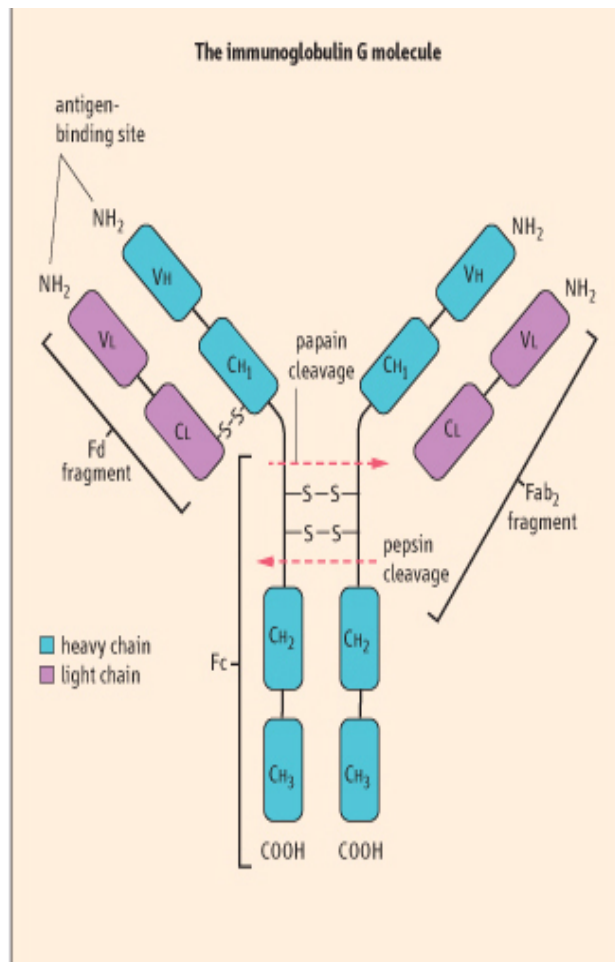
# INMUNOGLOBULINAS (Ig)

- Son glicoproteínas presentes en el plasma.
- Algunas de ellas actúan como receptores de linfocitos B.
- Son responsables de la inmunidad humoral.
- Se clasifican en base a la diferencia estructural en las regiones constantes en las cadenas pesadas.

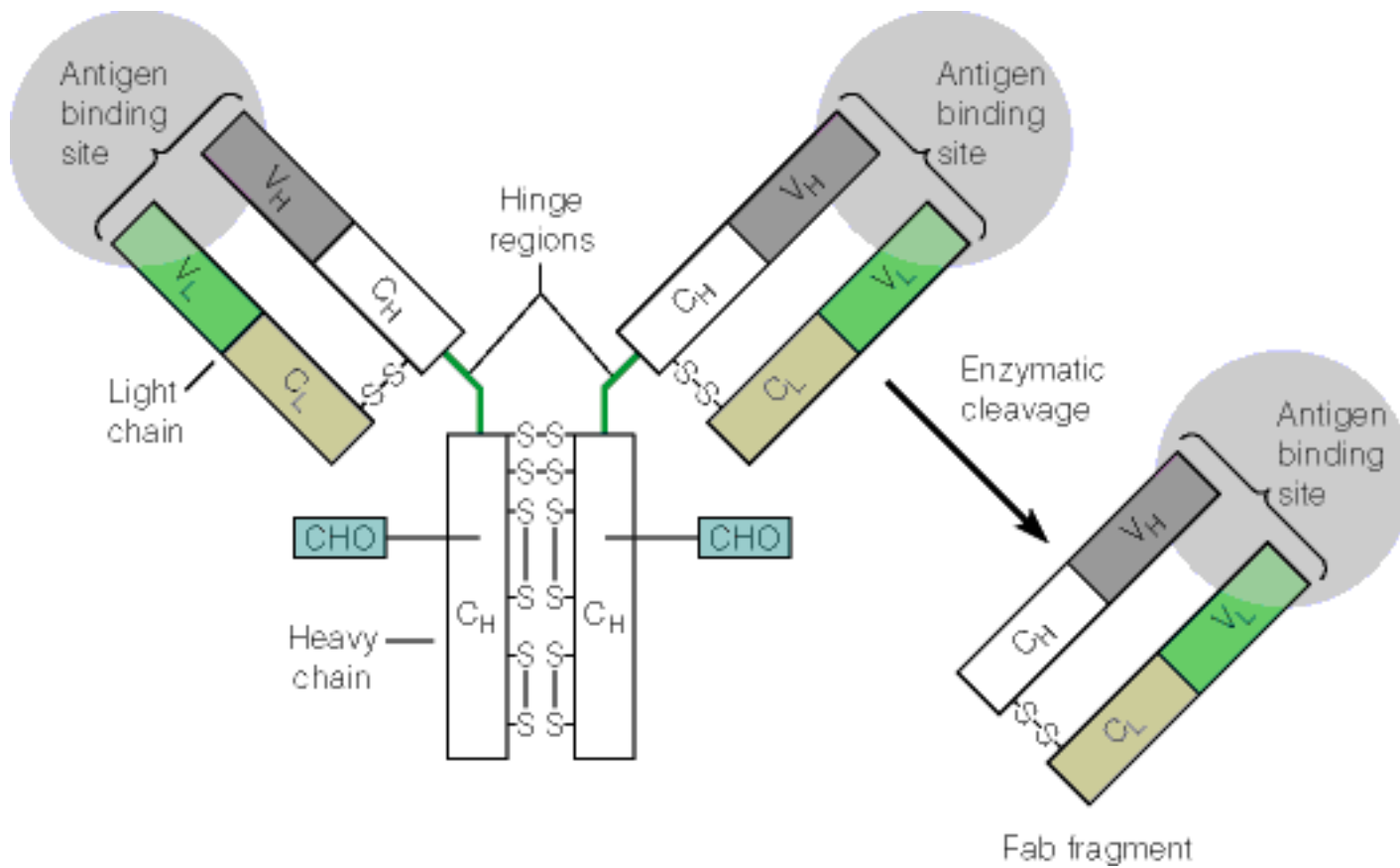
# Estructura de la Ig

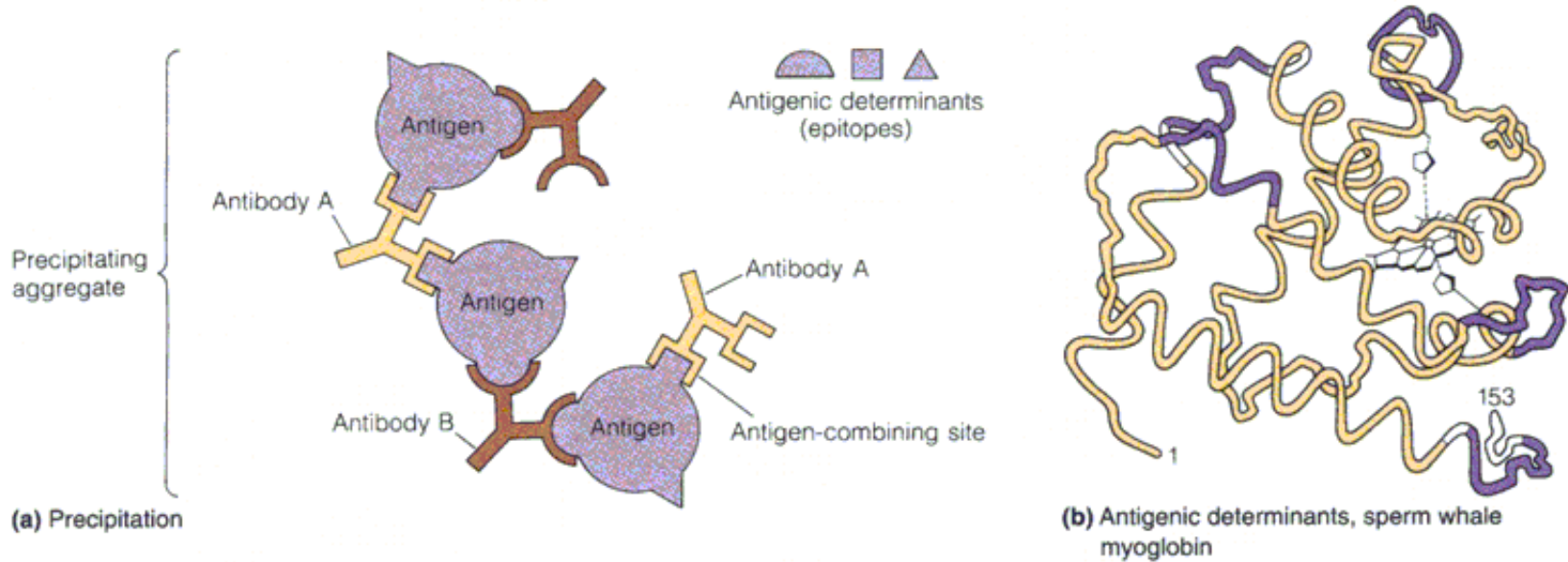


# Estructura de la Ig



# Estructura de la Ig





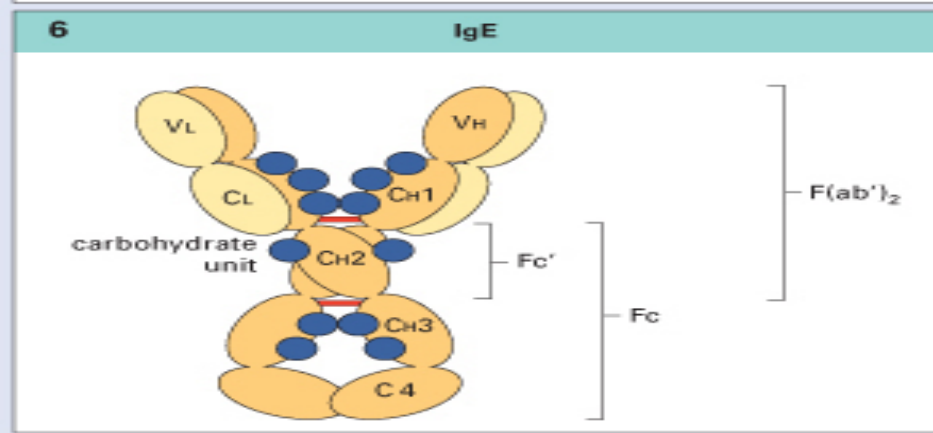
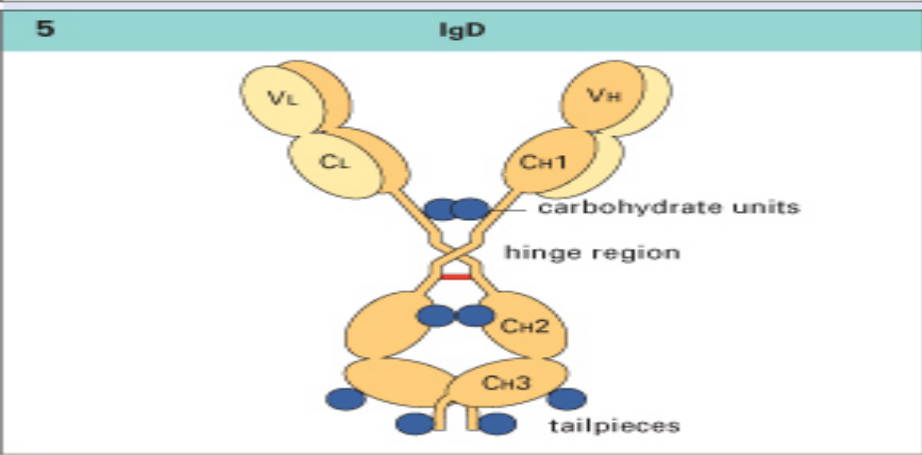
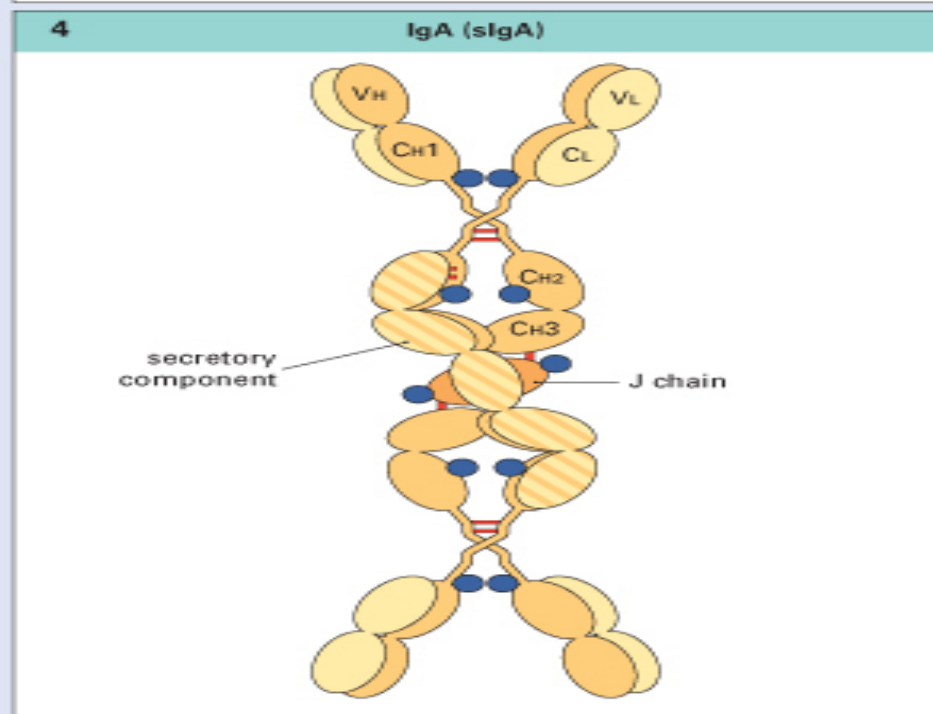
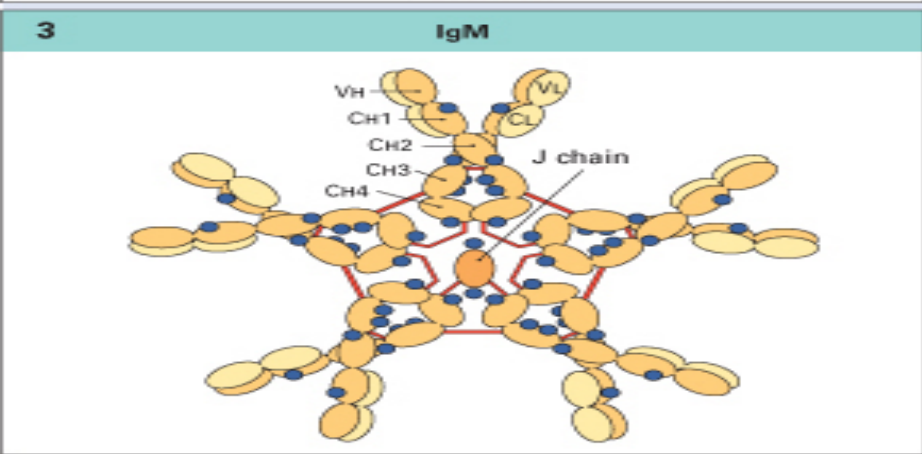
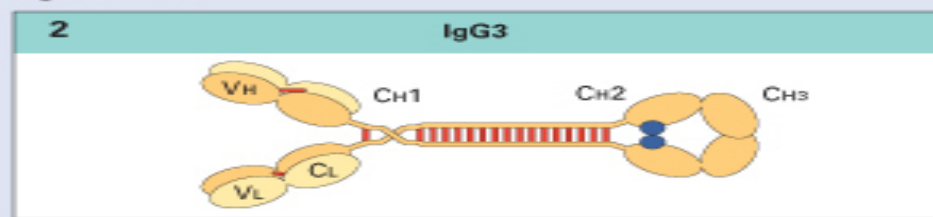
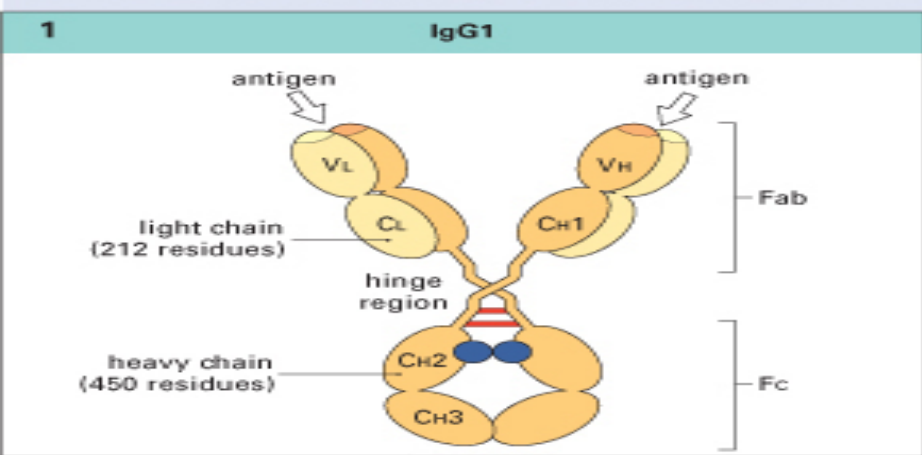


## Physicochemical properties of human immunoglobulin classes

property	immunoglobulin type									
	IgG1	IgG2	IgG3	IgG4	IgM	IgA1	IgA2	sIgA	IgD	IgE
heavy chain	$\gamma_1$	$\gamma_2$	$\gamma_3$	$\gamma_4$	$\mu$	$\alpha_1$	$\alpha_2$	$\alpha_1/\alpha_2$	$\delta$	$\epsilon$
mean serum conc. (mg/ml)	9	3	1	0.5	1.5	3.0	0.5	0.05	0.03	0.00005
sedimentation constant	7s	7s	7s	7s	19s	7s	7s	11s	7s	8s
mol. wt (kDa)	146	146	170	146	970	160	160	385	184	188
half-life (days)	21	20	7	21	10	6	6	?	3	2
% intravascular distribution	45	45	45	45	80	42	42	trace	75	50
carbohydrate (%)	2-3	2-3	2-3	2-3	12	7-11	7-11	7-11	9-14	12

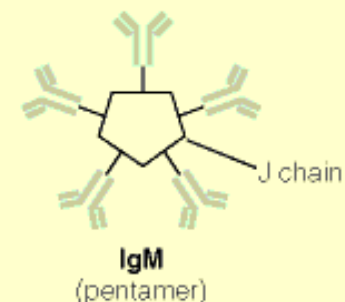


# Structural characteristics of various human immunoglobulins





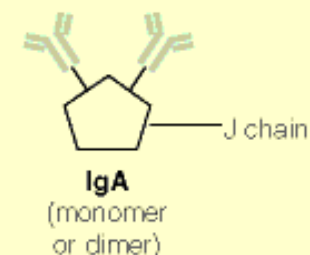
IgM is produced during the early response to an invading microorganism. It is the largest immunoglobulin, containing five Y-shaped units of two light and two heavy chains each. The units are held together by a component called a J chain. The relatively large size of IgM restricts it to the bloodstream. It is also effective in triggering an important mechanism for foreign cell destruction, called the complement system.



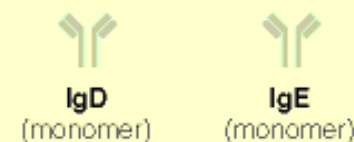
IgG molecules, also known as  $\gamma$ -globulin, are the most abundant of circulating antibodies. A variant is attached to B-cell surfaces. IgG molecules consist of a single Y-shaped unit and can traverse blood vessel walls rather readily; they also cross the placenta to carry some of the mother's immune protection to the developing fetus. Specific receptors allow such passage. IgG also triggers the complement system.



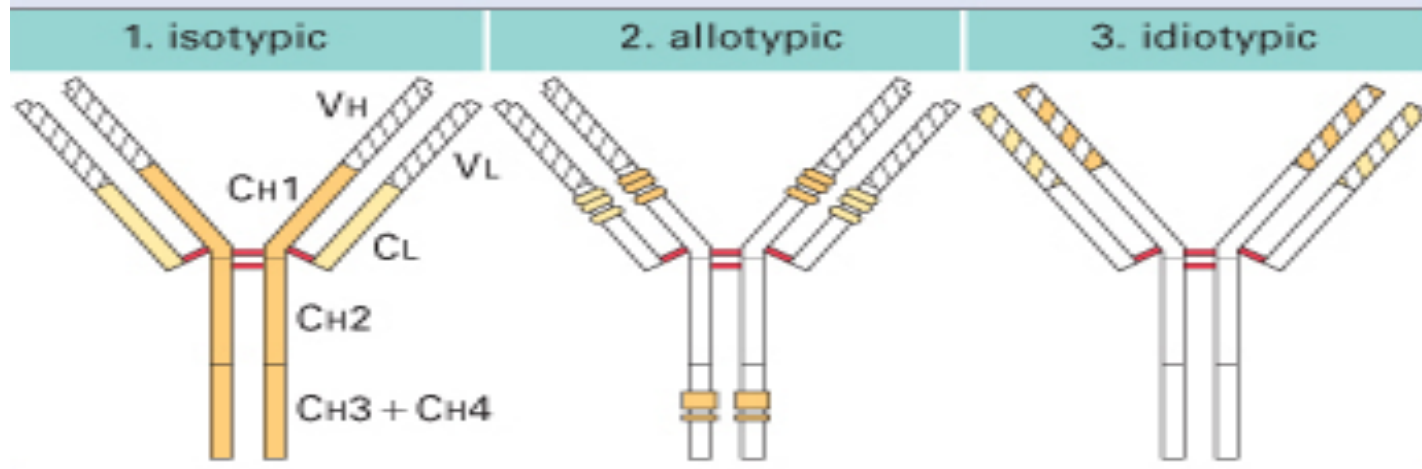
IgA is found in body secretions, including saliva, sweat, and tears, and along the walls of the intestines. It is the major antibody of colostrum, the initial secretion from a mother's breasts after birth, and of milk. IgA occurs as a monomer or as double-unit aggregates of the Y-shaped protein molecule. IgA molecules tend to be arranged along the surface of body cells and to combine there with antigens, such as those on a bacterium, thus preventing the foreign substance from directly attaching to the body cell. The invading substance can then be swept out of the body together with the IgA molecule.



Less is known about the IgD and IgE immunoglobulins. IgD molecules are found on the surface of B cells, though little is known about their function. IgE is associated with some of the body's allergic responses, and its levels are elevated in individuals who have allergies. The constant regions of IgE molecules can bind tightly to mast cells, a type of epithelial and connective tissue cell that releases histamines as part of the allergic response. Both IgD and IgE consist of single Y-shaped units.

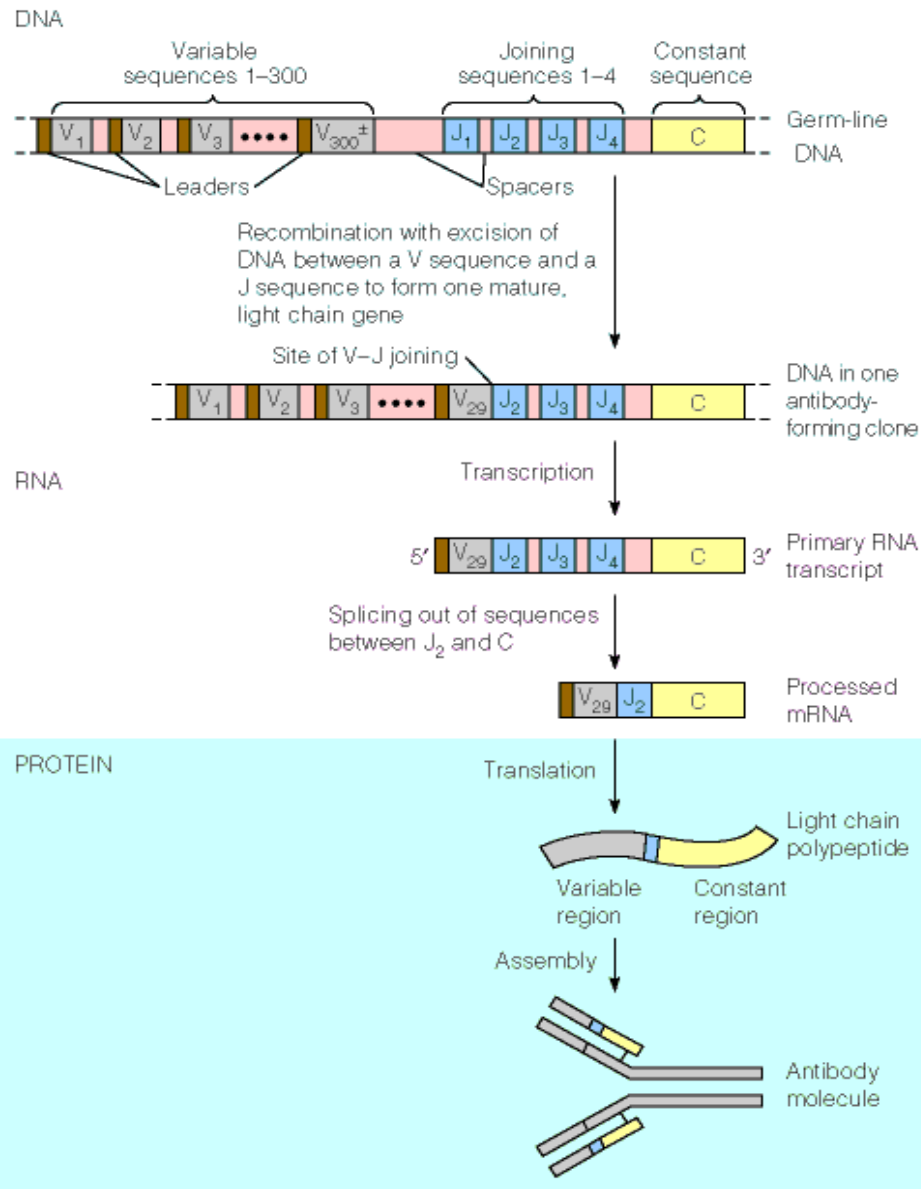


## Variability of immunoglobulin structure





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