

CONCEPT: CLASSES OF ANTIBODIES

• There are _____ classes of immunoglobulins based on differences in their *heavy* chains:

1) Ig_____

2) Ig_____

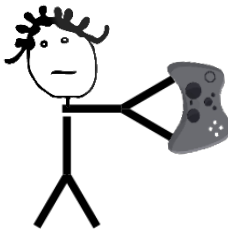
3) Ig_____

4) Ig_____

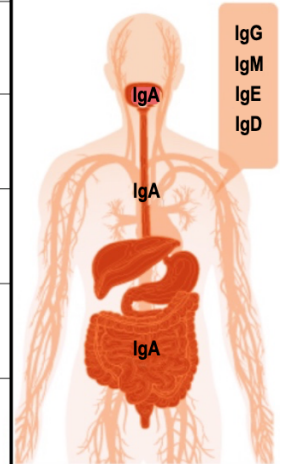
5) Ig_____

EXAMPLE: Classes of Antibodies.

GAMED



Ig Class	Structure	Heavy Chain	Light Chain	Molecular Mass (kDa)	Primary Feature
IgG		γ	κ or λ	150	Protects against _____ types of infections.
IgA		α	κ or λ	180-720	Highly concentrated in _____ membranes.
IgM		μ	κ or λ	950	_____ antibody produced upon infection.
IgE		ϵ	κ or λ	190	Defends against _____. <i>"I'm allergic!"</i>
IgD		δ	κ or λ	160	_____ B-cells.



PRACTICE: Which of the following is NOT an immunoglobulin class?

a) IgM.

b) IgH.

c) IgG.

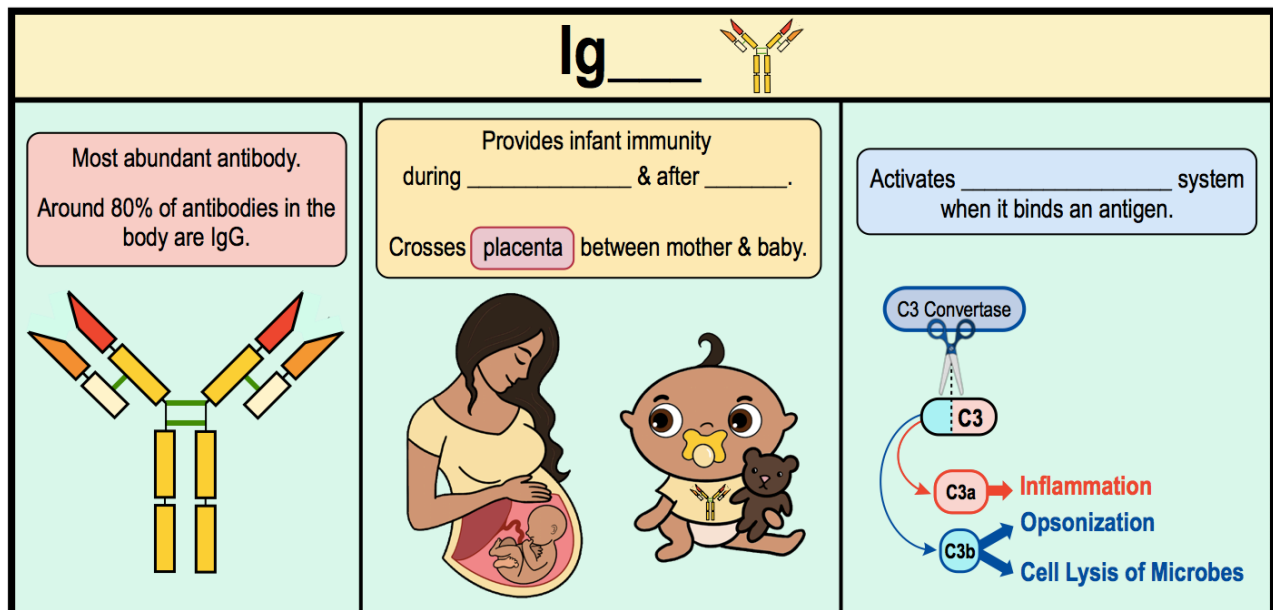
d) IgE.

e) IgD.

IgG

• **IgG:** the _____ *abundant* antibody class in the blood/tissues making up ~80% of all immunoglobulins

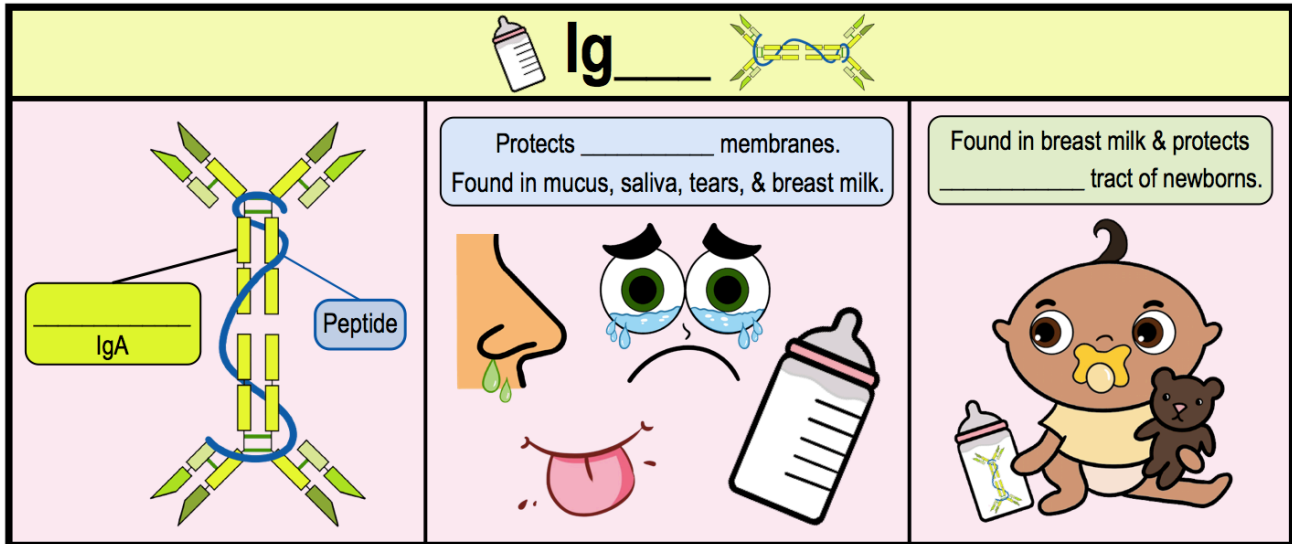
- ☐ Binds to antigens & eliminates pathogens by activating the complement system classical pathway.
- ☐ Provides immunity to a developing _____ during pregnancy & after the child has been born.
- ☐ Long half-life extends time of protection through first few months after birth.



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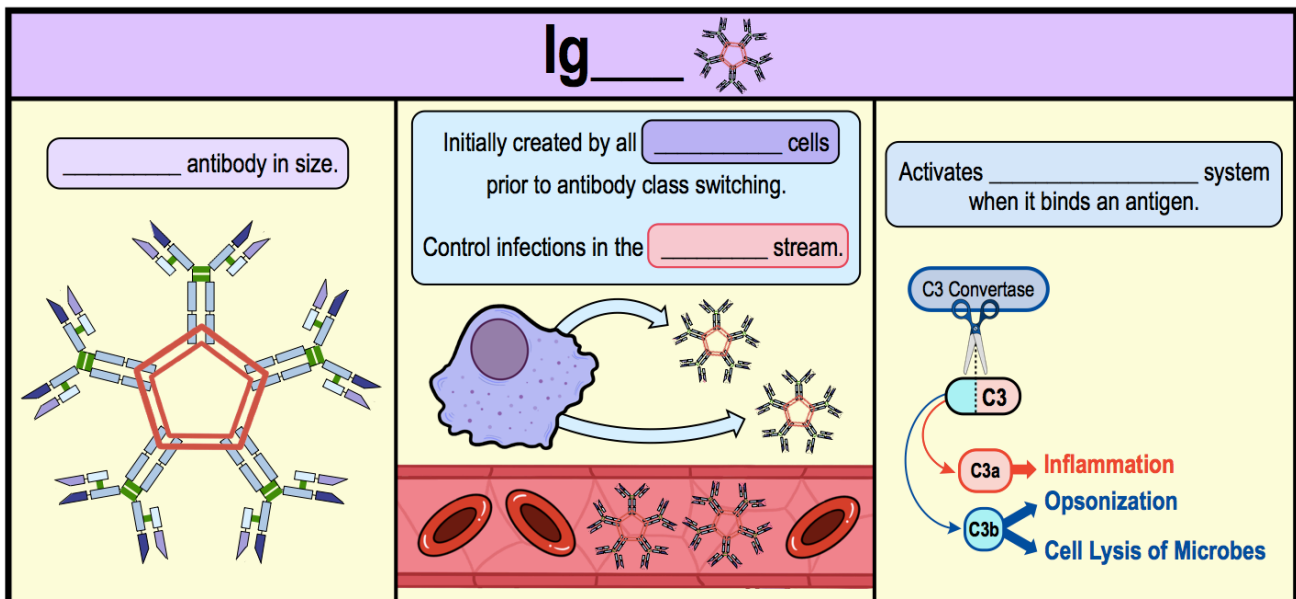
IgA

- **IgA:** Protects _____ membranes & can be found in body secretions (saliva, tears, breast milk).
 - Commonly found as a dimer called *secretory IgA* (_____) where monomers are held together by a peptide.
 - sIgA in breast milk protects intestinal tract of breast-fed newborns.



IgM

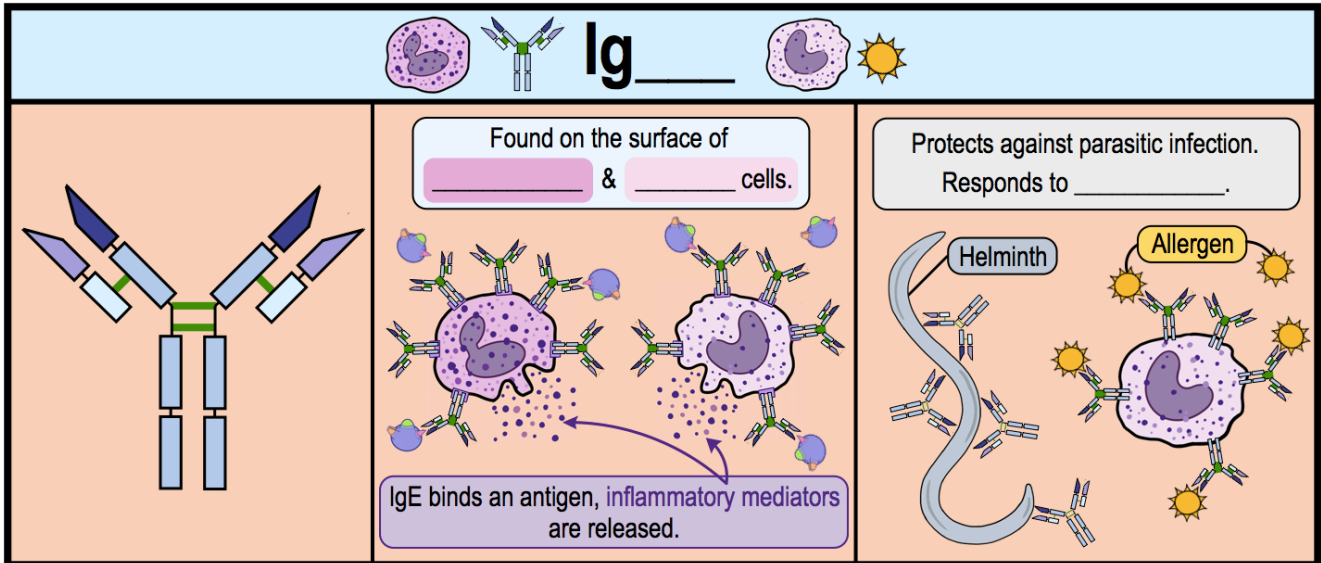
- **IgM:** Control infections in blood & is _____ antibody *initially* produced by plasma cells *before* “class switching”.
 - Largest class (in size) that is a *pentamer* composed of _____ Y-shaped subunits (10 antigen binding sites).
 - Large size *prevents* it from _____ the blood into tissues.
 - Most *efficient* antibody to activate the complement system via classical pathway.



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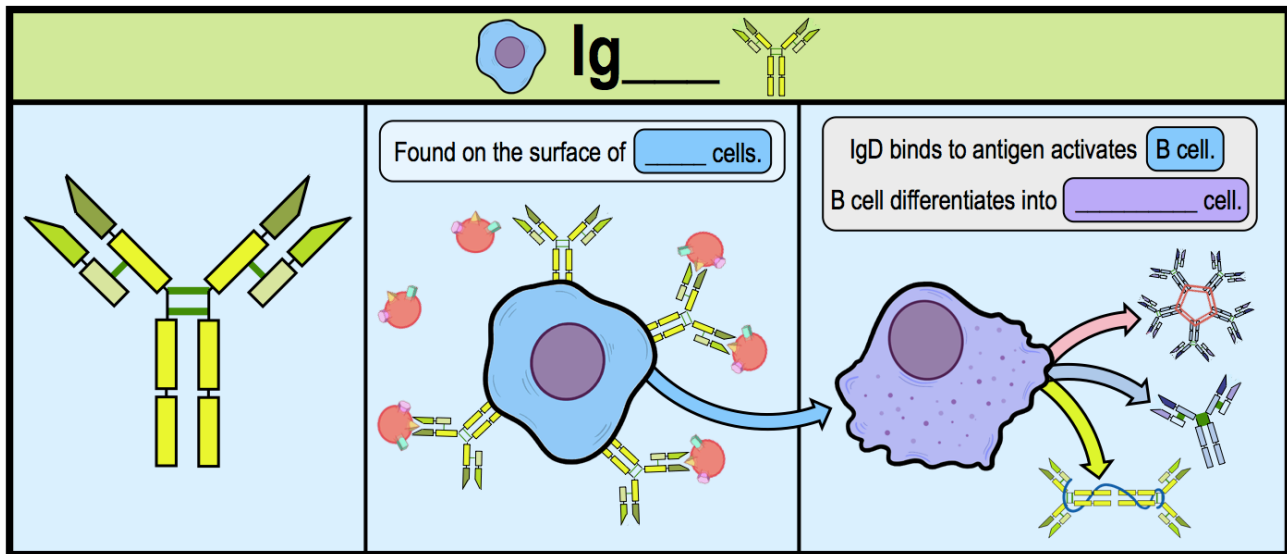
IgE

- **IgE:** Found on surface of basophils & _____ cells where they detect & respond to antigens.
 - Causes the cell to _____ & release inflammatory mediators in response to an infection.
 - Important for eliminating parasites (like worms) & response to many _____ reactions.



IgD

- **IgD:** Found on surface of B cells & signals B cell activation/maturation into antibody-secreting _____ cells.



PRACTICE: _____ is the first immunoglobulin class produced during a primary response.

- a) IgA.
- b) IgE.
- c) IgM.
- d) IgG.

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PRACTICE: Which antibody class crosses the placenta from mother to child?

- a) IgA.
- b) IgE.
- c) IgM.
- d) IgG.

PRACTICE: _____ is the immunoglobulin class that neutralizes viruses in the intestinal tract.

- a) IgG.
- b) IgA.
- c) IgD.
- d) IgE.

PRACTICE: Which of the following antibodies is involved in causing basophils to release histamine when the antibody encounters an allergen?

- a) IgG.
- b) IgA.
- c) IgD.
- d) IgE.

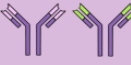
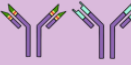

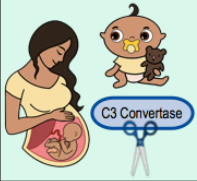
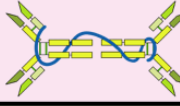

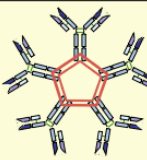
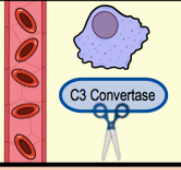

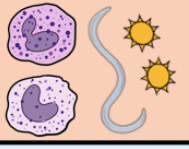

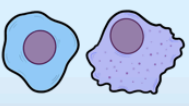
PRACTICE: The primary B-cell receptor is:

- a) IgD.
- b) IgA.
- c) IgE.
- d) IgG.

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Review Table of Immunoglobulin Classes

• Now let's review the different classes of immunoglobins (antibodies).

 Review of Antibodies 				
IgG		Half Life	<ul style="list-style-type: none"> Most abundant antibody. Around 80% of all antibodies are IgG. Crosses placenta between mother & baby. Provides _____ immunity during pregnancy & after birth. Activates complement system. 	
		LONG		
IgA		MEDIUM	<ul style="list-style-type: none"> Protects _____ membranes. Found in breast milk protecting infant intestinal systems. 	
IgM		MEDIUM	<ul style="list-style-type: none"> Initially created by all plasma cells prior to antibody class switching. Controls infections in the _____ stream. Activates complement system. 	
IgE		SHORT	<ul style="list-style-type: none"> Found on _____ & mast cells. Triggers the release of inflammatory mediators & allergic reactions. Protects against parasitic infections. 	
IgD		SHORT	<ul style="list-style-type: none"> Found on _____ cells. Triggers B cell activation & differentiation into _____ cells. 	

PRACTICE: Each class of antibody is specifically defined by its

- Amino acid sequence of the variable region of the light chain.
- Amino acid sequence of the constant region of the heavy chain.
- Ability to cross the placenta.
- Disulfide bonds.

PRACTICE: Match the following antibody classes with their description:

- a) IgA. b) IgG. c) IgE. d) IgM. e) IgD.

___ First antibody produced during primary response.

___ Protects mucous membranes.

___ Most abundant antibody.

___ Found on the surface of B cells.

___ Triggers allergic reactions to allergens.