



Antigen (Ag) :

Is a substance that when introduced into the body causes the production of antibodies.

These antibodies will combine specifically with the antigen that caused their production.







Classes of antibodies								
Isotype	Structure	Placenta transfert	Activates complement	Additional features				
IgM	N.	No	Yes	First Ab in development and response				
IgD	Usell	No	No	B-cell receptor				
IgG	Y	Yes	Yes	Involved in opsonization and ADCC. Four subclasses; IgG1, IgG2, IgG3, IgG4				
IgE	is ast cell	No	No	Involved in allergic responses				
IgA	¥ <u>>~</u>	No	No	Two subclasses; IgA1, IgA2. Also found as dimer (sIgA) in secretions.				



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	IgG	IgA	<u>IgM</u>	<u>Ig</u> D	<u>IgE</u>			
Molecular weight	150,000	150,000-350,000	900,000	180,000	190,000			
Sedimentation coefficient $(S_{20,w})$	7	7(9-15)	19	7	8			
Carbohydrate (approx. %)	3	7	12	12	12			
Biological survival (plasma T-1/2 days)	21	6	5	3	2			
Placental transfer	* +		in.	-	a. 67 (
Activation of classical complementsystem	+		+		5			
Serum concentration (mg per 100 ml)	1,100	250	100	3	.01			







ELISA Principle:

As its name suggests, uses an enzyme system to show the specific combination of an antigen with its antibody.

The enzyme system consists of:

*. An enzyme which is labeled, or linked, to a specific antibody or antigen.

*. A substrate which is added after the antigen antibody reaction. This substrate is acted on by the enzyme attached to the antigen antibody complexes, to give a color change.

















1.









Advantages of ELISA

♦ <u>Sensitive</u>: nanogram levels or lower

Reproducible

Minimal reagents

&<u>Qualitative & Quantitative</u>

- Qualitative \rightarrow eg. HIV testing
- quantitative assays → Eg Ther. Drug
 Monitoring



Applications of Immunoassays

- <u>Analysis of hormones, vitamins,</u> <u>metabolites, diagnostic markers</u>
 - eg. ACTH, FSH, T3, T4, Glucagon, Insulin, Testosterone, vitamin B12, prostaglandins, glucocorticoids
- <u>Therapeutic drug monitoring:</u> - Barbiturates, morphine, digoxin,
- <u>Diagnostic procedures for detecting</u> <u>infection</u>
 - HIV, Hepatitis A, B etc



- Therapeutic:
 - Neutralizing antibodies
 - Anti-ErbB2 for breast & ovarian cancer
 - Anti-CD20 for B-cell non-Hodgkin's lymphoma
 - Antisera & antidotes (viruses & venoms)
 - Drug discovery:
 - Identification of therapeutic targets (phage display)





