

These Notes are what u should add to your slides ,,

Best wishes from the immune team ☺

# Immunity to infections

## Immunity :

1- **Active:** Immune system is activated to produce antibodies , memory cells , and effector cells.

a. **Natural:** An individual gets an infection that will induce an active natural response, e.g. sub clinical infections & clinical

b. **Artificial:** Produced by vaccination, we intentionally inject antigens and get the immune system to work.

2- **Passive:** There is no activation of the T & B cells.

a. **Natural:** the baby is born with antibodies ( IgG ) from the mother. The antibodies protects the baby for 1-6 months after birth until the body can produce its own antibodies.

b. **Artificial:** Inject antibodies that will give protection in a passive way. These antibodies are obtained from pooled sera from healthy individuals.

## First encounter with any microbe:

### The four phases of primary immune response:

1- **Lag:** (no antibodies)

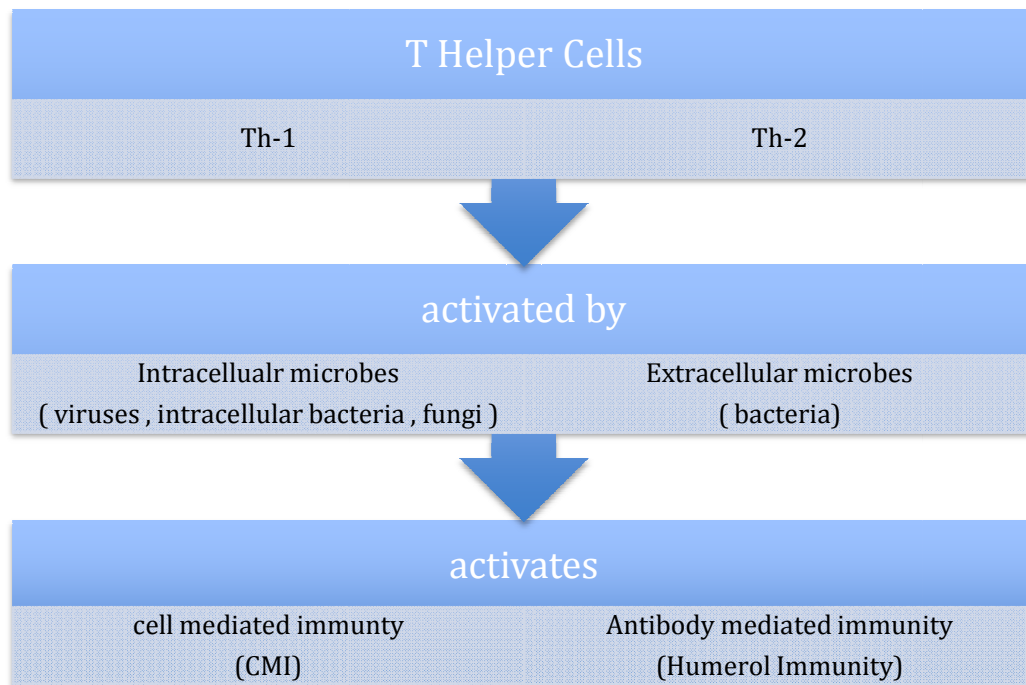
2- **Log:** After 7-10 days some antibodies can be detected in the serum and they keep on rising .

3- **Plateau:** No more increase in antibodies " Antibody levels remain unstable ".

4- **Decline:** The antibodies rate start to decrease.

\*When the human body gets infected by a microbe for the first time, the immune response that occurs is called primary immune response, if we get infected by the same microbe again a secondary immune response occurs .

Primary Immune Response	Secondary Immune Response
Mainly IgM	Mainly IgG
(recognition of antigen, differentiation & proliferation of cells (generating memory cells)).	Faster ( because of the memory cells)



- **Interferons** (secreted by the infected cells and the inflammatory cells) protect the other healthy cells and stimulate the ( NK cells and CD8 cells ) to kill the virally infected cells.
- **Endotoxin = lipopolysaccharide (LPS)**
- \*\* **IL-4 & IL-5**  $\Rightarrow$  are secreted from the Th-2 cells and they act mainly on B cells.
- **Septic shock** : is a serious medical condition that results from massive infiltration of endotoxins ( from bacteria) to the blood circulation.

**Immune paralysis: Not producing any immune response due to High dose of antigen.**

- Excessive cell-mediated immunity ( CMI ) can lead to *Granuloma formation*.
- Granuloma formation: is a protective mechanism to prevent spread of microbes ( can cause compression on other structures such as ; blood vessels ... etc.

### Antigenic Drift and reassortment of viral gene segments:

*Drift*: any change in the genetic material of the virus, any virus can undergo antigenic drift but this feature is more applied to influenza virus.

*Shift*: Sudden major change on the H and N antigens, e.g. swine flu. ( figure (b) )

