



These Notes are what u should added to your slides ,,
Immune Team wish u the best J

Natural Defense Mechanisms

- Sub-clinical infections occur when a microorganism enters the body and killed by the immune system without symptoms.

	Natural Immunity	Acquired Immunity
Mechanism of recognition of microbes	Very limited receptors (fewer than 100 receptor)	Diverse receptors
Immunologic memory	No retention of memory because their half life is short	There is immunologic memory
Effector protective mechanism	Non-specific	specific

Macrophages and monocytes link natural immunity and adaptive immunity by secreting cytokines that activate cells such as T & B lymphocytes to perform an adaptive immune response.

الجواب الرقيق: يُطفىء الغضب

Immunity

gets better as we get older , until a certain age in adulthood where it performs its best .After that, it starts to decrease with age

When we inhale microbes it gets trapped by the mucus and gets expelled by cilia (by coughing and sneezing).

Smoking cause damaged cilia so smokers are exposed to infections.

Dental procedures could cause infection because of the disruption of the mucus membrane in the oral cavity.

Lysosomes disrupt cell wall of pathogens by sticking to the pathogen so it get phagocytosed.

Neutrophils are the most important circulating effector cells.

Because of the **neutrophils'** short life , they only handle **extra cellular infections** .While **monocytes** and macrophages handle **intra cellular infections** because of their long life.

When the body encounters an infection for the first time, it is dealt with the natural immunity. However, if it bypasses the natural defense spontaneously we will have an adaptive response.

The natural immunity **doesn't** improve by the repetition of an infection. Whereas, the adaptive response improves by each time we get an infection of the same kind.

Neutrophils can kill microbes with or without oxygen.

- **Natural killer (NK)** are reasonable of **viral immunity**.
- **Mast cells** are the mediators of inflammation.
- **B-1 cells** are one of the circulating effector cells in fetus.

Platelets form a fibering clot which prevent the infection from spreading by surrounding it.

Monocytes are circulating cells in the blood , but when they enter an organ or a tissue they become attached, they are then called **macrophages**.

Chemotaxis involve adhesion molecules that slowdown the leukocyte and allow it to leave the blood vessel to the site of infection.

Lymphokines is an enzyme secreted by CD4 (helper T cells) to activate macrophages.

The complement system is a biochemical cascade that helps to clear pathogens from an organism. It is consisted of a number of small proteins found in the blood and synthesized by the liver and are normally inactive (zymogen).

{Pathogen is a bacterium, virus , or other microorganism that can cause disease}.

When the complement proteins are activated it leads to important effect :

- 1- Release of Chemotactic factors (C_{3A} , C_{5A}). C_{5A} is the most important chemotactic factors.
- 2- Opsonization of microbes (C_{3B} covers the microbe so the phagocytic cell can see it)
- 3- Lysis of target cells (C_8 & C_9 make holes bacteria and make it explode)

Macrophages produce many cytokines such as:

- IL-8 is chemotactic for neutrophils.
- IL-12 is chemotactic for natural killer cells.

Clinical signs of infection:

- 1-leukocytosis : high neutrophils in blood.
- 2-fever(pyrexia) is one of the most important signs.

- The complement protein system is activated by 3 pathways: (MCQ)

- 1) Cassical pathway \Rightarrow requires antigen and antibody (IgG, IgM).It is only activated in adaptive immunity because in natural immunity there are no antibodies. (MCQ)
- 2) Alternative pathway \Rightarrow activated by bacterial products (LPS, DNA)
- 3) Lectin pathway \Rightarrow activated by mannan-binding lectin.

McQs:

Subclinical infection ?

Remember that natural immunity is not specific

TLRs تتذكرها :

What are the cytokines produced by macrophage ?

Function of NK cells ?

Activation of complement system leads to ?

أخطاء الآخرين، أكثر لعاناً من أخطائنا!