

AN INTRODUCTION TO IMMUNITY

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What is IMMUNITY?

“**Immunity**” is a state of resistance offered by a host to the invasion/development, dissemination and/or pathology induced by a non-self/altered antigen, while having adequate tolerance to avoid allergy, and autoimmune diseases.

The word ‘*immunity*’ was derived from the Latin ‘**immunitatem**’, meaning **protection or exemption** from something, especially an obligation or penalty.

“the rebels were given **immunity from** prosecution“
“the nobles were given **immunity from** taxes“

Doctrine of Immune System

- Immune system is a physiological phenomenon of body
- It works on the principle/doctrine of “***horror auto-toxicus (SNS)***”
- Similar to each physiological mechanism, immune system should also be controlled, otherwise an exaggerated immune response will result in **immunopathology**
- **INS**
- **Danger model**

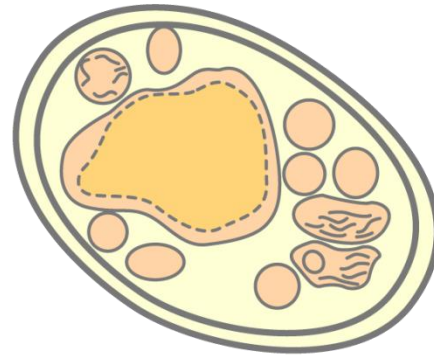
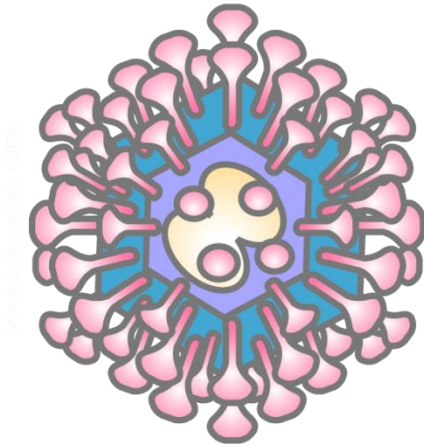
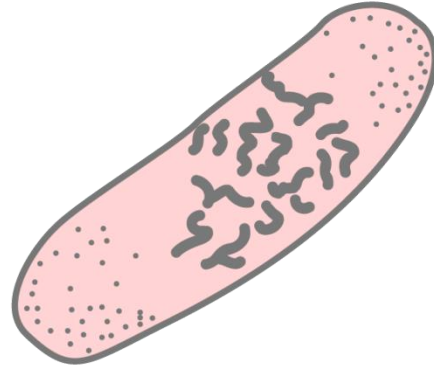
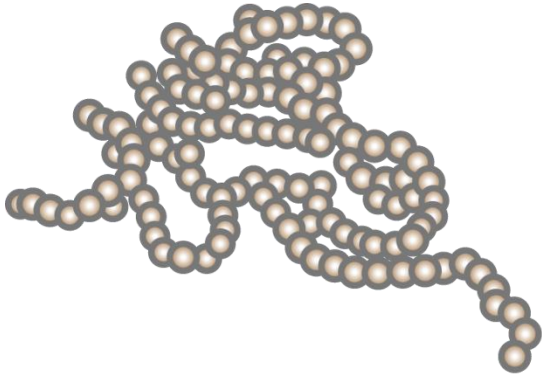
PRINCIPLES OF IMMUNITY

Healthy immunity accomplishes four essential principles:

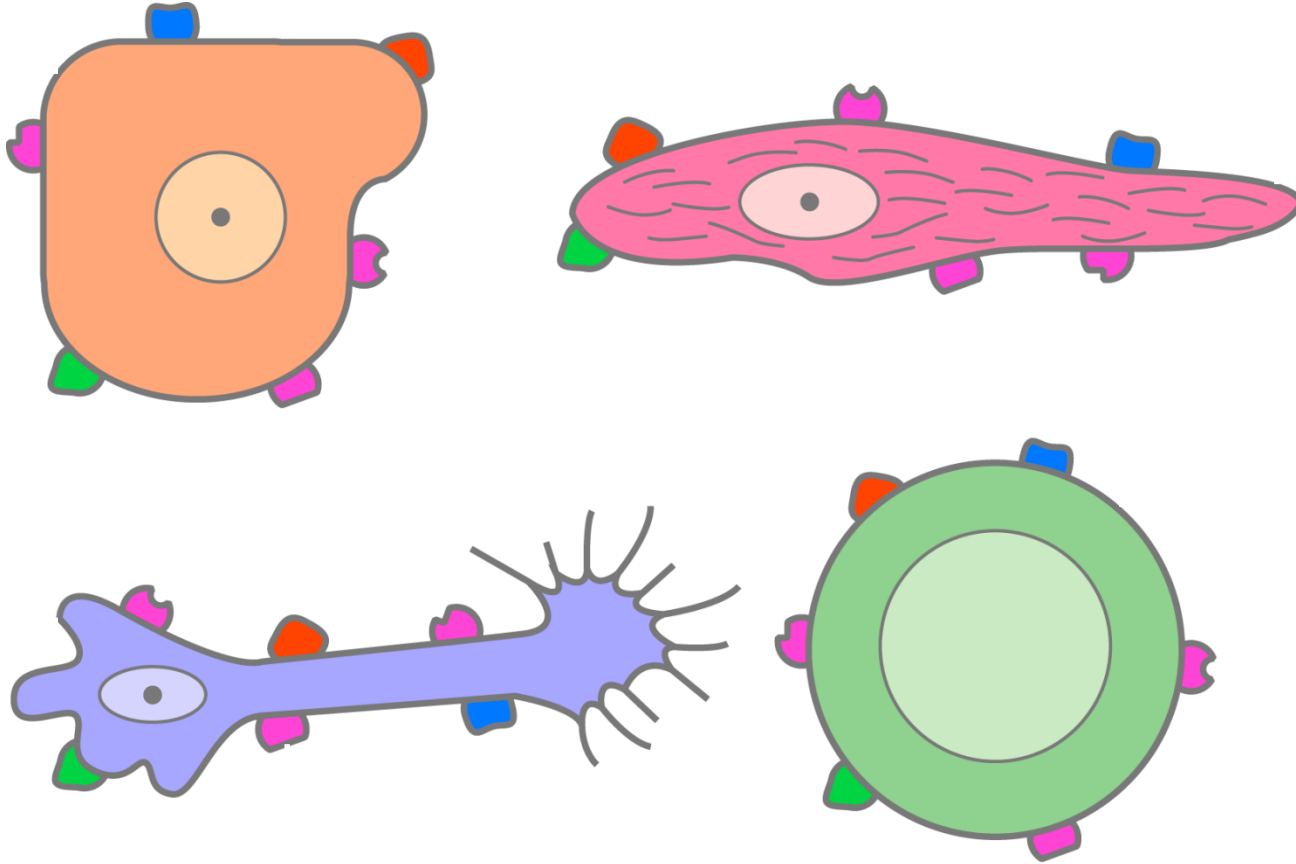
- (1) ability to detect and fight off infection;
- (2) ability to recognize a host's own cells as "self," thereby protecting them from attack;
(SNS)
- (3) a memory from previous foreign infections;
and
- (4) ability to limit the response after the pathogen has been removed.

(INS and Danger Model of immunity)

The Immune System

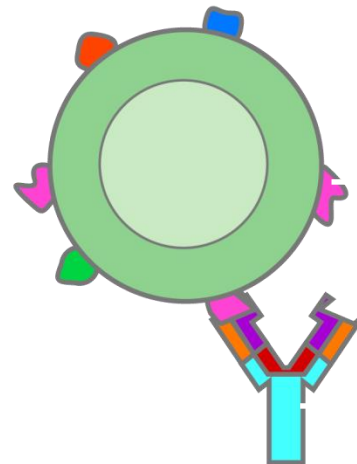
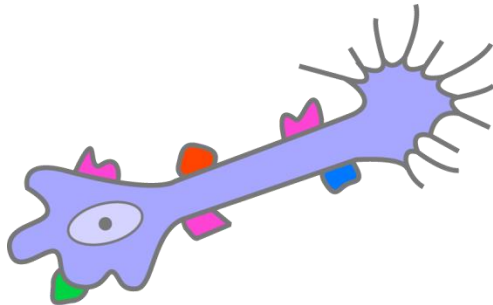
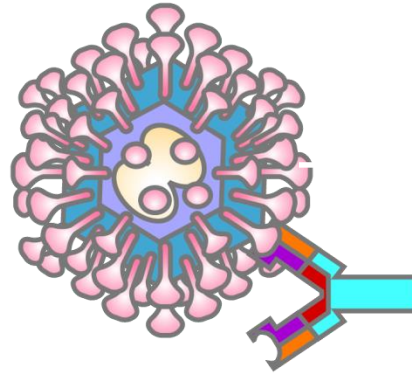
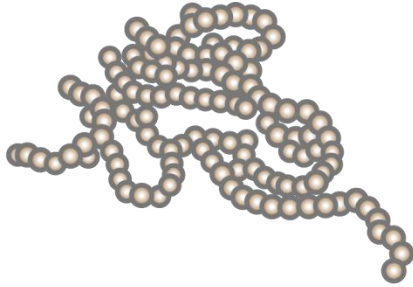


Markers of Self: MHC Antigens

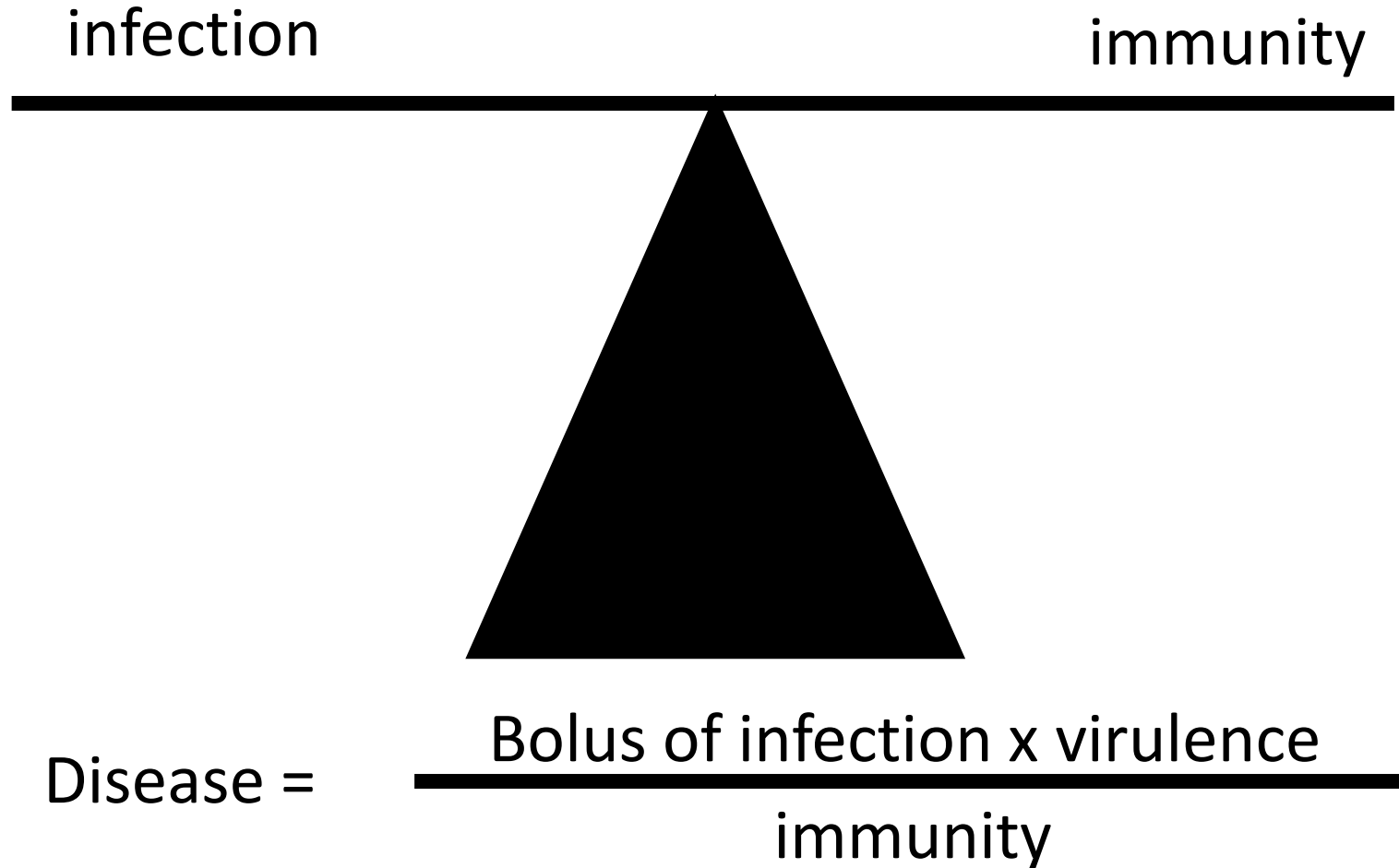


Artwork by Jeanne Kelly, 2004

Markers of Non-Self



Infection and Immunity Balance



FUNCTIONS OF IMMUNE SYSTEM

- **Defense** - immunologically mediated resistance to infection.
- **Surveillance** - detects and destroys mutant cells.
- **Homeostasis** – removes damaged self components and promote repair

Significance of the Immune System

□ **Beneficial:**

- Protection from Invaders
- Elimination of Altered Self

□ **Detrimental:**

- Discomfort (hypersensitivity)
- Damage to self (autoimmunity)

Important Immunological Milestones

□ 3000BC

- Evidence of sniffing powdered small pox crust in Egypt

□ 2000BC

- Sniffing of small pox crust in China

□ 1500BC

- Turks introduce variolation

□ 1700AD

- Introduction of variolation in England and later in the US

Important Immunological Milestones

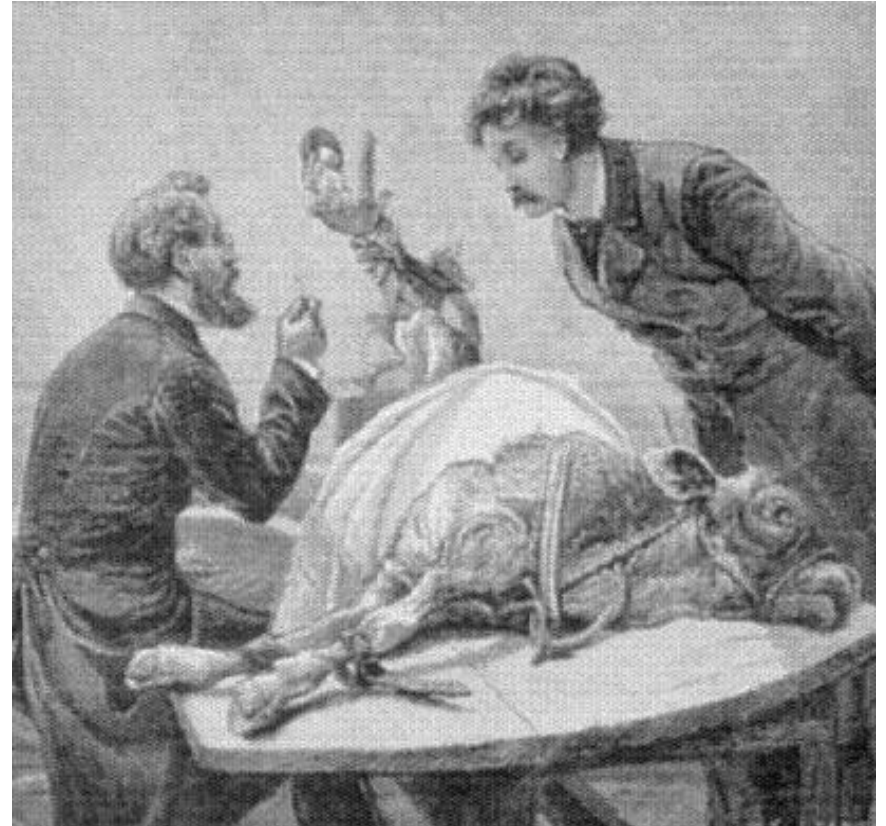
- 1780AD**

Edward Jenner discovers small pox vaccine

- 1885AD**

Louis Pasteur discovers Rabies vaccine

Edward Jenner



Discovery of small pox vaccine

Edward Jenner

Among patients awaiting small pox vaccination



NOBLE PRIZES IN IMMUNOLOGY

- **1901- Emil Adolf von Behring**, "for his serum therapy to treat diphtheria"

TO

- **2018- James P. Allison and Tasuku Honjo** "for their discovery of cancer therapy by inhibition of negative immune regulation."

(13 TIMES)