

## ADAPTIVE IMMUNITY

### 1. Define acquired and innate immunity.

Acquired or specific or **adaptive**, immunity reflects the presence of functional immune system that is capable of specially recognizing and selectively eliminating foreign microorganisms and molecules (i.e; foreign antigens). Both the humoral and the cell-mediated branches of the immune system require interaction among several different types of cells to induce a specific immunologic response.

The innate immune response (non-specific immune system or in-born immunity system) is the first line of host defense against invading pathogens until an acquired immune response develops. This immune response does not provide long-lasting immunity to the host.

### 2. Distinguish between acquired and innate immune system.

Features	Innate immunity	Acquired immunity
	T-cell is restricted to binding antigen displayed on self cells	B-cell is capable of binding soluble antigen
<b>Status</b>	Inborn	Acquired
<b>Immunological memory</b>	Absent, subsequent exposure to agents generate the same response	Present, subsequent exposure to the same agent induce amplified responses
<b>Diversity</b>	Limited, hence limited specificity	Extensive and resulting in a wide range of antigen receptors
<b>Lag phase</b>	Absent, response is immediate	Present, response takes at least a few days
<b>Receptors</b>	PRR (pattern recognition receptor)	B-cell receptor and T-cell receptor for antigen
<b>Receptor specificity</b>	Broad specificity, i.e.; able to recognize many related molecular structures called PAMP (pathogen associated molecular patterns)	Narrow specificity, i.e; recognize a particular epitope.
<b>Major cell source</b>	Macrophages, NK cells etc.	T-lymphocyte, B-lymphocyte
<b>Stimuli</b>	LPS, bacterial peptidoglycan, viral RNA, T-cell derived cytokine (IFN- $\gamma$ )	Antigens
<b>Principal physiologic function</b>	Mediators of inflammation (local and systematic)	Regulation of lymphocyte growth and differentiation, activation of effector cells (macrophage, eosinophils, mast cells)

### 3. What are the characteristic attribute of acquired immune system?

Acquired immune responses display 4 characteristic attribute—a)antigenic specificity, b)diversity, c)immunologic memory and d)self/ nonself recognition.

#### a)Antigenic specificity:

The specificity of the immune system permits it to distinguish subtle differences among antigens. Antibodies can differentiate between 2 molecules that differ by only a single amino acid. e.g; If one is immune to measles, he may be susceptible to polio or mumps virus. The body can differentiate specifically between the organisms.