

## Immunology Refresher

### Immune System

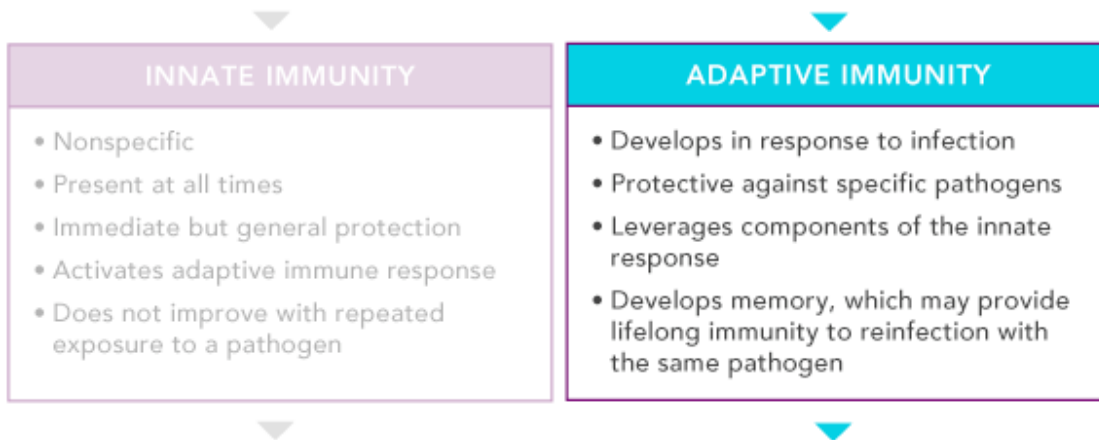
A coordinated system of cells, tissues, and soluble molecules that constitute the body's defense against invasion by nonself entities, including infectious and inert agents and tumor cells.<sup>1</sup>

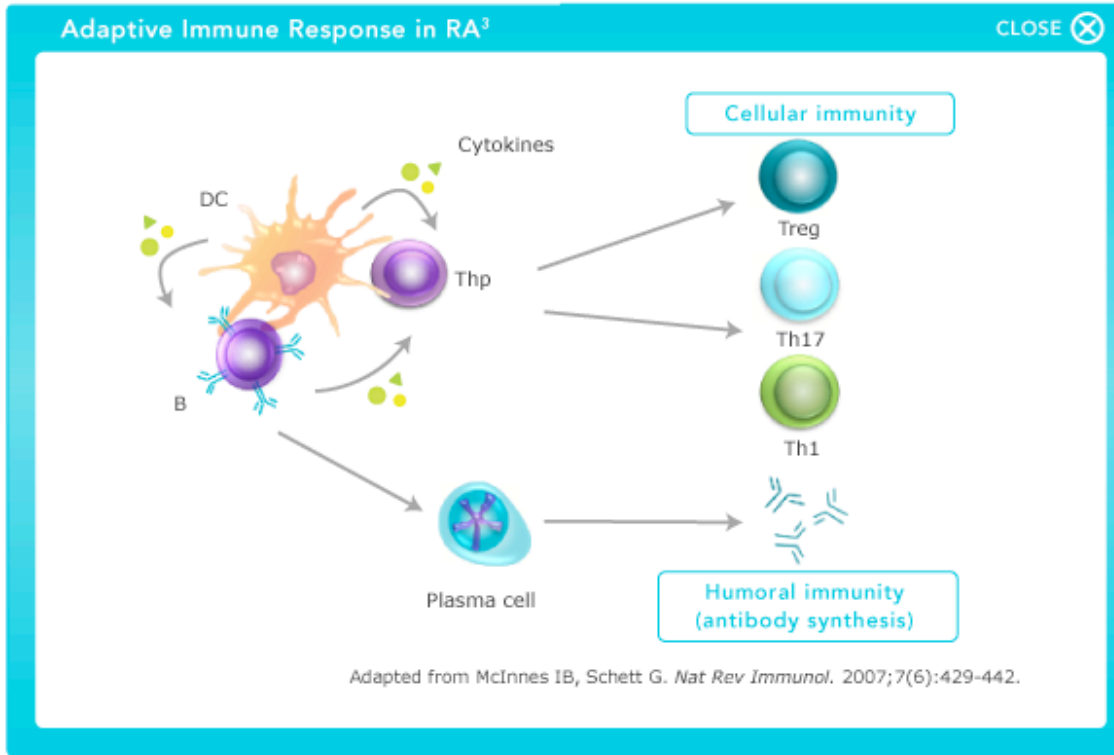
The immune system has 4 key tasks<sup>2</sup>:







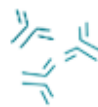




- 1. Recognition:** Detect infection or harm
- 2. Effector function:** Contain and eliminate infection
- 3. Regulation:** Control activity to avoid damage to the body
- 4. Memory:** Remember exposure; react immediately and strongly upon re-exposure

### Innate and Adaptive Immunity<sup>2</sup>

#### Immune System





COMPONENTS	FUNCTION	COMPONENTS	FUNCTION
Macrophage 	<ul style="list-style-type: none"> <li>• Phagocytosis</li> <li>• Activation of bactericidal activity</li> <li>• Antigen presentation</li> </ul>	T lymphocytes 	T cells fall into 2 broad classes according to function <ul style="list-style-type: none"> <li>• CD4<sup>+</sup> T helper cells (Th) that orchestrate and regulate immune responses</li> <li>• CD8<sup>+</sup> cytotoxic T cells (CTL) kill cells infected with viruses or other intracellular pathogens</li> <li>• All T cells secrete cytokines</li> </ul>
Dendritic cell 	<ul style="list-style-type: none"> <li>• Antigen uptake in the periphery</li> <li>• Antigen presentation</li> </ul>	B lymphocytes 	<ul style="list-style-type: none"> <li>• Produce antibodies in response to antigens</li> <li>• Antigen presentation</li> <li>• Cytokine secretion</li> </ul>
Neutrophil 	<ul style="list-style-type: none"> <li>• Phagocytosis</li> <li>• Activation of bactericidal activity</li> </ul>		
Other myeloid cells (eg. eosinophils, basophils, mast cells) 	<ul style="list-style-type: none"> <li>• Kill antibody-coated parasites</li> <li>• Release histamine granules and other pro-inflammatory mediators</li> </ul>	Antibodies 	<ul style="list-style-type: none"> <li>• Bind to antigens to neutralize them or facilitate destruction of microorganisms</li> </ul>
Natural Killer cells 	<ul style="list-style-type: none"> <li>• Release lytic granules to kill some virus-infected cells</li> </ul>	Cytokines 	<ul style="list-style-type: none"> <li>• Proteins secreted by cells that affect the behavior of nearby cells bearing appropriate receptors</li> </ul>
Complement 	<ul style="list-style-type: none"> <li>• Soluble proteins that form a complex to destroy microorganisms</li> </ul>	Cytokines 	<ul style="list-style-type: none"> <li>• Proteins secreted by cells that affect the behavior of nearby cells bearing appropriate receptors</li> </ul>

### Take Action to Learn More



#### Understanding JAK Pathways >

Discover more about JAK pathways and how they are related to inflammatory and autoimmune diseases such as rheumatoid arthritis (RA).



#### Behind the Science >

Watch leading scientists discuss the JAK pathways.