

Cells and organs of the immune system

Objective	Related information
<p>Key immune cells found in the blood</p>	<p>The granulocytes</p> <ul style="list-style-type: none"> • Basophils and eosinophils <ul style="list-style-type: none"> ○ Less abundant than neutrophils <ul style="list-style-type: none"> ▪ Eosinophils = 2 – 4% ▪ Basophils = 0.5% ○ Key cell types in combating large pathogens such as worm and parasites <ul style="list-style-type: none"> ▪ Suicide killer ○ Key cells associated with allergic responses <ul style="list-style-type: none"> ▪ Histamines ▪ Enzymes ▪ Release of immune signals • Neutrophils <ul style="list-style-type: none"> ○ Most abundant leukocytes in the blood <ul style="list-style-type: none"> ▪ 60-70% ○ Characterised by multi-lobar nucleus ○ Key phagocytic cell, important in clearing bacterial infections <p>Monocytes and macrophages</p> <ul style="list-style-type: none"> • Make ~5% of the immune cells • Monocytes are circulating cells and precursors of macrophage • As monocytes move into tissues, they differentiate into macrophages • Macrophages reside in all tissues where they can be early responders to pathogens • Macrophages are a key example of a phagocytic cell <ul style="list-style-type: none"> ○ Capable of engulfing and killing microorganisms ○ Can also aid in ongoing immune response ○ Scavenger cell in clearing dead cells and debris <p>Dendritic cells</p> <ul style="list-style-type: none"> • Phagocytic cell that has key role in bridging innate and adaptive immunity <ul style="list-style-type: none"> ○ Characterised by long dendrites ○ Can phagocytose and degrade microorganisms ○ Can ingest extracellular fluid and content (micropinocytosis) to sample the environment ○ Generated in the bone marrow, circulate in blood and enter tissues ○ Many different types ○ Known as the key antigen presenting cells of the immune system <p>The lymphocytes</p> <ul style="list-style-type: none"> • Makes up around ~28% of immune cells • Includes

	<ul style="list-style-type: none"> ○ T and B cells which are key immune cells of adaptive immune response <ul style="list-style-type: none"> ▪ B cells develop in bone marrow ▪ T cells develop in thymus from precursor from bone marrow ○ NK cells (natural killers) <ul style="list-style-type: none"> ▪ Part of the innate response ▪ Important in killing virus infected cells and tumour cells
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<p>Relationship between the key cells of the immune system</p>	<p>Underpinning many of the features of immunity are cells and cellular interactions</p> <p>Summary</p> <ul style="list-style-type: none"> • All blood cells are derived from HSC (haematopoietic stem cell) in the bone marrow • Lineages of immune cells can be divided in to myeloid and lymphoid lineages • Some terms that can be used to generally defined immune cells as a group of cells and is leukocytes or white blood cells
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<p>Key components of the lymph node</p>	<p>Lymph node</p> <ul style="list-style-type: none"> • Has structures and regions • Surrounded by capsules by capsule membrane <ul style="list-style-type: none"> ○ Trabeculae compartmentalise and add structure • Lymph fluid access <ul style="list-style-type: none"> ○ In to the node by the afferent lymphatic vessel ○ Out of the node by the efferent lymphatic vessel • Has a vascular supply <ul style="list-style-type: none"> ○ For tissue survival ○ Transport of pathogens ○ Transport of blood borne immune cells ○ Efferent and afferent blood vessels
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| | <ul style="list-style-type: none">• Zones<ul style="list-style-type: none">○ Has B and T cell zones○ Not randomly mixed○ Helps coordinate movements• Medulla and medulla sinus<ul style="list-style-type: none">○ Main site of blood○ WBC○ Lymph drains → efferent |
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