Immune System

2 Divisions

Innate Immune System

- Nonspecific, immediate
- Components include: **Antimicrobials**, **phagocytes**, **cilia** lined passages, **interferons**
- Activate inflammatory response
- Recruitment of immune cells via release of **cytokines.**

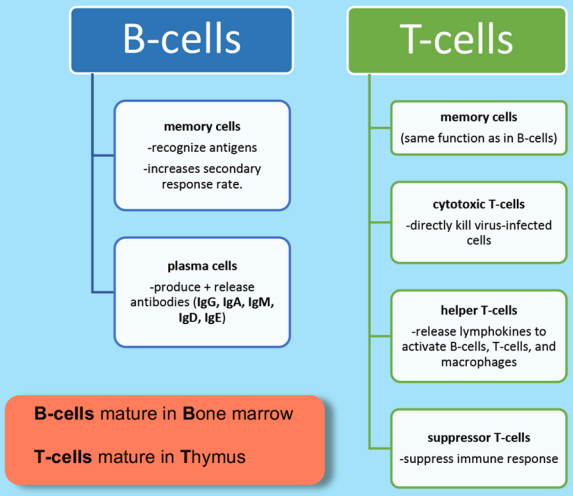
Cells of Innate Immune System:

Macrophages, mast cells, granulocytes, dendritic cells, natural killer cells

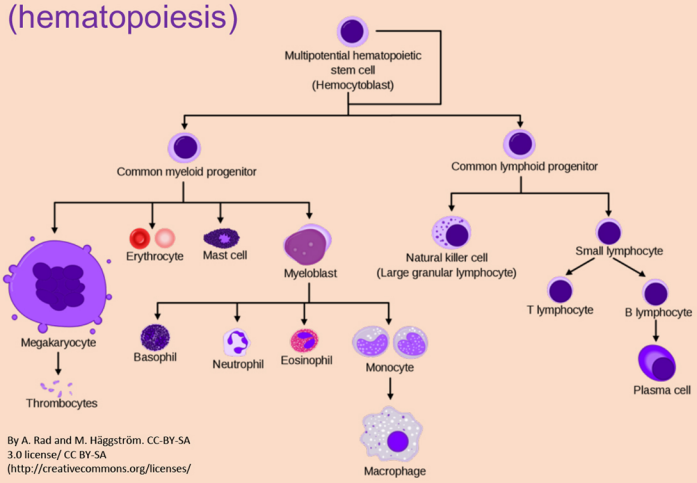
Adaptive Immune System

- Specific
- Activated **B-cells** produce **antibodies** in response to pathogen. (**humoral immunity)**
- Antibodies bind to **antigens** of pathogen (ex. bacteria)
- **T-cells** recognize antigen and signal for apoptosis (**cell-mediated immunity)**

Cells of Adaptive Immune System:



Blood Cell Formation (hematopoiesis)



Immune Cells (WBC's, Leukocytes)

Two Categories:

1. **Granulocytes:**
   - Neutrophils – phagocytes
   - Eosinophils – parasitic killer
   - Basophils – histamine release
2. **Agranulocytes**
   - Lymphocytes (B- and T-cells)
   - Monocytes (young macrophages, engulf invaders)

Major Organs and Tissues

- **Skin**
- **Lymphatic system**
  - **Bone marrow**: produces all WBC's, B-cell differentiation.
  - **Spleen:** blood storage, B-cell activation.
  - **Thymus**: T-cell differentiation
  - **Lymph nodes**: provide sites for cell communication and attack, B-cell activation
- **Gut-associated lymphoid tissue (GALT)**:
  - **Tonsils & Adenoids**: trap bacteria and viruses.
  - **Peyer's Patches**: monitors intestinal bacteria population.
  - **Appendix**: creation/protection of good bacteria