Development of Myeloid and lymphoid cells

Myeloid and lymphoid cells are **two types of multipotent, hematopoietic progenitor cells, which give rise to the cells in the blood**. Furthermore, myeloid cells refer to the cells derived from the bone marrow while lymphoid cells refer to the cells related to the lymphatic system

Myeloid Cells

Myeloid cells are a type of daughter cells produced by hematopoietic stem cells. Myeloid cells are progenitor cells of different types of cells. They produce many different types cells including RBCs, monocytes, neutrophils, basophils, eosinophils, and platelets.

Origin: Myeloid cells originate in bone marrows. They act quickly to kill foreign particles which can infect the body and alert the lymphoid cells for further defense mechanisms

•**Red blood cells** – the most common type of blood cells responsible for the transport of oxygen throughout the body

•**Neutrophils** – the most common type of granulocytes and they serve as phagocytes

•**Eosinophils** – another type of granulocytes, which combat multicellular parasites

•**Basophils** – the least common type of granulocytes responsible for generating inflammatory responses

•**Monocytes** – give rise to macrophages and dendritic cells

•**Platelets** – responsible for blood clotting

Lymphoid Cells

Lymphoid cells are the other type of multipotent, hematopoietic progenitor cells that occur in the bone marrow. They also give rise to the T lymphocytes, B lymphocytes, and natural killer cells. Lymphoid cells move around the body in the lymph and act more slowly to kill infections specifically

•**T lymphocytes** – play a key role in the cell-mediated immunity. Moreover, the three main types of T lymphocytes in the blood are the helper T cells, cytotoxic T cells, and regulatory T cells.

•**B lymphocytes** – play a key role in the humoral immunity by producing antibodies.

•**Natural killer cells** – involved in the innate immune system, providing a rapid response against viral-infected cells.

- Two common types of malignancies occur in the myeloid cells: acute myelogenous leukaemia (AML) and chronic myelogenous leukaemia (CML). Both AML and CML are cancers in the myeloid cells, characterized by the rapid growth of abnormal cells in the bone marrow

- In addition, the two main types of malignancies in the lymphoid cells are acute lymphoblastic leukaemia (ALL) and chronic lymphocytic leukaemia (CLL). In fact, both are cancerous situations characterized by the production of a large number of immature lymphoblasts.

Development of Myeloid and lymphoid cells (hematopoiesis)

- The bone marrow gives birth to different cells which are engaged in defense mechanisms of the body.

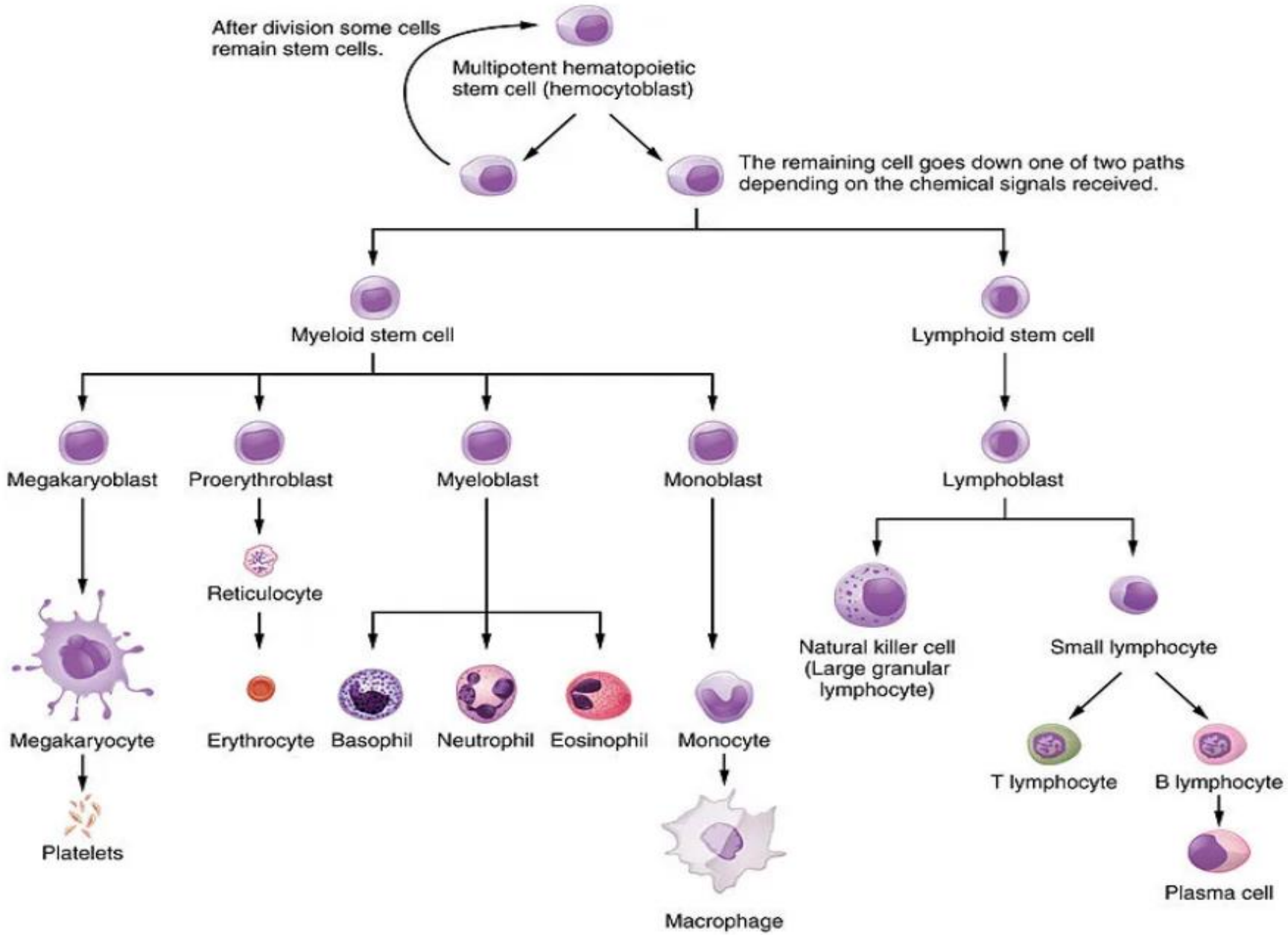
- Hematopoietic stem cells (hemocytoblasts) are the key cells produced in the bone marrow. Hematopoietic stem cells produce all other blood cells. The process of producing all blood cellular components from hematopoietic stem cell is known as hematopoiesis.

- Hematopoietic stem cells generate two lineages of blood cells known as myeloid cells and lymphoid lineage.

- Myeloid lineage cells include megakaryocytes, granulocytes, erythrocytes, macrophages, etc.

- Lymphoid lineage cells include lymphocytes (T lymphocytes and B lymphocytes) and natural killer cells. Lymphoid stem cells give rise to lymphocytes, which specifically identify foreign molecules and cells. The myeloid stem cells give rise to all other blood cells, including red blood cells**.** This is the key difference between myeloid and lymphoid cells.

Development of Myeloid and lymphoid cells



MYELOID CELLS VERSUS LYMPHOID CELLS

MYELOID CELLS	LYMPHOID CELLS
Large cells of the bone marrow that serve as a precursor of mainly the granulocytes and erythrocytes of the blood	Any of the cells responsible for the production of immunity mediated by cells or antibodies and including lymphocytes, lymphoblasts, and plasma cells
Give rise to erythrocytes, neutrophils, basophils, eosinophils, monocytes, and platelets	Give rise to T lymphocytes, B lymphocytes, and natural killer cells
Related to bone marrow cells	Related to the lymphatic system
AML and CML are the two main types of malignancies	ALL and the CLL are the two main types of malignancies

Similarities Between Myeloid and Lymphoid Cells

- Myeloid and lymphoid cells are progenitor cells
- Both cell types originate from hematopoietic stem cells
- Both cell types produce different types of daughter cells

Assignment

Structural features and functions of Myeloid Cells and lymphoid cells

What to include:

- Structural features (points)
- Functions (points)

(1 slide for each cell)

First three students will do it--

B170607002- Jyoti Deb Sinha- platelets, RBCs, Macrophage

B170607004- Sazzad Hossain-PMNs (neutrophil, basophil and eosinophil)

B170607007-Mahmuda Khatun- Lymphoblasts (killer cells, T-cells, B-cells)