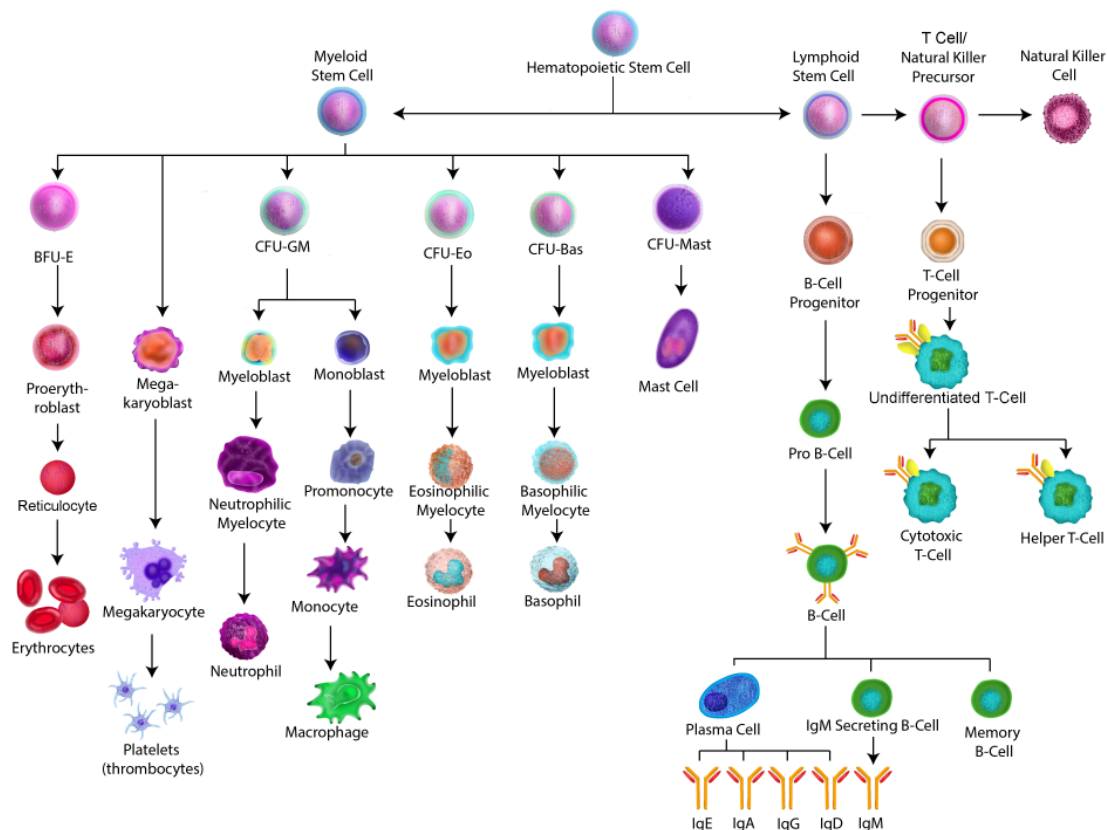


2.2.1

Hematopoiesis and Colony-Stimulating Factors



Hematopoietic Progenitor Cells

Image by Becky T F19

Hematopoiesis is the formation of the cellular components of blood. The stem cell from which all the cells in our blood are descended from is a hemocytoblast (hematopoietic stem cell). Hemocytoblasts differentiate into one of two cells: either a common myeloid progenitor cell or a common lymphoid progenitor cell. A helpful way to remember which cells come from which line is to know that natural killer cells, B-cells (including differentiated plasma cells), and T-cells (including differentiated helper and cytotoxic cells) come from the common lymphoid progenitor and everything else comes from the common myeloid progenitor. Hematopoiesis involves many cells and cytokines, known as colony-stimulating factors (CSFs), that stimulate the production of these various cells. Some of the most important CSFs are thrombopoietin (TPO), erythropoietin (EPO), granulocyte colony-stimulating factor (G-CSF) and granulocyte-monocyte colony-stimulating factor (GM-CSF). **Thrombopoietin (TPO)** stimulates the production of platelets (otherwise known as thrombocytes). TPO is made by the proximal convoluted tubule cells of the kidney and the hepatocytes of the liver. It is released into the blood where it binds to receptors on platelets. Platelets will take in the TPO and destroy it, so when

there are a lot of platelets, there will be less TPO. **Erythropoietin (EPO)** is made by the fibroblasts of the kidneys and increases the production of red blood cells (otherwise known as erythrocytes).



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