

## Role of Bone Marrow in the Formation of Blood Cells and Its Functions

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### DESCRIPTION

The spongy material called bone marrow is located in the middle of the bones. Bone marrow produces an important cells called hematopoietic stem cells an immature stem cells that develops into different kinds of blood cells. Each type of blood cell that are produced by the bone marrow produce performs a crucial function. Red blood cells deliver oxygen to the body's tissues. By assisting blood clotting, platelets prevent bleeding. The efficient operation of the body's immune system, which fights illness, depends on three highly significant types of white blood cells. Any type of infections are fought by White Blood Cells (WBC). These white blood cells, called neutrophils and macrophages, "eat" germs to battle bacterial and fungal illnesses. T-lymphocytes, commonly known as T-cells, fight off pathogens. Antibodies produced by lymphocytes aid in the eradication of bacteria in the body. Peripheral Blood Stem Cells (PBSC) are seen in relatively high concentrations in the blood of chemotherapy survivors as well as healthy individuals who take specific medications to promote bone marrow expansion. In some circumstances, the PBSC can be harvested and used as a source of stem cells for transplantation. Failure of the graft can come from the recipient's T cells rejecting the donor bone marrow cells. Hematopoietic stem cells found in the placenta of a newborn baby after the umbilical lead is severed is another source of stem cells. Both related and unrelated patients have benefitted from the use of Umbilical Lead Blood (UCB) as a source of bone marrow stem cells for transplantation.

The red bone marrow is where the majority of platelets, white blood cells, and red blood cells are created. Fat, cartilage, and

bone are produced by the yellow bone marrow. Red blood cells last roughly 120 days, platelets for about 10 days, and white blood cells for a few hours to a few days. Since each blood cell only has a certain amount of time left in its life, bone marrow must constantly replace these cells. More blood cells may be produced under certain circumstances. This could occur as a result of low oxygen levels in the bodily tissues, blood loss, anaemia, or a drop in red blood cell production. Erythropoietin, a hormone that prompts the bone marrow to create more red blood cells, is produced and released by the kidneys under such circumstances. Moreover, in reaction to infections, the bone marrow makes and releases more white blood cells, as well as more platelets in response to bleeding. Yellow bone marrow can activate and change into red bone marrow in the event of significant blood loss.

Diseases that impact bone marrow are; leukemia, a malignancy of the blood and bone marrow, specifically attacks bone marrow. As altered cells expand uncontrollably in bone marrow due to a cell mutation, less healthy, normal cells are produced. This is how leukaemia develops. As bone marrow serves as the starting point for the production of blood cells, diseases affecting the blood frequently result from bone marrow that is not working normally. These ailments consist of Multiple myeloma: In bone marrow, body creates malignant plasma cells. If bone marrow doesn't make enough blood cells, it may causing aplastic anaemia. When body produces too many red blood cells, it results in polycythemia vera, which thickens the blood. A set of disorders known as myelodysplastic syndromes are characterized by insufficient production of healthy blood cells by the bone marrow.

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