



## UNIT TWO Teacher Glossary

**Ablative (myeloablative) - – referring** to agents (such as chemotherapy and radiation) that destroy bone marrow activity. They are used to prepare patients for a bone marrow or stem cell transplantation.

**Adipocytes** (fat cells) — a cell specialized in the synthesis (manufacture) and storage of fat. This type of cell is one possible fate of mesenchymal stem cell differentiation. a connective tissue cell that has differentiated and become specialized in the synthesis (manufacture) and storage of fat.

**Allogeneic** - taken from different individuals of the same species. Two or more individuals are said to be allogeneic to one another when the genes at one or more loci are not identical.

**Aplastic anemia** - a condition where bone marrow does not sufficiently replenish the blood cell population. produce sufficient new cells to replenish blood cells.

**Apoptosis** - the process of programmed cell death that may occur in multicellular organisms

**Astrocytes** - are characteristic star-shaped glial cells in the brain and spinal cord. They perform many functions, including biochemical support of endothelial cells which form the blood-brain barrier, provision of nutrients to the nervous tissue, maintenance of extracellular ion balance, and a principal role in the repair and scarring process of the brain and spinal cord following traumatic injuries.

**Blastema** - a mass of undifferentiated adult stem cells that in newts gives rise to a new limb through a process called regeneration. Aside from some amphibians and fish, most animals cannot produce blastemas..

**Cell fate** - The ultimate differentiated state to which a cell has become committed.

**Chondrocytes** (cartilage cells) - cells that produce and maintain the cartilaginous matrix, which consists mainly of collagen and proteoglycans.

**Crypt cell** — Intestinal crypts are sites of digestion and nutrient absorption and contain cells that need to be replenished routinely because of their exposure to the harsh

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environment of the lumen. The basal portion of a crypt contains intestinal crypt stem cells that are responsible for this turnover.

**Differentiate** - the process by which a less specialized cell becomes a more specialized cell type

**Ectoderm** - The outermost of the three primary germ layers of an embryo, from which the epidermis, nervous tissue, and, in vertebrates, sense organs develop

**Endoderm** - the innermost of the three germ layers. The endoderm gives rise to the epithelium of the pharynx, including the eustachian tube, the tonsils, the thyroid gland, parathyroid glands, and thymus gland; the larynx, trachea, and lungs; the gastrointestinal tract (except mouth and anus), the urinary bladder, the vagina, and the urethra.

**Epidermal stem cell** - this stem cell replenishes skin, hair follicles, and sebaceous glands through the processes of asymmetric cell division and transient amplification.

**Epithelialization** - the regrowth of skin over a wound.

**Epithelial cells** (tendons, ligaments, and connective tissue, including osteoblasts) - Epithelial cells line the inside surfaces of fluid or air-filled tubes and spaces within the body. Epithelium may be protective (as in the skin) or secretory (as in the cells lining the wall of the gut).

**Erythroid** - describes a lineage of cells that gives rise to erythrocytes, or red blood cells

**Fibroplasia** - the formation of a scar during the fibroblastic repair phase of healing.

**Genetic typing** - refers to the process of determining the genotype of an individual by the use of biological assays. Finding a donor with a matching genetic type is crucial for an allogeneic transplantation.

**Glial cells** - non-neuronal cells that provide support and nutrition, maintain homeostasis, form myelin, and participate in signal transmission in the nervous system.

**Granulation tissue** - fibrous connective tissue that replaces a fibrin clot in healing wounds. Granulation tissue typically grows from the base of a wound and fills wounds of almost any size.



**Hematopoietic stem cells** - multipotent stem cells that give rise to all the blood cell types including myeloid (monocytes and macrophages, neutrophils, basophils, eosinophils, erythrocytes, megakaryocytes/platelets, dendritic cells), and lymphoid lineages (T-cells, B-cells, NK-cells).

**Homeostasis** - the ability to regulate internal conditions, usually by a system of feedback controls, so as to stabilize health and proper function amidst outside changing conditions.

**Immune deficiency disorders** - condition where the body's defense system is compromised, causing it to be less resilient to foreign invaders like viruses and bacteria.

**Intercalation** - the reversible inclusion of a molecule between two other molecules

**Invagination** - the morphogenetic processes by which an embryo takes form, and is the initial step of gastrulation, the massive reorganization of the embryo from a simple spherical ball of cells, the blastula, into a multi-layered organism, with differentiated germ layers: endoderm, mesoderm, and ectoderm. More localized invaginations also occur later in embryonic development, to form coelom, etc.

**Leukemia** - is a cancer of the blood or bone marrow and is characterized by an abnormal proliferation (production by multiplication) of blood cells, usually white blood cells (leukocytes)

**Lymphoma (Hodgkin's disease)** - is a cancer that begins in the lymphocytes of the immune system and presents as a solid tumor of lymphoid cells

**Mesoderm** - the middle layer of the three primary germ cell layers. It differentiates to give rise to a number of tissues and structures including bone, muscle, connective tissue, and the middle layer of the skin

**Microenvironment** - a specific set of physical, biological, and chemical factors immediately surrounding the cell. A stem cell's microenvironment influences whether it will proliferate or differentiate and into which cell type it will proliferate.

**Multipotent** — the ability of adult stem cells to differentiate into a number of cells, but only those of a closely related family of cells (a lineage).



**Multiple myeloma** - a cancer of the white blood cells known as plasma cells. As a type of B cell, plasma cells are a crucial part of the immune system responsible for the production of antibodies in humans

**Myeloid** - Referring to the non-lymphocytic groups of white blood cells, including the granulocytes, monocytes and platelets.

**Myocytes** (muscle cells) - the type of cell found in muscles. There are various specialized forms of myocytes: cardiac, skeletal, and smooth muscle cells, with various properties.

**Neurogenesis** - is the process by which neurons are generated. Neurogenesis does indeed continue into and throughout adult life, specifically in the hippocampus and olfactory bulb of mammals.

**Neurons** - an excitable cell in the nervous system that processes and transmits information by electrochemical signaling. Neurons are the core components of the brain, the vertebrate spinal cord, the invertebrate ventral nerve cord, and the peripheral nerves.

**Oligodendrocytes** - a type of brain cell, whose main function is the insulation of axons (the long projection of nerve cells) in the central nervous system (the brain and spinal cord) of higher vertebrates.

**Osteoblasts** - a cell that makes bone, by producing a matrix that then becomes mineralized.

**Pluripotent** - the ability of the human embryonic stem cell to differentiate along all lineages and become any cell type in the body. (They are only restricted from forming extra embryonic tissues, such as placenta and umbilical cord.)

**Progenitor cells** - is an early descendant of a stem cell that can only undergo differentiation, but not self-renewal. It is limited to differentiate along a specific cell lineage.

**Self-renew** - the ability to go through numerous cycles of cell division while maintaining the undifferentiated state.



**Senescent** — referring to a cell that has undergone the biological changes that take place in cell as it ages, which includes the halting of cell division

**Specialized** - referring to cells that perform specialized functions in multicellular organisms. Groups of specialized cells cooperate to form a tissue, such as a muscle.

**Totipotent** - the ability of a single cell to differentiate into all the different cell types in an organism including extraembryonic tissues

**Undifferentiated** - describing a cell that has not yet acquired a specialized structure and function; pertaining to an immature cell or a primitive cell