# Glossary

**ALU sequences**are the most abundant transposable DNA elements, containing over one million copies dispersed throughout the human genome.

**Anastomosis** is the connection between two blood vessels that are normally separated, diverging, or branching.

**Angiogenesis** is the growth of new capillaries from preexisting blood vessels.

**Athymic** means lacking a normal thymus gland, resulting in a defective immune system.

**Bio-inks** are biomaterials used to produce engineered/artificial live tissue using 3D printing.

**Cell sheets** are cells cultured as confluent layers along with their deposited extracellular matrix.

**Contrast agents**are substances used to increase the contrast of structures or fluids within the body in medical imaging.

**Dorsal skinfold chamber** is a rodent model for noninvasive microcirculatory analyses of striated muscle and skin tissue throughout an observation period of 2-3 weeks.

**Ectopically** refers to an abnormal location or position of something, e.g. an organ, a body part or the site of protein expression.

**Endothelial cells** are of mesodermal origin and form the lining of the blood vessels.

**Endothelial progenitor cells** are undifferentiated cells which are able to undergo endothelial differentiation and thus play roles in the regeneration of the endothelial lining of blood vessels.

***Ex vivo***refers to experimentation or measurements done outside the body in or on freshly isolated tissues.

**Fenestrated** (Fenestrae: Latin for windows) are orifices or pores of 60-80 nm in diameterfor exchange of nutrients, waste products and other substances, as seen in endothelial cells.

**Fibrous encapsulation** is the formation of scar tissue on the surface of an implanted biomaterial produced by myofibroblasts, as a consequence of incomplete phagocytosis.

**Flap technique** is a technique in plastic and reconstructive surgery where any type of tissue is lifted from a donor site and moved to a recipient site with an intact blood supply.

**Hypertrophy**is the increase in size of cells.

**Hypoxia** is a condition in which the body or a region of the body is deprived of adequate oxygen supply at the tissue level.

**Induced pluripotent stem cells** are a type of pluripotent stem cells generated directly from a somatic cell by expressing the transcription factors Oct 4, Sox2, Klf4 and c-Myc.

**Inosculation** refers to the junction or connection of natural components, such as blood vessels, channels or passages, to form unity. Same as anastomosis.

**Interconnectivity** refers to an open connection between two adjacent pores of a biomaterial scaffold.

**Intravital** imagingis a form of microscopy that permits the observation of biological processes in living animals at a high resolution,  enabling the distinction between individual cells of a tissue.

**Intussusceptive**is a process where a new blood vessel is created by splitting of an existing blood vessel in two.

**Lithography** is a patterning process where design is etched on to a flat surface.

**Luminal structures** are the most internal layer of a tubular structure, such as an artery or intestine.

**Matrices** are noncellular materials in between cells of different tissues.

**Matrigel** is the trade name for the solubilized basement membrane matrix secreted by Engelbreth-Holm-Swarm mouse sarcoma cells.

**Mechanobiology** focuses on how physical forces and changes in the mechanical properties of cells and tissues contribute to development, cell differentiation, physiology, and disease.

**Micro-vascular endothelial cells** are endothelial cells isolated from small blood vessels in the skin tissue.

**Micro-vascular fragments** are tissue fragments isolated from adipose tissue that exhibit a high angiogenic activity and represent a rich source of mesenchymal stem cells.

**Mural cells** are the vascular smooth muscle cells, and pericytes, of the microcirculation. Both types are in close contact with the endothelial cells lining the capillaries and are important for vascular development and stability.

**Neo-vascularization** is the de novo formation of new blood vessels**.**

**Orthotopically** refers to something that occurs in the normal or usual place in the body.

**Paracrine** is a type of cellular communication in which a cell produces a signal to induce changes in neighboring cells, altering the behavior of those cells.

**Pericytes** are a type of perivascular cells, defined as multi-functional mural cells of the microvasculature that wrap around the endothelial cells that line the capillaries throughout the body.

**Perivascular cells** are cells thatprovide stability and functionality to blood vessels and include vascular smooth muscles and pericytes.

**Plasma-gas treatment** is a process by which gasses (such as oxygen, argon, dry air) are used to etch a biomaterial to modify the physicochemical characteristics of its surface, facilitating the adsorption of biomolecules or the covalent grafting of active peptides.

**Plasma-spray** is a protective coating process in which melted (or heated) materials are sprayed onto a surface.

**Platelet-rich-plasma (PRP)** is a concentrate of platelets derived from whole blood after red blood cells removal.

**Pre-conditioning**is a concept in which an entity is exposed to stress or stimulus in order to prepare that entity to be more resilient against the stimulus when and if the stimulus is encountered in the future.

**Proteases** are enzymes that break down proteins into smaller polypeptides or single amino acids by cleaving the peptide bonds within proteins.

**Severe combined immunodeficiency** (SCID) is a group of rare disorders caused by mutations in different genes involved in the development and function of T and B immune cells. Individuals with SCID appear healthy at birth but are highly susceptible to severe infections.

**SINE elements** are short repetitive, non-coding sequences ranging in size from 100–600 base pairs, widely distributed in eukaryotic genomes and have roles in genome organization, genome evolution and modulating gene expression.

**Smooth muscle cells** are a specific type of muscle cells that are spindle shaped which can tense and relax slowly and automatically because of the presence of myosin and actin proteins.

**Spheroids** are a type of three-dimensional cell modeling that better simulate a live cell's environmental conditions compared to a two-dimensional cell model, specifically with the reactions between cells and the reactions between cells and the matrix.

**Stromal vascular fraction** is a heterogeneous collection of cells contained within adipose tissue.

**Subcutaneously** means that an entity is located under the skin.

**Surface topography** refers to the three-dimensional features of a surface.

**Vasculogenesis** is the process of blood vessel formation in the embryo, occurring by the differentiation of mesenchymal cells into endothelial cells.

**Wettability** is the ability of a liquid to maintain contact with a solid surface, resulting from intermolecular interactions between the liquid and the surface.

**Xenogeneic** is a tissue or organ that is derived from, originating in, or being a member of another species.

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