# Glossary

**Affinity-binding** is the strength of the binding interaction between a single biomolecule to its ligand/binding partner. It is the specificity of a ligand to strongly bind to its receptor.

**Anastomose (Anastomosis)** is the connection between two things that are normally diverging or branching, such as between blood vessels, leaf veins, or streams.

**Arrhythmogenesis** is a type of study where arrhythmia is induced and observed via electrocardiographic waveforms.

**Arterio-venous loop** is an *in vivo* tissue engineering strategy for generating axially vascularized tissues using the body as a bioreactor.

**Autologous** refers to cells or tissue obtained from the same individual.

**Bingham plastic** is a viscoplastic material that behaves as a rigid body at low stresses but flows as a viscous fluid at high stress.

**Cardiomyocytes** are the contractile cells of the heart.

**Cell sheet-based approach** refers to transplantation of bioengineered tissue layers onto damaged sites to minimize cell loss.

**Cellular hypertrophy** is an increase in size and mass of a cell, without proliferation. It should be differentiated from cellular hyperplasia where the number of cells increase.

**Coronary heart disease** is a termused for a variety of conditions consisting of the decrease of blood flow through coronary blood vessels which affects the structure and function of the heart.

**Diastolic load**  is the amount of sarcomere stretch experienced by cardiac muscle cells, at the end of ventricular filling before the upcoming beat.

**Endocardium** is a thin, smooth tissue that makes up the lining of the chambers and valves of the heart.

**Epicardium** is the layer that covers the myocardium, which lays below the pericardium.

**Extracellular matrix** is a three-dimensional network consisting of extracellular macromolecules and minerals, such as collagen, enzymes and glycoproteins that provide structural and biochemical support to surrounding cells.

**Heart failure** is the inability of the heart to properly pump blood around the body.

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

**Infarct expansion** isan alteration in the ventricular topography due to thinning and lengthening of the infarcted segment, which develops within the first few hours of the acute symptoms

**Ischemic (ischemia)** is the reduction or restriction of blood supply to tissues, preventing it from receiving enough oxygen and resulting in its dysfunction.

**Mechanotransduction** is the processes used by cells to sense mechanical stimulus and convert it to biochemical signals.

**Myocardial infarction** is the medical name of the heart attack, when oxygen supply to one or more areas of the heart muscle is restricted due to a blocked coronary blood vessel.

**Myocardium** is the muscle layer of the heart sandwiched between the endocardium and the epicardium.

**Myogenic** means originating in or produced by muscle tissue.

**Pacemaker cells** are heart cells that control the heart rate by creating rhythmic impulses.

**Paracrine** is a type of cellular communication in which a cell produces a signal to induce changes in nearby cells, altering their behavior. Factors are secreted into the immediate extracellular environment.

**Pleiotropic** is the ability of a single gene to produce or have multiple effects.

**Pluripotent** refers to cells that can give rise to different cell types that make up the body.

**Restenosis** is when a part of the artery that was previously cleared of blockage becomes narrow again.

**Septal defects** are abnormal openings in the wall that divides the right and left ventricles that appear during embryonic development.

**Shear stress** is the mechanical force sensed by cells exposed to flow.

**Smooth muscle cells** are spindle shaped cells containing centrally placed nucleus that form part of the non-striated, involuntary muscle tissue lining hollow organs such as arteries, lungs, and bladder.

**Syncytium** is a multinucleate cell which can result from multiple cell fusions of uninuclear cells.

**Systemic administration** (of substances) is a route of administration of medication, nutrition, or other substance into the circulatory system so that the entire body is affected.

**Systolic force** is the force that blood exerts on the artery walls as the heart contracts to pump the blood to the peripheral organs and tissues.

**Three-dimensional bioprinting** is the utilization of 3D plotting techniques to combine cells, growth factors, and/or biomaterials to fabricate biomedical parts imitating natural tissue characteristics.

© Jan de Boer. All glossaries can be found at www.jandeboerlab.com/TissueEngineering.

Some of this definitions were freely obtained and paraphrased from Wikipedia and Google.