

# Glossary

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### Apoptosis

Apoptosis is a highly regulated and ATP-dependent mechanism of cell death mediated by a death receptor/extrinsic pathway and/or mitochondrial/intrinsic pathway. Apoptosis is characterized by caspase activation, chromosomal DNA fragmentation leading to DNA ladder formation, and cell shrinkage.

### Caspases

Caspases are a family of cysteine aspartyl proteases that are activated following cleavage at specific aspartate residues. Caspase activation is a critical step involved in carrying apoptosis following activation of either the extrinsic or intrinsic apoptotic pathway.

### Cytochrome C

Cytochrome C is a protein found associated with the inner mitochondrial membrane that is a component of the electron transport chain and is also involved in initiating the mitochondrial/intrinsic pathway of apoptosis. Following the loss of integrity of the outer mitochondrial membrane, cytochrome c (and other proapoptotic factors) is (are) released into the cytosolic compartment of the cell, where following formation of the apoptosome leads to well characterized cellular changes observed in cell death mediated by apoptosis.

### Renin-angiotensin-aldosterone-system

The renin-angiotensin-aldosterone-system is the physiological hormone system responsible for the regulation of blood pressure and fluid balance. Renin (originating from the kidneys) stimulates the production of angiotensin, which induces blood vessel constriction and increases blood pressure. Angiotensin also stimulates the production of aldosterone, which acts on the kidneys to increase sodium and water reabsorption into the blood, also contributing to an increase in blood pressure.

### MicroRNA(s)

MicroRNA(s) are a class of highly conserved, endogenous, non-coding RNA molecules of approximately 22 nucleotides that silence gene expression at the post-transcriptional level by either promoting the degradation of messenger RNA (mRNA), or inhibiting the translation of protein from mRNA by translational repression.

### Natriuretic peptide(s)

The natriuretic peptides are a family of peptides that are involved in the induction of natriuresis, which is the discharge of sodium through the urine. Peptide members include atrial natriuretic peptide, brain natriuretic peptide, and C-type natriuretic peptide.

### Bradykinin

Bradykinin is a 9 amino acid peptide belonging to the kinin group of proteins that is involved in vasodilation and the lowering of blood pressure.

### Endothelin-1/2

Endothelin-1/2 are isoforms of the human protein, endothelin, which is a 21 amino acid peptide produced by the endothelium that is involved in blood vessel constriction and increasing blood pressure.

### Troponin (Troponin-1 and Troponin-2)

Troponin (Troponin-1 and Troponin-2) are heterotrimeric complexes present in striated muscle (skeletal and cardiac muscle) that is comprised of a  $\text{Ca}^{2+}$  binding subunit (troponin-C), an inhibitory subunit (troponin-1), and an elongated troponin molecule (troponin-2) which binds both troponin-C and 1. In conjunction with tropomyosin, the troponin heterotrimer forms a regulatory complex that controls the interaction of actin and myosin. The binding of  $\text{Ca}^{2+}$

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to troponin permits muscle contraction. Cardiac troponins (troponins- 1 and 2) are released from cardiac myocytes following myocardial damage and loss of

membrane integrity, and serve as highly sensitive and specific biomarkers for establishing the diagnosis of myocardial infarction.