

Glossary

Autophosphorylation is the phosphorylation of the kinase by itself to regulate its catalytic activity.

Cellular signaling is the ability of a cell to receive, process, and transmit signals with its environment and with itself.

Conformational change is a change in the shape of a macromolecule, often induced by environmental factors (e.g. temperature, pH, ionic strength).

Cross-talk refers to instances in which one or more components of one signal transduction pathway affects another.

Cyclases are enzymes that catalyze a chemical reaction to form a cyclic compound.

Cytokines are a broad category of small soluble proteins important in cell signaling.

Diffusible molecules are molecules secreted by a cell to trigger change either in itself or in other surrounding cells.

Endocytosed/Endocytosis is a cellular process in which substances are actively imported into the cell.

Epigenetics is the study of heritable phenotype changes that do not involve alterations in the DNA sequence.

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

Filopodia are present in migrating cells and are thin cytoplasmic projections that represent the continuation of lamellipodia.

Heteromeric complex formation is the formation of a protein complex that contains two or more different proteins.

Histones are proteins that bind DNA in eukaryotic cell nuclei. They act as spools around which DNA winds to create structural units called nucleosomes.

Kinase is an enzyme that catalyzes the transfer of phosphate groups from high-energy, phosphate-donating molecules to a specific substrate in a process called phosphorylation.

Lamellipodia are cytoskeletal protein actin projections on the leading edge of the cell.

Latent regulatory proteins are already present in most cells, but only activated in response to stress.

Length scale is a particular length or distance determined with the precision of one order of magnitude.

Ligand is a molecule which produces a signal by binding to a receptor on a target protein.

Lymphokines are a subset of cytokines that are produced by a type of immune cell known as a lymphocyte.

Membrane-bound proteins are proteins attached either permanently or temporally to the cell membrane.

Molecular switches are molecules that reversibly shift between two or more stable states in response to environmental stimuli.

Phosphatase is an enzyme that removes a phosphate group from a protein.

Regulated proteolysis is the specific removal or modification of proteins by proteolytic cleavage in response to specific signals.

Second messengers are intracellular signaling molecules generated in the cell in response to exposure to extracellular signaling molecules to trigger physiological changes at cellular level. Examples are calcium, IP₃, cAMP, and gases such as carbon monoxide and nitric oxide.

Signaling cascade is a series of chemical reactions that occur within a cell when initiated by an external stimulus (e.g. ligand, shear stress, toxins).

Transcription factors are proteins that control the rate of gene transcription by binding to a specific DNA sequence.

Transcriptomic(s) is the study of the transcriptome—the sum of all of its RNA transcripts, under specific circumstances or in a specific cell—using high-throughput methods, such as RNA sequencing.

Transmembrane receptors are proteins embedded in the cellular plasma membrane to act in cell signaling by conveying signals from the outside to the inside of the cell and vice versa.

Ubiquitin (Ub) is a small regulatory protein found in tissues of eukaryotic organisms. Tagging ubiquitin to a protein can mark it for degradation, alter its cellular location, affect its activity and modify its interaction with other proteins and enzymes.