# Phosphorylation

Process: Addition of a phosphate group to specific amino acid residues (serine, threonine, or tyrosine) on the protein. Function: Often involved in signal transduction, regulating enzyme activity, and cellular processes such as cell cycle control.

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Phosphorylation of a molecule is the attachment of a phosphoryl group. Together with its counterpart, dephosphorylation, it is critical for many cellular processes in biology. Phosphorylation is especially important for protein function, as this modification activates (or deactivates) almost half of the enzymes, thereby regulating their function.

Many proteins (between 1/3 to 2/3 of the proteome in eukaryotes are phosphorylated temporarily, as are many sugars, lipids, and other molecules.

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Protein kinase A (PKA), also known as cAMP-dependent protein kinase, is an enzyme that plays a vital role in regulating various cellular processes in eukaryotic organisms, including humans. PKA is a member of the protein kinase family, which consists of enzymes responsible for adding phosphate groups to other proteins, a process known as phosphorylation. Phosphorylation is a critical mechanism in cell signaling, controlling various aspects of cellular activity.