

## Protein Phosphorylation

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Protein phosphorylation is a transfer reaction in which a protein is modified by covalent incorporation of a phosphate group from ATP [1]. It is catalyzed by a family of protein kinases, which may be either Ser/Thr (EC 2.7.11.1) or Tyr protein kinases (EC 2.7.10.1 and 2.7.10.2) [2]. The protein phosphorylation is more widespread than the other types of covalent modification of proteins [3]. In fact, the phosphorylation of enzyme protein modulates its enzyme activity. This occurs as either an activation of some enzymes such as glycogen phosphorylase and pyruvate kinase or an inactivation of others such as glycogen synthase [2]. In addition, the mechanism of action of growth factor (GF) receptors is dependent upon their activation as Tyr protein kinases following the binding of their corresponding growth factor [4]. The receptors of epidermal GF, platelet-derived GF and vascular epithelial GF are common examples of this type of protein kinases [5]. There are important phosphoproteins, which take an important role in many cellular processes. The product of retinoblastoma (RB) protein gene, pRB, binds certain viral proteins and forms inactive complex binds to certain transcription factors that are active in S phase thus slowing cell cycle [6]. Another type is the tumor suppressor protein p53, the product of p53 gene that regulates cell cycle [7]. Accordingly, Protein phosphorylation is implicated in many cellular processes.

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