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The Effects of pH on p53 Phosphorylation by Ataxia Telangiectasia Mutated Kinase

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Abstract : Ataxia telangiectasia mutated (ATM) is a serine-threonine kinase, which is the major regulator of the DNA damage response. ATM is activated upon the formation of DNA double-strand breaks (DSBs) in the cells. ATM phosphorylates the proteins involved in apoptotic responses, cell cycle checkpoint control, DNA repair, etc. Tumor protein p53, known as p53 is one of these proteins that phosphorylated by ATM. Phosphorylation of p53 at Ser15 residue leads to p53 stabilization in the cells. Often enzymes activity is affected by hydrogen ion concentration (pH). In order to find the optimal pH range for ATM activity, steady-state kinetic assays were performed at acidic and basic pH ranges. Ser15 phosphorylation of p53 is determined by using ELISA. The results indicated that the phosphorylation rate was better at basic pH range compared with the acidic pH range. This could be due to enzyme stability, or enzyme-substrate interaction is pH dependent.

Keywords : ataxia telangiectasia mutated, DNA double strand breaks, DNA repair, tumor protein p53
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