

Effects of medium viscosity on kinetics of the enzymatic reaction catalyzed by bacterial RNase

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Abstract

Effects of medium viscosity on kinetic parameters of poly(U) hydrolysis catalyzed by RNase from *Bac. intermedius* 7P (binase) were studied in solutions of sucrose (4-50 wt. %) and glycerol (35-62 wt. %) in Tris-sodium acetate buffer (pH 7.5) at 25°C. The rate constant of reaction k_{cat} was practically unchanged over a wide range of viscosities (1-15 cP for sucrose and 2.5-3 cP for glycerol). In glycerol solutions, k_{cat} slightly increased with viscosity increase from 4 to 10 cP. Addition of NaCl to the buffer medium resulted in an inhibitory effect of Na⁺ on k_{cat} , prevented by 50% sucrose or 60% glycerol. It is concluded that binase-catalyzed poly(U) cleavage occurs through a "tense"-substrate mechanism, similarly to reactions catalyzed by α -chymotrypsin, trypsin, and laccase.

Keywords

Enzymatic catalysis, Kinetic parameters, Medium viscosity, RNase from *Bac. Intermedius* 7P