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Effects of Salts on the Genome Repairing Activity of RNase H2

Kiyoshi Yasukawa, Kenji Kojima

Kyoto University

Summary

Ribonuclease H (RNase H) is an enzyme that specifically degrades RNA of RNA/DNA hybrids. RNase H is present ubiquitously in sources ranging from bacteria to human. It has recently been shown that, under physiological conditions, DNA polymerases incorporate a ribonucleotide every few thousand base pairs, and that mutations in human RNase H2 genes lead to a sever neuroinflammatory disorder, Aicardi-Goutières syndrome.

In this study, we examined the effects of salts on the activity and stability of human RNase H2. Human RNase H2 was expressed in *Escherichia coli* and purified from the cells. The activity increased with increasing NaCl or KCl concentrations at 0−60 mM and decreased with increasing them at 60−200 mM. The activities at 60 mM NaCl or 60 mM KCl were 390 and 310%, respectively, of that salts. In the thermal incubation at 30, 35, or 40ºC, the first-order rate constants, k_{obs}, were 92, 63, and 67%, respectively, of that without salts. These results suggest that under physiological conditions, NaCl and KCl increase activity and stability of human RNase H2.