

Abstract Submitted
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A Study of the Physical and Chemical Stabilization of the DNA Molecule Due to the DNA Mutation MICHELLE PAIK KWON, RICHARD KYUNG, Choice Research Group — A spontaneous DNA mutation observed in chemical or biological transformation can lower the energy of the system, at least locally. The enthalpy or potential energy of the product after the most of the chemical reactions becomes smaller than that of the reactant. But in case of any endothermic reaction, in which heat energy becomes chemical potential energy, the reactions higher the chemical potential energy of their products. Study on the thermodynamic enthalpy and the kinetics of DNA is complicated not only since the system is made of a large number of elements such as nitrogenous bases, sugar, and phosphate group, but also DNA doesn't exist in isolation. In this research, the deamination of cytosine, which is frequent spontaneous mutation, is computationally and thermodynamically tested for the local double helical structure of the DNA molecule to assess its stereo-chemical effects. To determine whether the DNA molecule is locally destabilized by a spontaneous mutation, the research uses physical and chemical softwares to further display the optimized geometry energy levels and calculate each compound models theoretical values.

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