Guanosine triphosphate

Guanosine-5'-triphosphate (GTP) is a purine nucleoside triphosphate. It can act as a substrate for the synthesis of RNA during the transcription process of DNA during DNA replication. Its structure is similar to that of the guanine nucleobase, the only difference being that nucleotides like GTP have a ribose sugar and three phosphates, with the nucleobase attached to the 1' and the triphosphate moiety attached to the 5' carbons of the ribose.

It also has the role of a source of energy or an activator of substrates in metabolic reactions, like that of ATP, but more specific. It is used as a source of energy for protein synthesis and gluconeogenesis.

GTP is essential to signal transduction, in particular with G-proteins, in second-messenger mechanisms where it is converted to guanosine diphosphate (GDP) through the action of GTPases.

GTP sensor

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