

*Perspective***Biological function and chemical nature of adenine**

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INTRODUCTION**Adenine**

Adenine is a purine nucleobase that has an amine group linked to the carbon at position 6. Nucleosides, adenosine, and deoxyadenosine are all made up of adenine. Adenine's molecular formula is C₅H₅N₅.

Adenine (A), along with cytosine (C), guanine (G), and thymine (T), is one of four chemical bases found in DNA (T). Within the DNA molecule, adenine bases on one strand create chemical interactions with thymine bases on the opposing strand. A four-base DNA sequence contains the cell's genetic instructions. Adenosine triphosphate (ATP) is a kind of adenine that is used to power many chemical reactions inside the cell as an energy storage molecule. According to the IUPAC, adenine's chemical name is 9H-Purin-6-amine.

Structure and chemical nature: Adenine is a carbon, nitrogen, and hydrogen atom-based compound. C₅H₅N₅ is its chemical formula. A nucleotide is formed when a base, such as adenine, binds to ribose and phosphate. Purines are a category of nucleotides that includes adenine. A purine is a nitrogen ring with six members joined to a nitrogen ring with five members. Pyrimidines are the other sort of nucleotide group. Pyrimidines are smaller than purines because they only have one nitrogen ring. The purine group includes adenine and guanine, while the pyrimidine group includes cytosine and thymine. Make up a mnemonic device to help you remember these terms. Make a statement with the first letter of each base and the nucleotide group it belongs to. For example, Alexander (adenine) the Great (guanine) was pure in purines (purines). Climb (cytosine) to the summit (thymine) of the pyramid (pyrimidines) for the pyrimidines.

Biological functions of adenine: The other four primary (or classical) nucleobase are guanine, cytosine, thymine, and uracil, with adenine being one of them. These fundamental nucleobase make up the genetic code. Nucleic acids, such as DNA and RNA molecules, hold the genetic code for a certain protein, which is based on nucleobase sequence. Nucleic acids are essential for cellular processes, hereditary inheritance, and organism survival.

In addition to being the major component of nucleic acids, adenine is a critical component of Adenosine triphosphate (ATP), which is adenosine with three phosphate groups attached to it. Adenosine triphosphate (ATP) is a high-energy molecule required for cellular metabolism and other biological functions.

The energy-rich Adenosine triphosphate (ATP) and the cofactors nicotinamide adenine dinucleotide (NAD), Flavin Adenine Dinucleotide (FAD), and Coenzyme A are involved in a variety of biochemical processes, including cellular respiration. It also plays a function in protein synthesis and is a chemical component of DNA and RNA.

Adenine effects to health: Uric acid is the metabolic end product of purine metabolism, which contains adenine. Purines can be found in large quantities in the diet, particularly in the liver, kidneys, and other internal organs. Small amounts can also be found in beef, salmon, cauliflower, beans, and mushrooms.

Hyperuricemia is a condition in which the uric acid level in the body is abnormally high. Uric acid build-up, which can lead to gout (joint inflammation) and kidney stones, can be caused by a high-purine diet. People with these diseases should eat a low-purine diet as a result. Because alcohol and saturated fats hinder purine metabolism, it is also recommended that you avoid or limit your intake.

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