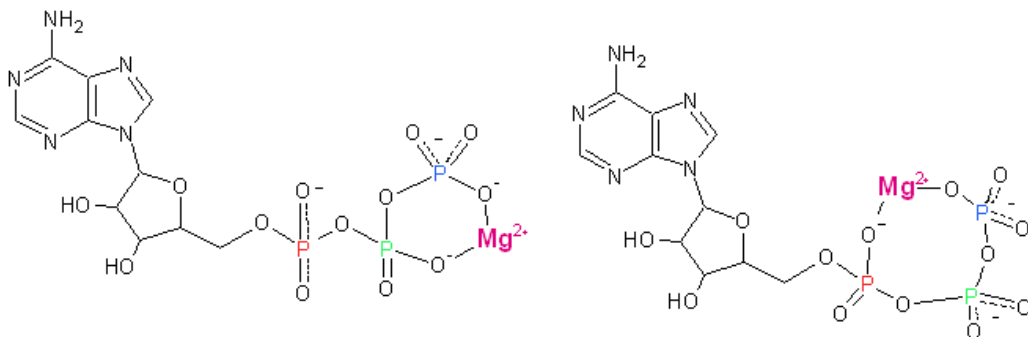


STEM CHECK (side bar)

Are all Nucleotides Used for Constructing our Genetic Material?



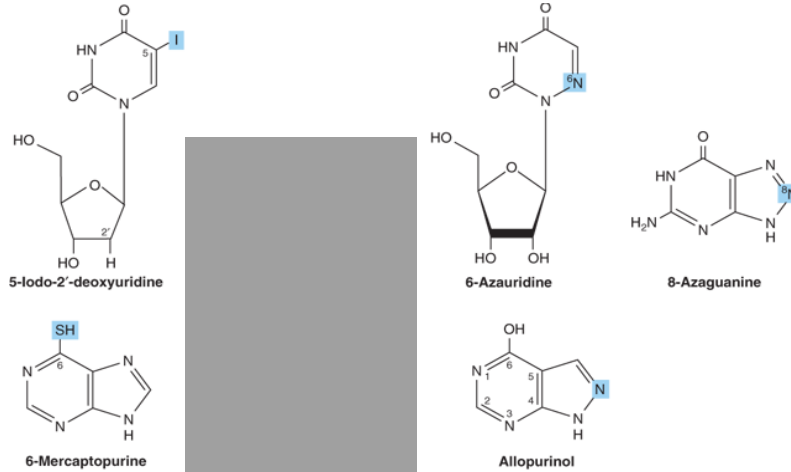
Nucleotides are always associated with genetic materials such as DNA and RNA, but is that the only thing that they do?

Certainly not. Other forms of nucleotides are present in the body or are acquired from the diet, which affects the living processes. One of the most important nucleotides is the adenosine triphosphate (ATP), the energy currency of the cell. Its structure consists of the Adenine nitrogenous base, a ribose sugar unit, and three phosphate molecules that are attached to each other. The phosphate groups are all negatively-charged, their propensity to repel each other. So what holds them together? A magnesium ion forms a complex with the phosphate groups in the molecule, making them become stable. Luckily, magnesium can be easily obtained through eating leafy vegetables, as it is a component of the chlorophyll of plants. Other related nucleotides in the cell include Guanosine triphosphate (GTP), Uridine triphosphate (UTP) and Cytidine triphosphate (CTP).



Cyclic forms of AMP and GMP are also present in the cell. These molecules are important second messengers that facilitate

cascade of events, resulting to cells responding to external stimuli.



As what has been previously discussed, uric acid, the causative agent for the development of gout arthritis is a nucleotide, and the conversion of a nucleotide. Allopurinol is a drug that resembles uric acid and is used to treat and alleviate medical manifestations and symptoms of gout arthritis.



Furthermore, as cancer cells require more nucleotides to incorporate to their replicating DNA, that is used to further invade the host, Nucleotide analogs are administered as chemotherapeutic agents. This includes 5-Iodo-2'deoxyuridine, 5-Fluorouracil, 6-Azauridine, 8-Azaguanine, 6-Mercaptopurine and 6-Thioguanine, which once incorporated to the growing DNA chain of cancer cells, disrupts correct base-pairing and replication.