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BIOCHEMISTRY

ASSIGNMENT FOR VIVA

**(STEPS INVOLVED IN URIC ACID FORMATION )**

***Answer***

The formation of uric acid is through the enzyme xanthine oxidase, which oxidizes oxypurines. Normally a small amount of uric acid is present in the body, but when there is an excess amount in the blood, called hyperuricemia, this can lead to gout and formation of kidney stones. As a therapeutic agent, it is known that uric acid is increased in response to oxidative stress, and as such, uric acid acts as an antioxidant.

Most of it is excreted (removed from your body) in your urine, or passes through your intestines to regulate "normal" levels. Normal Uric acid levels are 2.4-6.0 mg/dL (female) and 3.4-7.0 mg/dL (male). Normal values will vary from laboratory to laboratory. Also important to blood uric acid levels are purines.

***1. Introduction***

Uric acid production and metabolism are complex processes involving various factors that regulate hepatic production, as well as renal and gut excretion of this compound. Uric acid is the end product of an exogenous pool of purines and endogenous purine metabolism. The exogenous pool varies significantly with diet, and animal proteins contribute significantly to this purine pool. The endogenous production of uric acid is mainly from the liver, intestines and other tissues like muscles, kidneys and the vascular endothelium.

In addition to problems with uric acid excretion due to kidney dysfunction, hyperuricemia can also result from the increased generation of uric acid. Diets heavy in purine or fructose, or exposure to lead can also contribute to high uric acid levels.

*2. 5′-Nucleotidase* - Enzyme 5′-Nucleotidase hydrolyzes nucleotide monophosphates or deoxynucleotide monophosphates to nucleotides and deoxynucleotides more inorganic phosphate. This enzyme, together with nucleotide kinase, regulates the pool of the nucleotides in cells.

*3. Adenosine deaminase* - Adenosine deaminase (ADA) is an important enzyme in the purine metabolism that catalyzes the deamination of both adenosine and 2′-deoxyadenosine to inosine and 2′-deoxyinosine, respectively, and ammonia.

*4. Xanthine oxidase* - The physiological role of xanthine oxidoreductase enzyme (XOR) is to catalyze the terminal two reactions of purine catabolism in human.

*5. Conclusion* - Elevated serum levels of uric acid has been shown to play an important role in many disease states including gout and articular degenerative disorders as well as vascular inflammation and atherosclerosis. The balance of uric acid formation and excretion is driven by several enzymatic pathways which occur via different genetically-defined isoforms being also highly regulated by pathophysiological determinants including metabolic products and free radical species.

