**Course Title: Medical Biochemistry II**

**DT 2nd, Sec A**

**Lab Assignment**

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**Note: Avoid copy paste material, as it may deduct your marks.**

Q1. Explain the process of Uric Acid Formation.

Q2. Discuss all the protein complexes used in Electron transport chain.

**Answer: 1**

Following **enzymes** are involved in catabolic reaction of purines.

1. Nucleotidase
2. Deaminase
3. Nucleoside phosphorylase
4. Oxidase

**Process of Uric Acid Formation:**

1. **Conversion of nucleotide to nucleoside:**

In the presence of nuleotidase enzyme adenosine monophosphate is converted into adenosine and inorganic phosphate.

1. **Conversion of nucleoside to Inosine:**

In this step nucleoside i.e. adenosine is converted into Inosine with the liberation of NH3 (Ammonia) in the presence of adenosine deaminase enzyme.

1. **Synthesis of hypoxanthine**

 In the presence of nucleoside phosphorylase enzyme, Inosine is converted into

 Hypoxanthine (with the liberation) along with pentose sugar.

1. **Formation of xanthine:**

Hypoxanthine is converted into xanthine by the addition of oxygen molecule in the presence of xanthine oxidase enzyme.

1. **Conversion of xanthine to uric acid:**

This is the final step of purine degeneration in which xanthine is converted in to final product **uric acid** by the addition of oxygen molecule in the presence of xanthine oxidase.

**Answer: 2**

**Protein complexes in the ETC:**

There are four protein complexes in ETC that functions to pass electrons down the chain. A fifthprotein complex serves to transport hydrogen ios back into the matrix. The complexes are embedded within the inner mitochondrial membrane.

**Complex 1:**

NADH transfers two electrons to complex 1 resulting in four H+ ions being pumped across the inner membrane. NADH is oxidized to NAD+, which is recycled back into the Krebs cycle. Electrons are transferred from complex 1 to a carrier molecule ubiquinone (Q) or CoQ, which is reduced to ubiquinol. Ubiquinol carries the electrons to complex 3.

**Complex 2:**

FADH2 transfers electrons to complex 2 and the electrons are passed along to ubiquinol, which carries the electrons to Complex 3. No H+ ions are transported to the intermembrane space in this process.

**Complex 3:**

 The passage of electrons to complex 3 drives the transport of four more H+ ions across the inner membrane. While electrons are passed to another electron carrier protein cytochrome.

**Complex 4:**

Cytochrome C passes electrons to the final protein complex in the chain, complex 4. Two H+ ions are pumped across the inner membrane. The resulting oxygen atoms quickly grab H+ ions to form two molecules of water.

**ATP Synthase:**

ATP synthase moves H+ ions that were pumped out of the matrix by the electron transport chain back into the matrix. The energy from the influx of protons into the matrix. The energy from the influx of protons into the matrix is used to generate ATP by the phosphorylation (addition of a phosphate) of ADP. The movement of ions across the selectively permeable mitochondrial membrane and down their electrochemical gradient is called chemiosmosis.

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