M.SC
Semester
III Core
Course XI
Bio-Inorganic Chemistry

TOPIC:- Copper Metabolism

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Characteristics

- Copper is deposited in abnormal amounts in liver and lenticular nucleus of brain.
- This may lead to hepatic cirrhosis & brain necrosis.
- Low levels of copper and ceruloplasmin in plasma with increased excretion of copper in urine.

- Copper deposition in kidney causes renal damage.
- This leads to increased excretion of amino acids, glucose, peptides & hemoglobin in urine.
- Intestinal absorption of copper is very high, about 4-6 times higher than normal.

Probable causes of Wilson's disease

- A failure to synthesize ceruloplasmin or an impairment in the binding capacity of copper to this protein or both.
- Copper is free in the plasma, it easily enters the tissues (liver, brain, kidney), binds with the proteins & gets deposited.
- Albumin bound copper is either normal or increased

- Copper accumulates particularly in liver, brain, kidney and eyes leading to copper toxicosis.
- Causes neurological symptoms, liver damage leading to cirrhosis, renal tubular damage and Kayser-Fleisher rings (brown pigment around the iris) at the edges of the cornea due to deposition of copper in the cornea.

- **Treatment:**
- **Includes diet low in copper and administration of copper chelator, D-penicillamine.**