الكلية : الطب

القسم او الفرع : الامراض والطب العدلي

المرحلة: الثالثة

أستاذ المادة : امراض

اسم المادة باللغة العربية : علم الامراض النسيجي

سم المادة باللغة الإنكليزية ا:pathology

اسم المحاضرة الثانية باللغة العربية: التراكم داخل الخلية/ المحاضرة االثانية

اسم المحاضرة الثانية باللغة الإنكليزية : Intracellular accumulations

Intracellular accumulations

The accumulated substance falls into one of three categories:

1. **A normal cellular constituent accumulated in excess**

   e.g. lipid, protein, and carbohydrates.

2. **An abnormal substance that is a product of abnormal metabolic pathway.**

3. **A pigment i.e. a colored substance.**

accumulation is either:

- harmless **or** severely toxic to the cell.

- nuclear or cytoplasmic.

Within the cytoplasm, the accumulated substance is most frequently within the lysosomes.

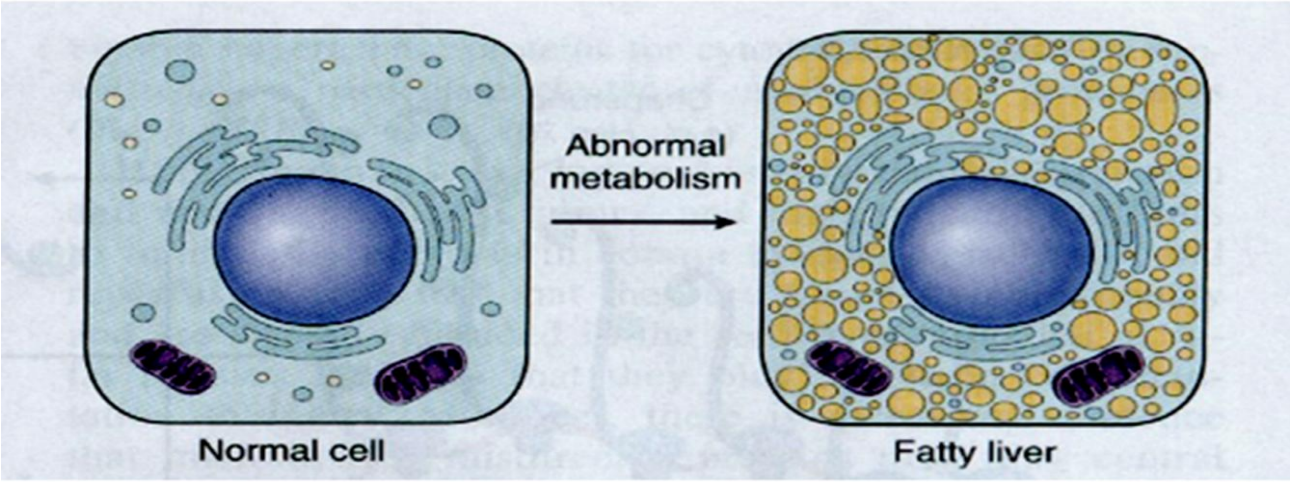
Mechanisms of abnormal intracellular accumulations.

The mechanisms of abnormal intracellular accumulations are many but can be divided into four general types .

1 .Abnormal metabolism :

A normal substance is produced at a normal rate, but the rate of its removal is inadequate. e.g. fatty change of the liver and occurrence of protein droplets in the epithelial cells of proximal convoluted tubules in cases of proteinuria due to leaky glomeruli.

Mechanisms of intracellular accumulations



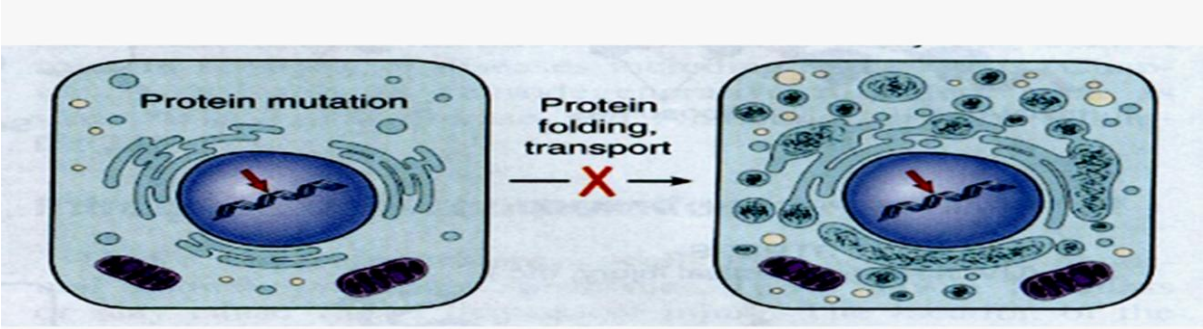
1. Abnormal metabolism as in fatty change liver

Next

2. Genetic mutations producing changes in protein folding and transport.

A protein is composed of amino acids linked in specific sequences by peptide bonds and coiled and folded into complex globular or fibrous structures.

A change in this configuration may result in interference with its transport so that it gets accumulated at the site of production.

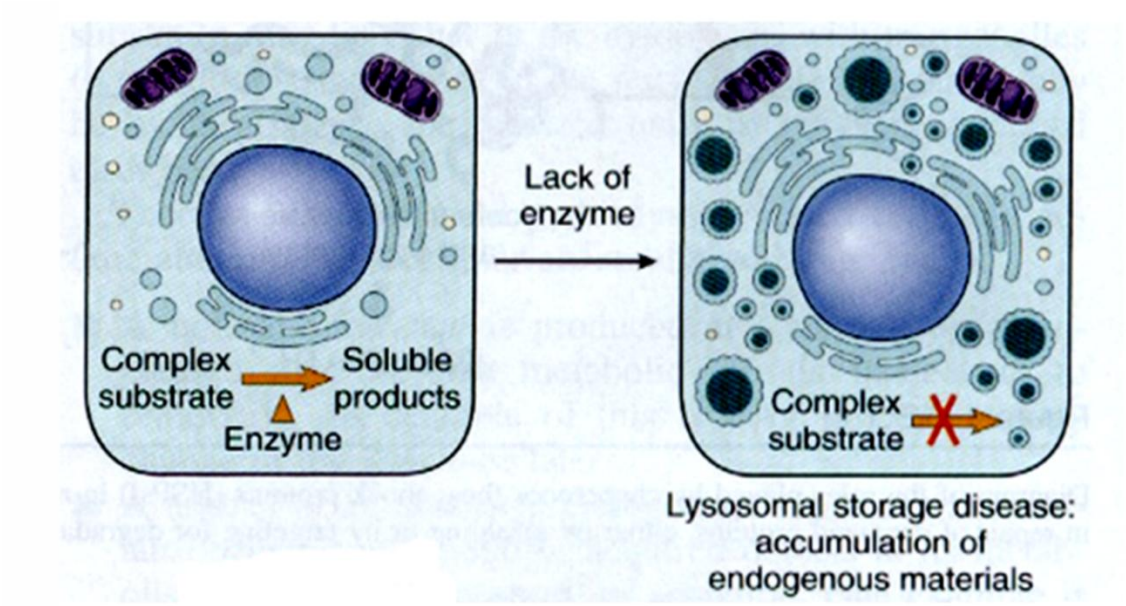


2. Mutations causing alterations in protein foldings and transport, so that defective molecules accumulate intracellularly.

3. A normal or abnormal substance is produced but cannot be metabolized.

This is most commonly due to lack of an enzyme, which is genetically determined **(inborn error of metabolism).**

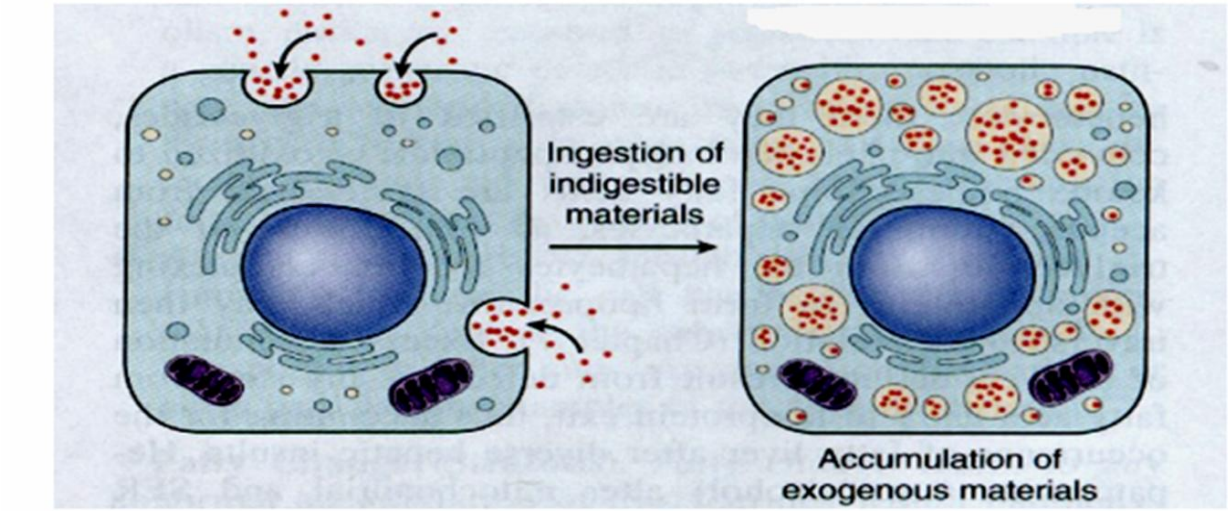
Such a deficiency of enzymes blocks a specific metabolic pathway resulting in the accumulations of unused metabolite(s) proximal to the block. The resulting diseases are referred to as **storage diseases.**



3. A deficiency of critical enzymes responsible for breaking down certain compounds, causing substrates to accumulate in lysosomes as in lysosomal storage diseases.

4 .An abnormally exogenous substance:

is deposited and accumulates because the cell is incapable to get rid of it (through enzymatic degradation or transport it to the outside) e.g carbon particles in anthracosis & silica particles in silicosis.



4. An inability to degrade phagocytosed particles, as in carbon pigment accumulation.