



**Libyan International Medical University  
Faculty of Pharmacy**

# **(Cell injury)**

**Second Year PharmD students,  
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# Ilos

- **Define Cell injury.**
- **List causes of Cell injury.**
- **Differentiate between reversible and irreversible cell injury.**

## **Cell injury:**

**Cell injury results when cells are stressed so severely that they are no longer able to adapt or when cells are exposed to inherently damaging agents or suffer from intrinsic abnormalities.**

# The causes of cell injury .

## ❑ Oxygen Deprivation.

Hypoxia, or oxygen deficiency



## ❑ Physical Agents.

Trauma, extremes of temperature,



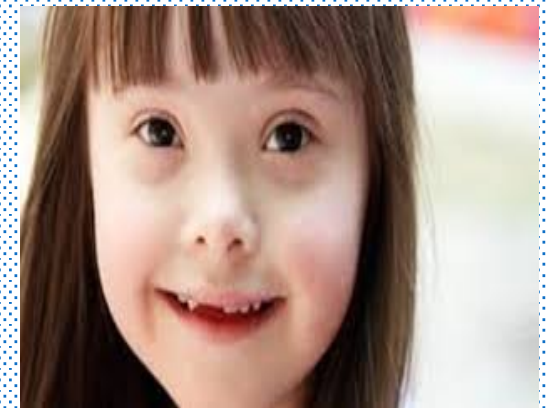
## ❑ Chemical agents

e.g. drugs, toxins



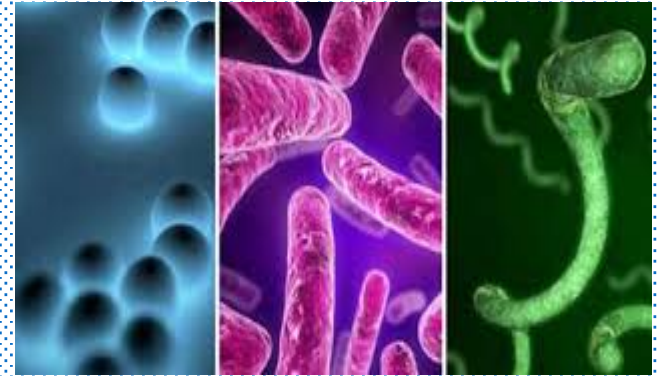
## ❑ Genetic Factors

**Genetic aberrations can result in pathologic changes as conspicuous as the congenital malformations associated with Down syndrome**



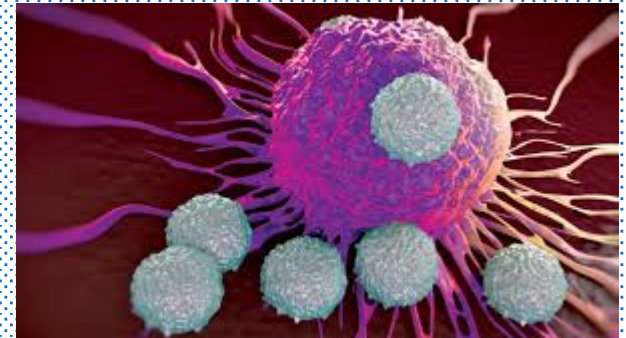
## ❑ Infectious Agents.

Agents of infection range from submicroscopic viruses to meter-long tapeworms



## ❑ Immunologic Reactions.

Although the immune system defends the body against pathogenic microbes,



## ❑ Nutritional Imbalances.

Even in the current era of burgeoning global affluence



# Types of Cell injury

## ❖ Reversible

Reversible cell injury occurs when the damaged cell is capable of returning to its normal physiological state when the stress is removed from the cell.

## ❖ Irreversible

Irreversible cell injury takes place when a cell is subjected to intense stress. Irreversible cell injury results in cell death. This is either caused by apoptosis or necrosis

# Etiology

**Reversible**

**Tissue  
hypoxia**



**Irreversible**

**Anemia**



Normal



Anemia



# Mechanism

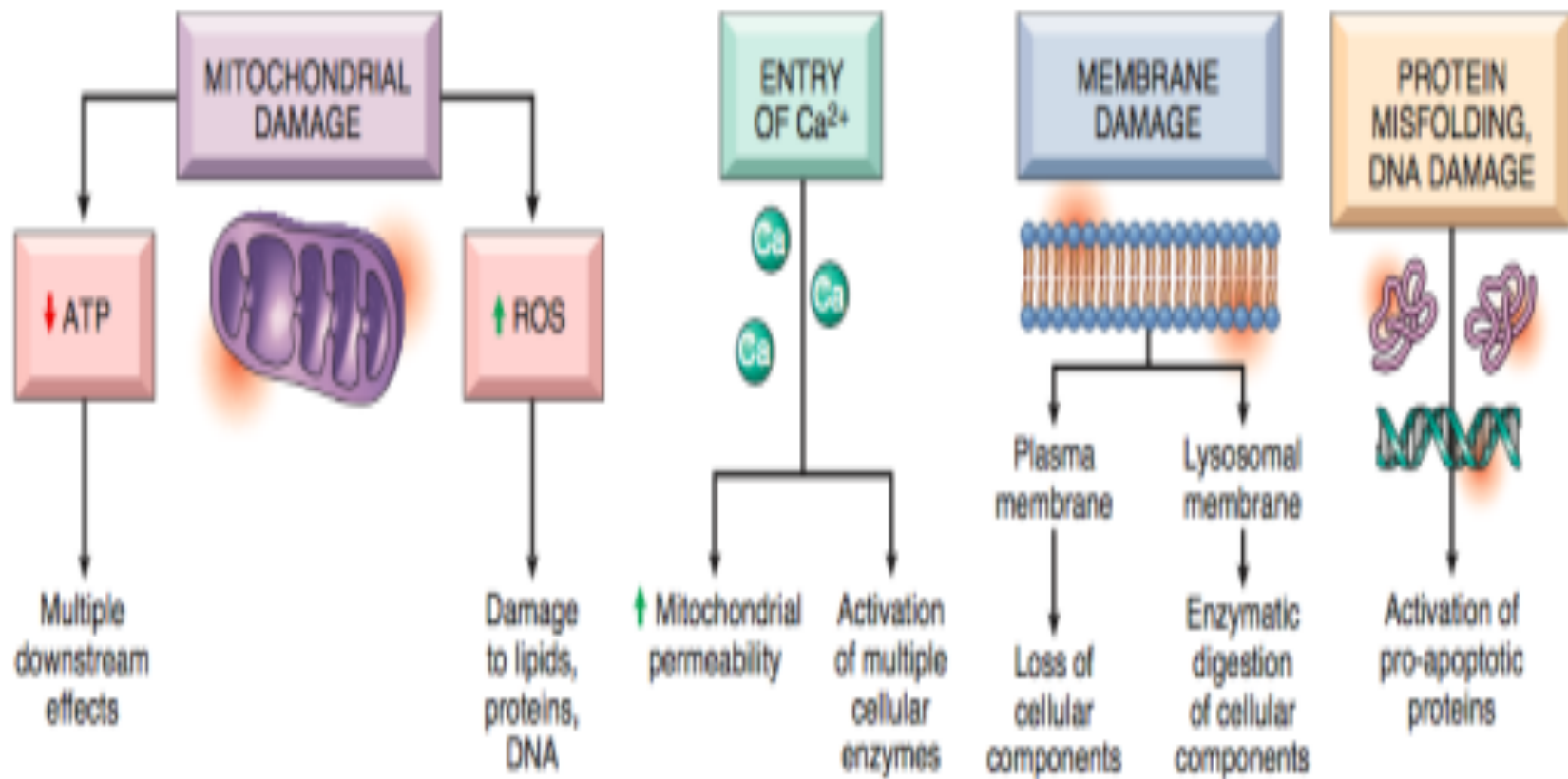


Figure 2-16 The principal biochemical mechanisms and sites of damage in cell injury. ATP, Adenosine triphosphate; ROS, reactive oxygen species.

# Morphology

**Reversible**

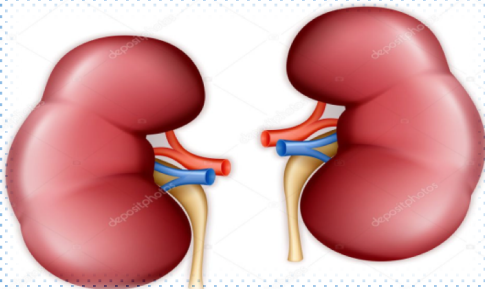
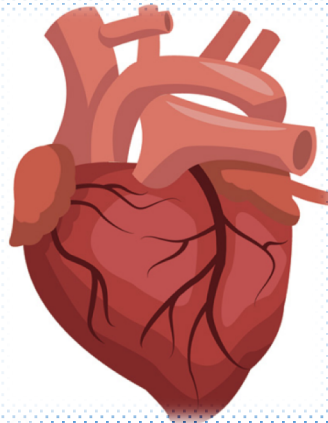
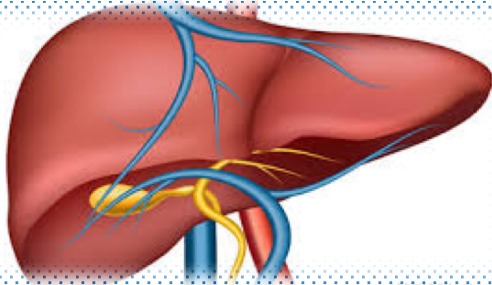
**Cellular ,swelling,  
fatty change.**

**Irreversible**

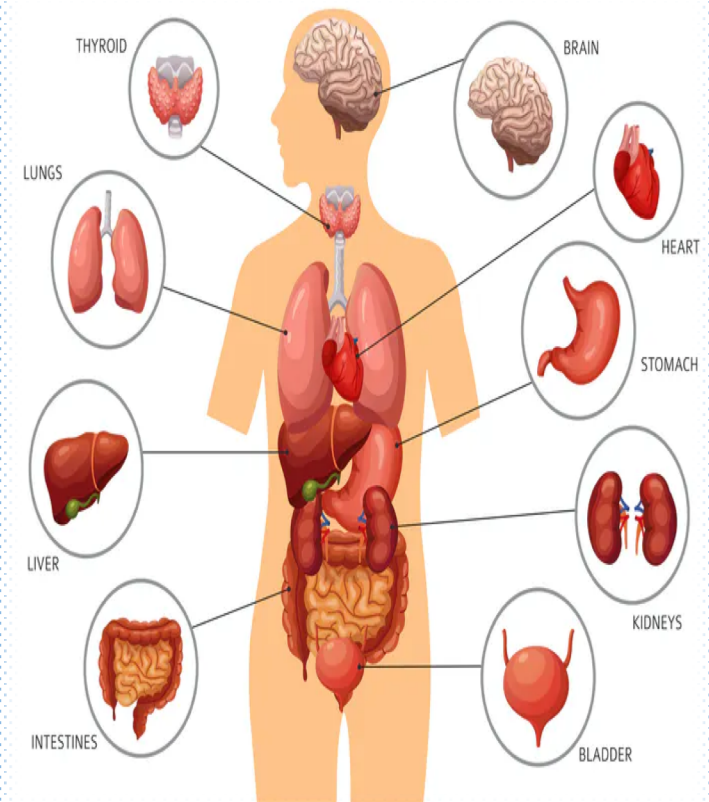
**Necrosis  
Apoptosis**

# Organ affected

## Reversible



## Irreversible



# Summary

- ✓ Cell injury results when cells are so stressed that they are no longer able to adapt.
- ✓ There are causes of cell injury , including the chemical agent .
- ✓ Reversible and irreversible injury are the two main types of cell injury.
- ✓ Irreversible this is either caused by apoptosis or necrosis.

# Reference

[https://www.differencebetween.com/difference-between-reversible-and-vs-irreversible-cell-injury/?fbclid=IwARoULaNdCUpzP7MVkl\\_O59wHOMYnR8cCWBcKzmTxRl3SfSigiuJvCTuDlxk](https://www.differencebetween.com/difference-between-reversible-and-vs-irreversible-cell-injury/?fbclid=IwARoULaNdCUpzP7MVkl_O59wHOMYnR8cCWBcKzmTxRl3SfSigiuJvCTuDlxk)  
<http://www.pathwaymedicine.org/cell-injury-causesxsgQ8>  
[https://www.google.com/search?q=liver&safe=active&source=lms&tbm=isch&sa=X&ved=2ahUKEwjVo\\_LdxdLsAhXMsKQKHW3fCrQQ\\_AUoAXoECBwQAw&biw=1366&bih=600](https://www.google.com/search?q=liver&safe=active&source=lms&tbm=isch&sa=X&ved=2ahUKEwjVo_LdxdLsAhXMsKQKHW3fCrQQ_AUoAXoECBwQAw&biw=1366&bih=600)

Robbins, S. L. (1973) *Basic pathology, General and Oral Pathology for the Dental Hygienist*. doi: 10.1136/jcp.47.1.95-d.

<https://theartofmed.wordpress.com/2015/05/29/pathologic-cell-injury-and-cell-death-i-mechanism-of-reversible-cell-injuries/>

