**Lecture 8**

**CELL SIGNALLING**

The general principles of cell communication involve a sequences by which a cell detects and respond to the signals in its surrounding or within itself.

Many cell signals are carried by molecules that are released by one cell and move to make contact with another cell . Signaling molecules can belong to several chemical classes:

LIPIDS PHOSPHOLIPIDS AMINO ACIDS

MONOAMINS PROTEINS GLYCOPROTEINS or

GASES.

EXOCYTOSIS :

Is the process by which a cell transports molecules such as NEUROTRANSMITTERS and PROTEINS out of the cell .

Exocytosis requires the use of energy to transport materials, and is the a process by which a large amount of molecules are realsed;thus it is a form of bulk transport.

Exocytosis occurs via secretory portals at the cell plasma membrane called PROSOMES.

Prosomes are permanent cup-shaped lipoprotein structures at the cell plasma membrane, where secretory vesicles transiently dock and fuse to release intra-vesicular contents from the cell.

ENDOCYTOSIS :

The process that brings substances into the cell, are used by all the cells because most chemical substances important to them are large polar molecules that cannot pass through the hydrophobic portion of the cell membrane by passive transport .

FORMS OF CELL SIGNALLING :

1. AUTOCRINE

Involves a cell secreting hormone or chemical messenger

( called the autocrine agent ) that binds to autocrine receptors on that same cell, leading to changes in the cell itself.

2-INTRACRINE

In intracrine signaling ,the signaling chemicals are produced inside the cell binds to cytosolic or nuclear receptors without being secreted from the cell.

3-JUXTACRINE

Is a type of cell-cell or cell-extracellular matrix signaling in a multicellular organisms that requires close contact.

There are three types:

1. A membrane ligand ( protein , oligosaccharide , lipid )

and a membrane protein of two adjacent cells interact.

1. A communicating junction links the intracellular compartments of two adjacent cells, allowing transit of relatively small molecules.
2. An extracellular matrix glycoprotein and a membrane protein interact.

4- PARACRINE

In paracrine signaling , a cell produces a signal to induce changes in nearby cells , altering the behavior of those cells.

5-ENDOCRINE

Endocrine signals are called HORMONES , Hormones are produced by endocrine cells and they travel through the blood to reach all parts of the body.

STAGES OF CELL SHGNALLING

Cell signaling takes place in the following three stages:

1. Binding of the signal molecule to the receptor.
2. Signal transduction , where the chemical signals activate the enzymes.
3. Finally , the response is observed.

CELL SIGNALLING PATHWAYS

The cell signaling pathways are:

MECHANICAL

 or

BIOCHEMICAL









