

Cell signaling

Presented by

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CELL SIGNALING

- A biological mechanism that occurs in cells which gives cells an ability to receive or generate the signals in response to their surrounding environment
- Cell to cell communication between cells is mediated by extracellular signal molecules. Some of those operate over long distances

WHY DO CELLS COMMUNICATE ?

- Maintenance of homeostasis
- Control of division and cell death
- Adaptation to environmental conditions
- Control of development and growth
- Release and production of hormones and others regulatory molecules
- Regulation of metabolism

Steps in cell signaling

**Synthesis
of
signaling
molecule**

**Release
of
signaling
molecule**

**Transport
of signal
to target
cell**

**Detection
and
binding of
signal by
specific
receptor**

**Changes
due to
receptor-
signal
complex**

**Signal
removal
and
response
terminatio
n**

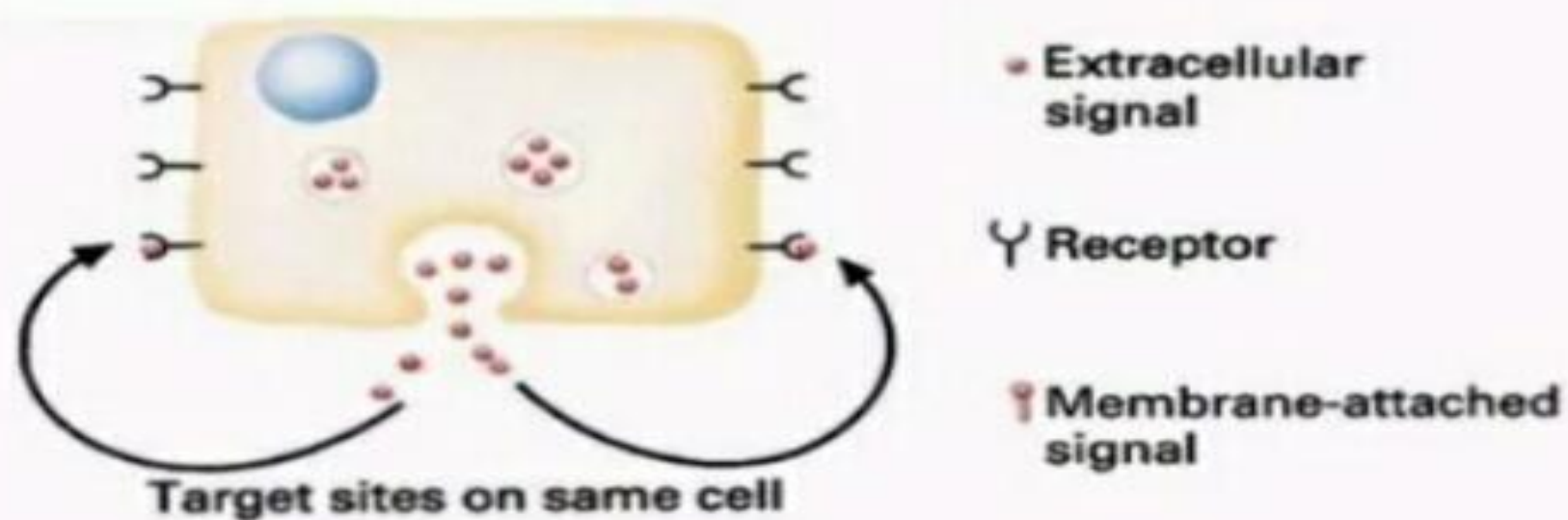
Types of intercellular signaling pathways

- Autocrine signaling
- Paracrine signaling
- Endocrine signaling
- Juxtacrine signaling

Autocrine signaling

- Autocrine signals target the cell itself. Sometimes autocrine cells can target cells close by if they are the same type of cell as the emitting cell
- An example of this are immune cells

Autocrine signaling

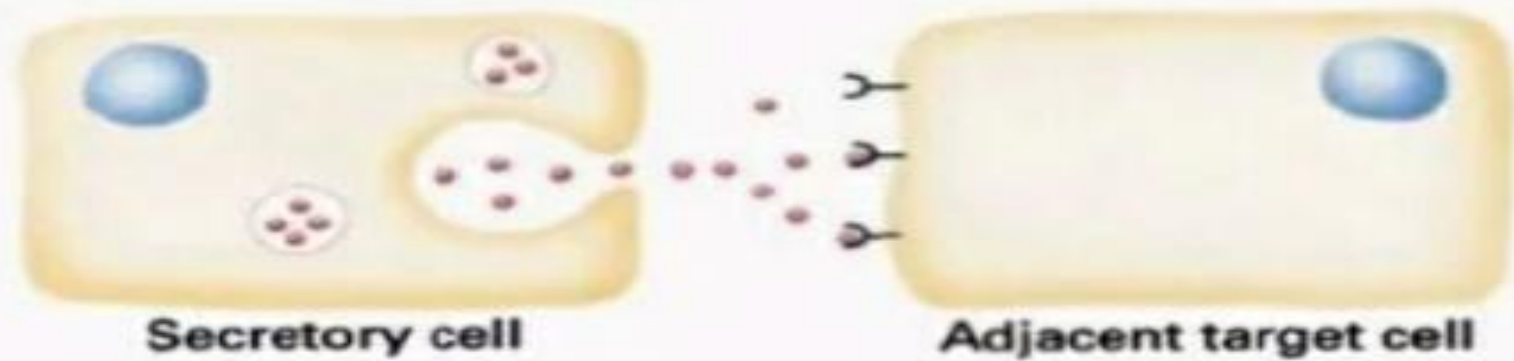


Examples: cytokines/immune cells, growth factors

Paracrine signaling

- Paracrine signals target cells in the vicinity of the emitting cell
- Neurotransmitters represent an example

Paracrine signaling

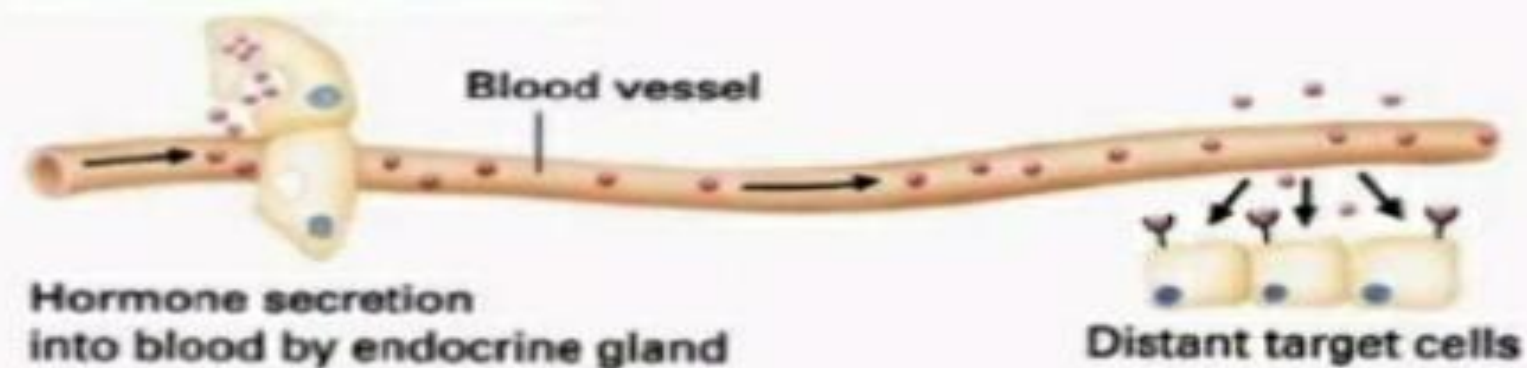


Examples: nerve-nerve, nerve-muscle cells, cytokines

Endocrine signaling

- Endocrine signals target distant cells
- Produce hormones that travel through the blood to reach all the parts of the body

Endocrine signaling

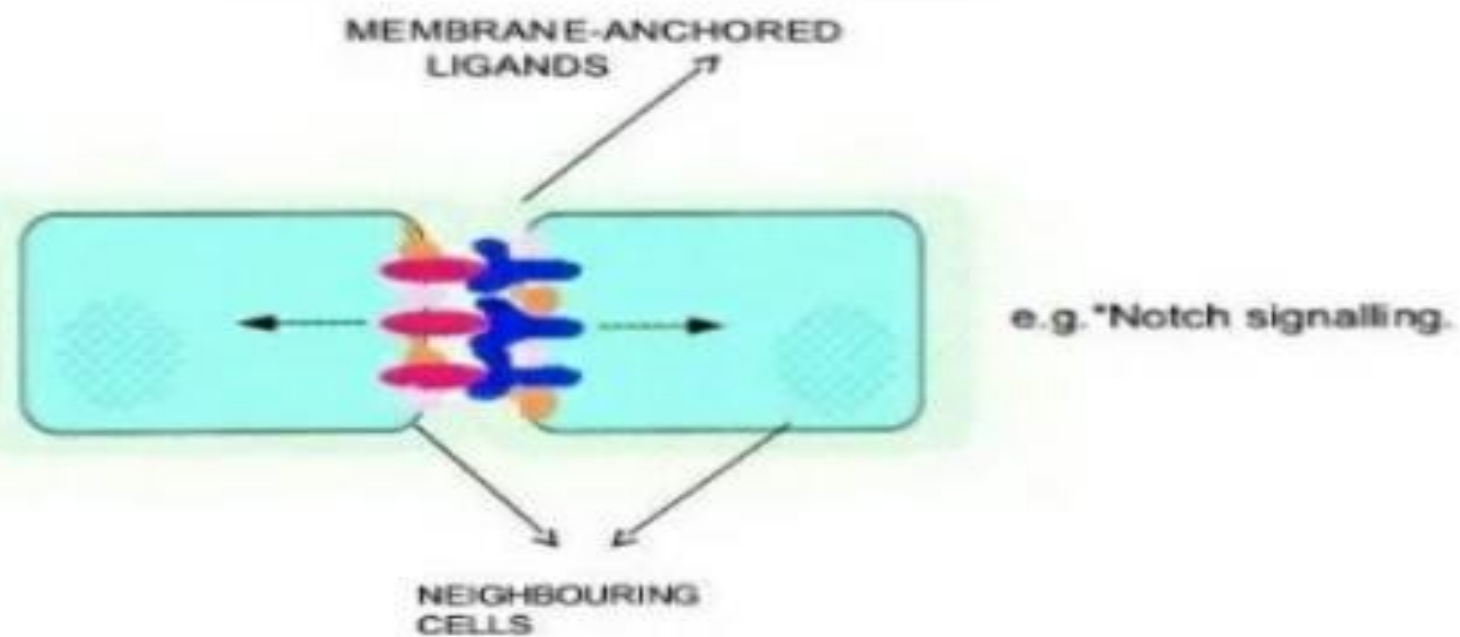


Examples: peptide and steroid hormones

Juxtacrine signaling

- Juxtacrine signals target adjacent (touching) cells
- Transmitted along cell membranes via protein or lipid components integral to the membrane
- Capable of affecting either the emitting cell or cells immediately adjacent

Juxtacrine signaling



Thank-you