

Biology 1113

Chapter 11

Each topic is the focus of each section from the book. The questions answered are from the concept questions at the end of the chapter. Please note that not all questions are answered, the vast majority are, and I don't claim that my answers are the only right answer or they are always right. The guide follows a numerical order in which the chapter was taught. This guide utilizes concept and concept questions from Campbell Biology, "Biology" by Reece, Urry, Cain, Wasserman, Minorsky, and Jackson. It also involves information learned from Professor Ball's lectures. Any of their work shown here is copyrighted and belongs to them respectively. I do not own any of this information. All images were acquired from Google Images and they are also copyrighted and belong to them. I do not own any of these images.

Chapter 11: Cell Communication

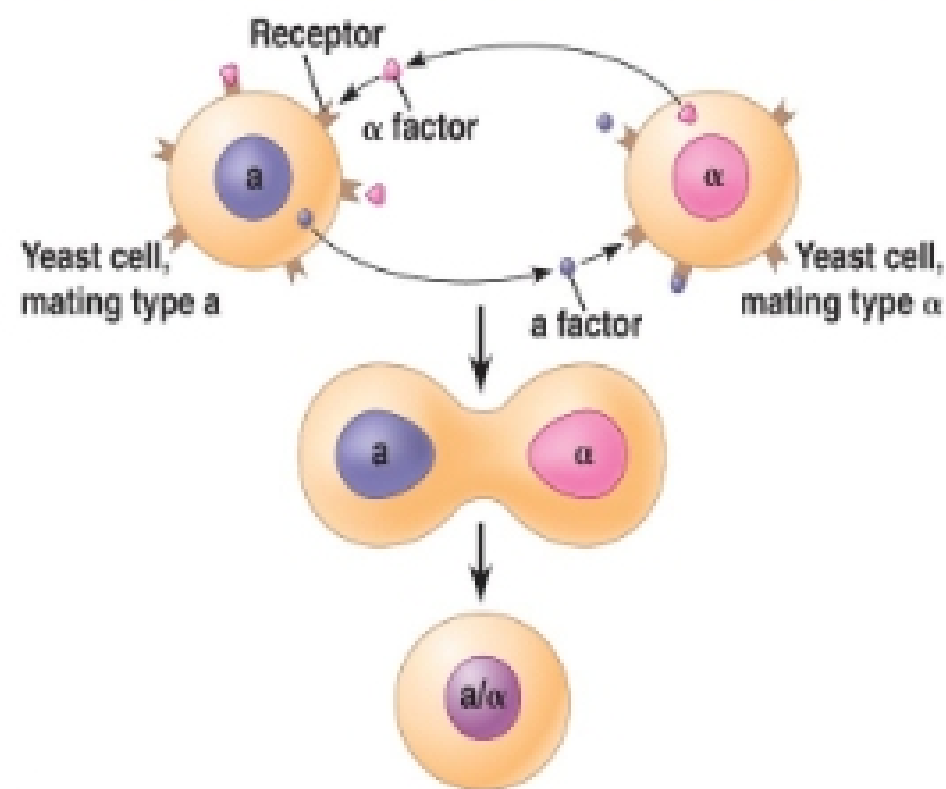
Concept 11.1: External Signals are converted to responses within the cell

- Cells talk and listen to each other

Evolution of Cell Signaling

- Used in sexual reproduction for some yeasts

Below a picture that explains the yeast cells



- Once a signal is received it is transduced (changed) into a form that brings about cellular response
- **Signal Transduction Pathway**- A received signal is converted to a specific cellular response through this pathway
- **Quorum Sensing**- Concentration signaling molecules sensed by bacteria, this allows them to monitor local density of cells

Local and long distance signaling

Local regulators- Messenger molecules secreted by a signaling cell that only travel short distance

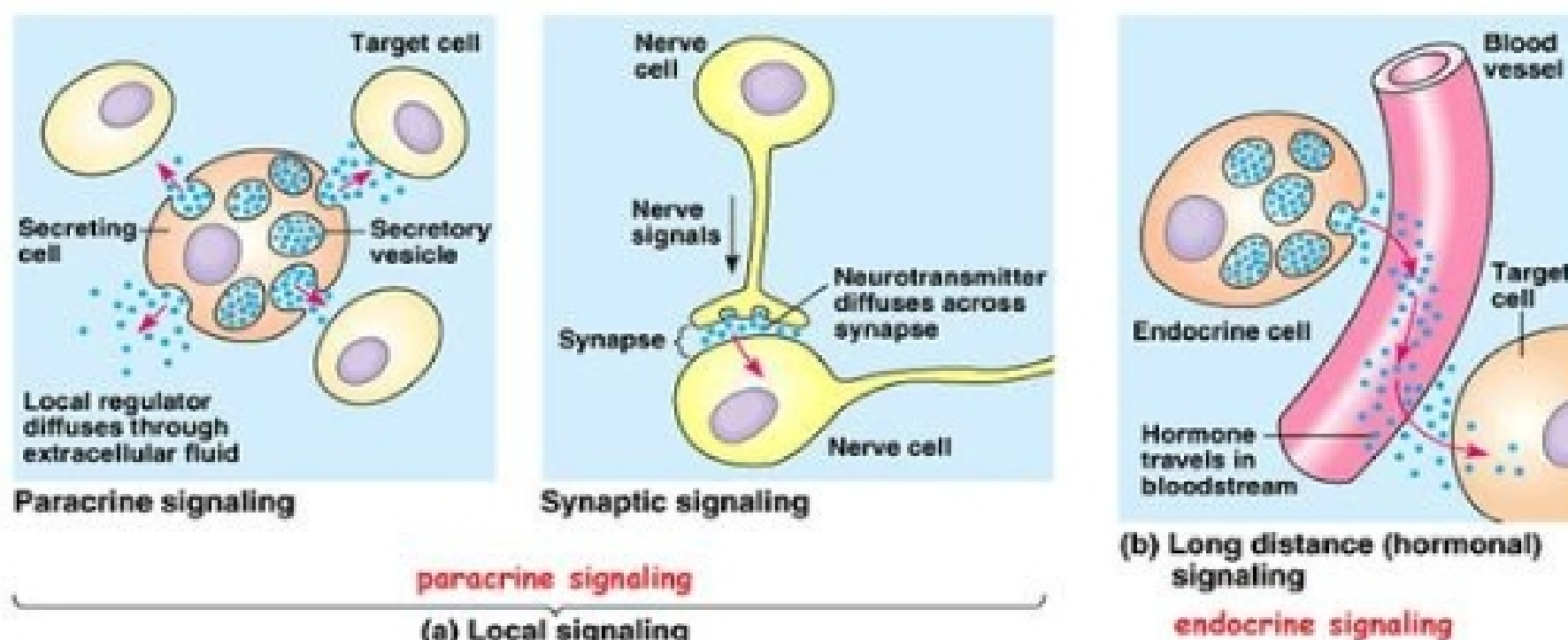
- Influence cells in their area
- An example is stimulating nearby cells to grow and divide

- o The message can be received and acted upon simultaneously by all the cells in the area that can receive it
- **Paracrine signaling**- When a secreting cell acts on nearby target cells by discharging molecules of a local regulator into the extracellular fluid.
- **Synaptic signaling**- An electrical signal along a nerve cell that causes the release of neurotransmitters stimulating the target cell

Both plants and animals use hormones

- **Hormones**- Long distance signaling
 - o Can perform a variety of tasks
 - o Animals
 - Known as endocrine signaling
 - Travel through the circulatory system
 - o Plants
 - Can travel in vessels
 - Usually travel by moving through cells and diffusing through the air as a gas

Below is a picture showing paracrine signaling along with synaptic signaling and long distance hormone communication



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The Three stages of Cell signaling: A preview

Earl W. Sutherland was the pioneer in understanding signal transduction pathways

Reception:

The cell's detection of a signaling molecule coming from outside the cell

- It is detected when the signaling molecule binds to a receptor protein on the cells surface or inside the cell