Figure 11.0 Yeast
OVERVIEW OF CELL SIGNALING

• YEAST CELLS AND MATING.
• A AND ALPHA CELLS.
• A FACTOR/RECEPTOR CELLS OF Alpha cells.
• Fusion of cells/mating
• Surface signals/cellular response
• Signal Transduction Pathway
Figure 11.1 Communication between mating yeast cells

**Exchange of mating factors.** Each cell secretes its mating factor, which binds to the other cell.

**Mating.** Binding of the factors to receptors induces changes in the cells that lead to their fusion.

**New a/α cell.** This cell combines in its nucleus all the genes from the a and α cells.
Figure 11.2  Communication among bacteria
Figure 11.2x Myxobacteria
TYPE OF CELL COMMUNICATION

• Local regulator/growth factors and animal nervous system/ neurotransmitters.
• Distant regulators/hormones such as insulin/have target organs.
• Direct contact/junctions or plasmodesmata between cells.
Figure 11.3  Local and long-distance cell communication in animals

(a) Local signaling

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Figure 11.4 Communication by direct contact between cells

(a) Cell junctions

(b) Cell-cell recognition

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TYPE OF CELL COMMUNICATION

- Local regulator/growth factors and animal nervous system/ neurotransmitters.
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SIGNAL RECEPTION

• Signal molecule binds to receptor protein, causing the protein to change shape.
• Signal receptors are plasma-protein membranes.
• G protein linked receptor.
• Ligand binding activities.
• Lipid hormones, nitric oxide.
Figure 11.5 Overview of cell signaling (Layer 1)
Figure 11.5  Overview of cell signaling (Layer 2)
Figure 11.5  Overview of cell signaling (Layer 3)
Figure 11.6 The structure of a G-protein-linked receptor
SIGNAL TRANSDUCTION PATHWAYS

- PATHWAYS RELAY SIGNALS FROM RECEPTORS TO CELLULAR PROCESSES.
- PROTEIN PHOSPHORYLATION, ADD PHOSPHATE GROUPS.
- SECONDARY MESSANGERS, SMALL IONS & MOLECULES.
- CYCLIC AMP AND Ca++ ion.
Figure 11.7  The functioning of a G-protein-linked receptor
Figure 11.8  The structure and function of a tyrosine-kinase receptor
Figure 11.9 A ligand-gated ion-channel receptor

1. Ligand binds, channel opens, and ions flow through.
2. Change in ion concentration triggers cellular responses.
3. Ligand dissociates and channel closes.
CELLULAR RESPONSES TO SIGNALS

- IN RESPONSE TO SIGNAL, CELL MAY REGULATE ACTIVITIES IN THE CYTOPLASM OR TRANSCRIPTION IN THE NUCLEUS.
- ELABORATE PATHWAYS AMPLIFY AND SPECIFY THE CELLS RESPONSE TO SIGNALS.