

Week 1 Multicellularity and Cell Communication

Learning Goal: Understand how cells communicate with their external environment and respond to change

After finishing the pre-class assignments, students will be able to...

- Discuss how a signal can lead to both short- and long-term responses
- Describe the mechanism of action for a receptor tyrosine kinase pathway
- Define the role of kinases and phosphatases in cell signaling pathways
- Distinguish the potential for differentiation of totipotent, pluripotent, and multipotent stem cells

After this class meeting, students will be able to...

- Evaluate why diffusion and surface area limit cell size and its implications for large, multicellular organisms
- Determine if certain proteins in a signaling pathway function as phosphatases, kinases, or neither.
- Explain how a signal transduction pathway can be turned off
- Predict the effect of altering part of a signal transduction pathway
- Interpret data related to different types of cell signaling pathways
- Predict cell fate based on cell activation of signaling pathways

Week 1 Tissues, cytoskeleton, and extracellular matrix

Learning Goal: Appreciate cellular diversity, the role of the cytoskeleton, and the ways that individual cells come together to form a multicellular organism

After finishing the pre-class assignments, students will be able to...

- Describe the different types of cell-cell junctions
- Define microtubule, microfilament, and intermediate filament.
- Explain how motor proteins actively move material around the cell
- Explain how cell-cell junctions and the extracellular matrix (ECM) contribute to cells' ability to form tissues and organs

After this class meeting, students will be able to...

- Evaluate how changing components of the cytoskeleton would change cell structure (shape) and/or function (i.e., motility)
- Evaluate the effect of modifying cell-cell junctions or ECM components on tissue structure and function