Learning Objectives for Cell Biology

Exam IV

Chapter 16  Cell Communication
- Review the diversity of signaling molecules (see handout).
- Appreciate the different types of receptors and their significance.
- Examine cell-surface receptors and outline specific examples of their function.
- Understand G-protein structure and its importance to cell signaling.
- Describe what second messengers are and how they work

Chapter 18  Cell cycle
- Provide an overview of the cell cycle and describe key events associated with each stage.
- Consider the molecular basis of cell cycle control, including a detailed examination of cyclins and Cdns.
- Describe the importance of the proteins p21, p53, Ras and Rb for the cell cycle.
- Outline the molecular details of the M-phase, including organelle fragmentation, spindle fiber formation and chromatin separation.
- Understand the significance of apoptosis and the cellular events associated with it.

Chapter 17  Cytoskeleton
- Distinguish the three types of protein filaments that comprise the cytoskeleton.
- Outline the regulation of subunit interactions and regulation of associations.
- Review the molecular structure of the filaments, their subunits, and how assembly is controlled.
- Explain the significance of motor proteins and the control of their activity.
- Describe selected examples of other proteins that associate with the filaments.

Chapter 20  Tissue Organization
- Appreciate the significance of the extracellular matrix to tissue organization.
- Review the different tissue types found in multicellular organisms.
- Relate tissue organization to the cytoskeleton.
- Describe the function and structure of desmosomes and gap junctions.
- Understand how tissues renew themselves.
- Relate various cell cycle and cell signaling events to the development of cancer.
- Distinguish oncogenes and tumor-suppressor genes.

READING AND PROBLEM ASSIGNMENTS

Essential Cell Biology, Alberts et al., 4th edition

<table>
<thead>
<tr>
<th>Chapter: Pages</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>16: 5251-563</td>
<td>2, 3, 4, 5, 6, 7, 10, 11, 12, 17, 18, 19, 20</td>
</tr>
<tr>
<td>18: 603-642</td>
<td>1, 2, 3, 4, 5, 7, 9, 10, 12, 13, 15, 16, 26, 30</td>
</tr>
<tr>
<td>17: 565-600</td>
<td>2, 3, 5, 7, 8, 9, 10, 11, 13, 14, 15, 17, 22</td>
</tr>
<tr>
<td>20: 683-725</td>
<td>2, 3, 5, 6, 7, 8, 12, 15, 16, 17, 19</td>
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</tbody>
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