**Chapter Review**

**Chapter 16: Cell Walls, the Extracellular Matrix, and Cell Interactions**

16.1

The principal component of bacterial cell walls is a peptidoglycan consisting of polysaccharide chains cross-linked by short peptides. The cell walls of algae and higher plants are composed of fibrous polysaccharides (e.g., cellulose) embedded in a gel-like matrix of polysaccharides and proteins. Their rigid cell walls allow plant cells to expand rapidly by the uptake of water.

16.2

The major structural proteins of the extracellular matrix are members of the collagen family. Collagens form the fibrils that characterize the extracellular matrix of connective tissues, as well as forming networks in basal laminae. Polysaccharides in the form of glycosaminoglycans and proteoglycans make up the bulk of the extracellular matrix. They bind to collagen fibrils and interact with other matrix molecules. Adhesion proteins link the components of the extracellular matrix to one another and to cells. Integrins are the major cell surface receptors that attach cells to the extracellular matrix. At focal adhesions and hemidesmosomes, integrins provide stable links between the extracellular matrix and the cytoskeleton.

16.3

Selective cell–cell interactions are mediated by four major groups of cell adhesion proteins: selectins, integrins, immunoglobulin (Ig) superfamily members, and cadherins. The cadherins link the cytoskeletons of adjacent cells at stable cell–cell junctions. Tight junctions prevent the free passage of molecules between epithelial cells and separate the apical and basolateral domains of the plasma membranes. Gap junctions are regulated channels connecting the cytosols of adjacent animal cells. Adjacent plant cells are linked by cytoplasmic connections called plasmodesmata.