STUDY GUIDE—CHAPTER 1
Reading Assignment: Section 1.1-1.3
  Human Perspective—Replacing damaged cells and organs
  Experimental Pathways—origin of eukaryotic cells

Concepts:

What is the difference between stem cells and differentiated cells?
What is the difference between adult stem cells and embryonic stem cells?
What are the limiting factors for cell size?
Compare and contrast prokaryotic and eukaryotic cells.
What is the endosymbiont theory?
What is the relationship between eubacteria, archaeabacteria and eukaryotes?

Terms:

Endosymbiont
Eubacteria
Archaebacteria
Eukaryote
Stem cells

Sample Question:

Vertebrates have organs that contain many identical cells adjacent to each other. Much energy is expended to make sure the cells stay together and communicate effectively. Why haven’t we simply evolved to make larger cells instead of the myriad small ones?

1. A few large cells would not flex appropriately.
2. A large cell would not have enough surface to volume ratio to take up enough nutrients to support its metabolic activities.
3. The diffusion of oxygen to the interior of the cell would be fine but the diffusion of CO₂ out would be too slow.
4. There is no reason; evolution just didn’t progress that way.
5. Both 2 and 3 are correct.