Chapter 16: Regulation of Gene Expression

16.1

1. What does the quote, “A virus is a piece of bad news wrapped in protein” mean?
2. Since cells that have incorporated phage DNA into their genome may continue to divide and propagate the viral genome, this might be considered somewhat like the Trojan horse. What might trigger the switchover from *lysogenic* to *lytic* mode?

16.2

1. All genes are not “on” all the time. Using the metabolic needs of *E. coli*, explain why not.
2. List the three components of an *operon*, and explain the role of each one.
3. How does a *repressor* protein work?
4. Distinguish between *inducible* and *repressible operons*, and describe one example of each type.
5. What happens when a repressor is bound to the operator?

16.3

1. Operons have not been found in eukaryotic cells, and the genes coding for the enzymes of a particular metabolic pathway are often scattered over different chromosomes. What is a plausible mechanism for the *coordination of gene expression*?

16.4

1. What is *DNA methylation*? What role does it play in gene expression?

16.5

1. What is alternative splicing of pre-mRNA transcripts? How does this contribute to complexity?
2. How do microRNAs inhibit translation?
3. What are 3 ways the translation of mRNA can be regulated?