

Review Questions
Lecture 1

1. What are some factors that determine species complexity?
2. How do *all* cells store their hereditary information?
3. Define transcription and translation.
4. Are proteins the only functional molecules encoded by genes? Explain.
5. What is the difference between the meanings of the words 'genome' and 'genotype'?
6. What is an allele and how does it relate to an individual's genotype?
7. What is the difference between traditional genetic phenotype, cellular phenotype and molecular phenotype?
8. Can you determine which of the following organisms is likely to be more complex?
Explain your answer.
Species A: 50,000 genes, 200,000 bases
Or
Species B: 10,000 genes, 500 million bases

9. Are there genes expressed in our cells that are also expressed by bacteria? Are there genes expressed in our cells that can be found in *any* organism? Explain.

10. The small ribosomal subunit is highly conserved across all species. What does that tell us about this gene? Is this stretch of DNA somehow resistant to mutation? If not, why don't we observe mutations as often in this gene?

11. You are using *C. elegans* (a nematode) to do a genetic study. You have sequenced two different genes. Gene #1 is conserved in humans while gene #2 is not. What conclusions can you make about the functions of these two genes?

12. Why can scientists use model organisms to study genes and diseases that are relevant to humans?