

Answers to Quiz Review

1. When Griffith injected heat-killed disease-causing bacteria into the mice, the mice survived, suggesting the cause of the pneumonia was not a chemical poison.
2. Griffith proposed the idea that the harmless bacteria had somehow been transformed into disease-causing bacteria. (One strain had been changed into another by some unknown factor.)
3. Some scientists were hesitant to accept that DNA is the molecule of heredity because it seemed to be too simple of a molecule (only made of 4 different chemicals). They believed protein, which consisted of 20 amino acids, was a more likely alternative.
4. Avery and his colleagues determined that DNA had to be present in order for transformation to take place. They tested carbohydrates, lipids, proteins, RNA and DNA, and found that in every case, DNA must be present, or the bacteria did not transform.
5. Hershey and Chase used radioactive isotopes of phosphorus to label DNA, and sulfur to label protein in bacteriophage (viruses). They phage were allowed to infect bacteria, and then the results were separated and tested for radioactivity in the bacteria cells. Only the labeled phosphorus was detected, indicating that DNA, but not protein, was injected into the cells, and therefore carried the genetic material of the bacteriophage virus.
6. According to Chargaff's Rule: **32% guanine = 32% cytosine**
Therefore, $100\% - 32\% = 68\%$ (for A and T)
 $68\% \div 2 = 34\%$
So 34% adenine (and 34% thymine)
7. Rosalind Franklin used x-ray diffraction to take images of DNA molecules. Her results indicated that the structure of DNA was helical.
8. See Fig. 12-7, p. 294
9. Long DNA molecules in eukaryotes are packed into short chromosomes by wrapping the DNA around histone proteins. DNA and histones form beadlike structures called nucleosomes, which are then coiled and folded together into a thick fibre and packed up as chromosomes.
10. DNA polymerase joins individual nucleotides to produce a DNA molecule during replication. It is also responsible for "proof-reading" the resulting strands of DNA to ensure that each new DNA molecule is a copy of the original.