**DNA Replication**

Chapter 8 of Malloy, Cronan and Freifelder and chapter 1 of Snyder and Champness.

1. How does negative supercoiling of the template help initiation of DNA replication?
2. What is the role of dnaA protein in the replication of initiation?
3. What function does dnaB protein perform during replication?
4. Can DNA polymerase perform initiation of DNA synthesis in the absence of a primer?
5. Is the primer for DNA synthesis RNA or DNA? Which protein is responsible for making the RNA primer?
6. Why is the synthesis of one strand continuous, while the other is discontinuous?
7. Which component of the polymerase holoenzyme gives it processivity (the ability to synthesize long stretches of DNA without dissociating from the template)?
8. During DNA synthesis, what sort of supercoiling is built up ahead of the replication fork? How can the torsional stress be relieved to help the fork progress?
9. What is proof-reading? Which subunit of the polymerase is responsible for this activity? How is a misincorporated nucleotide removed during replication?
10. How is replication terminated? What are the roles of the ter sequence and the terminator protein in stopping the replication fork? Which component of the polymerase complex does the terminator protein interact with?
11. How is RNA primers removed from the replicated DNA? Which component of the replication machinery carries out this activity?
12. How are mistakes (mismatches) corrected after replication ahs been completed? How is the directionality of this correction determined?

13. How do bacteria adjust their replication rates to match variable division times under different growth conditions?