

HWB: 1, 8, 9, 10, 11 Chapter 25

- ① The Dispersion or random model of DNA replication implies that the new DNA is assembled in pieces all across the chromosome.

The Messelson-Stahl experiment showed that the DNA in successive rounds of replication moved from a "Heavy", all N^{15} labeled state to a "half heavy", one N^{15} labeled strand and one N^{14} labeled state to an all light and a "half heavy" state.

- ⑧ See table on page 1019 and 1023

- ⑨ The light fraction contains Okazaki fragments that weren't ligated together

The heavy band contains the leading strand from DNA synthesis

- ⑩ $3' \rightarrow 5'$ exonuclease activity and the α -Helix of DNA polymerase maintains fidelity during DNA replication.

No difference in lagging strand versus leading strand synthesis.

$$\textcircled{10} \quad \sigma = +0.14 \quad \Rightarrow \quad \frac{\Delta L_k}{L_{k0}} = \text{stall } \sigma$$

6000 bases

$$\text{Starting } \sigma = -0.06$$

Calculate L_{k0} by dividing $\frac{6000 \text{ bases}}{10.5 \text{ bases/turn}} = 571 \text{ turns}$

$$\Delta L_k = -0.06 (571) = -34 \text{ turns unwound}$$

in the original DNA

To get to the σ of +0.14, you need another

$$+0.14 = \frac{\Delta L_k}{571}$$

$$\Delta L_k = 79 \text{ turns unwound}$$

The total difference in the ΔL_k is $79 + 34$ or 113 turns

$$113 \text{ turns} \times \frac{10.5 \text{ bases}}{\text{turn}},$$

1190 bases unwound before stalling