

**DNA: Prokaryotes vs. Eukaryotes**

Prokaryotes are simple unicellular organisms without a nucleus.

The DNA floats freely in the cell's cytoplasm, and is often found in one long circular strand, known as the cell's chromosome.

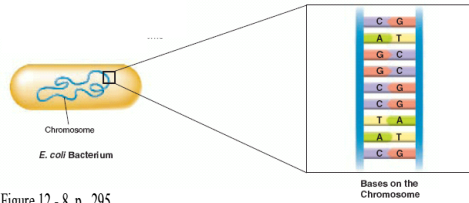


Figure 12-8, p. 295

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Such a cell's chromosome such as *E. Coli* can contain over 4 million base pairs.

Eukaryotic cells can contain more than 1000 times more DNA. Replication needs to be a precise exercise to prevent mistakes.

see figure 12-1, p. 298

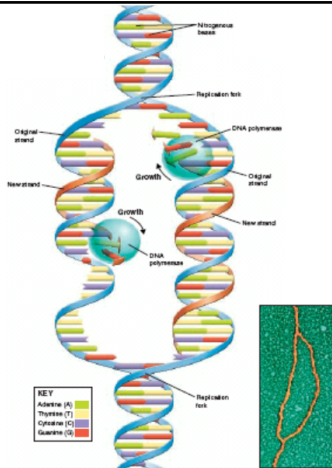
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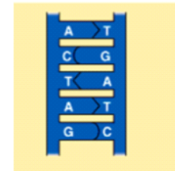
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figure 12-1, p. 298



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**DNA Replication**



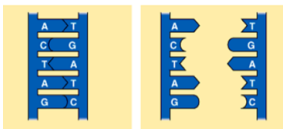
The "parent" molecule has two complementary strands of DNA.

Each is base paired by hydrogen bonding with its specific partner:

A with T

G with C

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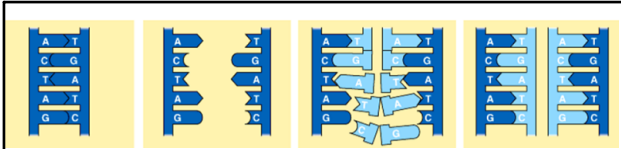
The first step in replication is the separation of the two strands.

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Each parental strand now serves as a template that determines the order of the bases along a new complementary strand.

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The nucleotides are connected to form the sugar-phosphate backbones of the new strands.

Each "daughter" DNA molecule consists of one parental strand and one new strand.

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DNA replication is done by enzymes .

There is one enzyme, for example, that is responsible for the separation of the strands of the parent DNA.

DNA polymerase , is responsible for attaching the individual nucleotides into a new DNA strand. It will also "proofread" the final copies to make sure there are no mistakes.

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