Bell Ringer

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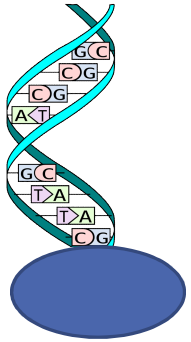

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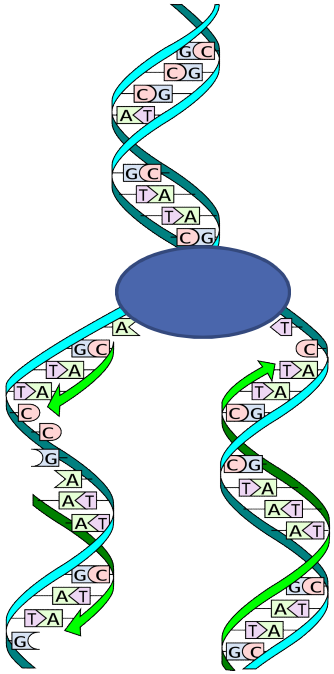
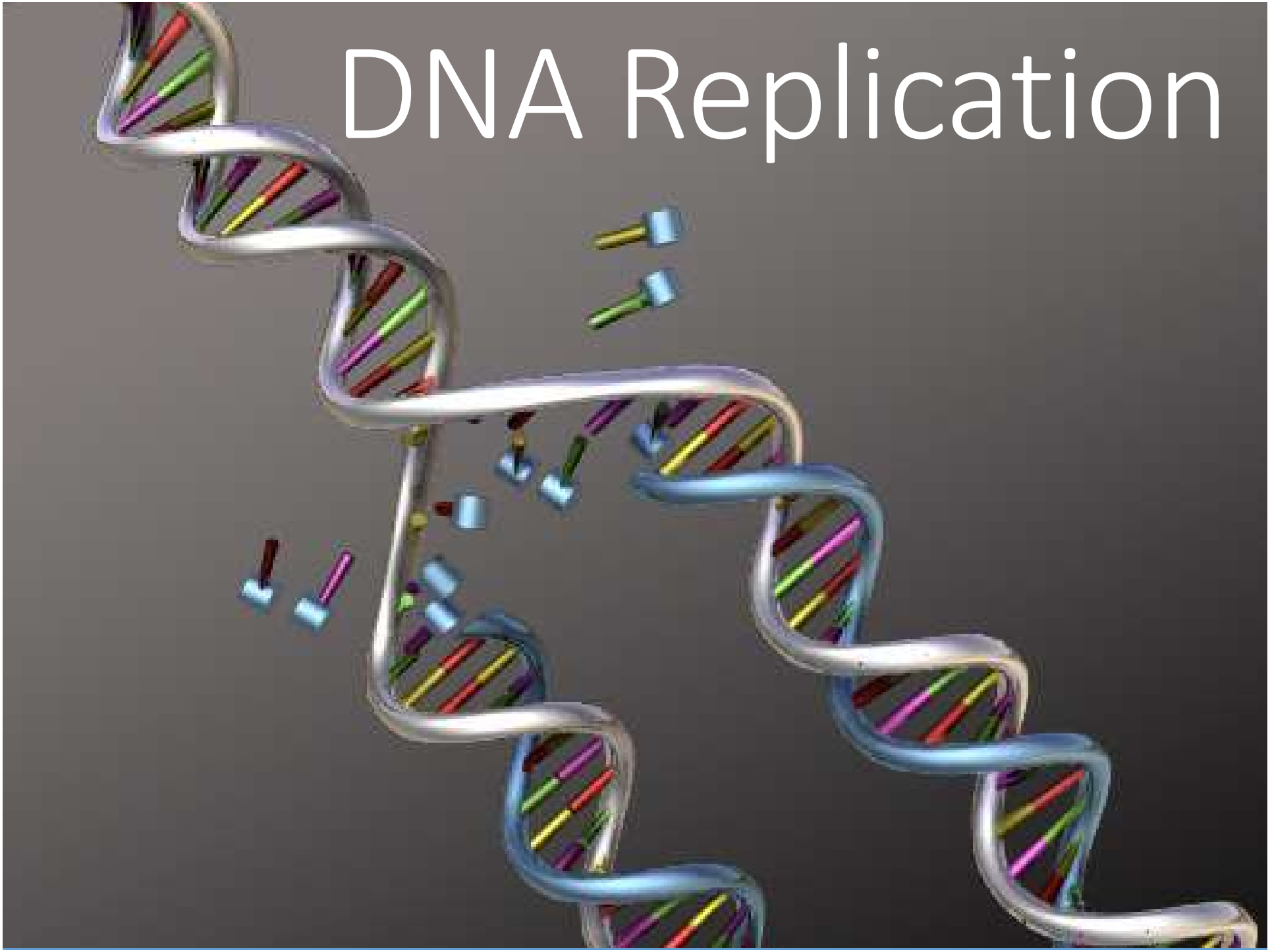


DNA Replication



Percentages of Bases in Five Organisms				
Source of DNA	**A**	**T**	**G**	**C**
Streptococcus	29.8	31.6	20.5	18.0
Yeast	31.3	32.9	18.7	17.1
Herring	27.8	27.5	22.2	22.6
Human	30.9	29.4	19.9	19.8
E.coli	24.7	23.6	26.0	25.7

Which organism has the most “A”s?

What do these percentages tell you about which letters pair together?

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If a DNA sequence was 40% G, what are the percentages of the other nucleotides in the same sequence?

Erwin Chargaff

Austro-Hungarian biochemist, professor at Columbia University.

Research on nucleotide ratios determined base pairings (A→T and C→G). (Chargaff's Rule)

Rosalind Franklin

English chemist in the 40s and 50s.

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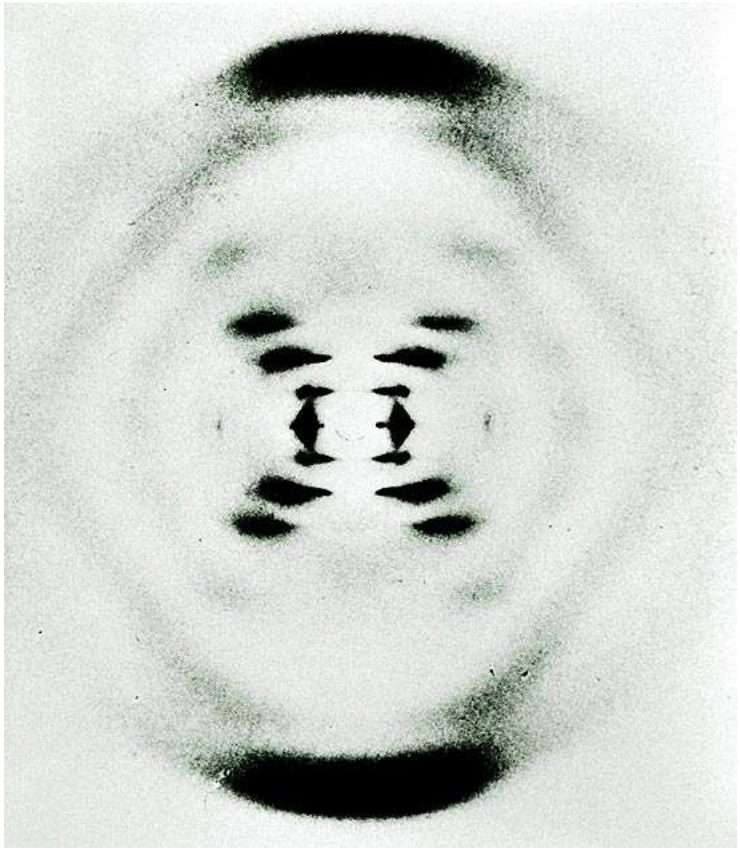
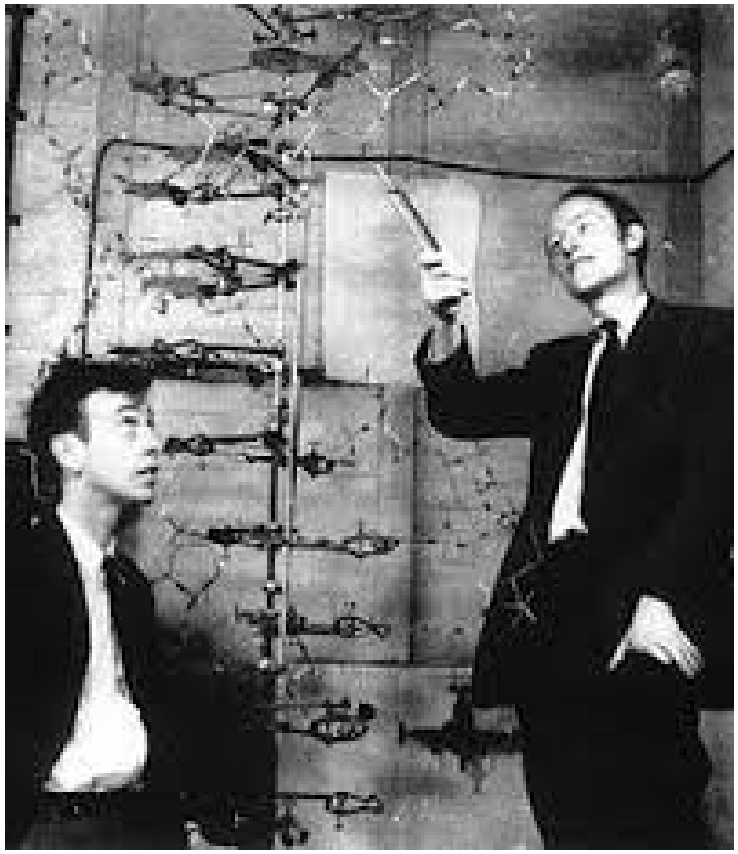
Used x-ray crystallography to study the shape of DNA.



James Watson & Francis Crick

Cambridge University researchers (1950s)

Used information from Franklin's and Chargaff's research to construct the double helix model we know today.

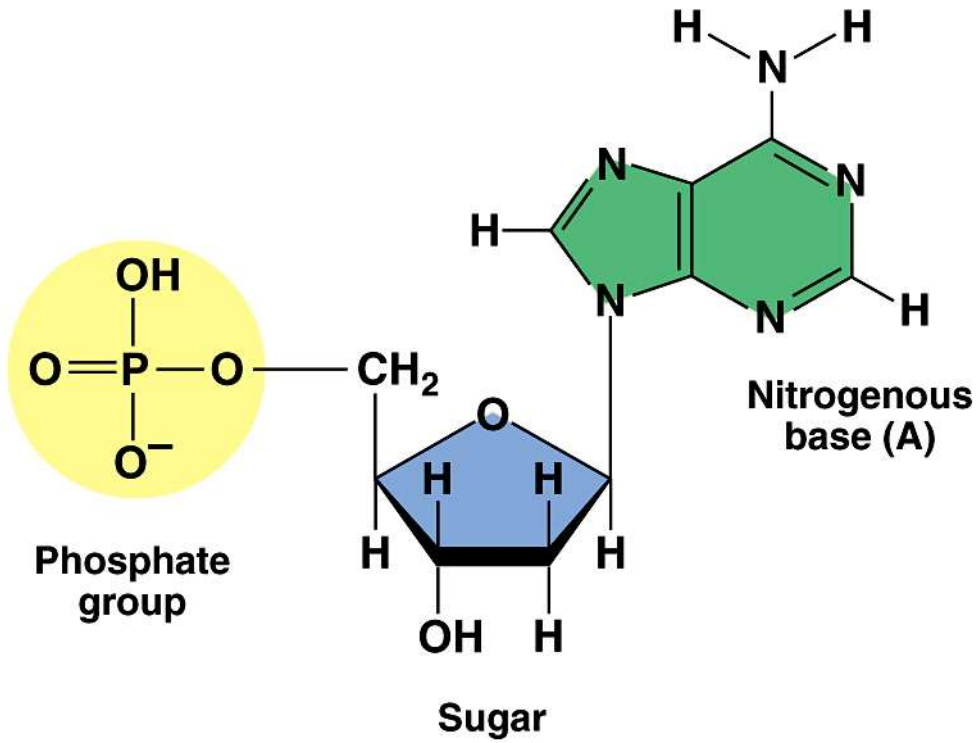


DNA Structure

Deoxyribose sugar

Phosphate group

Nitrogenous base

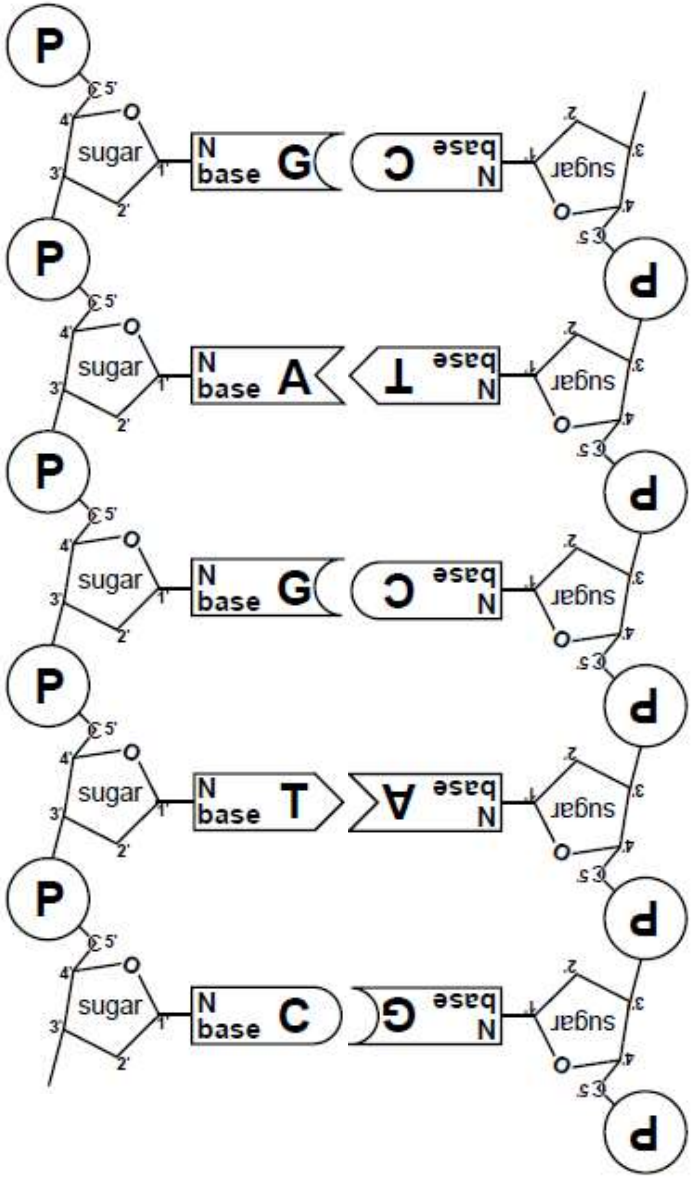


DNA Structure

Sugar-phosphate backbone (outside)

Nitrogenous bases - A, T, C, G (inside)

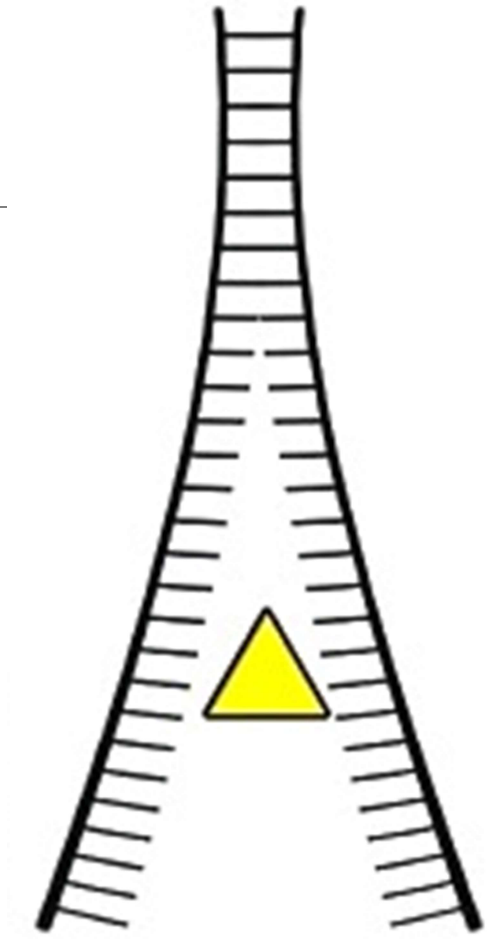
Phosphate groups of nucleotide bonded to 3’ sugar of next nucleotide.



Helicase

Enzyme that “unzips” two strands

Temporarily breaks the bonds between base pairs (A→T and C→G)



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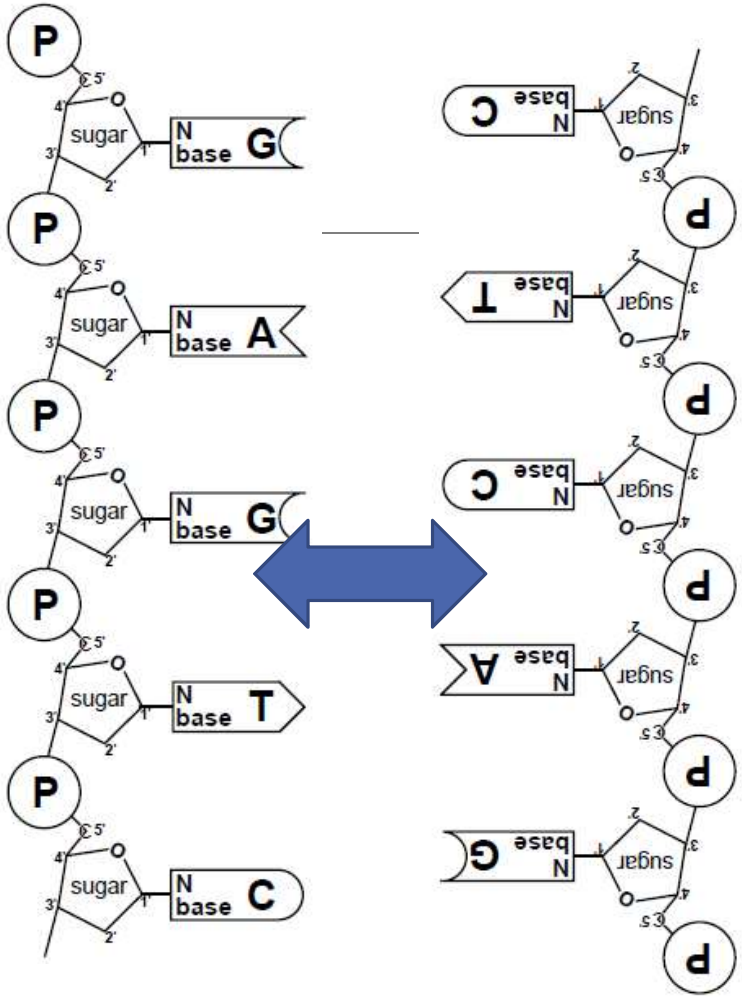
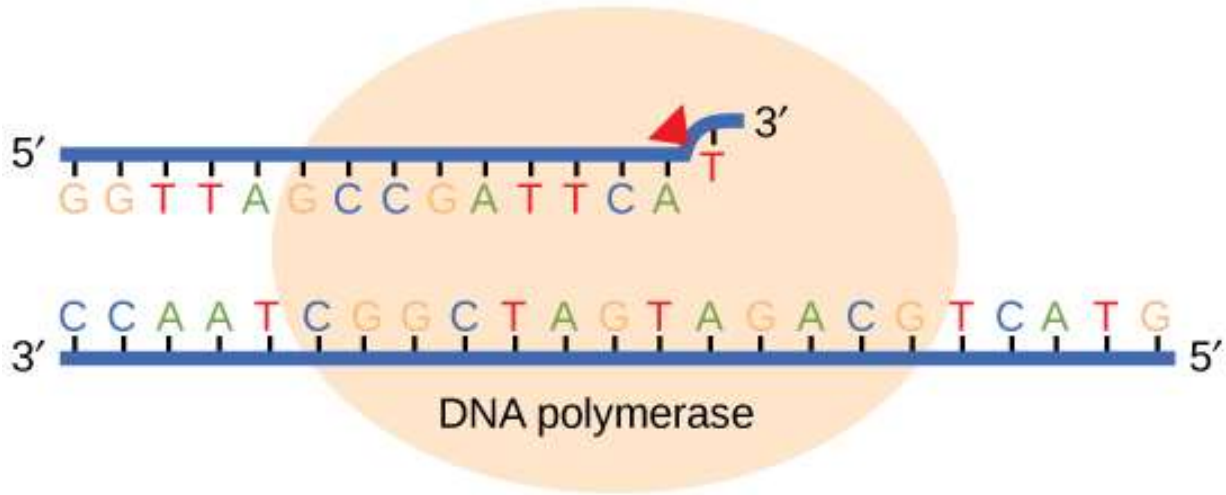


DNA Polymerase

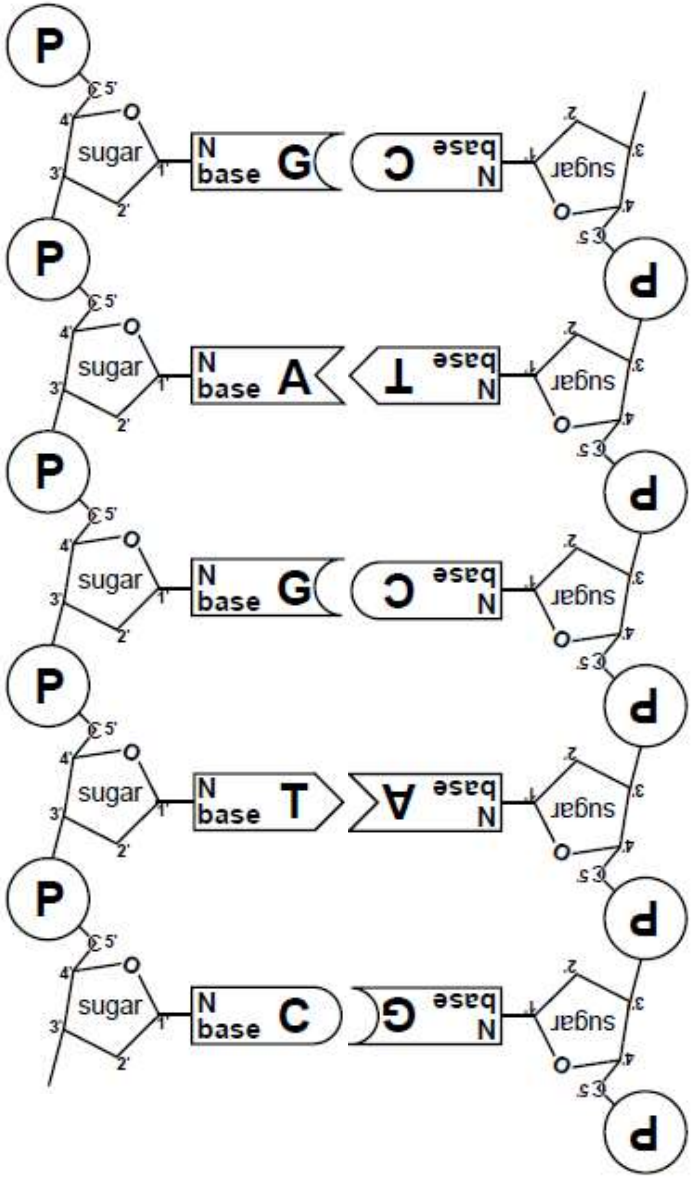
Each strand acts as a template for a new strand.

DNA polymerase is the enzyme that adds new nucleotides together based on each template strand.



DNA Structure

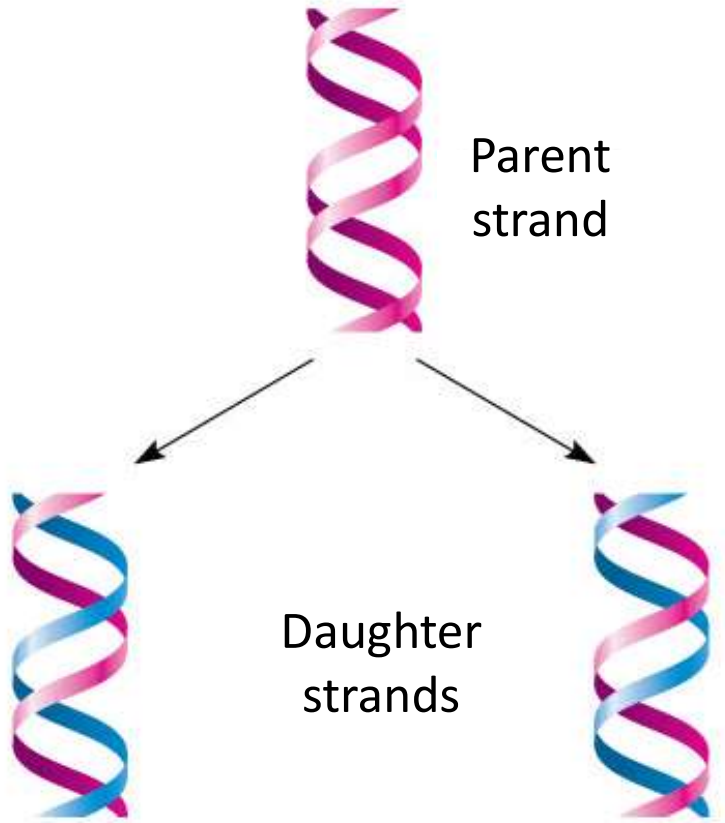
One strand forward, other strand backward.



Semi-conservative replication

Each new DNA molecule is half “old” and half “new”.

Only half of the parent strand is conserved (saved) with each replication.



Exit Task

Summarize the steps of DNA replication.