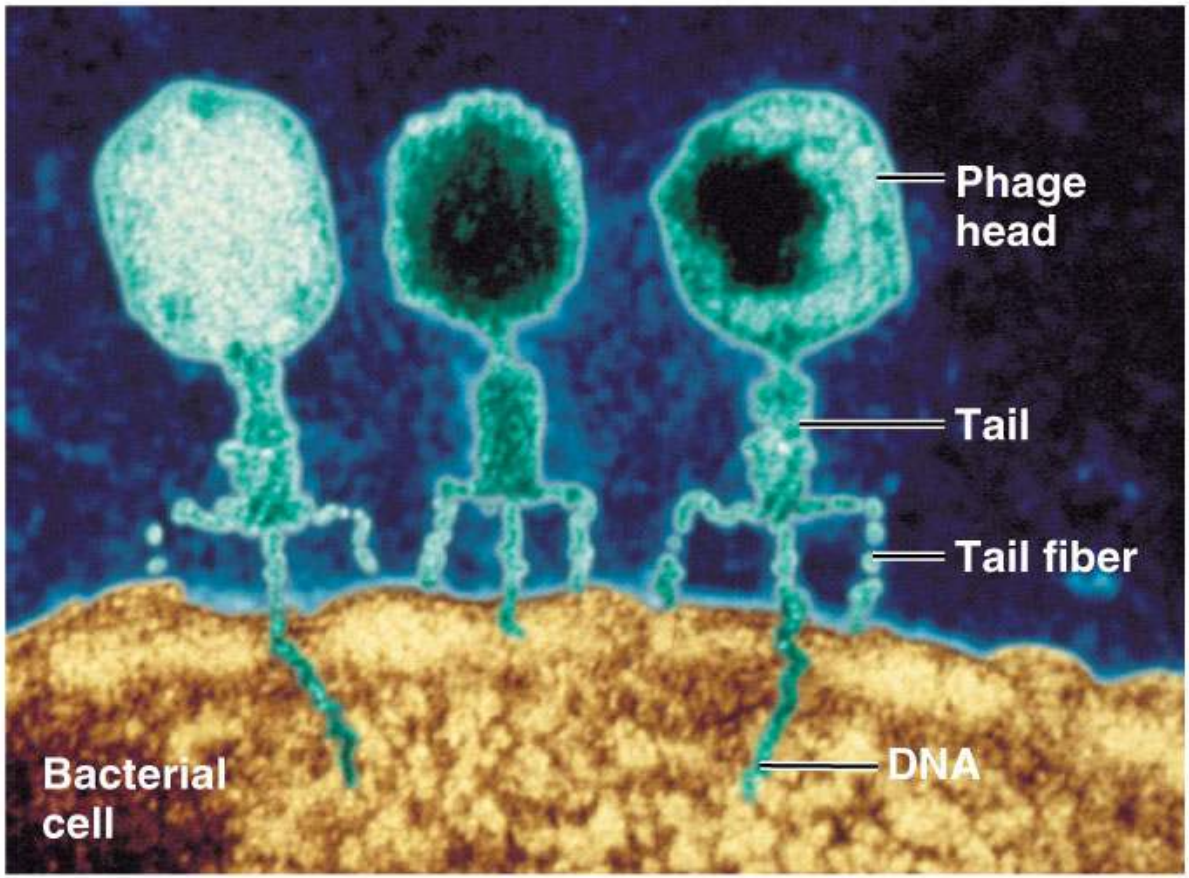
Pre-AP Biology

DNA History, Structure, and Replication (4.1)

Part 1

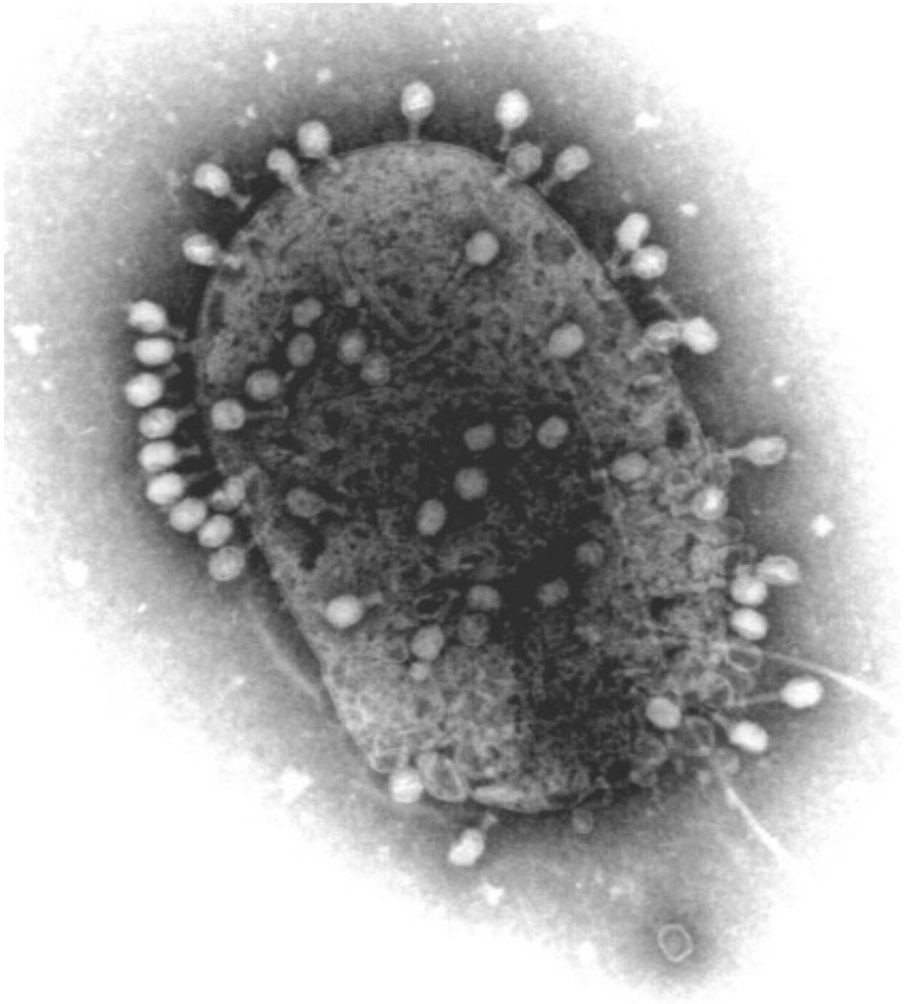
Alfred Hershey & Martha Chase

Bacteriophage injecting its DNA into the host cell.

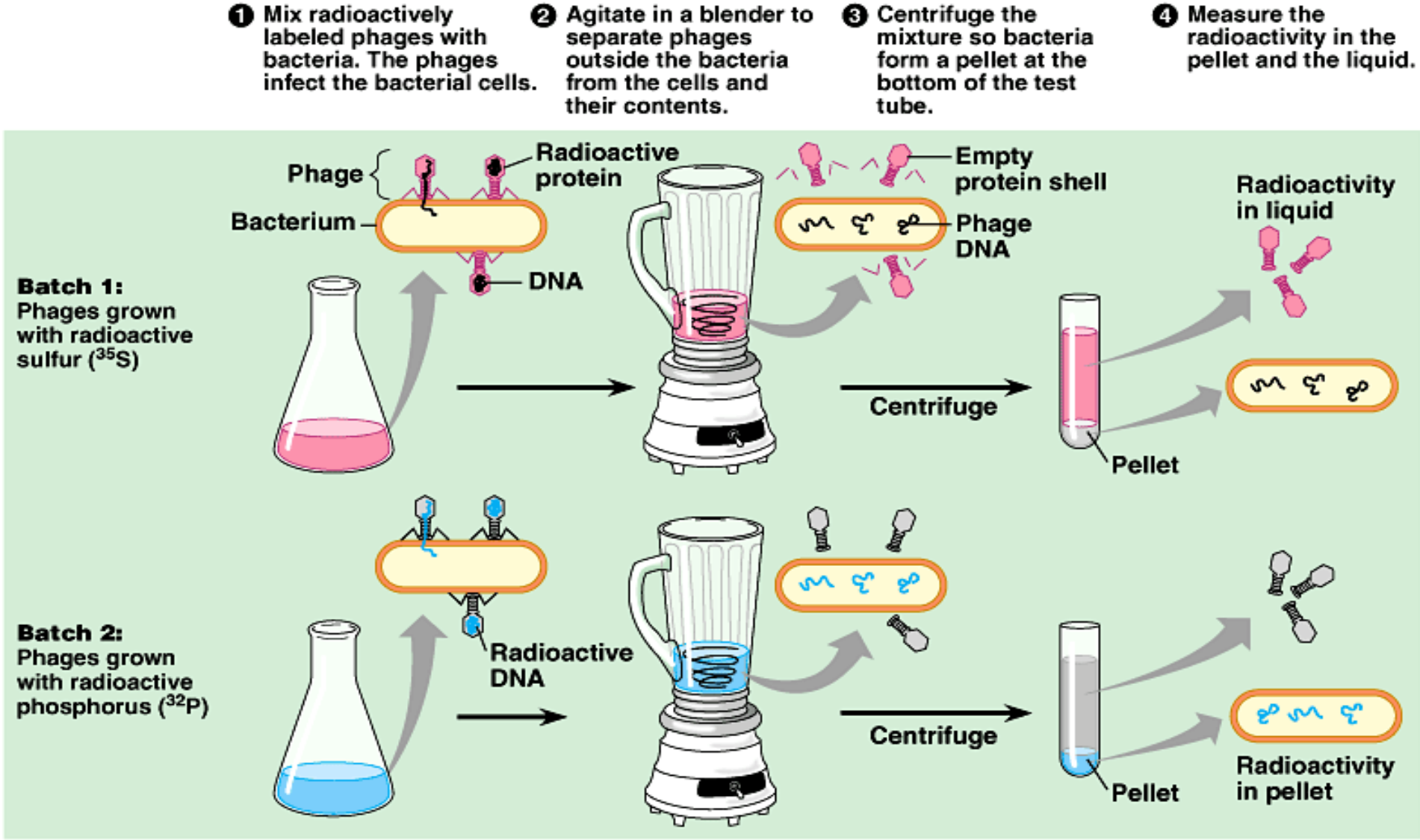


(a) T2 and related phages use their tail pieces to attach to the host cell and inject their genetic material (TEM).

Electron Microscope View of Bacteriophages on the host cell.

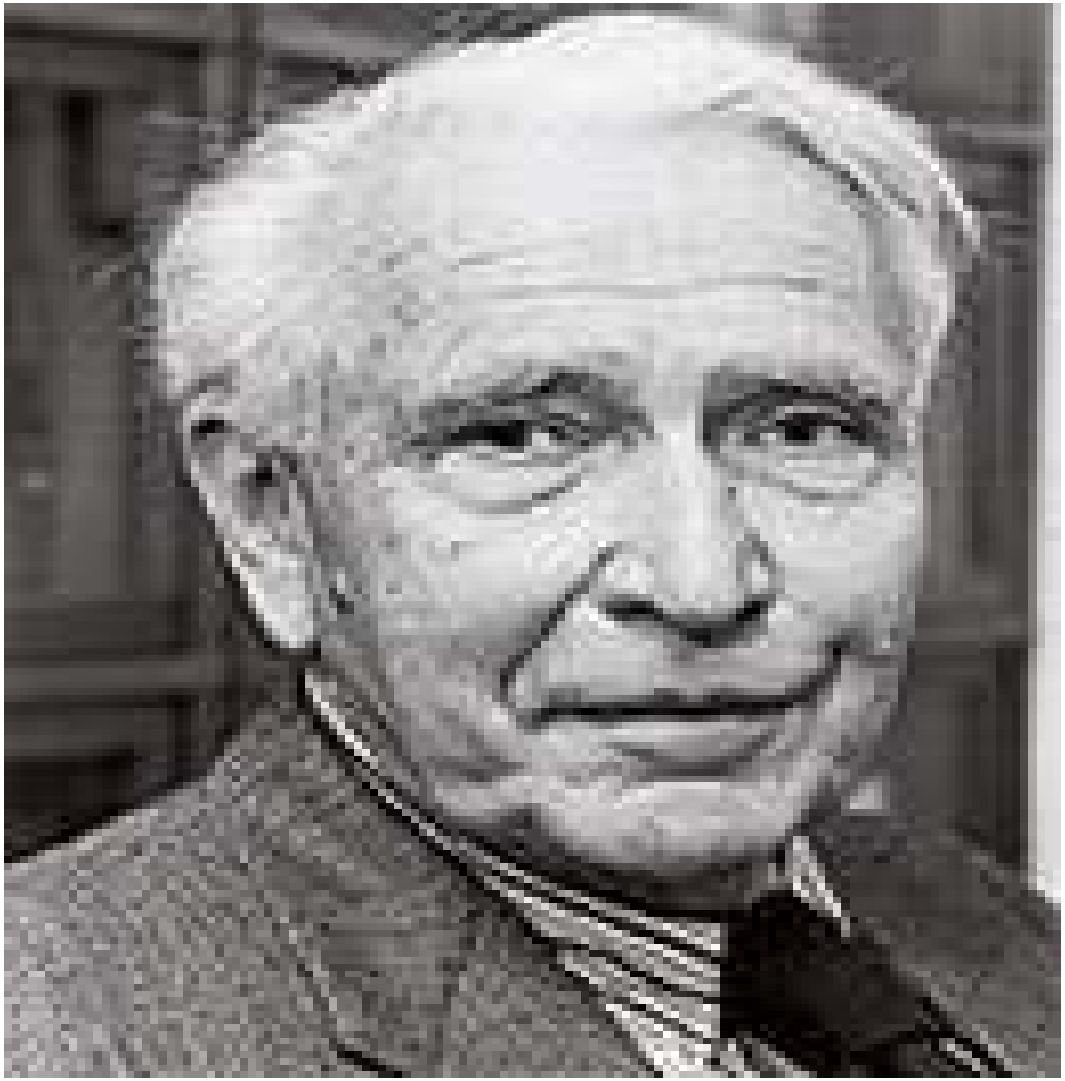


Hershey-Chase experiment



(b) The experiment showed that T2 proteins remain outside the host cell during infection, while T2 DNA enters the cell.

Erwin Chargaff



Chargaff's Rule

Adenine = Thymine (DNA) or Uracil (RNA)

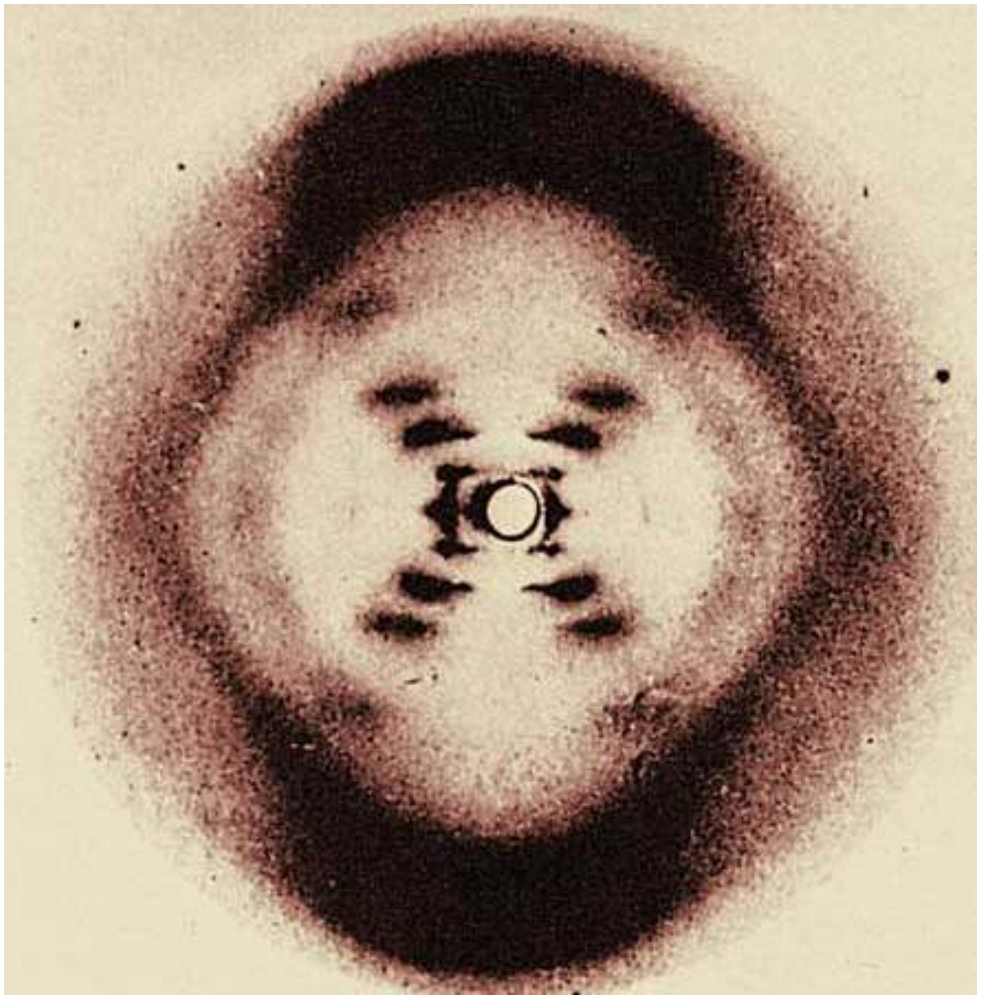
&

Guanine = Cytosine

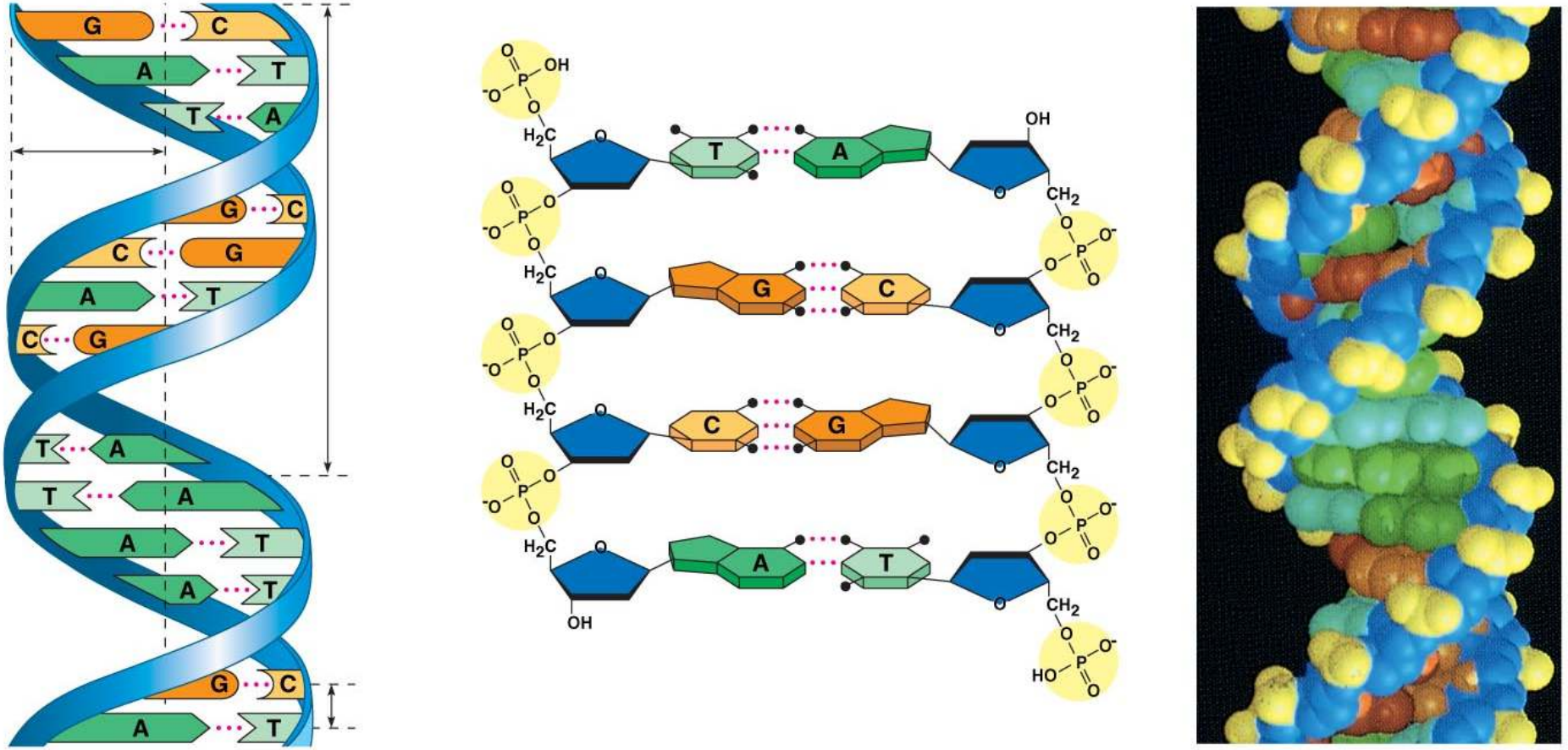
If you know the % composition of 1, you can find the % composition of the other 3.

Rosalind Franklin

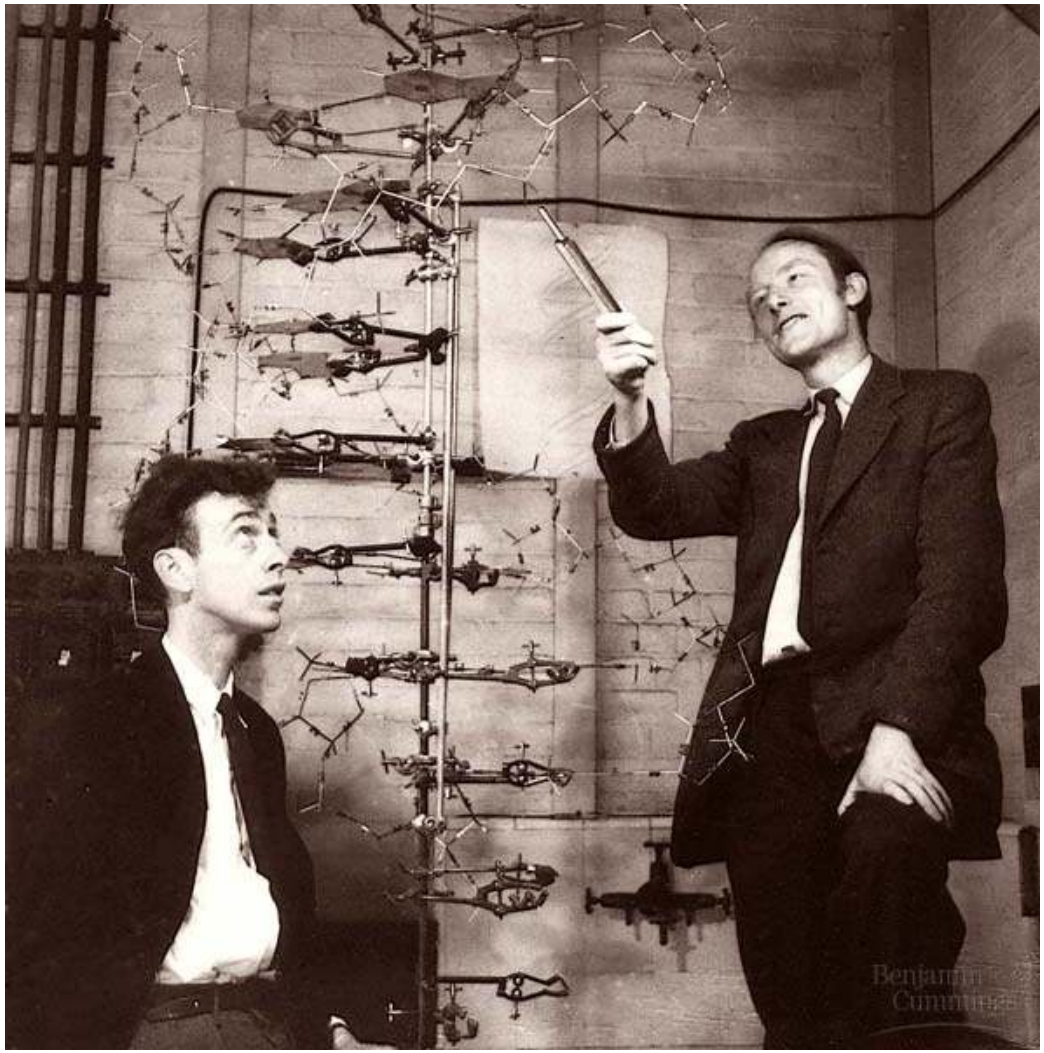
Franklin's X-ray crystallography of DNA molecule.



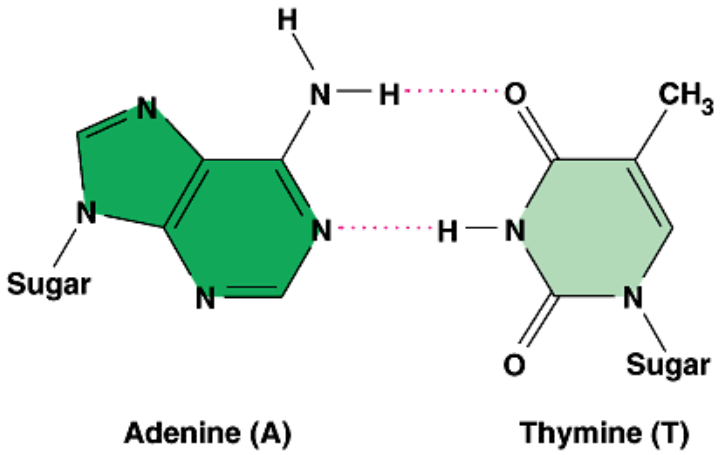
DNA from a side view



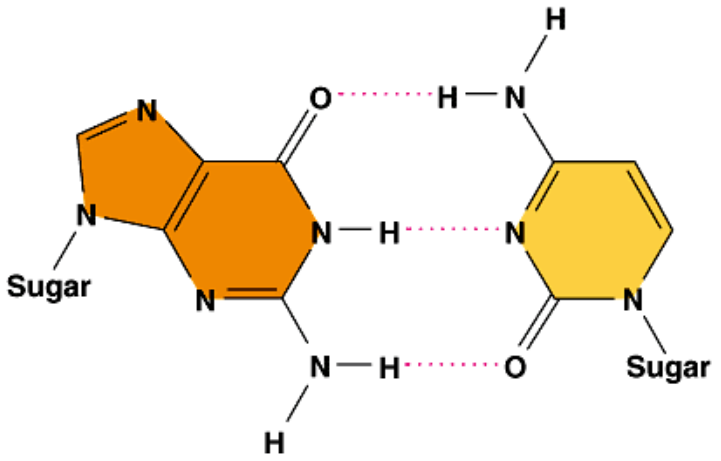
James Watson & Francis Crick with their DNA model



Base Pairing & Hydrogen bonding



Adenine (A) Thymine (T)



Guanine (G) Cytosine (C)

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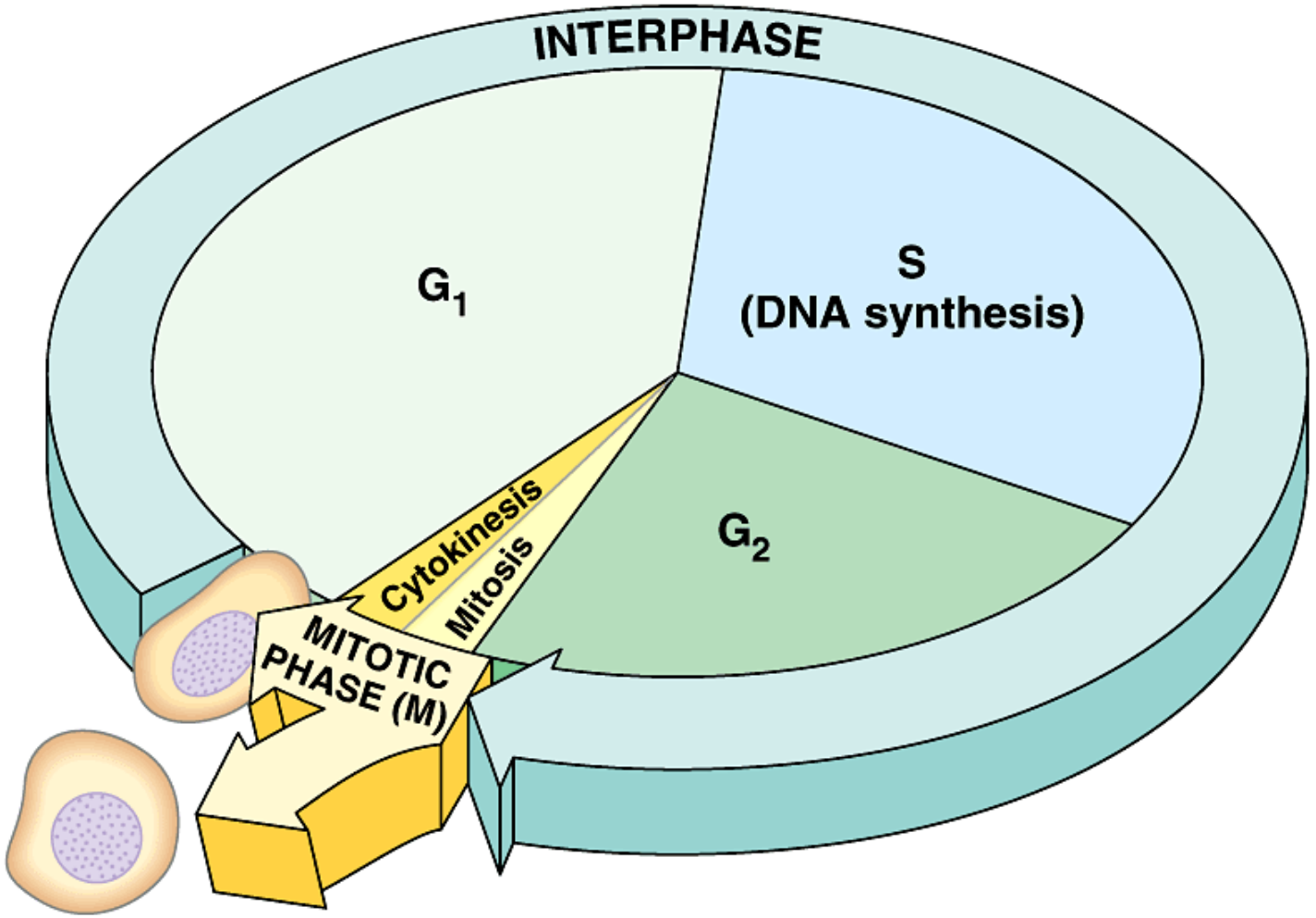
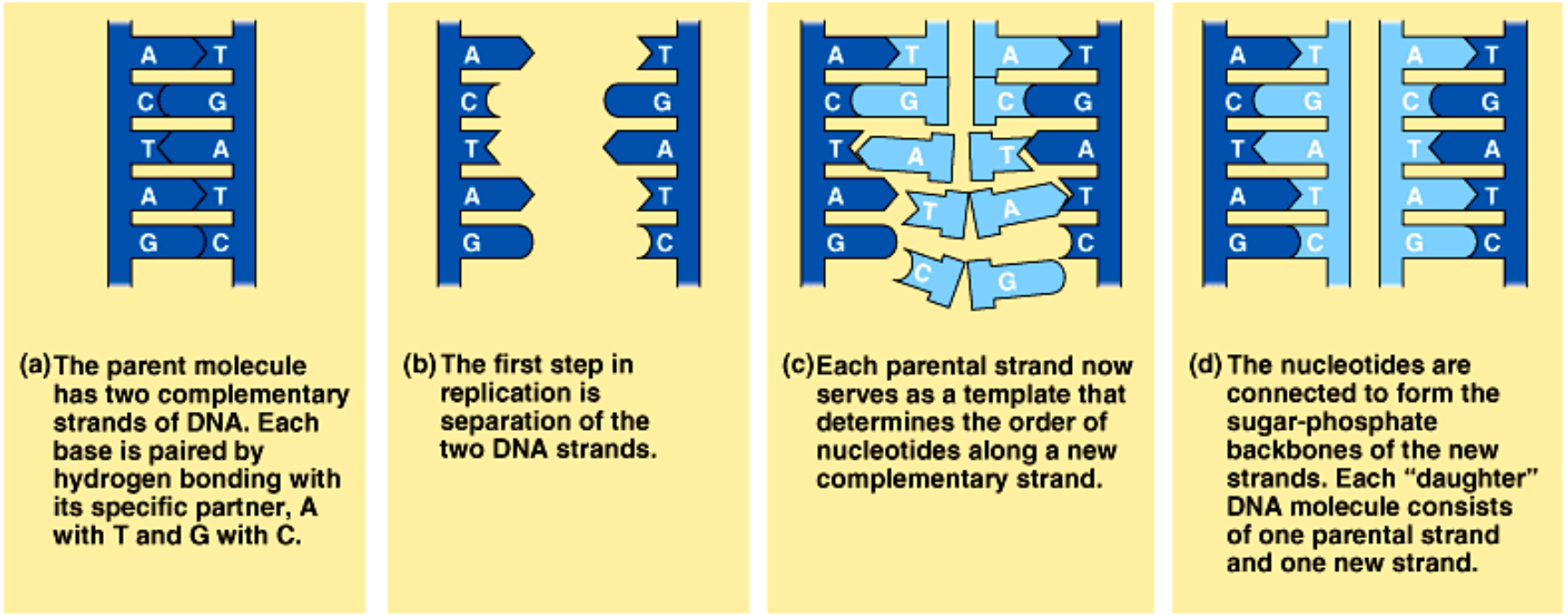
Part 2

S Phase of Cell Cycle

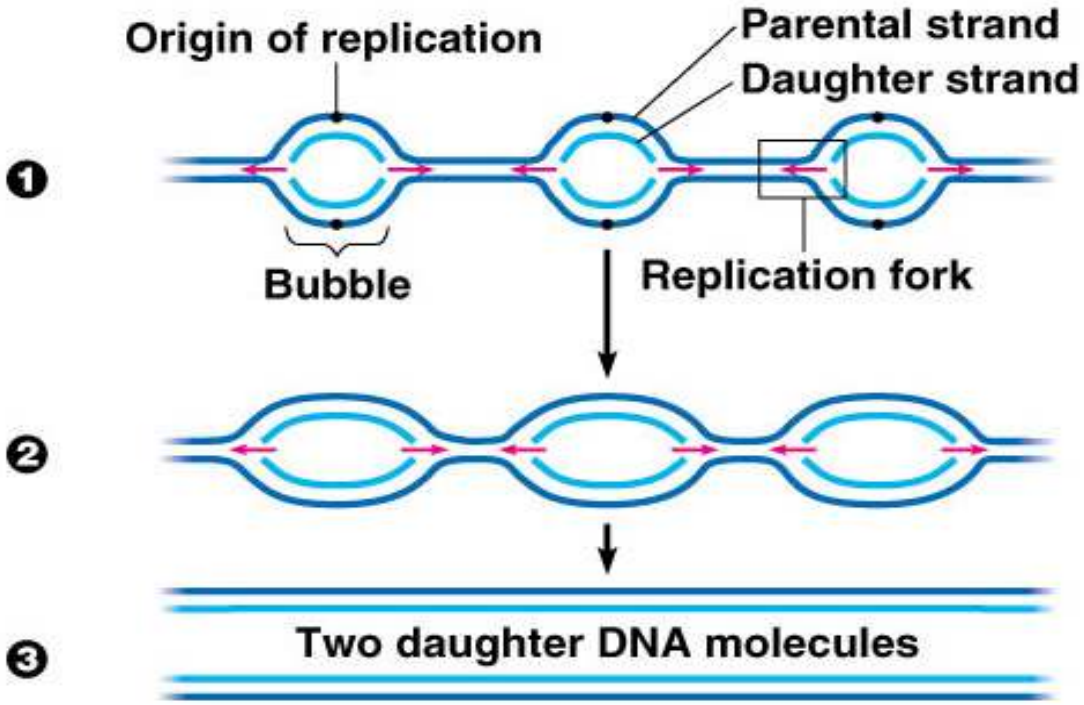


Complimentary base pairing

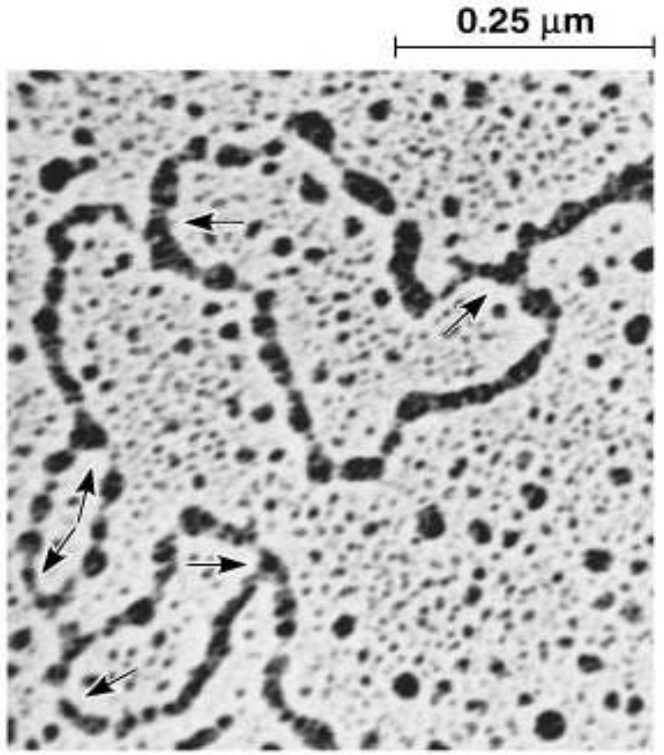
See how the dark blue strand is half ("semi") of the new strand?



Origins of Replication & Replication Bubbles

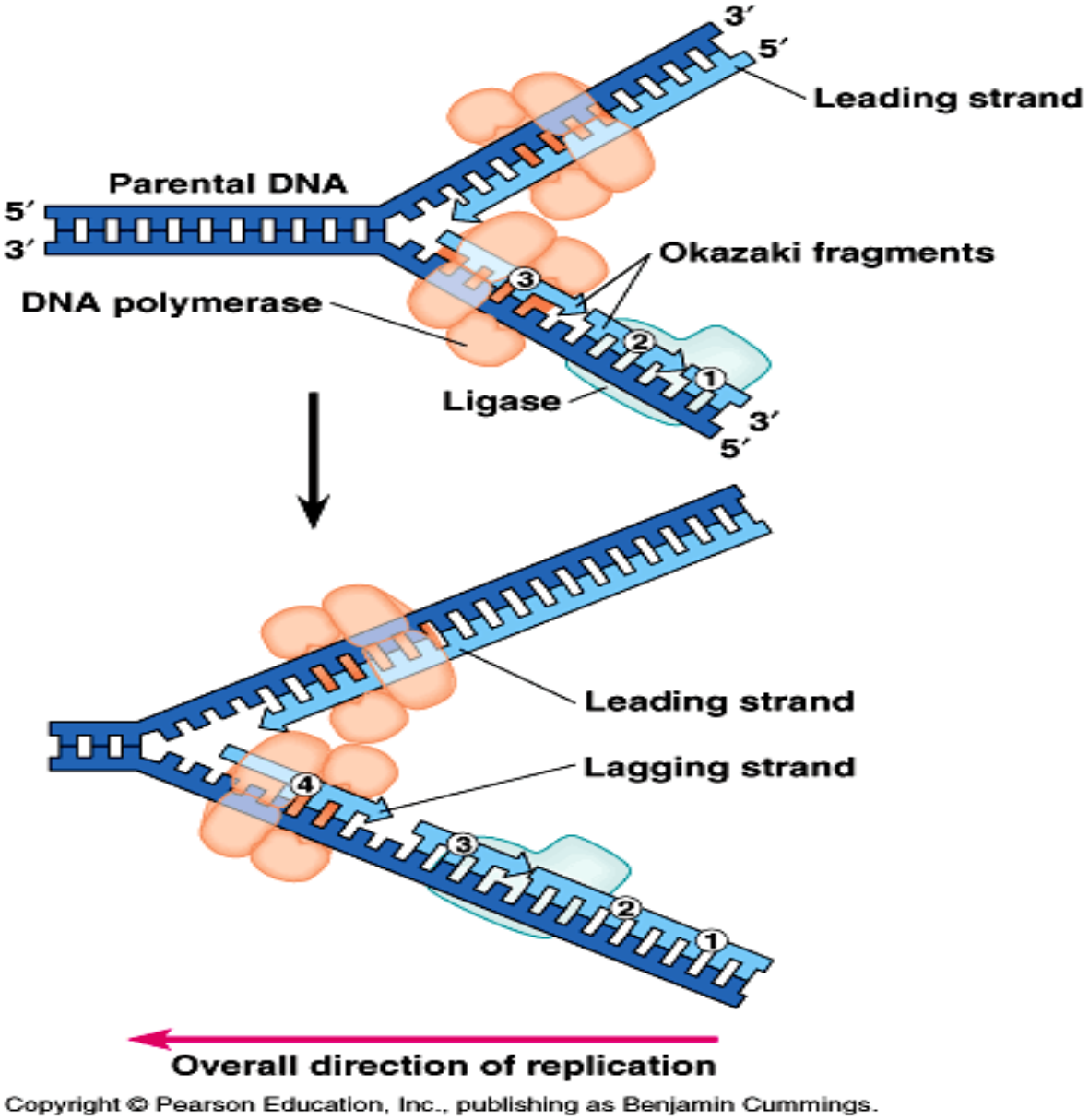


(a) In eukaryotes, DNA replication begins at many sites along the giant DNA molecule of each chromosome.

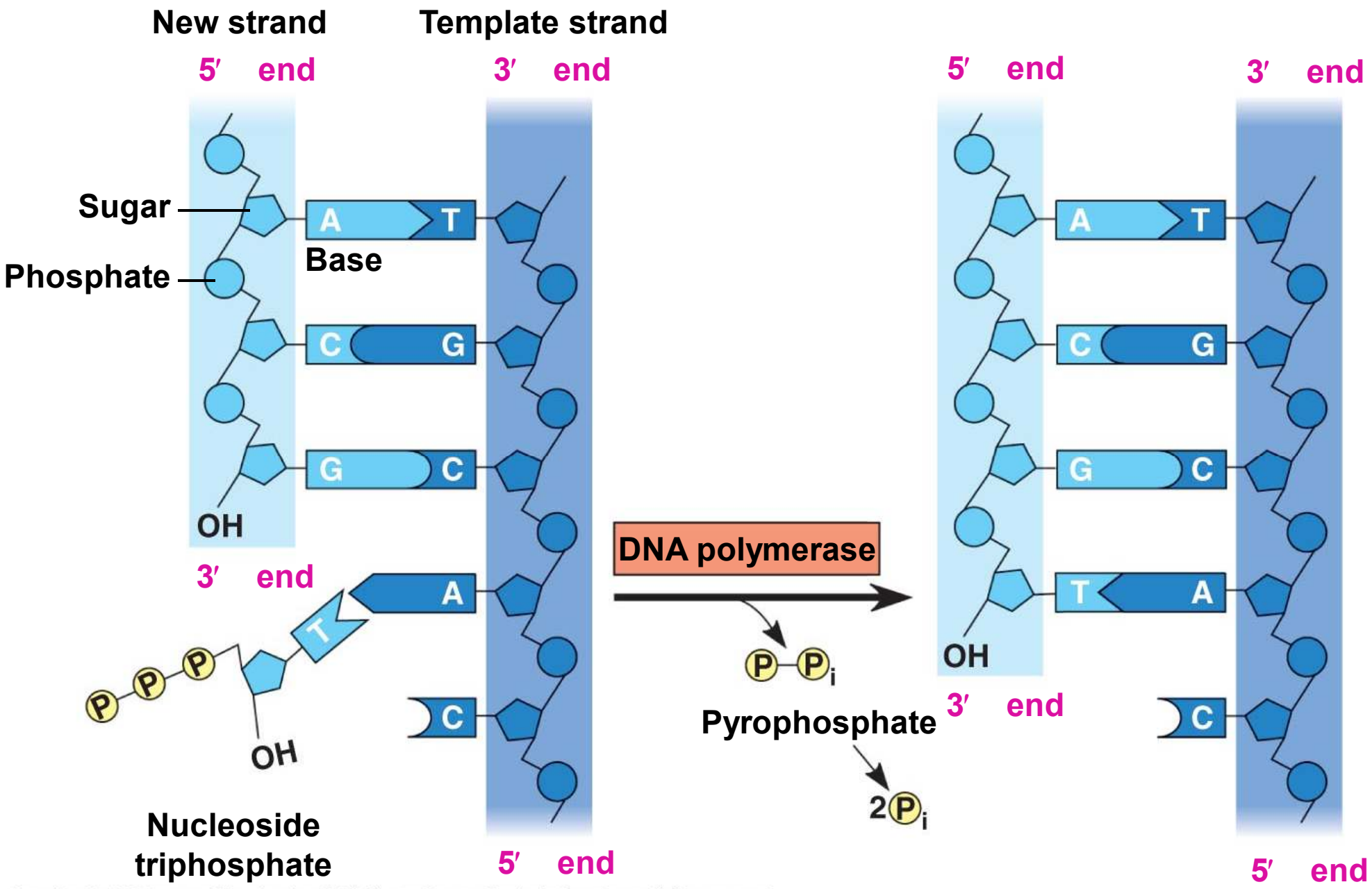


(b) In this micrograph, three replication bubbles are visible along the DNA of cultured Chinese hamster cells. The arrows indicate the direction of DNA replication at the two ends of each bubble (TEM).

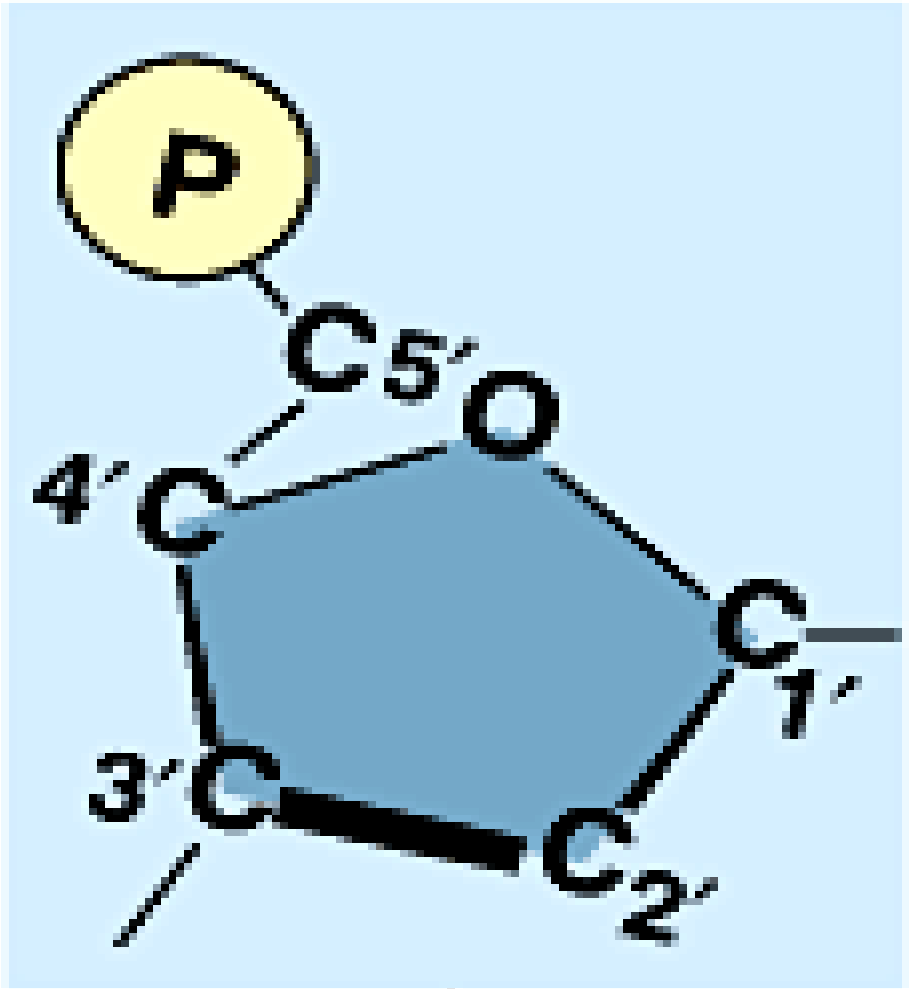
Elongation using DNA Polymerase III



DNA Replication by adding Nucleosides on the 3′ end

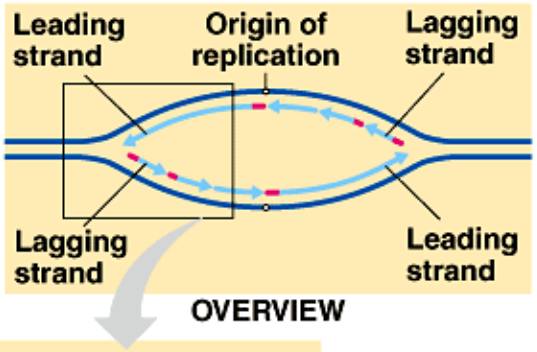


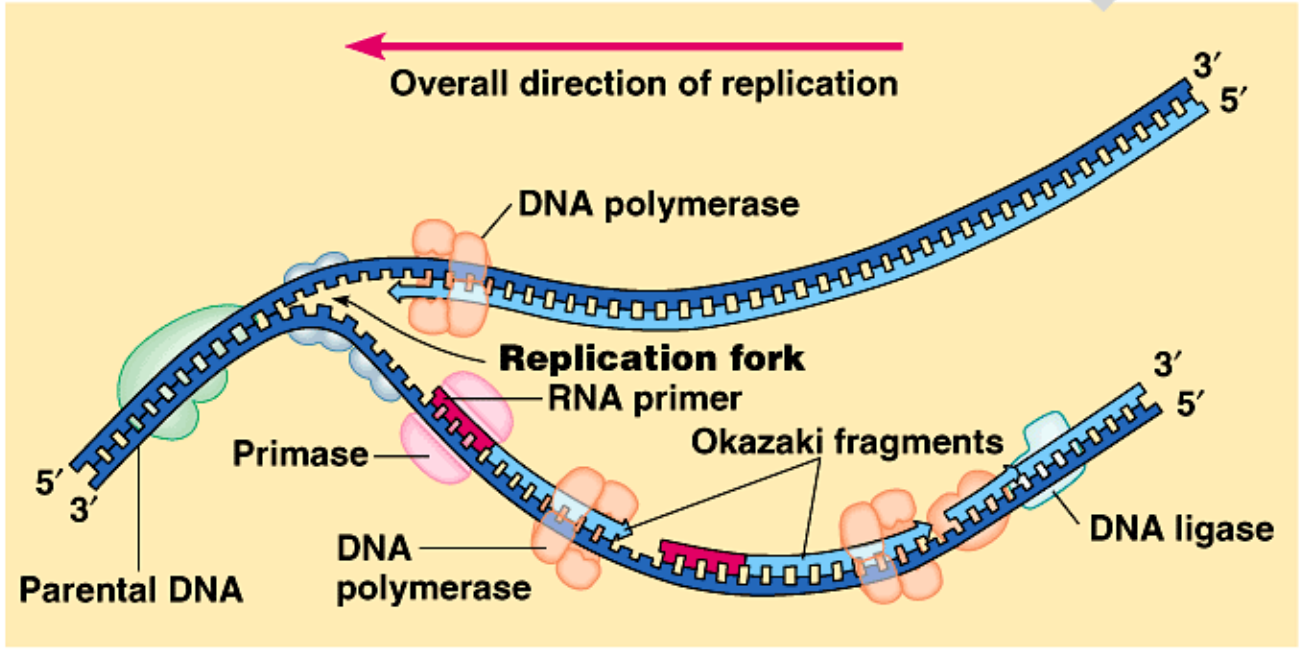
5 Carbon Sugar Important Parts (It could be DNA or RNA)



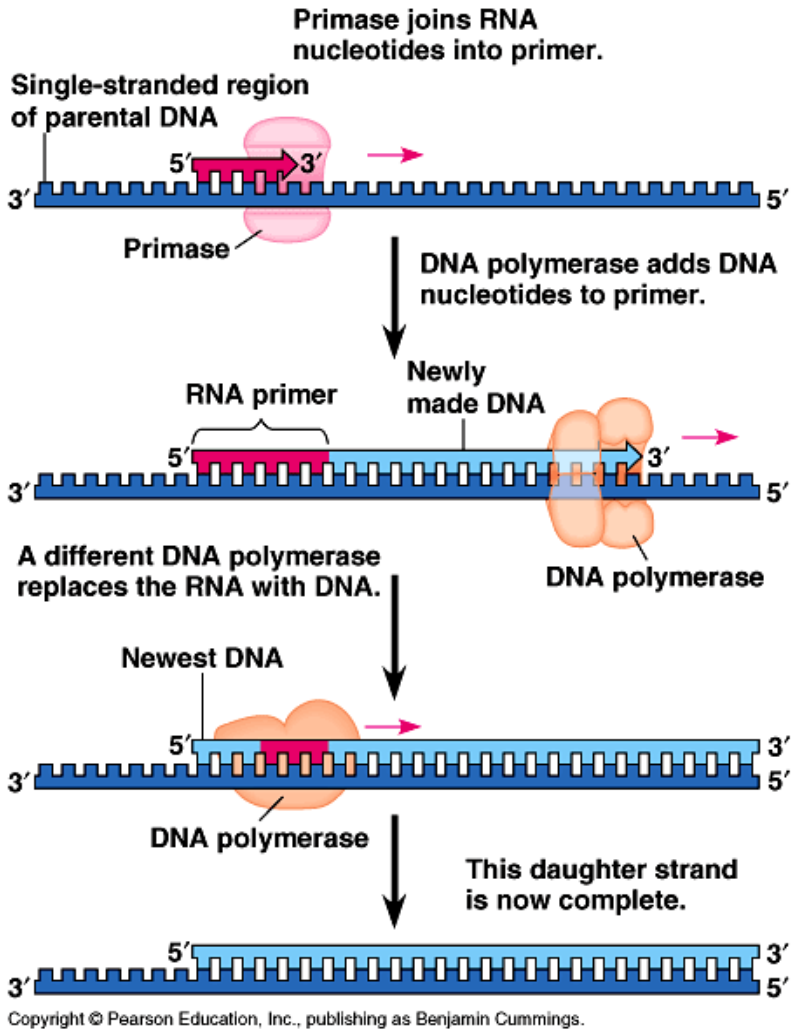
Lead strand(top) versus Lagging strand (bottom)

Helicase is the GREEN "blob"





RNA Primer (“starting point”)



Nucleotide Excision Repair