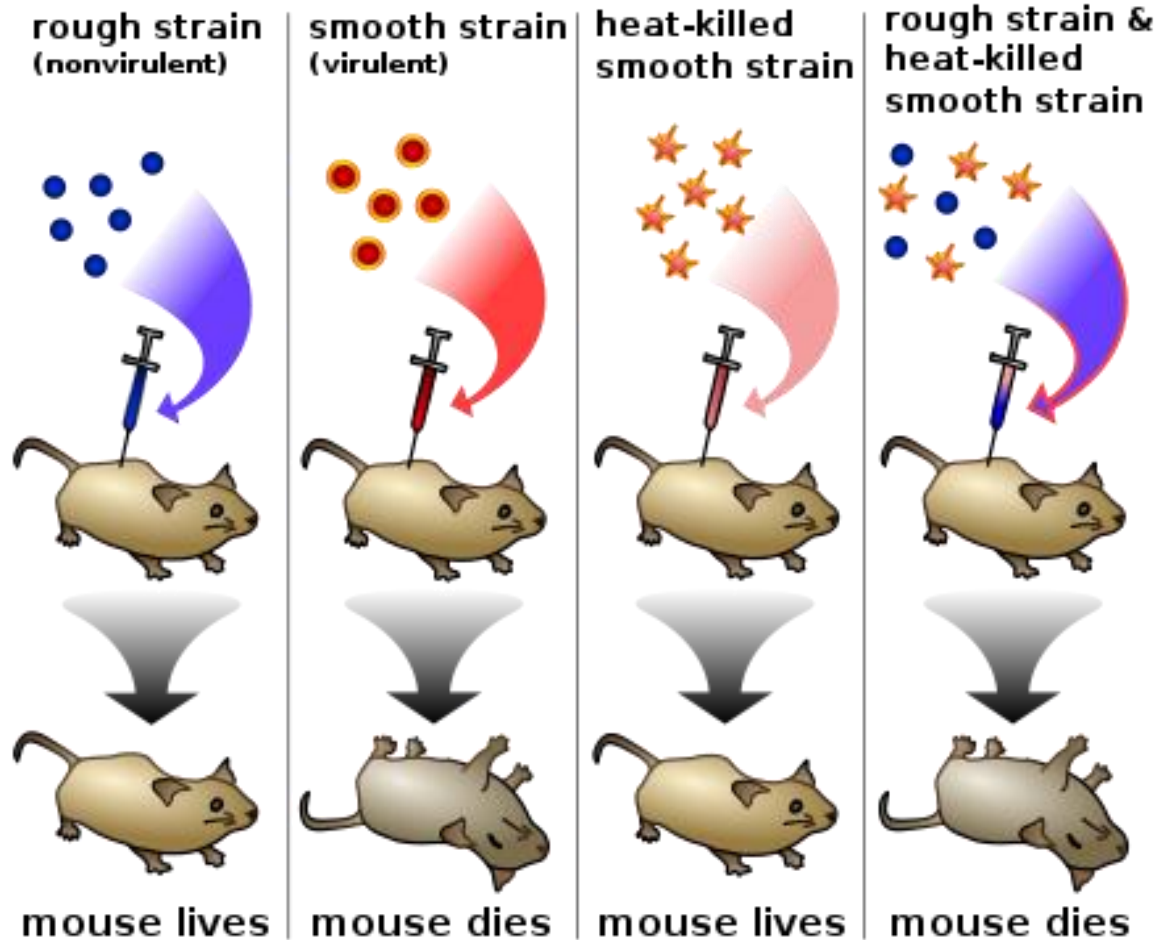


# DNA History & Structure



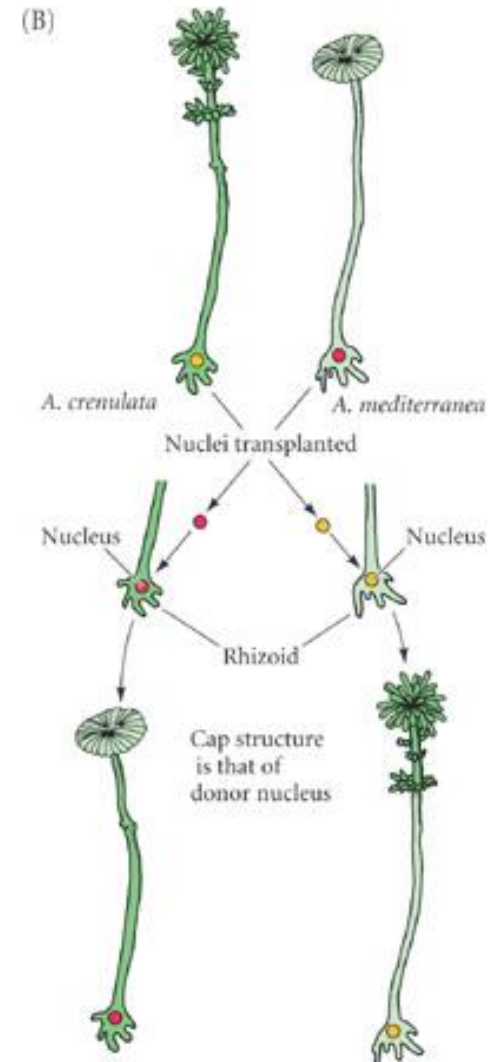
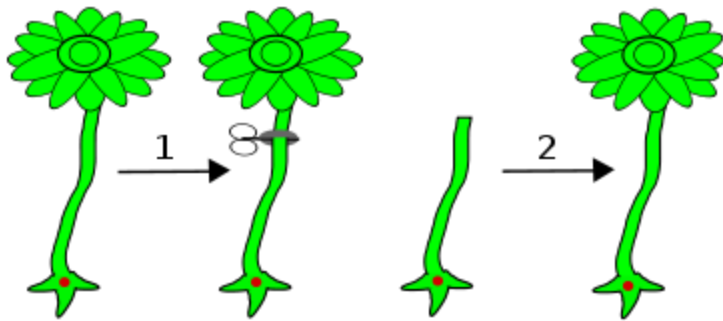
# Frederick Griffith (1928)

- Discovered process of transformation.



# Joachim Hammerling (1934)

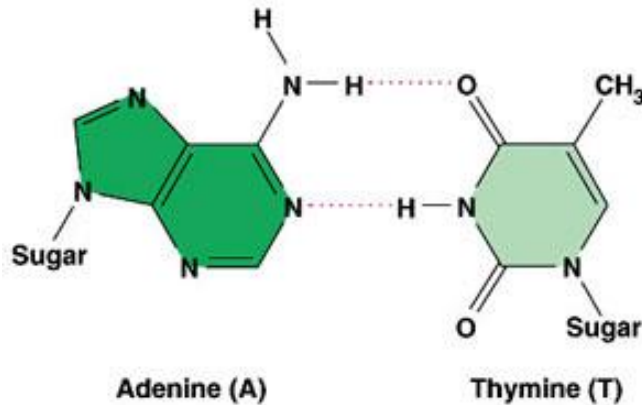
- Hypothesized hereditary information stored in nucleus.



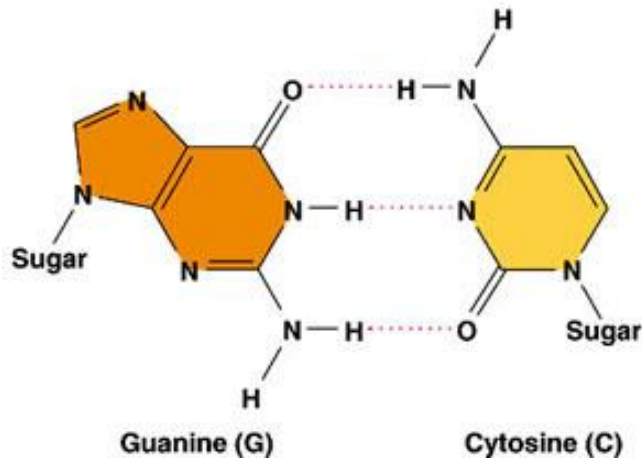
# Erwin Chargaff (1950)

- Discovered “complimentary base-pairing”:

– A α T

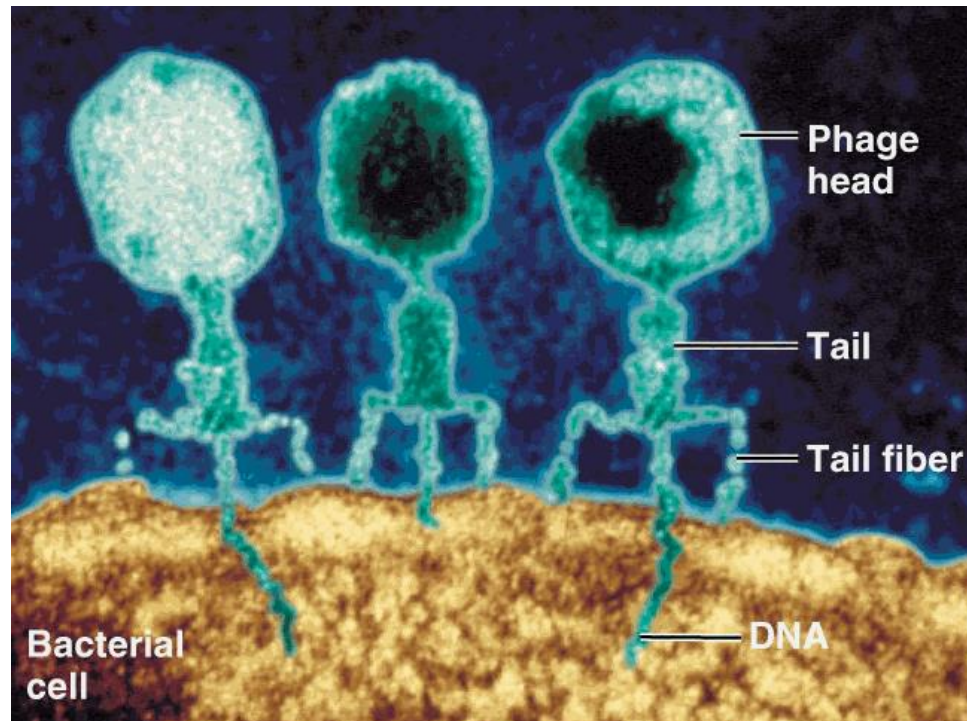


– G α C

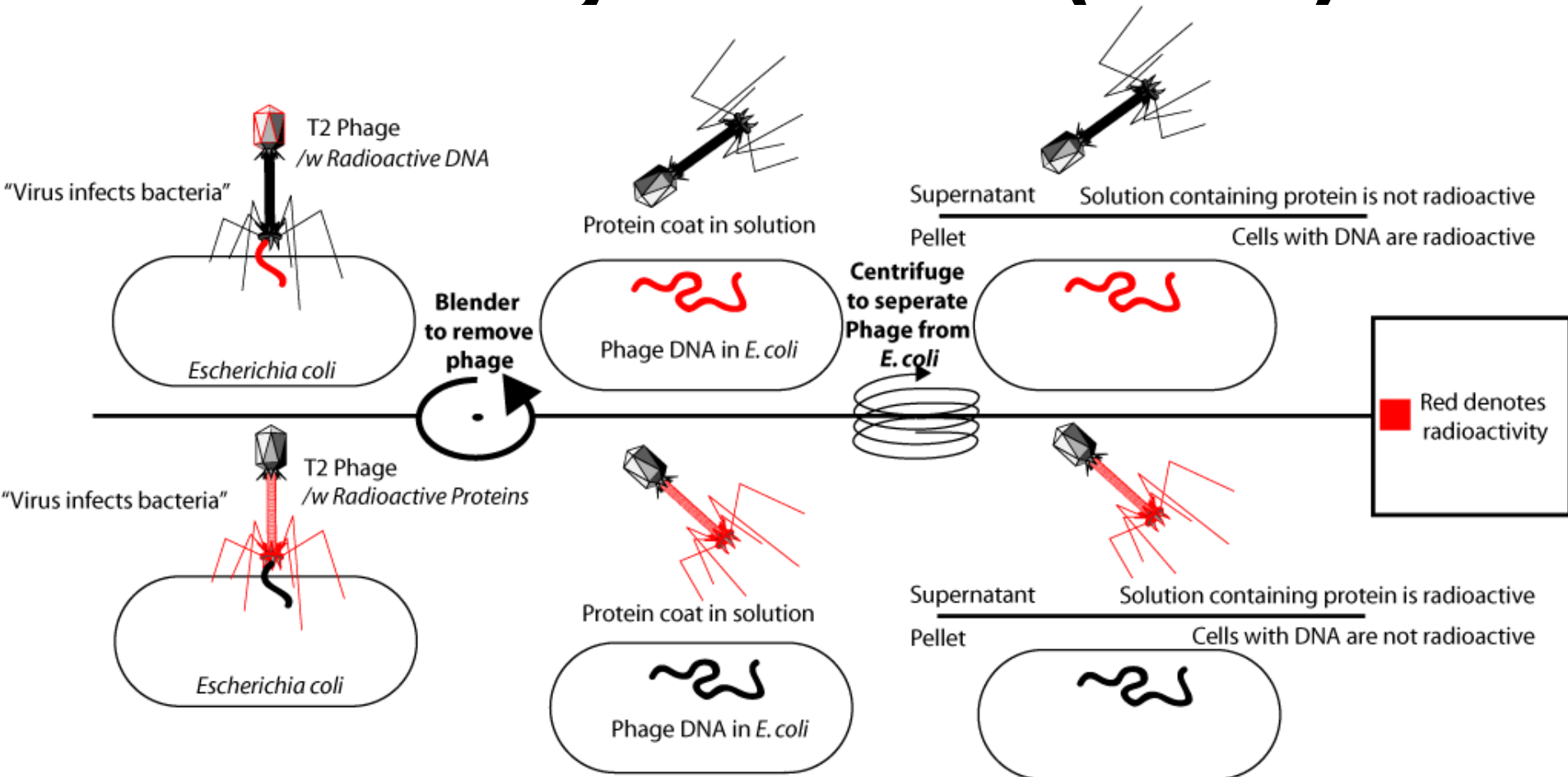


# Hershey & Chase (1952)

- Suggested that DNA is the hereditary material (not protein).

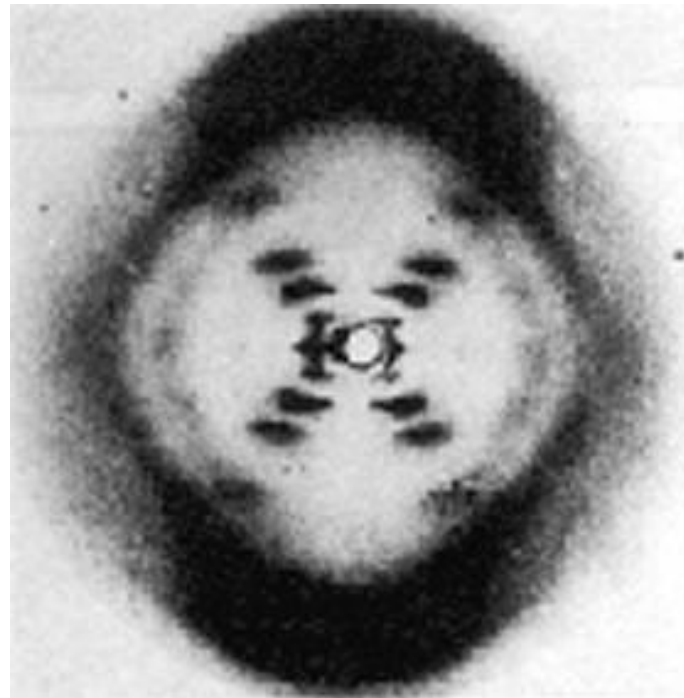


# Hershey & Chase (1952)



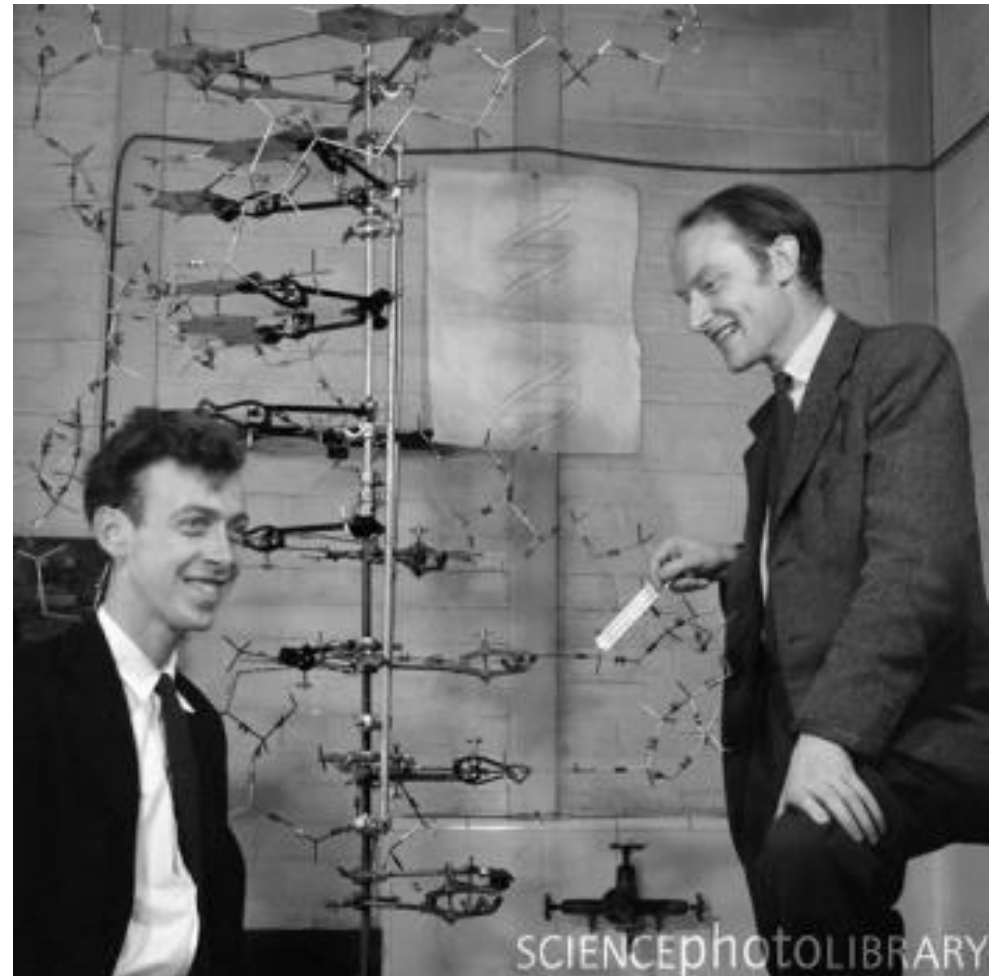
# Rosalind Franklin (1953)

- Using X-ray diffraction,
- Determined DNA was a double helix.



# Watson & Crick (1953)

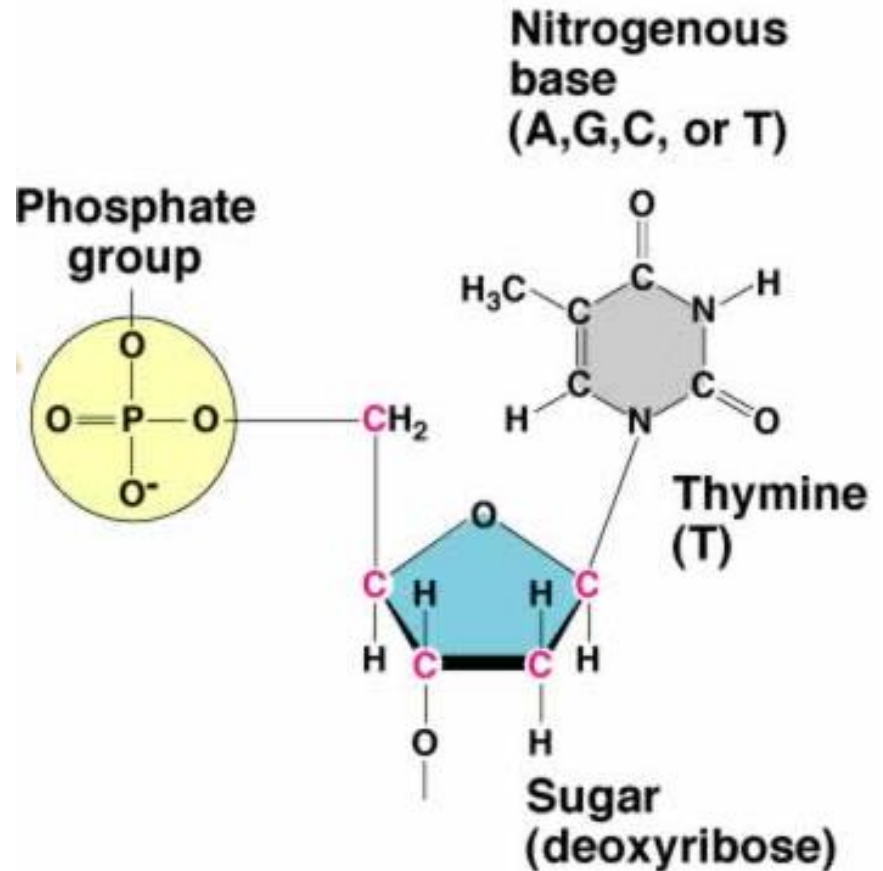
- Built the first model of DNA
- Determined how base pairs connected to form double helix





# DNA Structure

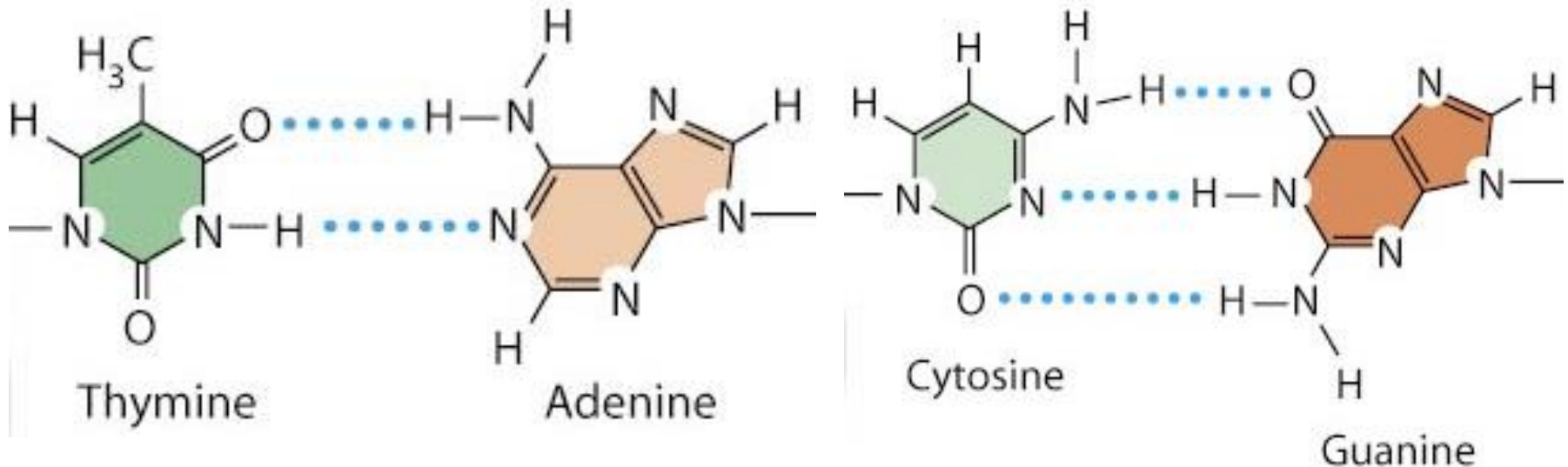
- Composed of nucleotides
  - Deoxyribose sugar
  - Phosphate group
  - Nitrogenous base
    - Adenine
    - Thymine
    - Cytosine
    - Guanine



# Chargaff's Rule

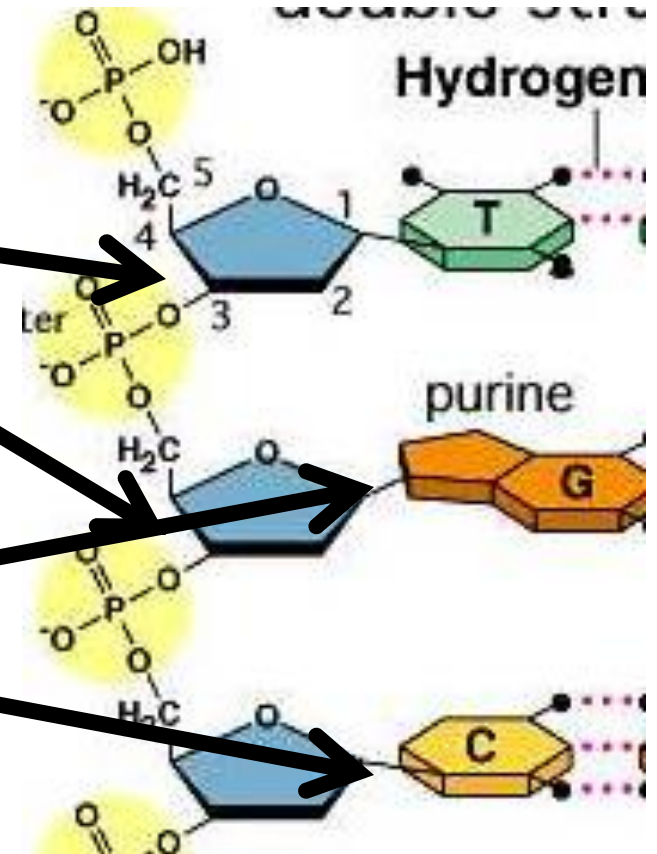
- Adenine 2 H-bonds Thymine.
- Cytosine 3 H-bonds Guanine.

**Held together by hydrogen bonds**

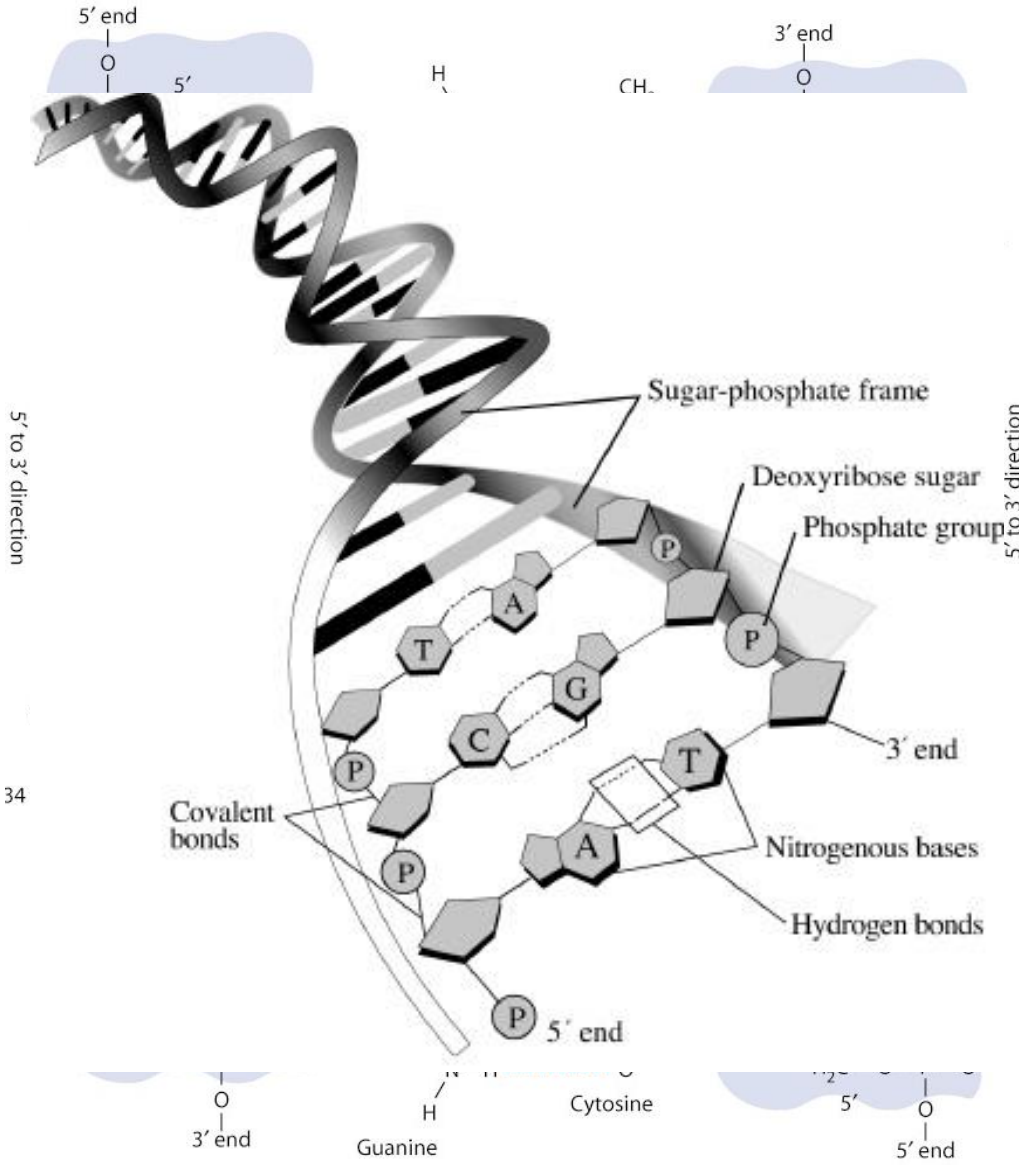


# DNA Bonding

- **Phosphodiester** bond joins sugar and phosphate group.
  - Sugar-phosphate backbone
- **Glycosidic** bond joins nitrogenous base to sugar.



# DNA Structure



- Antiparallel strands.
  - Running in opposite directions
  - **5' end aligns with 3' end**
- Arranged as a double helix.

WATCH THIS!!!

# DNA Structure

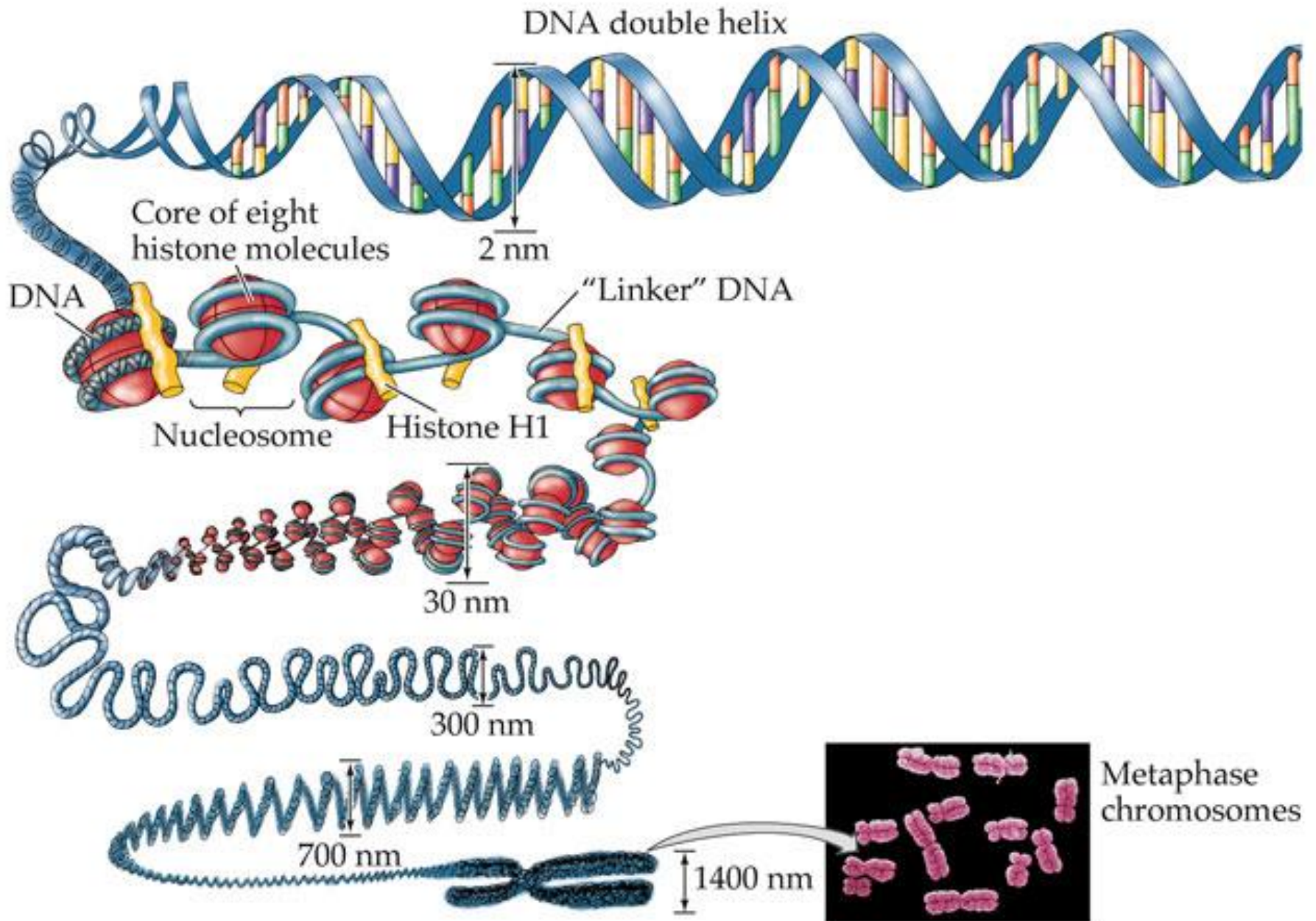
- If you know the sequence of one strand, you can find the sequence of the complementary strand:

5' – ATGCCGTA – 3'

3' – TACGGCAT – 5'

5' – GCATCGTTA – 3'

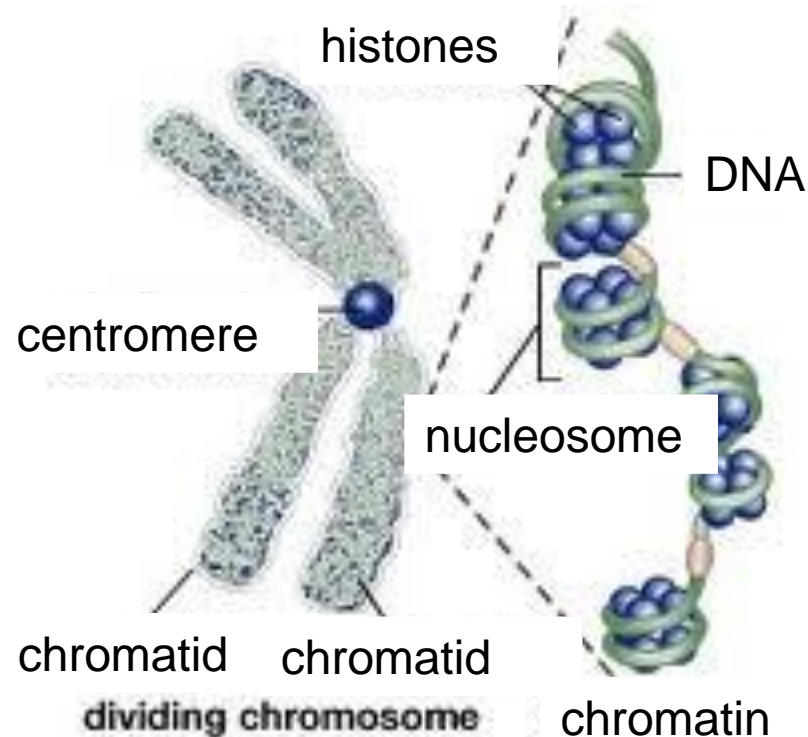
3' – CGTAGCAAT – 5'



LIFE: THE SCIENCE OF BIOLOGY, Seventh Edition, Figure 9.6 DNA Packs into a Mitotic Chromosome  
 © 2004 Sinauer Associates, Inc. and W. H. Freeman & Co.

# Terminology: DNA Packaging

- **Histone**: structural proteins
- **Nucleosome**: section of DNA wrapped around histones
- **Chromatin**: DNA + structural proteins
- **Chromatid**: when a chromosome duplicates there are 2 chromatids
- **Centromere**: holds chromatids together
- **Chromosome**: highly condensed chromatin



- A **GENE** is a segment of DNA that codes for a particular trait.

