

Molecular Basis of Inheritance

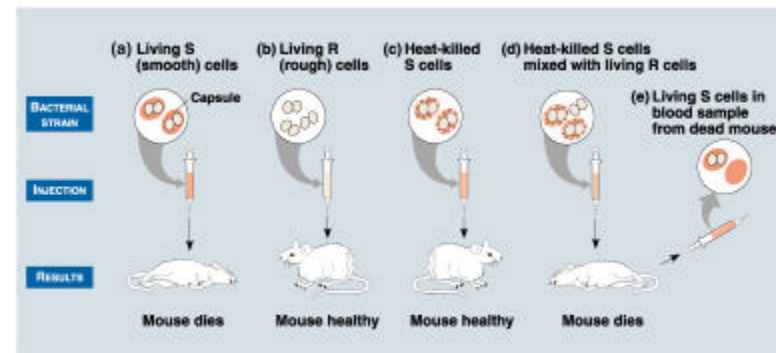
Chapter 16

Objectives

- Understand how the structure of DNA was determined
- Understand the role of DNA in the cell and in inheritance

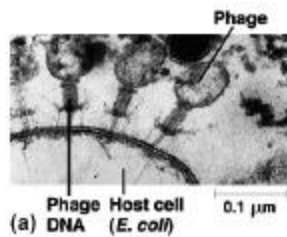
Categorizing the Role

- The function of DNA was first described from tests utilizing microbe and viruses
- Frederick Griffith (1928)
- First to describe **Transformation**: change in genetic and physical composition as a result of assimilation of external DNA

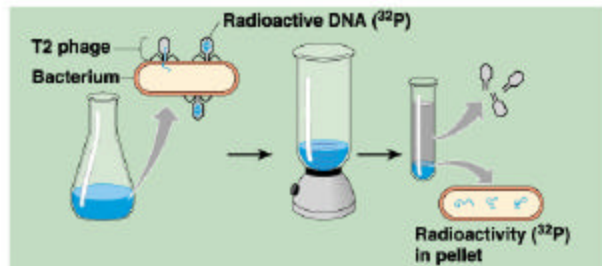


- Oswald Avery, Maclyn McCarty, and Colin MacLoed announce that DNA was the transformation agent (1944)

More Evidence



Mix radioactively labeled phage with bacteria. The phage infects the bacterial cells.
Agitate in a blender to separate phage outside the bacteria from the cells and their contents.
Centrifuge and measure the radioactivity in the pellet and supernatant.



(b)

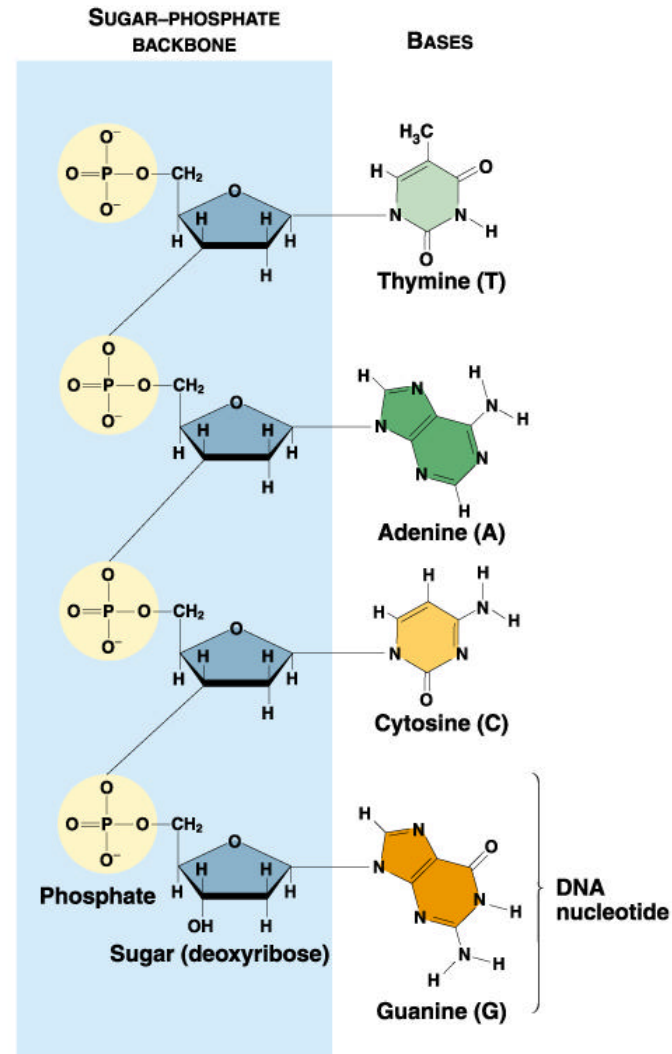
- Alfred Hershey and Martha Chase perform bacteriophage experiments that showed that DNA was injected by Viruses into bacteria (1952)
 - Used radioactivity of S and P

Just one more

- Erwin Chargoff determined that the DNA composition varied from species to species
- Also noted that the ratio of A to that of T and G to that of C were approximately equal (1947)

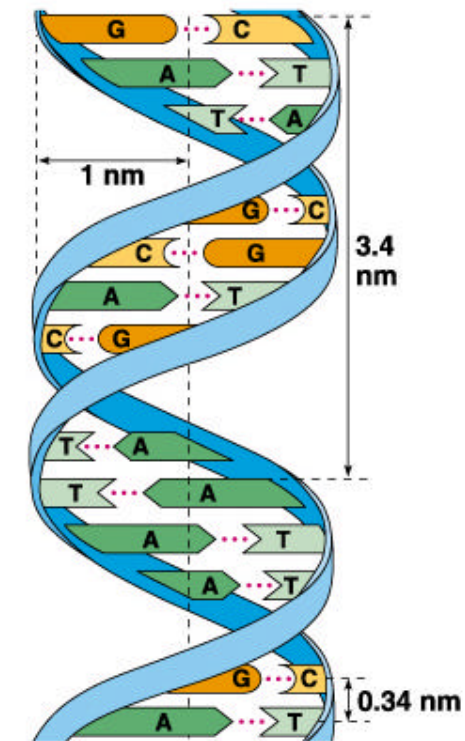
Determining The Structure

- DNA is a nucleotide polymer with covalent bonds between the sugar and Phosphate groups



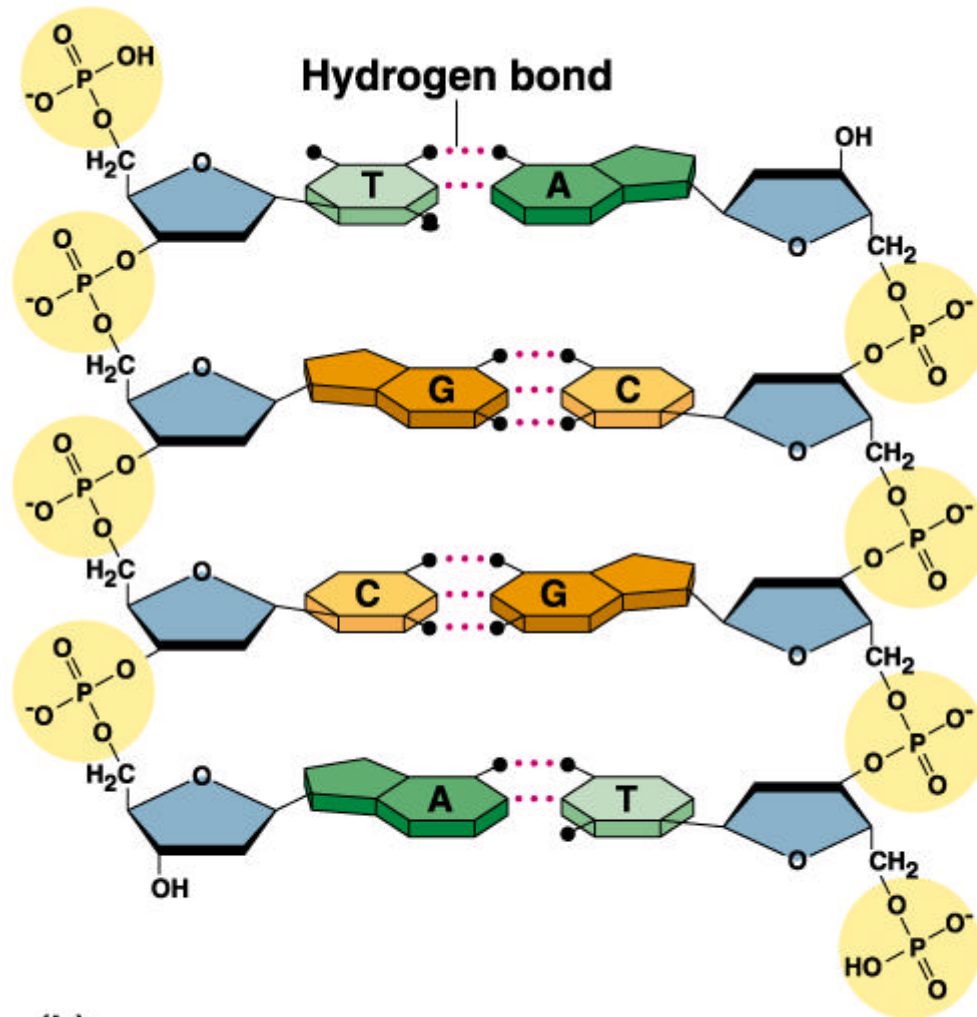
DNA is a Helix

- The three dimensional structure of DNA was first determined with the assistance of X-ray crystallography
- James Watson and Francis Crick described it as a double helix (1953)



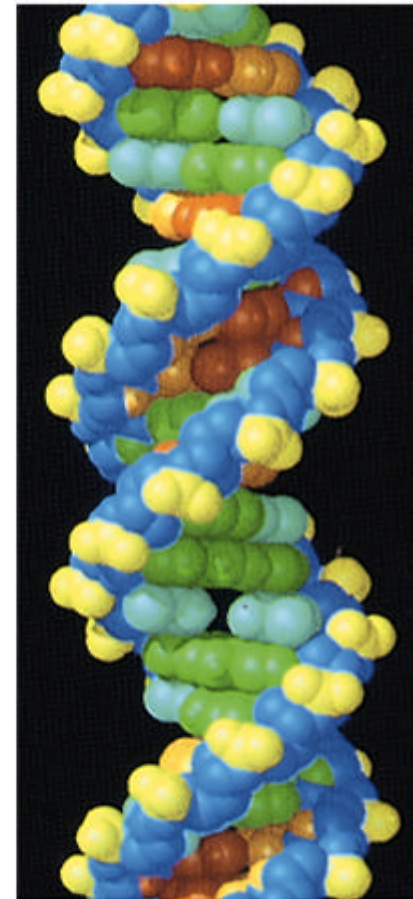
(a)

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(b)

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