12.1 DNA: The Genetic Material

1. Skim through pp. 326-331, plus p. 350
2. Determine what each of the following scientists worked on
3. Record the contribution of each to our knowledge of DNA and put their discoveries in chronological order

Avery Chargaff Griffith
Hershey-Chase Watson-Crick
Wilkins-Franklin

GRIFFITH--1928

Worked with pneumonia and mice

smooth bacteria--->pneumonia--->killed mice
rough bacteria--->no pneumonia--->mice lived
dead smooth--->no pneumonia--->mice lived
rough (live) + smooth (dead)---> --->killed mice

Bacterial Transformation

AVERY--1944

Separated the components of the bacteria from dead S cells: DNA, proteins, lipids

Found that only the injected DNA was able to kill the mice

Therefore, DNA is the important genetic material

HERSHEY and CHASE--1952

Used radioactive labeling to track viral DNA (P-32) and protein (S-35) injected into bacteria

Results:

Phages labeled with P-32 'injected' DNA into bacteria

Phages labeled with S-35 left the protein outside the bacteria

CHARGAFF--1950's

Determined that the ratios of DNA were fixed:

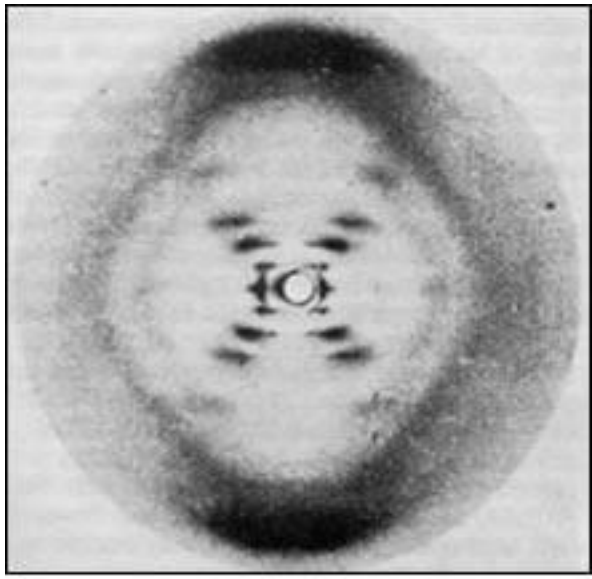
A=T and G=C

WILKINS and FRANKLIN--1952

Used X-ray diffraction to photograph crystalline DNA

Franklin took the decisive photograph (#51) of the double helix

Wilkins received the Nobel Prize



Franklin's X-ray photograph shows DNA's 'B'-form (1952)

WATSON and CRICK--1953

Determined the structure of the DNA molecule to be a double helix using models

Won the Nobel Prize in Physiology and Medicine in 1962