Characteristics of DNA
Week 2

DNA Composition

- 4 different nukleotides (A, T, C, G)
- Each nucleotide comprises of a phosphate, a sugar, and a base
- The sugar molecule in the DNA is deoxyribose (Ribose in RNA)
- Uracil is replaced with thymine in RNA

DNA Composition

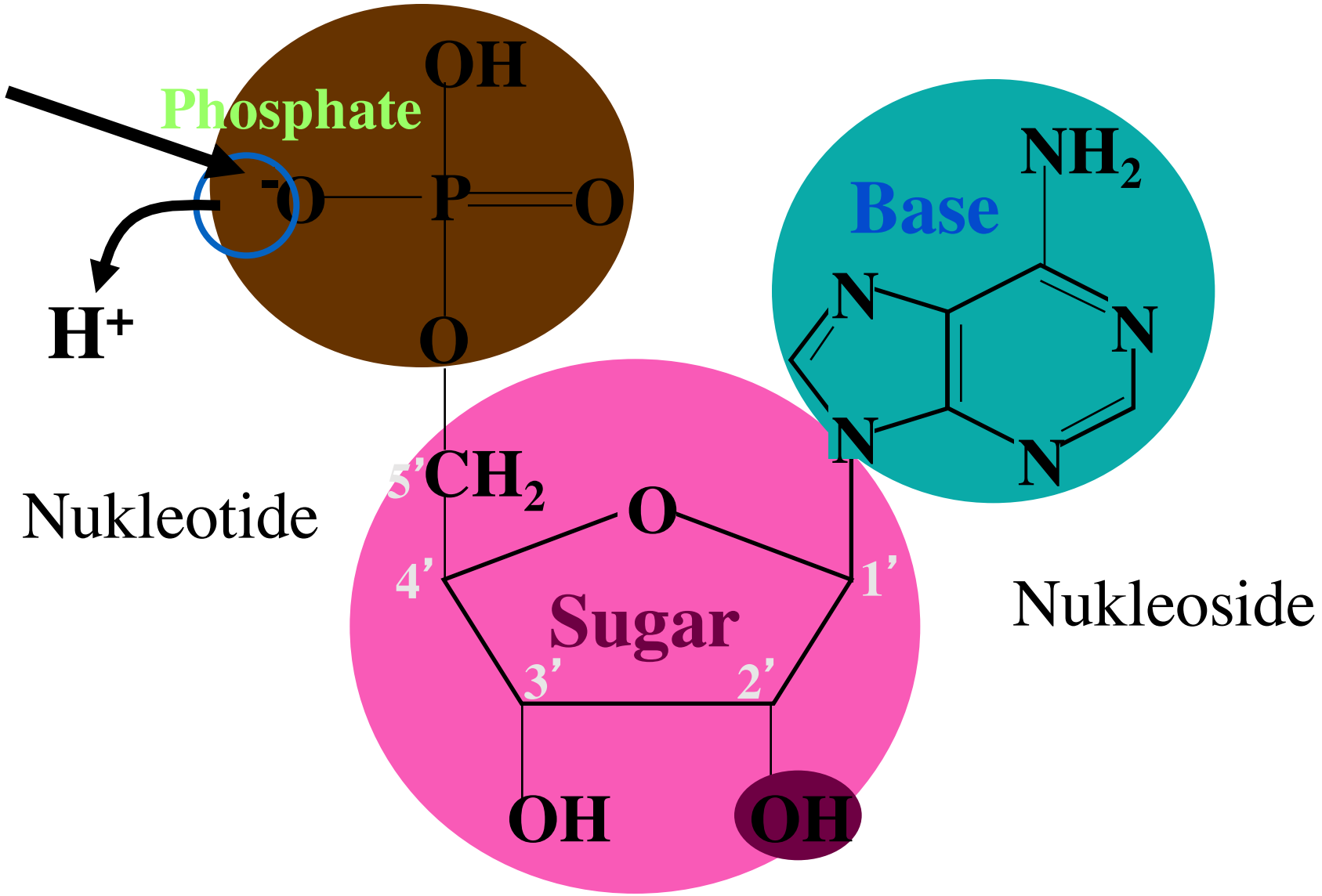
- A & G purines
- C & T pirimidines
- [purines] = [pirimidines]
- [A] = [T] ; [C] = [G]
- A/T base pairs contains 2 hydrogen bonds
- C/G base pairs contains 3 hydrogen bonds

Structure of DNA

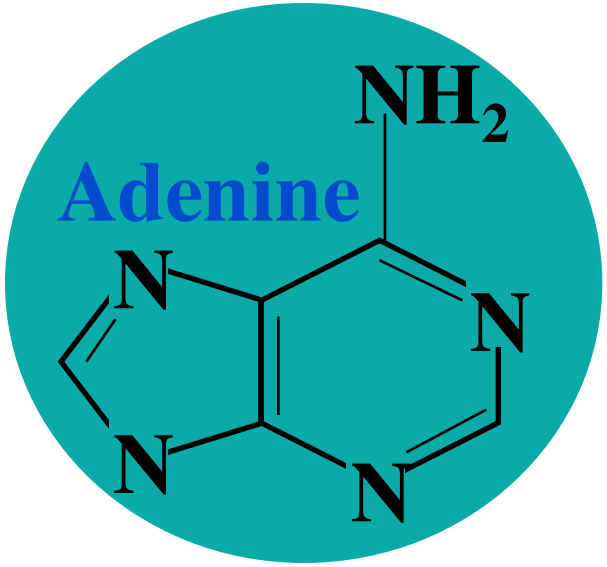
- Double-stranded helicoidal structure
- Strands are in opposite direction and antiparallel to each other
- Complementary strands are bounded with hydrogen bonds to each other
- Strands have complementary sequences

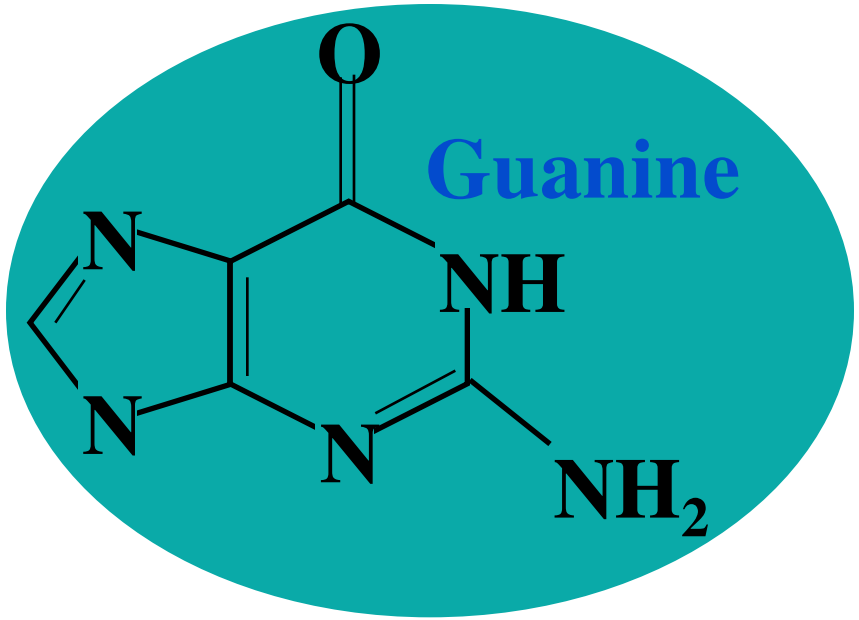
Structure of an Nucleotide

Adenosine Mono Phosphate (AMP)

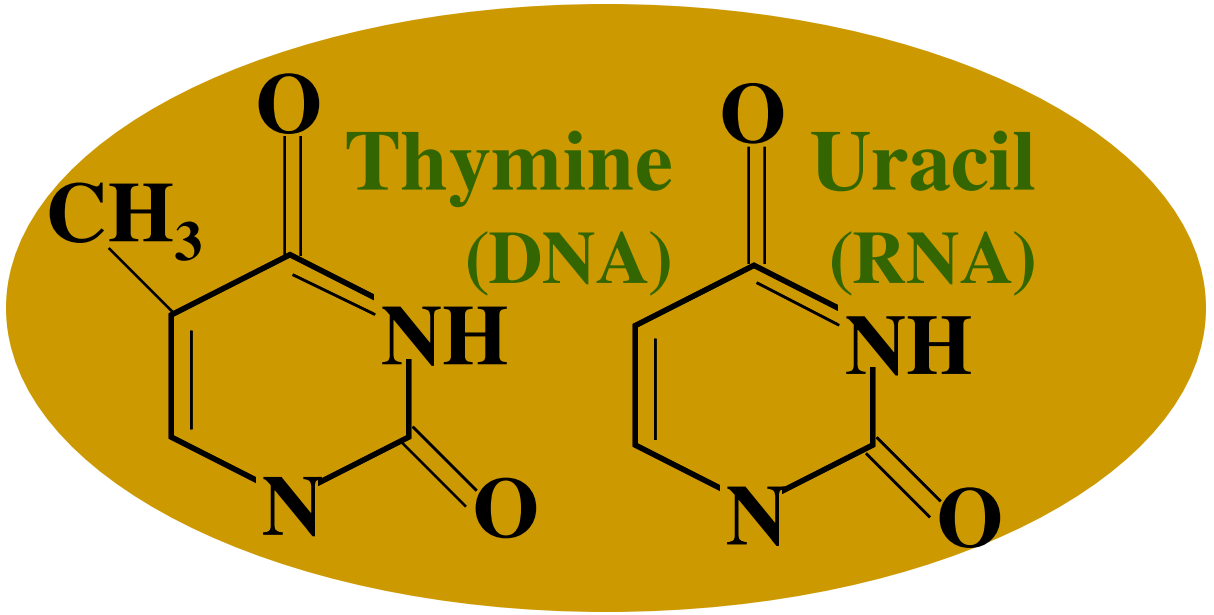


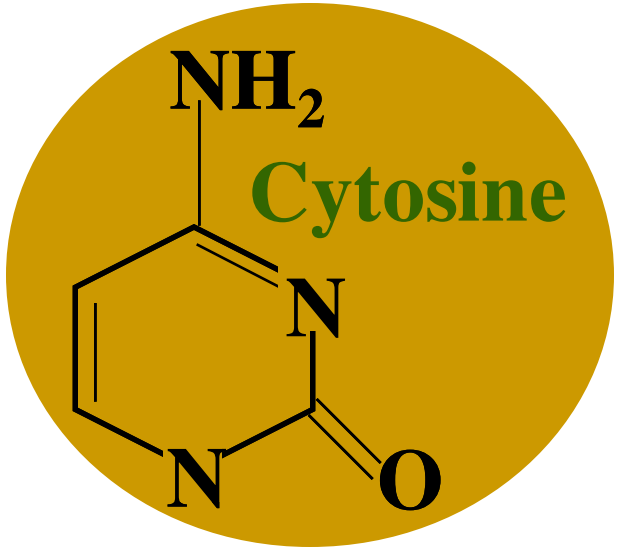
Purines





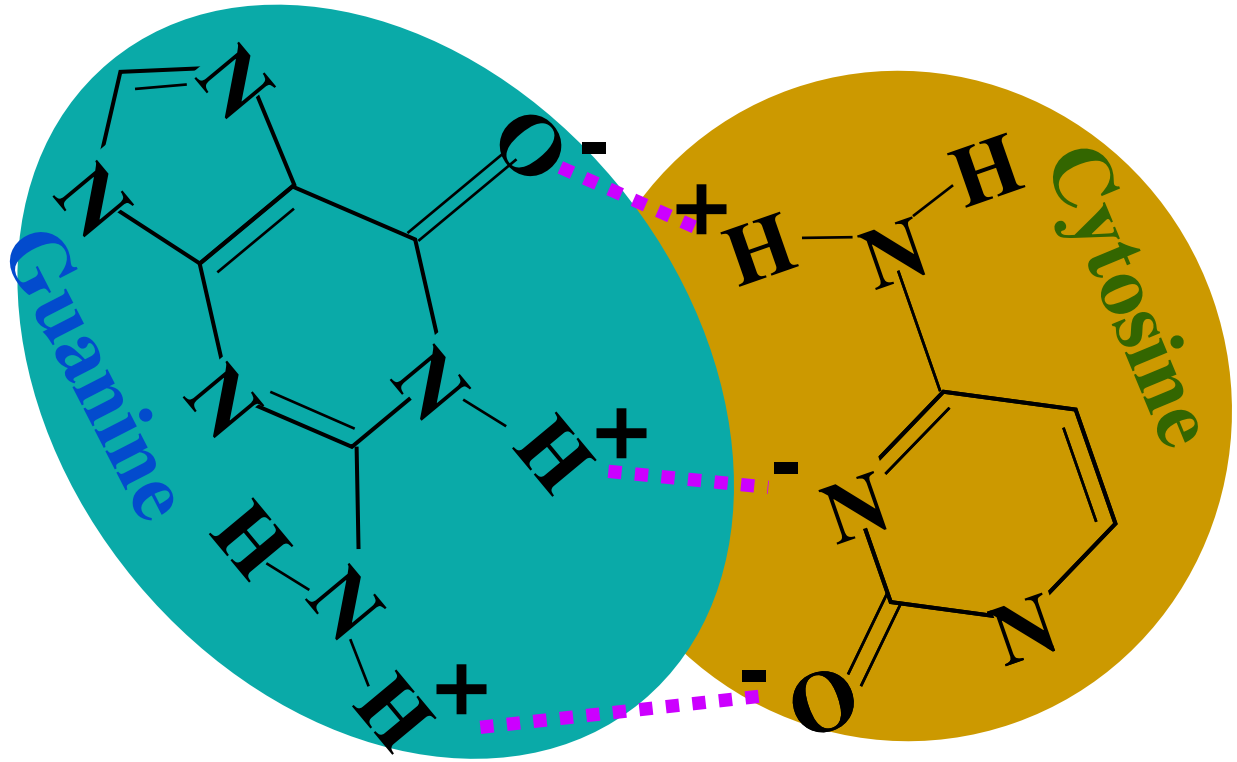
Pirimidines





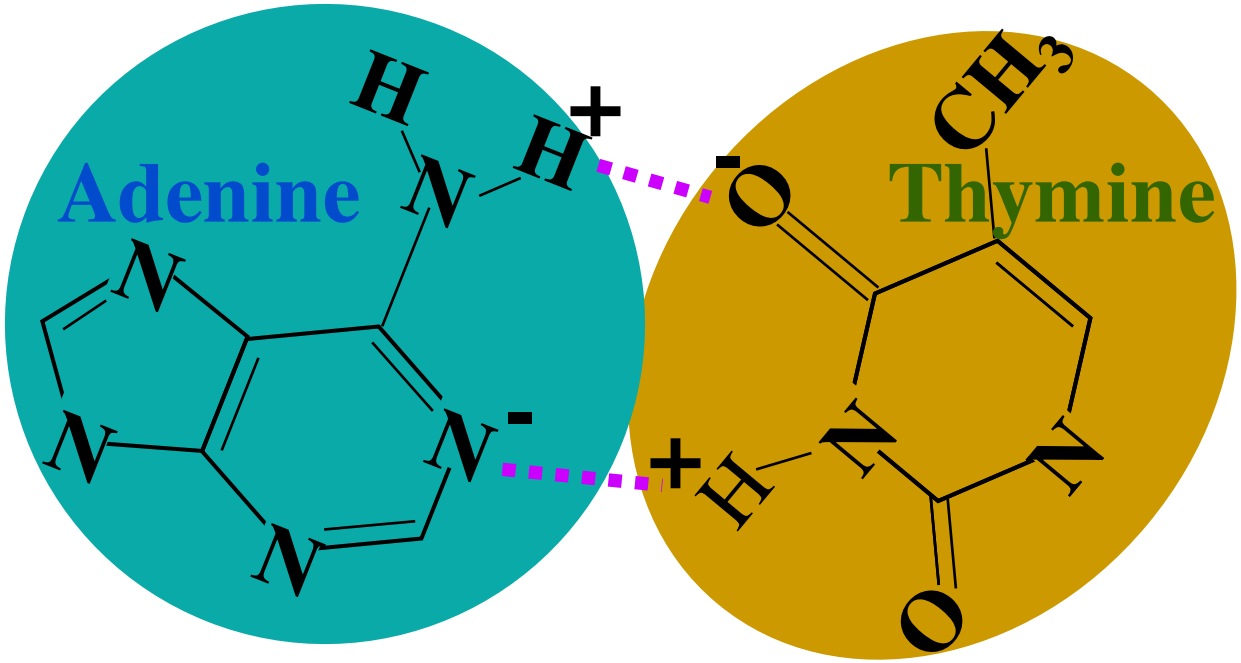
Base Pairs

Guanine and Cytosine



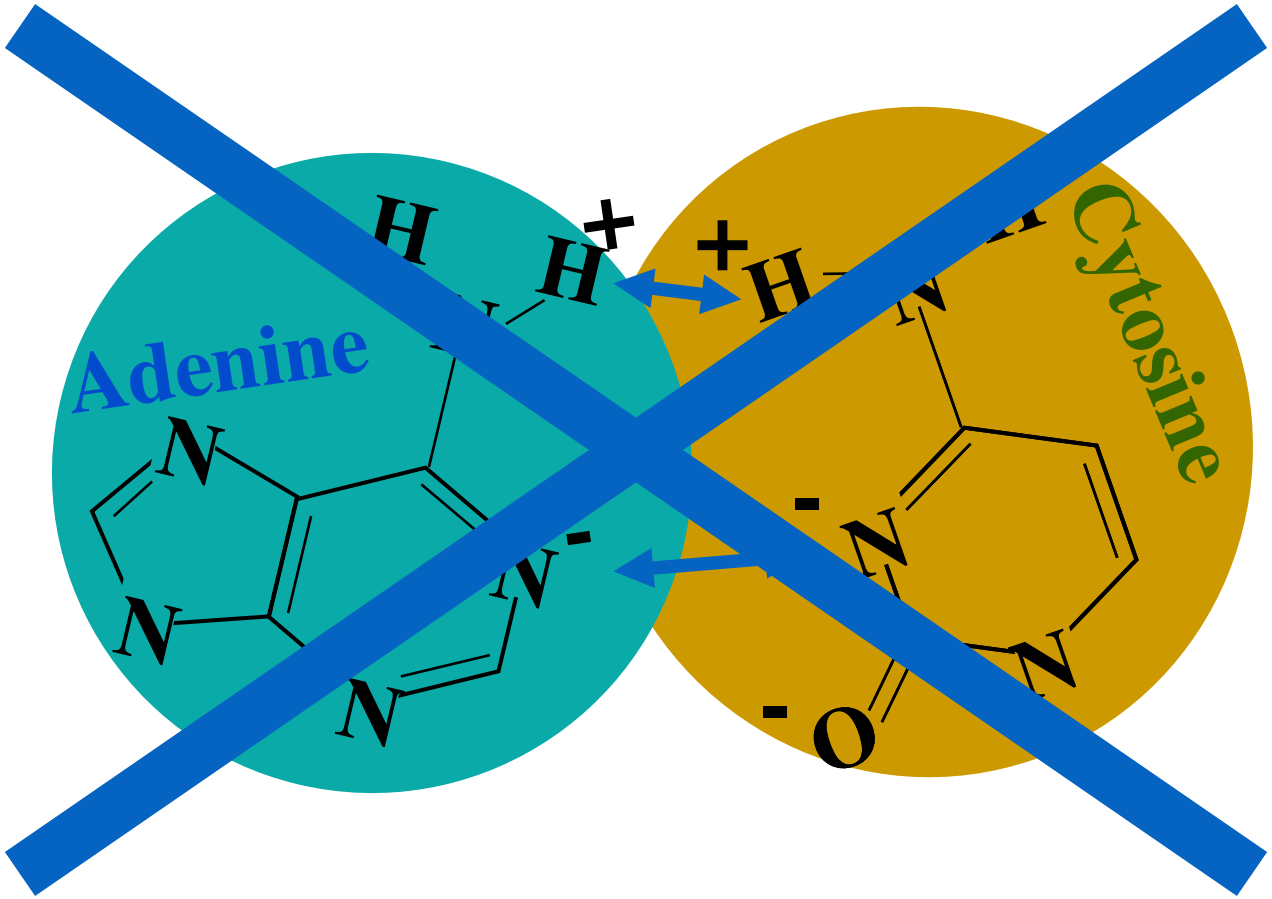
Base Pairs

Adenine and Thymine



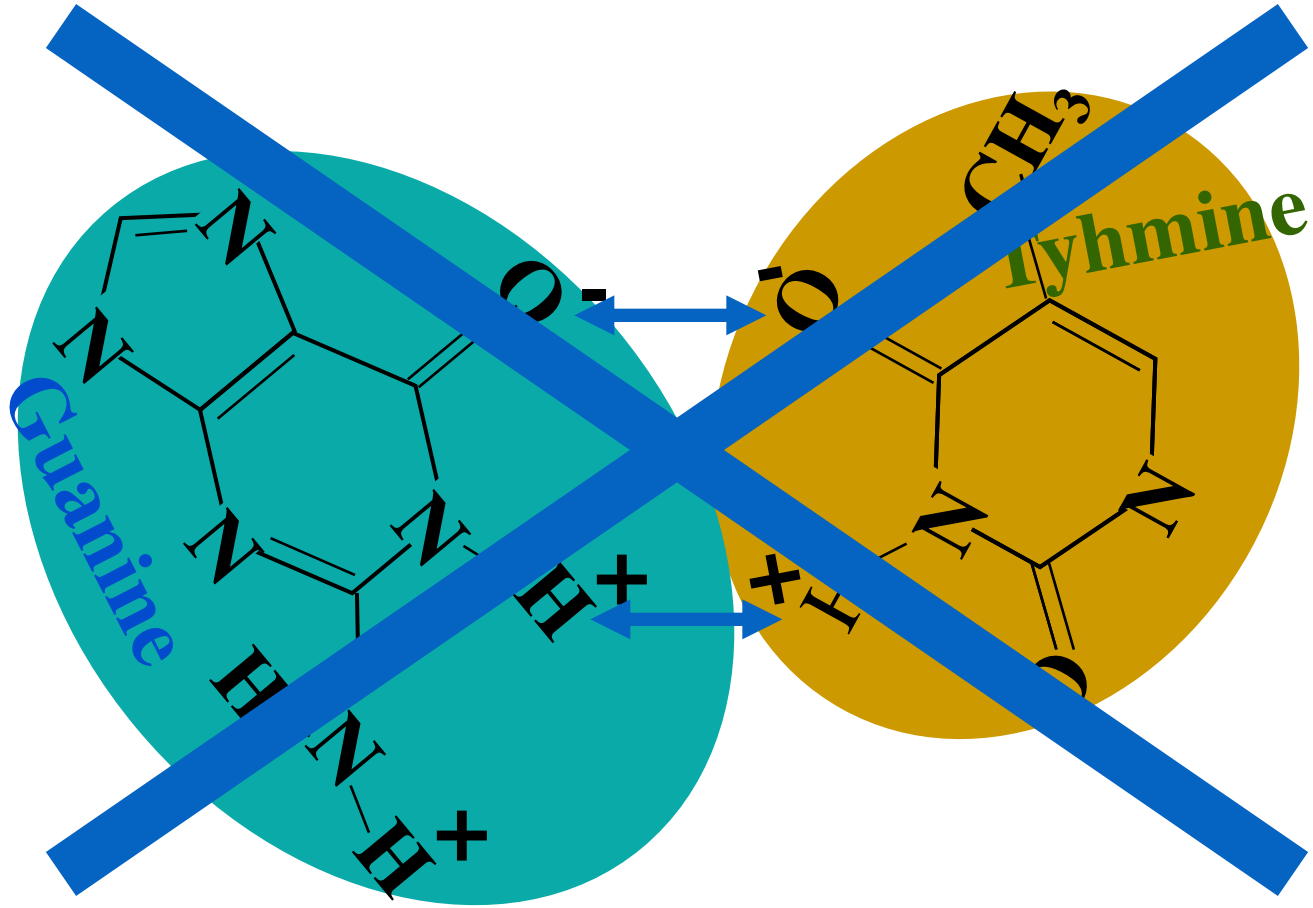
Base Pairs

Adenine and Cytosine

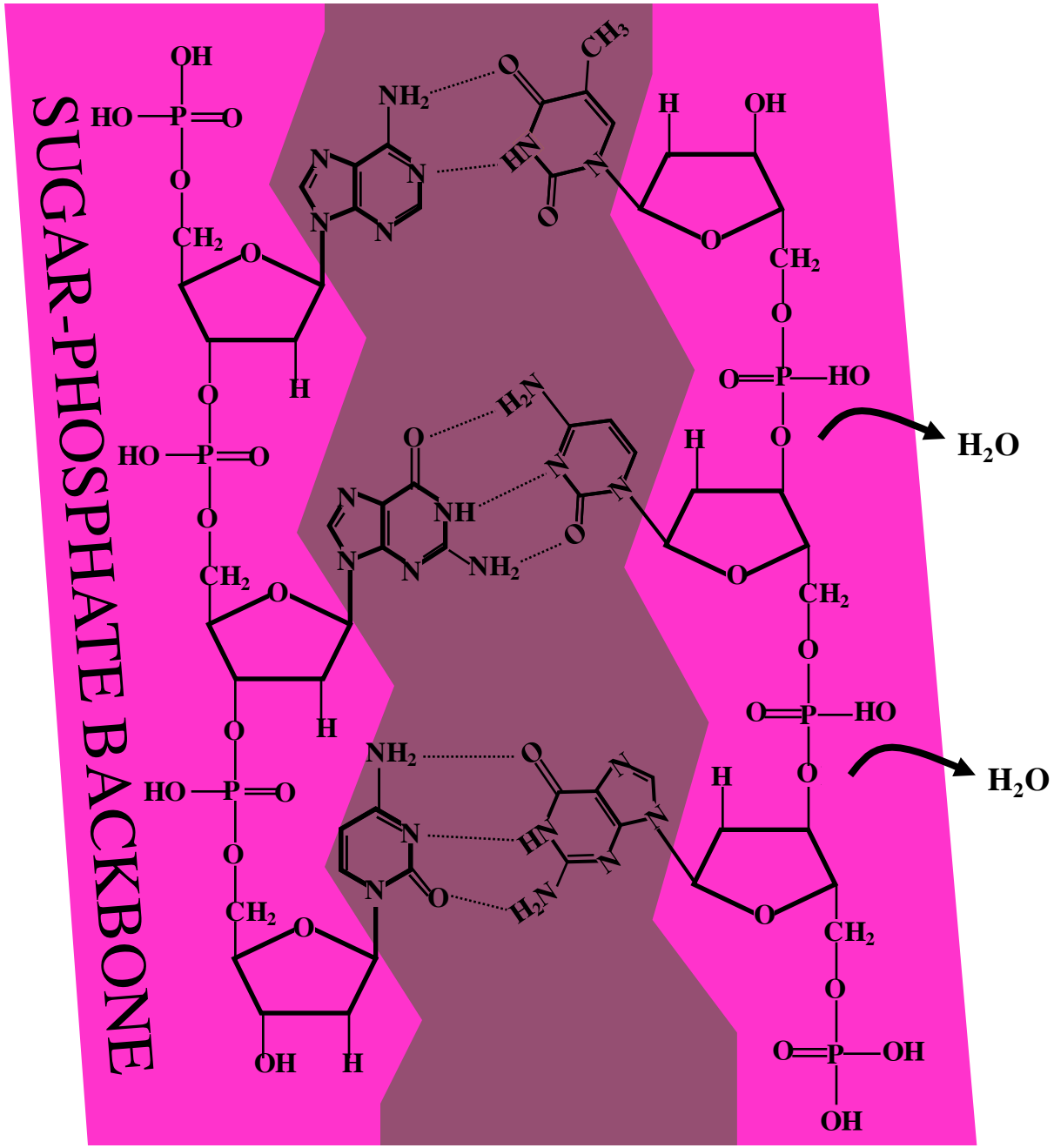


Base Pairs

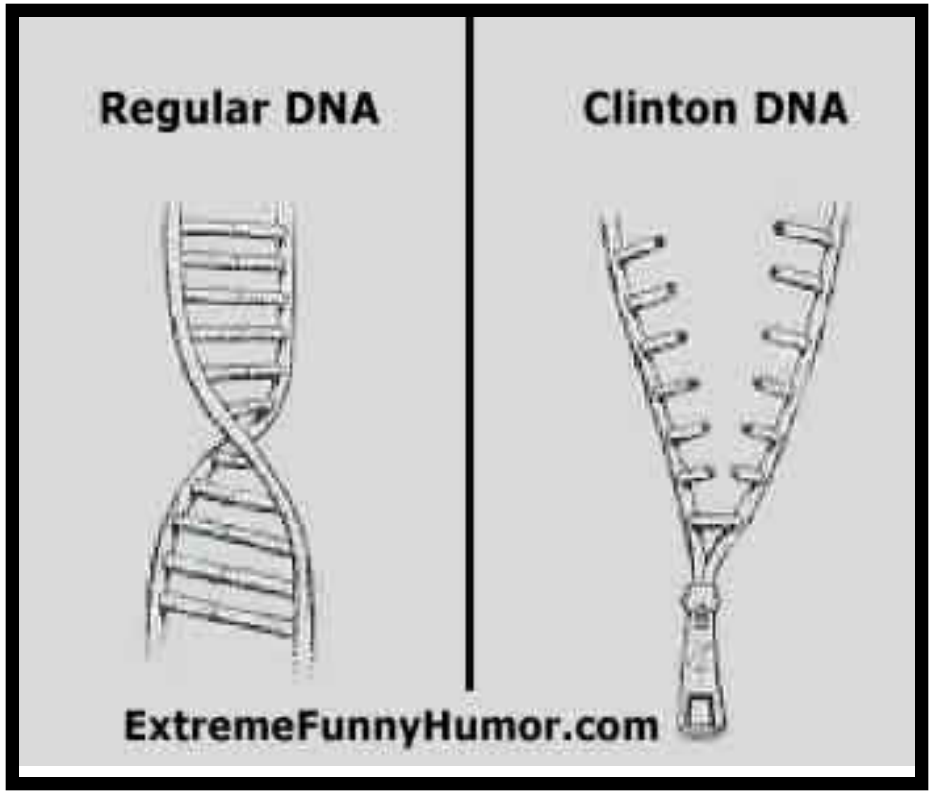
Guanine and Tyhmine

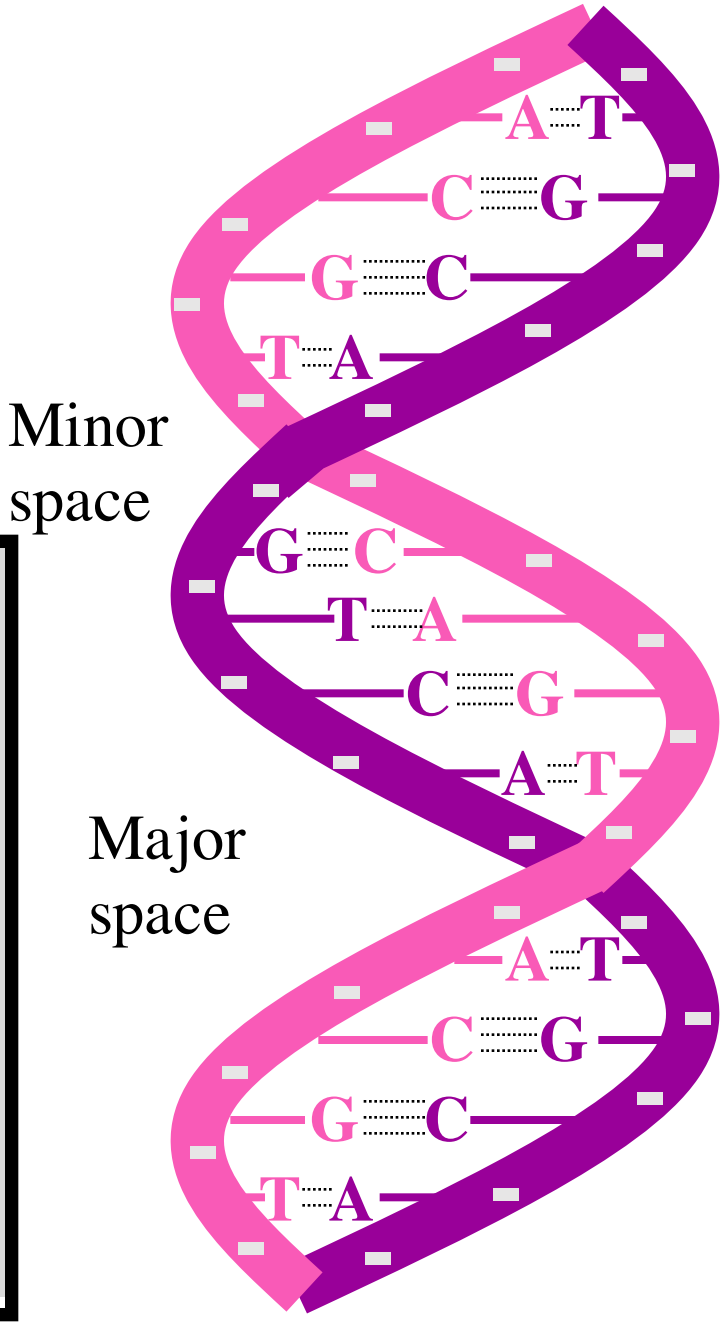


D N A



Watson - Crick Modeli

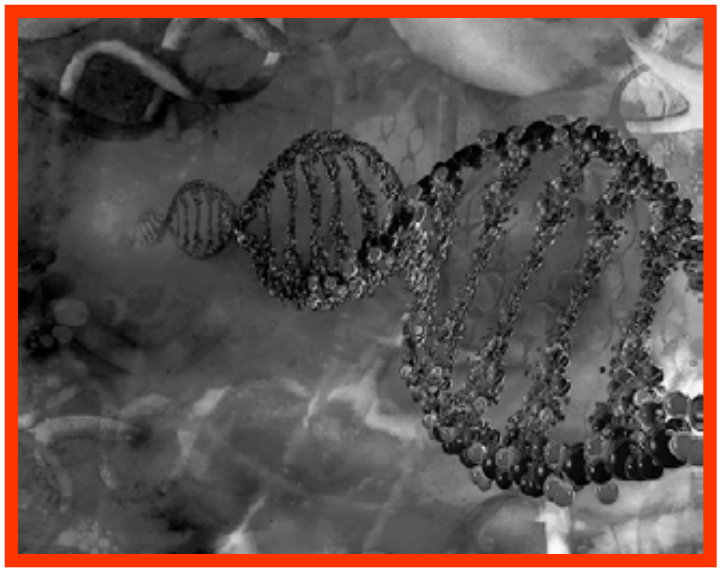




Physical Characteristics of DNA

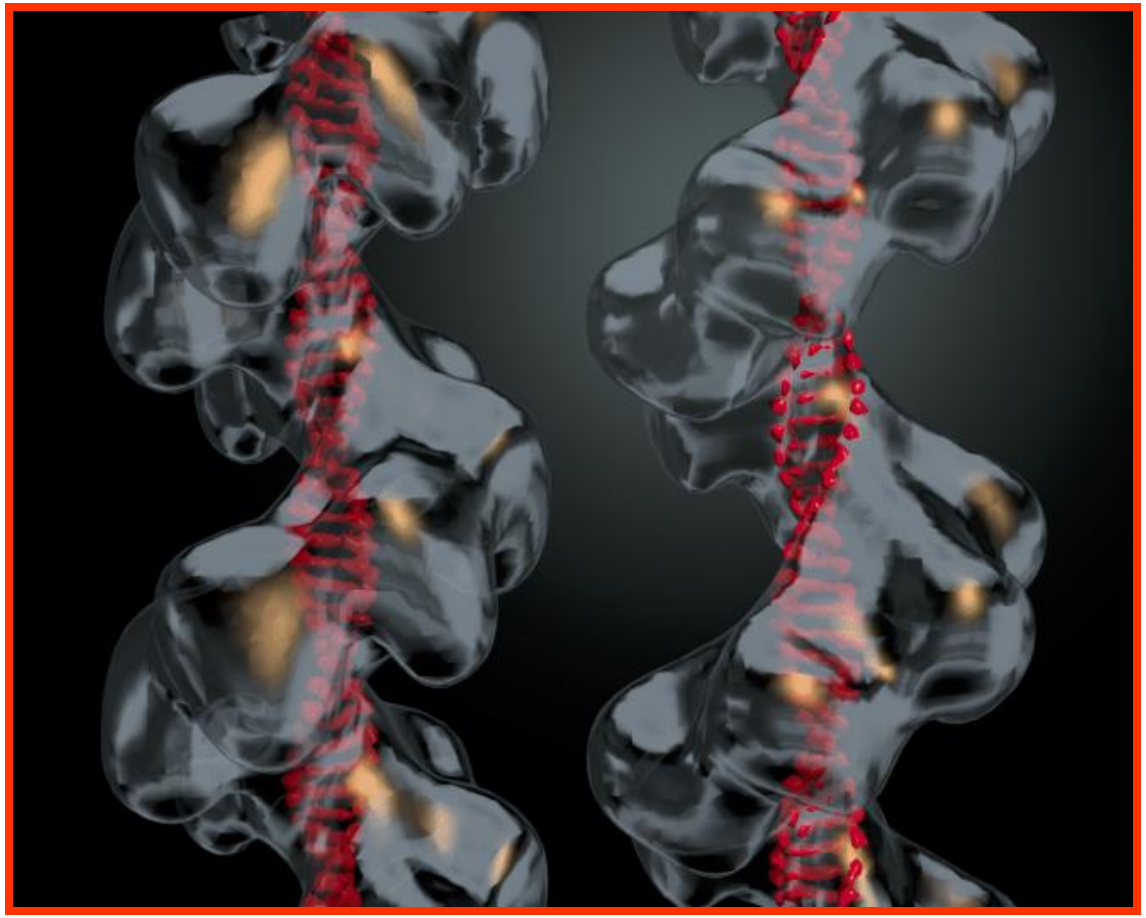
- DNA absorbs 260 nm wavelength UV light
  - This feature enables quantitation of DNA
- DNA resolves in water
- DNA precipitates in alcohols
- DNA is a negatively charged molecule (electrophoresis)
- DNA is very fragile and can be easily destructed with rigorous applications
- DNA has a characteristic melting and binding temperatues

Preparation of samples to Polymerase Chain Recation (PCR): Principles and Methods of DNA Isolation



Department of Microbiology

Why do we isolate DNA?



- Molecular cloning (antibacterial peptides, hormones, enzymes, etc. in *E. coli*)
- Molecular diagnosis (PCR)
- Hybridisation methods (Southern blotting)
- Molecular Typing (RFLP)
- Protection (i.e. DNA vaccines)
- Forensic Medicine
- Maternity / Paternity tests

Stages of Molecular (DNA) Cloning