Human Genetics

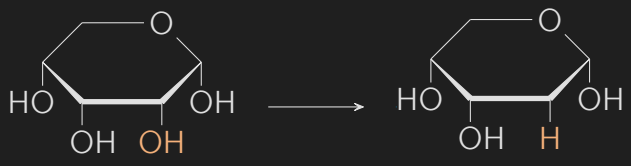
DNA Structure and Function

...

Deoxyribonucleic Acid

▷ **Deoxyribonucleic Acid (DNA)**: a double helix containing two polynucleotide chains that carries the genetic instructions for all known organisms and many viruses.

- The bases are made of four bases:
  - The purine derivatives: adenine (A) and guanine (G).
  - The pyrimidine derivatives: thymine (T) and cytosine (C).
- The backbone is made of alternating deoxyribose molecules (a ribose missing its 2' oxygen) connected to phosphodiester bonds from 5' → 3' positions—forming two antiparallel strands.

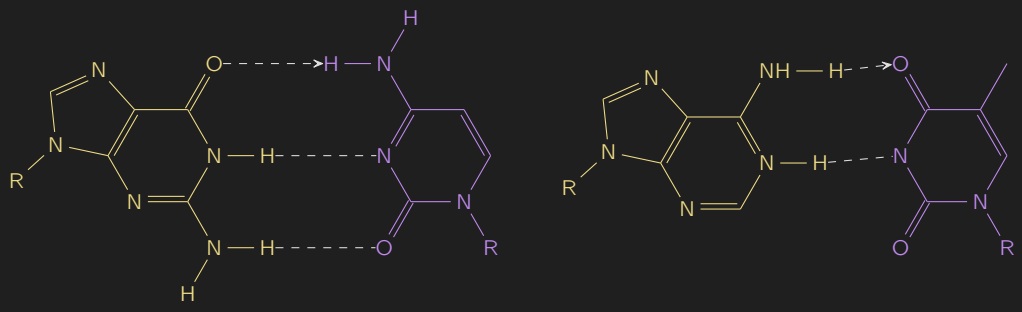


Ribose Deoxyribose

▷ Number of adenines = thymines. (A-T)

▷ Number of guanines = cytosines. (C-G)

- Bonds between bases are noncovalent (no electron sharing, weak).
- C—G pairs form three hydrogen bonds, while A—T forms two; making G—C slightly more stable.



Guanine Cytosine Adenine Thymine