DNA Base Pairing

In DNA, complementary nucleotide bases pair with each other to form the double-stranded helix. Each strand has a 5’ end and a 3’ end, and the two strands run antiparallel to each other, such that the 5’ end matches with the other strand’s 3’ end. Complementary strands pair, meaning that the nucleotide bases composing each strand must pair with the corresponding nucleotide base of the other strand. For example, adenine and thymine form a pair, which has two hydrogen bonds. In RNA, thymine is replaced by uracil, resulting in U-A bonds, where uracil binds with adenine. Guanine and cytosine form the other pair, which has three hydrogen bonds. Thus, G-C bonds are stronger than U-A bonds.



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Characteristics

3' End
(3) Tree on end of DNA-strand
The 3' end of a DNA strand terminates with a sugar that has a free OH group on its 3' carbon. This end is complementary to the 5’ end of another DNA strand.

5' End
(5) Hand on end of DNA-strand
The 5' end of a DNA strand terminates in a phosphate group. This end is complementary to the 3’ end of another DNA strand.

Antiparallel Base Pairing
Ant-tie with Parallel-symbol pairing Bass
DNA strands pair in an antiparallel manner, such that the 5' end of one DNA strand lines up with the 3' end of the paired strand.

Complementary Strands Pair
One bass Complimenting the other
Complementary strands pair, meaning that the nucleotide bases composing each strand must pair with the corresponding nucleotide base of the other strand. Thymine and adenine pair, while guanine and cytosine also pair with one another.

Thymine And Adenine Pair
Thigh-man pairing with Add-dummy
Thymine and adenine are two bases that form a pair. They are complementary bases that form hydrogen bonds, which hold DNA strands together.

2 Hydrogen Bonds
(2) Tutu Water Bond
The adenine-thymine base pair forms two hydrogen bonds.

Adenine and Uracil Pair in RNA
Add (+) dummy being kidnapped by U-wrestler on RNA-rhino
In RNA, there is no thymine base. Instead, uracil is used. As a result, in RNA, adenine and uracil form a base pair with two hydrogen bonds.

Guanine And Cytosine Pair
Guacamole pairing with Side-toe-sun
Guanine and cytosine are the other two bases that form a pair, and they do so in both DNA and RNA.

3 Hydrogen Bonds
(3) Tree Water Bond
The guanine and cytosine base pair bond consists of three hydrogen bonds, which makes G-C pairs stronger than T-A pairs.

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