DNA Replication
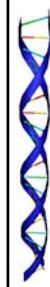### Replication
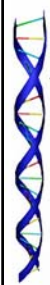### Replication
Replication
Replication

Every cell in my body knows how to replicate DNA yet I'm not in on it so I have to spend hours studying it
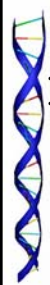
DNA Replication

• DNA is the only known molecule that can replicate itself.
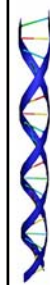
• Because of it's Structure!

DNA Replication

• Each strand of the molecule has all the information needed to reconstruct the other side by nitrogen base pairing.

Rules for Replication

• 1. Adenine will bond with Thymine
• 2. Cytosine will bond with Guanine
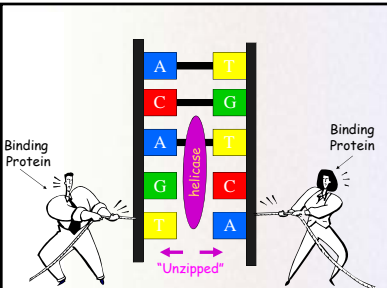
Steps of Replication

1. DNA ladder is opened up by an enzyme called helicase.

   Single stranded binding proteins keep the two halves separated

If I were an Enzyme, I'd be helicase, so I could unzip your genes!

Howard Wolowitz (Simon Helberg) TotallyLoo

Binding Protein

Binding Protein

helicase

"Unzipped"

A   T
C   G
A   T
G   C
T   A

Original DNA

A   T
C   G
A   T
G   C
T   A

2. Correct bases are attached to each side of the ladder/backbone (A - T and C - G)

3. Sugar-phosphate backbone has links added to extend the ladder

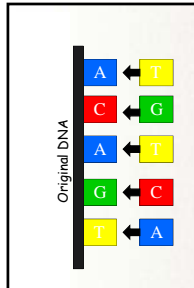4. Polymerase (an enzyme) checks or proofreads the new strands to make sure the base pairing is correct.

* If there is a mistake, it will be cut, removed, and corrected. This is called Excision Repair.

Cut - It - Out

DNA Molecule

Original DNA Strand

Hydrogen bonds are holding the bases together

New bases are inserted

Polymerase

5. End up with 2 identical DNA strands

Notes on DNA Replication

1. Complex
2. Extremely rapid
3. Very accurate, only 1 in a billion are incorrectly paired
4. DNA has around 50 different enzymes whose job it is to continually monitor and repair the genetic information for mistakes

Questions? Comments?