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Replication of DNA

Watson and Crick suggested that two strands of DNA separate from each other and act as template for synthesis of new complementary strands. After the completion of replication each DNA molecule would have one parental and one newly synthesised strand, this method is called semiconservative replication.

• Messelson and Stahl's shows experimental evidence of semiconservative replication by growing E. coli on nutrient media containing nitrogen salts ($^{15}\text{NH}_4\text{Cl}$) labeled with radioactive ^{15}N .

- ^{15}N was incorporated into both the strands of DNA and such a DNA was heavier than the DNA obtained from E. coli grown on a medium containing ^{14}N . Then they transferred the E. coli cells on to a medium containing ^{14}N .
- After one generation, when one bacterial cell has multiplied into two, they isolated the DNA and evaluated its density. Its density was intermediate between that of the heavier ^{15}N -DNA and the lighter ^{14}N -DNA.
- This is because during replication, new DNA molecule with one ^{15}N -old strand and a complementary ^{14}N -new strand was formed (semi-conservative replication) and so its density is intermediate between the two.

Replication : Replication of DNA require Enzyme DNA polymerase that catalyse the polymerisation in one strand $5' \rightarrow 3'$ only after unwinding with the help of Helicase enzyme . So, replication in one stand is continuous and other strand it is discontinuous to synthesise okazaki fragments that are joined together by enzyme DNA ligase.