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ID 15041

SUBJECT MOLECULAR BIOLOGY

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Q1 : FILL IN THE BLANKS

1 : James Watson, Francis crick and Maurice Wilkins .

2 : 1962.

3 : DNA .

4 : Gene .

5 : Replication form.

6 : Topoisomerase.

7 : Genetic code .

8 : Aminoacylation .

9 : DNA helicase .

QUESTION :2 Write short note of the following.

1 : Common tools of molecular biology ?

Answer : Common tools of molecular biology .

- Molecular cloning .
- Polymerase chain reaction.
- Gel electrophoresis.
- Macromolcule blotting and probing.
- Microarrays.
- Allele _ specific oligonucleotide.

2 : What is nucleic acid ?

Answer : Nucleic acid

Discovery :: nucleic acid were isolated by Friedrich Mieseher (1869) from pus cells.

They were named nucleicin

Proposed Hertwig (1884) that the nucleic is the carry of hereditary traits. Because of their acidic nature ,After that they were named nucleic acid .

DEFINATION: Nucleic acid are the small biomolecules, essential to all known forms of life , The term nucleic acid is the overall name for the DNA and RNA . they also composed of nucleotides, which are monomers made of three compounds,

a_ 5 carbons

a_ phosphate group

a_ nitrogenous base .

what is chargaff,s rule ?

- **Answer :** Chargaff,s rule state that DNA from any cell of any oraganisms should have 1:1 ratio(base pair rule) of pyrimidine and purine , based and more specifically that the amount of guanine should be equal to cytosine and the amount of adenine should be equal to thymine, this patter is found in both strands of the DNA .

What is wobble hypothesis ?

Answer : According to this hypothesis only the first two bases of the codon have a precise pairing with the bases of the anticodon of the tRNA , while pairing between the third bases of codon and anticodon In wobble (wobble mean to sway or move un steadily) .

Write the main steps of translation and transcription ?

Answer : Transcription : Transcription occurs in the three steps.

Steps 1 initiation: It is the beginning step of transcription.

Steps 2 Elongation: it is the second step of transcription in which the addition of nucleotides to the mRNA strands.

Steps 3 Termination: it is the last steps of transcription.

Translation : Translation proceed in three steps.

Initation phase : The ribosome assembles around the target mRNA .

Elongation phase : The tRNA transfer an amino acid to the tRNA corresponding to the next codon.

Termination phase: When a peltidyl tRNA encounters a stop codon, then the ribosome folds the polypeptide into its fixed structure.

Explain the process of DNA replication ?

DNA : DNA is the essential molecule for life .it acts like a recipe holding the instructions telling our bodies how to develop and function.

DNA Replication : DNA replication is the process by which DNA makes a copy of itself during the cell division

The DNA molecule separates into two strands, and then produces two new complementary strands following rules of base pairing. Each strands of the double helix of DNA serves as template or models, for the new strands

DNA replication key players :

Helicase

DNA polymerase

Primes

Ligase .

DNA polymerase : are the family of enzyme that carry out all forms of DNA replication.

Steps of DNA replication :

- The first step in DNA replication is to unzip the double helix structure of the DNA molecule.
- This is carried out by an enzyme called helicase. Which breaks the hydrogen bonds holding the complementary bases of DNA together.
- The separation of the two single strands of DNA creates a (Y) shaped called a replication form.
- The two separate strands will acts as templates for making the new strands of DNA.
- One of the strands is oriented in the 3, to 5, direction, this is the leading strands.
- Other strands is oriented in the 5, to 3 direction .this is logging /lagging strands .
- As a results of their different orientation, the two strands are replicated differently.
- Once all of the bases are matched up enzyme call exonuclease strips away the primer (s).
- The gaps where the primer were are then filled by yet more complementary nucleotide.
- The now strands is proofread to make sure there are no mistakes in the new DNA sequences.
- Finally, an enzyme called ligase seals up the sequence of DNA into two continues double strands.
- The results of DNA replication is two molecule consisting of one new and one old chain of nucleotide.