

BIOLOGY CAPSULE – DNA – MOLECULAR STRUCTURE

FORMS OF DNA

Right handed DNA

- A- DNA - 11 base pairs per turn
- B-DNA – 10 base pairs per turn – Watson Crick DNA
- C- DNA - 9 base pairs per turn
- D-DNA , C-DNA, E-DNA are experimental forms.

Left handed DNA

Z – DNA is called **left handed DNA** or Zig – Zag DNA.

Coiling in the Anti clock wise

RL HELIX –

DNA with alternate right and left handed coilings. Also called Zig - Zag DNA

HAIR PIN DNA

De naturation followed by re naturation of DNA converts double helix of DNA into hair pin like

SNAP – BACK MECHANISM

Renaturation of DNA is called Snap – back mechanism.

SATELLITE DNA

Also called Repetitive DNA, DNA segment with repeated sequences which cause re association of separated strands by heat. Found in Drosophila.

TEMPLATE DNA

DNA strand used for producing a new DNA strand.
0 x 174 and S-13 virus contains Single stranded DNA

REPLICATION OF DNA

1. Eukaryotic DNA has many Ori while Prokaryotic DNA has only one Ori.
2. Replication Fork is produced by the unwinding of DNA.
3. DNAPOLYMERASES I,II, and III causes DNA synthesis.
4. DNA synthesis occurs only in the 5'-3' direction.
5. Primer RNA is formed from DNA during replication.
6. Primase or RNA polymerase produce RNA Primer.
7. Formation of Okasaki fragments indicates Discontinuous DNA synthesis.
8. Lagging Strand is shows discontinuous DNA

CENTRAL DOGMA

1. Central Dogma was proposed by Crick in 1958.
2. Central dogma explains the relation between Gene and Proteins.
3. In the representation of Central Dogma, the circle arrow around DNA indicates that DNA is self replicating.
4. Central Dogma is reversed in Reverse transcription.

TRANSCRIPTION

1. Transcription always occur in the forward direction by the action of Transcriptase enzyme .
2. Transcription occurs in the Reverse direction in RNA viruses.
3. Transcription takes place with the help of RNA polymerase.
4. Three forms of RNA Polymerases – I,II, and III are present.
5. RNA polymerase cause Chain Elongation of RNA in the 5' – 3' direction.
6. In bacteria Operon act as the transcription unit and a single m-RNA is formed form the Operon. It is called Polycistronic RNA.
7. In Eukaryotes the m-RNA is Monocistronic.
8. Eukaryotic transcription occurs in the Nucleus and in Prokaryotes it is in the cytoplasm.

RNA MATURATION

- 1.Processing of m-RNA before leaving the nucleus is called Maturation.
- 2.During maturation a Cap made up of 7-methyle Guanosine or 7 - mG is added to m-RNA. Cap is the modified GTP.
3. Poly tail A is added to the 3' end of m-RNA. The Primary m-RNA formed in the nucleus is called as Heterogenous nuclear RNA or hn RNA / Pre m-RNA

RNA SPLICING

Removal of Introns from the Pre m-RNA is called Splicing.
During Splicing, 2 small ribonucleoproteins called **SnRNPs or Spurps** are added to the ends of m-RNA. **Spliceosomes** is the complex formed by the combination of SnRNPs.
Spliceosomes take energy from ATP and splice m-RNA.
RNA Editing takesplace in the m-RNA before translation.