

Botany Excel 2- Genetics

1. RESTRICTION MODIFICATION SYSTEM

This system protect the bacteria from invading foreign DNA.

2. DESIRABLE CHARACTERS OF CLONING DNA

It should have

1. *Replication site*
2. *one or more restriction endonuclease sites*
3. *one or more drug resistant sites.*

3. **Eukaryotic genes** may not function in bacteria because of the inability to excise introns.

4. **DNA finger printing** involves VTNR loci.

5. **Puromycin** is the antibiotic that inhibits translation in prokaryotes and eukaryotes.

6. AGAROSE GEL ELECTROPHORESIS – AGE

It uses Ethidium bromide to visualize DNA.

7. **Multiple cloning** sites allows flexibility for restriction enzymes.

8. COSMID

Lambda phage used as plasmid. It contains Cos site.

9. **Radio isotope** to detect proteins is **35 S**

10. **PCR** uses **Taq polymerase** enzyme because it can withstand high temperature. The enzyme is obtained from **Thermophilus** bacteria found in Hot springs.

11. Bacterial chromosome is **Negatively Super coiled**.

12. **Cryptic Plasmids** do not carry any detectable functions.

13. **Highly repetitive** sequence of DNA is found near Centromere and Telomere.

14. PRIBNOW BOX

Sequence found in the -10 position of the promoter of E.coli. It contains the sequence 5' TAA TTA 3'.

15. Splicing of pre mRNA occurs in the nucleus.

16. DNA absorbs radiation at **260 nm**.

17. **Shot Gun approach** is used to make Genomic Library.

18. Hydrolysis of nucleotide yields Phosphoric acid.

19. SPLICEOSOMES

Complex of Sn RNA, Protein, Pre – mRNA . Found in prokaryotes to splice pre-Mrna.

20. Non coding eukaryotic DNA includes **Introns, Pseudogenes and Specer DNA**.

21. Granular component of Nucleolus represents incomplete Ribosomes.

22. Isotopes used to study Semiconservative replication of DNA are **N14 and N15**.

23. Transcription in bacteria occurs in the cytoplasm or cytosol.

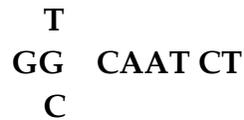
24. **Transposones** are the mobile genes found in prokaryotes and eukaryote. These are also called Dancing genes, Jumping genes etc.

25. **Histones** are basic proteins associated with DNA. These are similar between species. Histones are rich in **Lysine and Arginine** which gives the basic nature to histones.
26. Amount of DNA found in egg cell is 20 pg and that of somatic cell during G2 stage is 80 pg.
27. **PALINDROME SEQUENCE**
Symmetrical sequences of nucleotides base pairs in DNA that read the same on each strand from 5' to 3' direction.
28. **RIFAMPICIN**
The antibiotic used in Tuberculosis. It is the product of soil Streptomyces. Rifampicin inhibit the RNA polymerase (beta unit) preventing the transcription in bacteria. Mycobacterium causing TB is only sensitive to Rifampicin.
29. **SIGMA FACTOR**
It is the 5th protein unit present in the RNA polymerase of prokaryotes that initiate transcription by binding the promoter site.
30. **ALPHA AMANITIN**
The toxin produced by the Mushroom Amanita. It inhibits RNA polymerase II in eukaryotes and inhibits mRNA synthesis. Amanita poisoning causes liver failure, so that new enzymes cannot be synthesized after the degradation of enzymes by the liver.
31. **ENHANCERS**
These are gene specific sequences that positively affect transcription.
32. **RIBOZYMES**
These are RNAs acting as enzymes. Ribonuclease P or Rnase P is a true catalyst. It contains both RNA and Protein components. After the discovery of Ribozymes in 1980s, Evolution is considered as the " RNA World ". According to this concept RNA not DNA was the first nucleic acid formed and RNA initiated the formation of DNA.
33. **RHO FACTOR**
It is a hexameric protein with RNA dependent ATPase activity.
34. **FRAGILE X SYNDROME**
It the most common type of mental retardation caused by a mutation in the X chromosome gene concerned with the translation of mRNA during brain development.
35. **TATA BOX**
Conserved sequences present upstream from the mRNA start site in the DNA. It is centered about 25 bp upstream from the transcription unit.

AA
TATA A TATA Box
TT

36. **CAAT BOX**

Found upstream not as highly conserved as TATA Box.



37. **BETA THALASSEMIA**

It is caused by a mutation in the Beta globin chain that interferes intron removal from mRNA.

38. **INOSINIC ACID**

A fragment anticodon nucleotide. It is the nucleotide of Hypoxanthine which pairs with U,C or A during Wobbling.

39. **MISSENCE MUTATION**

Arise from a base change that causes incorporation of a different AA in the encoded protein. The most important one is that change A to U in either GAA or UAG codon for Glutamate. **Eg. Haemoglobin C disease.** The **Glutamic acid in the 6th position** of beta chain is replaced by **Lysine.**

40. **NON SENSE MUTATION**

Results in premature termination of transcription and formation of truncated protein. Eg. Thalassemia.

41. **THALASSEMIA**

It is caused by the inability of alpha and beta chains of haemoglobin to associate during the formation of hemoglobin. **Thalassemia appears not in foetus** because there is no beta chain in foetal hemoglobin.

42. **SANGER PROCEDURE**

DNA sequencing based on the random termination of a DNA chain during enzymatic synthesis.

43. **RT-PCR**

Reverse Transcriptase PCR. Alternate method of PCR to construct c DNA library using Reverse transcriptase enzyme.

44. **CHROMOSOME WALKING**

Technique to define gene arrangement in long stretches of DNA. The sequences are verified one by one just like walking over the road.

45. **PAW FINGER PRINTING**

Technique used to fingerprint animal DNA other than human DNA.

46. **FOOT PRINTING**

Technique used in DNA sequencing in which the histone binding sites of DNA that donot accept DNAase are identified. It is used to identify protein binding sites of DNA.

47. **ANTI-SENSE RNA**

Non coding mRNA which do not translate protein used in genetic engineering. It is produced by reversing the coding sequences of DNA. This technique was used to

produce genetically engineered Tomato. One of the gene sequence coding the fruit ripening in tomato was introduced in the transgenic tomato in the reverse order. So that one gene produced the fruit ripening protein normally and the reversed gene failed to produce the protein because it transcribed an anti-sense mRNA. This delayed fruit ripening.

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