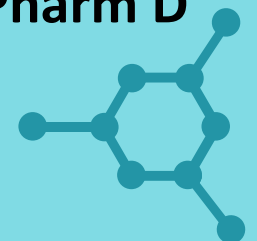




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Genomic libraries and chromosome library & DNA sequencing

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ILOs

A

Define chromosome library and genomic library

B

List Applications of Genomic Library

C

Differentiate between chromosome libraries & genomic library

D

Define DNA Sequencing

E

List Uses of DNA Sequencing

Introduction

A gene library is a collection of different DNA sequences from an organism, which has been cloned into a vector for ease of purification, storage and analysis. There are two types of gene library that can be made depending upon the source of the DNA used.

- 1. Genomic library.**
- 2. cDNA library**



Definition

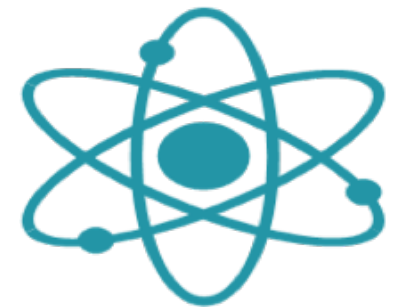
- ✓ **A genomic library is a collection of clones that, when successfully made, theoretically contains at least one copy of every DNA sequence in the genome.**
- ✓ **A library consisting of a collection of cloned DNA fragments derived from one chromosome is called a chromosome library**

Applications of Genomic Library

- 1. Genomic library construction is the first step in any DNA sequencing projects.**
- 2. Genomic library helps in identification of the novel pharmaceutically important genes.**
- 3. Genomic library helps in identification of new genes which were silent in the host.**
- 4. It helps us in understanding the complexity of genomes.**



- 5. Study of the function of regulatory sequences in vitro .**
- 6. Study of genetic mutations in cancer tissues.**
- 7. Create cDNA libraries to determine what genes are being expressed at a particular time.**





The diagram features a central DNA double helix structure. Two horizontal arrows, one pointing left and one pointing right, are positioned around the helix. The left-pointing arrow is labeled 'Genomic Library' and the right-pointing arrow is labeled 'Chromosome library'. The arrows are light blue with a 3D effect and a shadow. The DNA helix is a darker blue. The entire scene is set against a white rounded rectangle on a teal background with faint DNA helix patterns.

Genomic Library

Chromosome library

Genomic Library

Chromosome DNA Library

Expression

Entire genome

Only specific genes.

Size

Large

Smaller

Introns

Present

Absent

Genomic Library

Vector

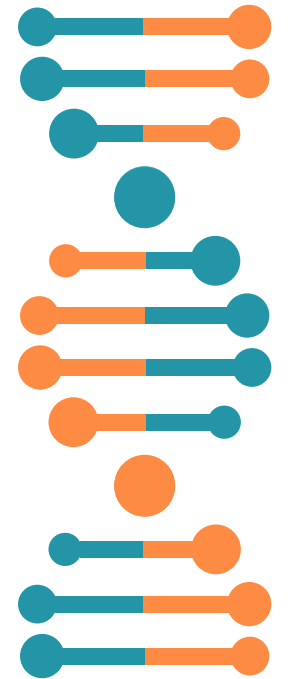
It uses plasmids, cosmid, lambda phage, YAC and BAC for the accommodation of large fragments.

Chromosome DNA Library

It has no introns so uses plasmids, phagemids, lambda phage to accommodate small fragments.

Define DNA sequencing

DNA sequencing is the process of determining the sequence of nucleotide bases (As, Ts, Cs, and Gs) in a piece of DNA. Today, with the right equipment and materials, sequencing a short piece of DNA is relatively straightforward



Uses of DNA sequencing

Diagnostics

Genome sequencing is particularly useful for identifying the causes of rare genetic disorders

**Molecular
Biology**

DNA sequencing is now an integral part of most biological laboratories. It is used to verify the results of cloning exercises to understand the effect of particular genes.



Forensics:

The ability to use low concentrations of DNA to obtain reliable sequencing reads has been extremely useful to the forensic scientist.

recent advances allow forensic scientists to sequence the exome of a person after death, especially to determine the cause of death



Which type of library consist of collection of cloned DNA fragments derived from one chromosome?

Summary

They are two types of gene library which are the chromosome library and the genomic library.

One of the applications of genomic libraries is the study of genetic mutations in cancer tissue.

One of the differences between genomic and chromosome, is that the genomic library is large and the chromosome library, is smaller.

DNA sequencing is the process to determine the sequencing of nucleotides bases.



Thank You



References:

1. <https://biologydictionary.net/dna-sequencing/>
2. <https://www.difference.wiki/genomic-library-vs-cdna-library/>
3. <http://www.authorstream.com/Presentation/ashok09-2032647-genomic-cdna-libraries/>