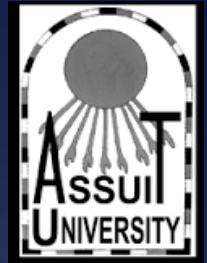




Molecular Biology Research Unit



DIFFERENT APPLICATIONS OF DNA SEQUENCING

Amira Adel Taha AL-Hosary
Lecturer of Infectious Diseases,
Faculty of Veterinary Medicine,
Assiut University

APPLICATION

1. In Medicine and pharmacy:

a. The spread of disease/organism through populations can be monitored by PCR sequencing.

Especially the appearance of new virulent subtypes.

The sub-types of an organism that were responsible for earlier epidemics can also be determined by PCR analysis.

APPLICATION

b. Detection of genetic diseases.

c. Detection of Mutation: In case of genetic diseases, there is a mutation resulting in a detectable change in the length of the restriction fragment.

APPLICATION

d. Diagnosis of retroviral infection and cancers.

Many forms of cancer involve alterations to **oncogenes**

e. Prenatal testing.

f. Gene Therapy: helps to monitor the gene in gene therapy

g. Genomic studies: helps to compare the genomes of two organisms and identify the difference between them.

APPLICATION

2. Evolutionary studies: The differences in the genomes of two organisms can be detected.

It plays an important role in phylogenetic analysis.

Minute quantities of DNA from any source such as fossilized material, hair, bones, mummified tissues can be amplified using PCR technique.

APPLICATIONS

3. Metagenomics: study of genetic material obtained from environmental samples (Ecological studies).

4. Agriculture:

a. Detection of phytopathogens

The agricultural industry is constantly striving to produce plant propagules or seedlings that are free of pathogens in order to prevent economic losses and safeguard health.

b. Genetically modified organisms (GMO)

- ⦿ **Genetically modified organism (GMO) is a living organism whose genetic composition has been altered by means of gene technology.**
- ⦿ **The genetic modification usually involves insertion of a piece of DNA (the insert).**
- ⦿ **These smaller pieces of DNA are usually taken from other naturally occurring organisms.**

**c. Detection of genetically modified organisms
(GMOs):**





THANKS A LOT

WITH MY BEST REGARDS AND MY BEST WISHES

AMIRA A. AL-HOSARY
E-MAIL: AMIRAELOHOSARY @YAHOO.COM
MOB. (002) 01004477501