



Department of Medical Laboratories Techniques
Human genetic
Lab.9: DNA analysis
M.Sc. Mazin E. Hadi

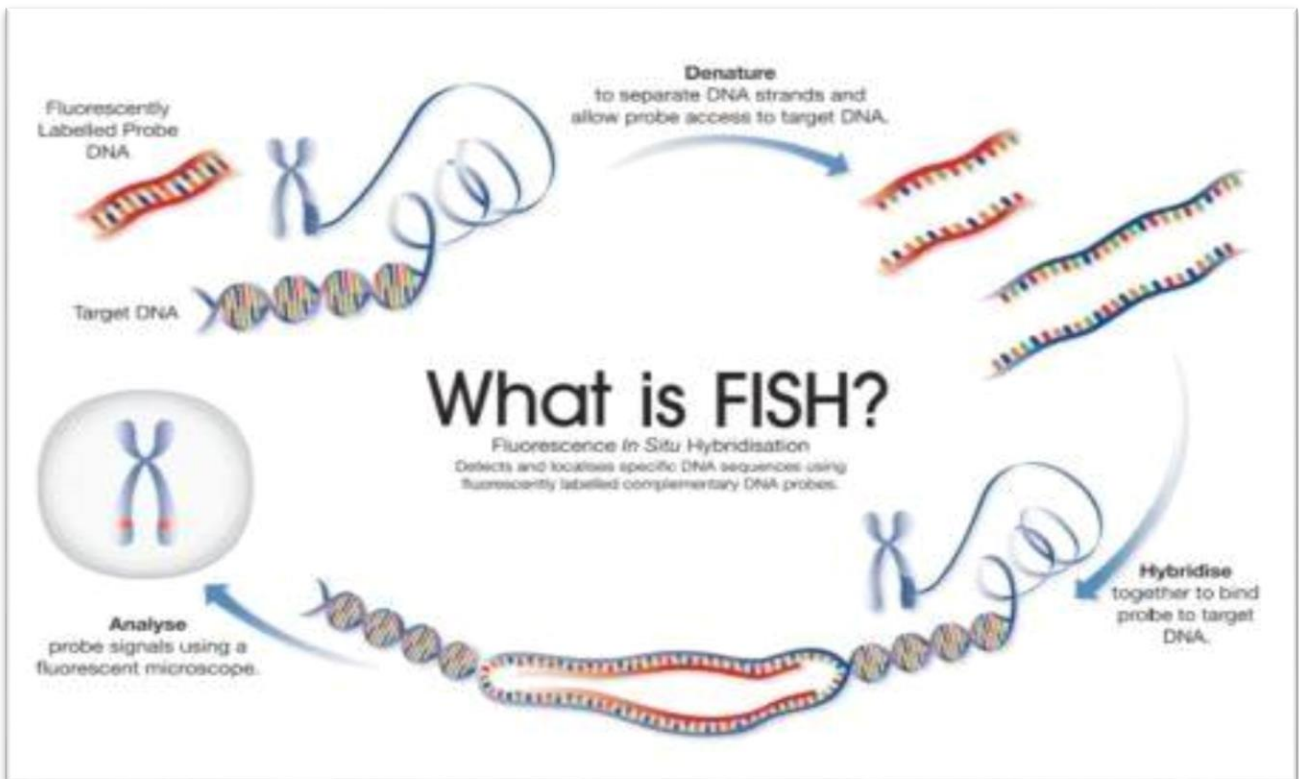


DNA analysis

DNA analysis is the name given to the interpretation of genetic sequences and can be used for a wide variety of purposes. It can be used to identify a species but can also differentiate individuals within a species. ...Some advance Technique for DNA analysis:

1- Fluorescence in situ hybridization (FISH)

Fluorescence in situ hybridization (FISH) is a laboratory technique for detecting and locating a specific DNA sequence on a chromosome. The technique relies on exposing chromosomes to a small DNA sequence called a probe that has a fluorescent molecule attached to it. The probe sequence binds to its corresponding sequence on the chromosome.



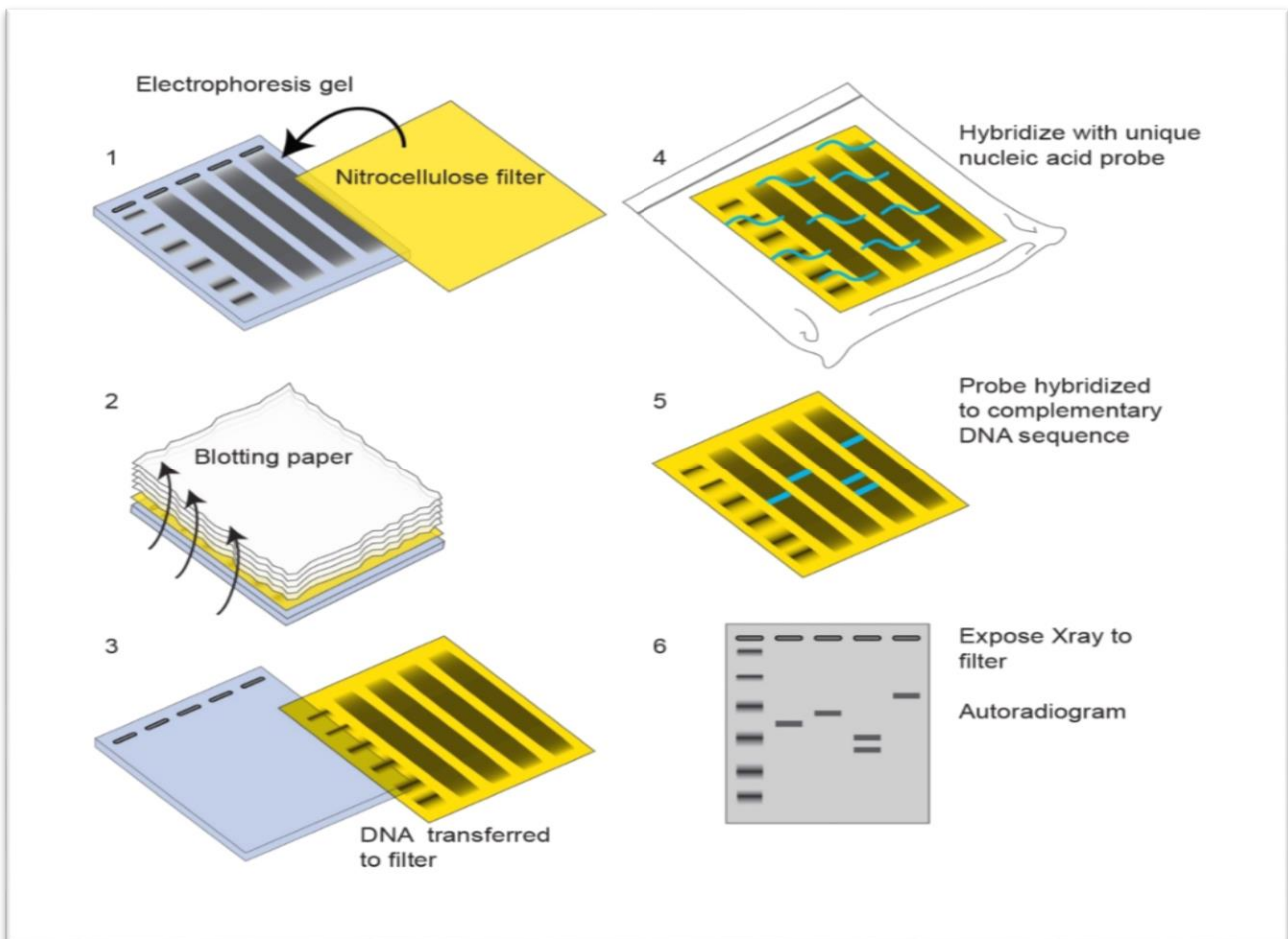


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2- Southern blot

Southern blotting is a laboratory technique used to detect **a specific DNA sequence** in a blood or tissue sample. A restriction enzyme is used to cut a sample of DNA into fragments that are separated using gel electrophoresis. The DNA fragments are transferred out of the gel to the surface of a membrane. The membrane is exposed to a DNA probe labeled with a radioactive or chemical tag. If the probe binds to the membrane, then the probe sequence is present in the sample.





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3- Northern blot

Northern blot is a laboratory technique used to detect a specific RNA sequence in a blood or tissue sample. The sample RNA molecules are separated by size using gel electrophoresis. The RNA fragments are transferred out of the gel to the surface of a membrane. The membrane is exposed to a DNA probe labeled with a radioactive or chemical tag. If the probe binds to the membrane, then the complementary RNA sequence is present in the sample.

4- Another blot “zoo blot” and “garden blot”

A **zoo blot** or garden blot is a type of Southern blot that demonstrates the similarity between specific, usually protein-coding, DNA sequences of different species. A zoo blot compares animal species while a **garden blot** compares plant species. The purpose of the zoo blot is to detect the conservation of the gene(s) of interest throughout the evolution of different species.

5- DNA sequencing

DNA sequencing is the process of determining the nucleic acid sequence – the order of nucleotides in DNA. It includes any method or technology that is used to determine the order of the four bases: adenine, guanine, cytosine, and thymine. The advent of rapid DNA sequencing methods has greatly accelerated biological and medical research and discovery.