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STUDY NOTE ON FISH

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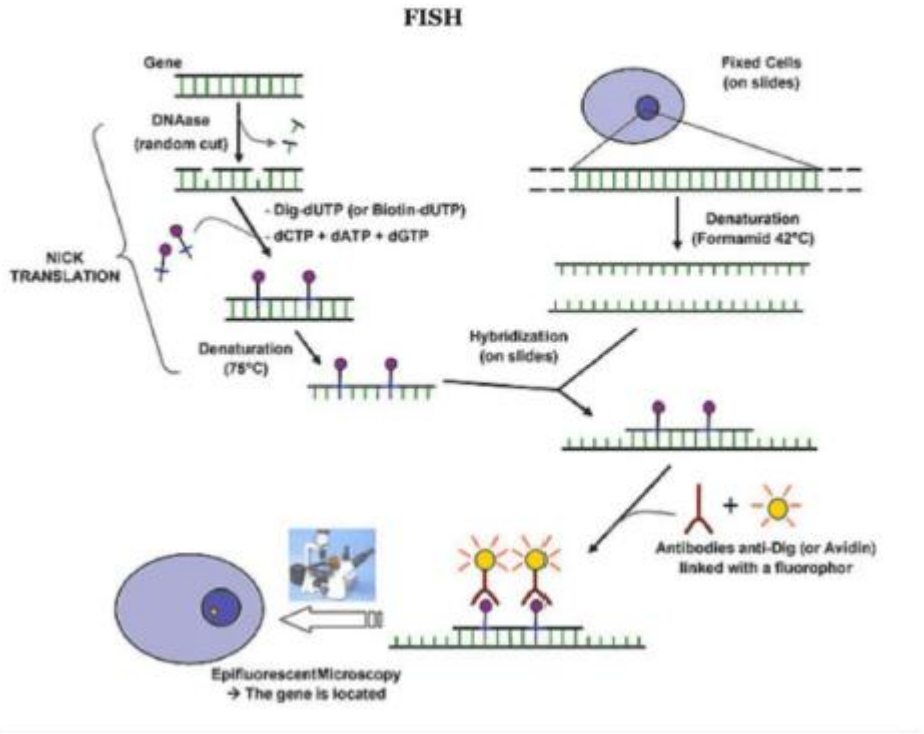
FISH

- Fluorescence in situ hybridization (FISH) is a kind of cytogenetic technique
- Uses fluorescent probes
- Fluorescence microscopy can be used to find out to visualize and map the geneticmaterial in an individual cell, including specific genes or portions of genes.
- It is an important tool for understanding a variety of chromosomal abnormalitiesand other genetic mutations.



Steps

- Make a probe complementary to the known sequence. When making the probe,label it with a fluorescent marker, e.g. fluorescein, by incorporating nucleotidesthat have the marker attached to them.
- Put the chromosomes on a microscope slide and denature them.
- Denature the DNA and add it to the microscope slide, allowing the probe hybridizeto its complementary site.
- Wash off the excess probe and observe the chromosomes under a fluorescentmicroscope. The probe will show as one or more fluorescent signals in the microscope, dependon how many sites it can hybridize to

Eg: of cancer patient cytogenetic data: Del(20q), del(12p), del(11q)

Types of Probes Used in FISH Technique:

1. Locus specific probes bind to a particular region of a chromosome. This type ofprobe is useful when researchers have isolated a small portion of a gene andwant to determine on which chromosome the gene is located

2. Alphoid or centromerie repeat probes are generated from repetitive sequencesfound in the middle of each chromosome.

Researehers use these probes to determine whether an individual has the correctnumber of chromosomes.

These probes can also be used in combination with “locus specific probes” to determinewhether an individual is missing genetic material from a particular chromosome.

3. Whole chromosome probes are actually collections of smaller probes, each of which binds to a differentsequence along the length of a given chromosome. Using multiple probes labeled with a mixture of differentfluorescent dyes, scientists are able to label each chromosome in its own unique color.The resulting full-color map of the chromosome is known as a spectral karyotype.Whole chromosome probes are particularly useful for examining chromosomalabnormalities,for example, when a piece of one chromosome is attached to the end of anotherchromosome.

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