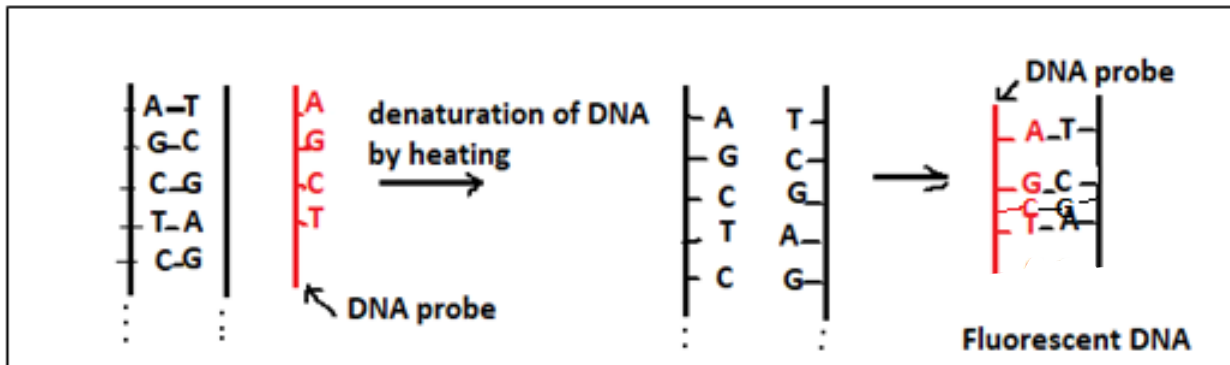


### 1. Fluorescence In Situ Hybridization (FISH):

**Importance:** FISH is a technique used to localize a particular gene in a chromosome.(to determine the loci of a specific allele on a chromosome)



First, we separate the 2 strands of the DNA by denaturation (heating); then we use a DNA probe, which is synthetic radioactive short DNA segment(monostrand) that is complementary (that hybridizes or binds) to a specific coded sequence of a particular allele.As a result, the chromosome shows a fluorescent dot; hence, the gene or the DNA sequence is localized .

FISH has allowed scientists to construct human genetic maps.

### 2. DNA fingerprint : Observation of only coded fragments(alleles) by a technique called ( **Jeffrey's technique**):

- To determine the real genotype of the individual
- To know whether a person is diseased or not
- To identify the paternity of individual
- To identify the criminal
- Dead bodies identification

#### **Steps of Jeffrey's technique**(Doc.c page 68)

1. Preparation of restriction fragments by adding restriction enzymes to DNA of 3 individuals
2. Transfer of restriction fragments to wells in gel electrophoresis.
3. Southern blotting: transfer of restriction maps on filter paper
4. FISH: -Separation of DNA fragments of restriction maps by denaturation  
-Hybridization by adding DNA probe.
- 5.After washing, observation of the coded fragments by autoradiography.

**3. DNA fingerprint in paternity testing** (p.69): Each band of the child's DNA fingerprint should be shared with either the father's or the mother's DNA fingerprint.

Probing the activity p.69

1. In FISH technique, the denaturation is essential to render the double –stranded DNA molecule into single strands. This is needed for hybridization with a radioactive probe to occur. So hybridization helps to visualize the approximate location of a gene on the chromosome.