

Medicolegal Aspect of Blood



By

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Learning objectives

- ✘ Identification of the blood stain
- ✘ Identification of human blood stain
- ✘ Identification of the blood of certain person
- ✘ Medico-legal aspect of blood grouping
- ✘ DNA Finger printing



Stains

Types of stains

Blood , semen, saliva , vomit, pus, urine, feces

Description of blood stain

Shape , position, color changes

smell ,old or recent, solubility



Identification of blood stain



**Preliminary
oxidase Tests**

Guaiacum test-Green
Benzidine test- Blue
Kastle Meyer test-Pink

**CONFIRMATORY
TESTS**

Microscopic test
Microchemical test:-
A-Teichman Brown
B- Takayama Pink
Spectroscopic test

Identification of human blood stain

Microscopic test

Precipitin test → +Ve Reaction (Anti-human serum + human stain)



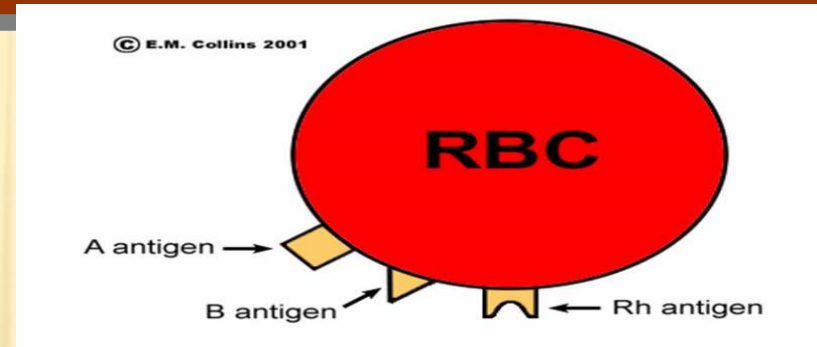
Identification the blood of certain person

ABO system

RH factor

Other factors

MN system



ABO System

Blood Group	Agglutinogens In cells	Agglutinins In serum
A	A	Beta
B	B	Alpha
AB	A&B	-----
O	-----	Alpha & Beta

Rh factor

DD homozygous +ve	Dd heterozygous +ve	dd -ve
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MN System

Agglutinogen -M No agglutinin	Agglutinogen - N No agglutinin
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BLOOD GROUPING TECHNIQUE

Fresh Blood

Direct Method

Blood Stains

**Indirect
absorption
Method**

Identification

Disputed Paternity



Blood Transfusion

Medico-legal aspect of blood groups

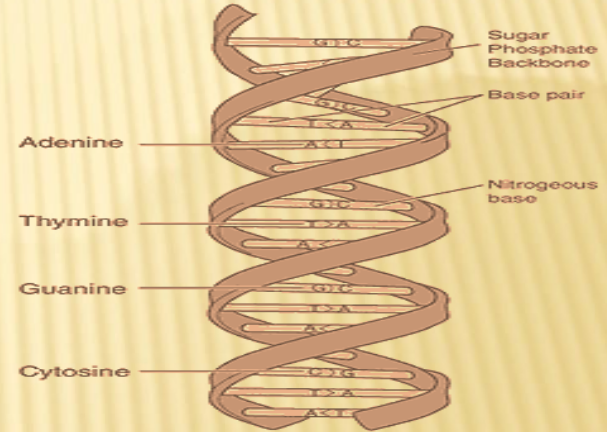


DISPUTED PATERNITY- ABO INHERITANCE

Group of parents	Group of Children		
	Possible	Impossible	
O * O	O	A,	B, AB
A * A	A	O	B, AB
A * O	A	O	B, AB
B * O	B	O	A, AB
B * B	B	O	A, AB
A * B	A	B, AB, O	None
AB * O	A	B	AB, O
AB * A, B or AB	A	B	AB
			O

DNA

1. DNA (deoxyribonucleic acid) is in chromosomes within the nucleus of the cell.
2. Gene is a segment of DNA .
3. It determines the body characters.
4. Inherited character is controlled by one or several genes.
5. The DNA alphabet is made up of four building blocks called base pairs, which are linked together in long chains.



A “Adenine”, C “cytosine”, T ”thymine” and “guanine” G.

DNA FINGERPRINT

- ✘ Part of DNA is not useful “non-coding” or junk because it is not translated into useful proteins.
- ✘ Sequences of DNA (genetic fingerprint) in non-coding regions, are repeated multiple times - variable number tandem repeats (VNTRs) between different people .
- ✘ VNTRs can be amplified by **PCR** and run on agarose gel to produce unique DNA fingerprints from person to other.
- ✘ Our genetic code is made of 3 billion pairs

USES OF DNA FINGERPRINT

- ❖ 99% of human DNA is an identical between individuals, but 1% that differs to distinguish the identity.
- ❖ DNA fingerprinting cannot discriminate between the identical twins because their banding patterns are the same.
- ❑ Disputed paternity
- ❑ Identification
- ❑ Forensic testing
- ❑ Diagnosis of inherited disorders (Gene therapy)

PRECAUTIONS FOR DNA FINGERPRINT

Specimen Collection

gloves, avoid sneezing, avoid touching, environmental factors

Sample size

The inaccurate results of the test are increased if there is a mixing DNA sample with other DNA sample.

Blood transfusion

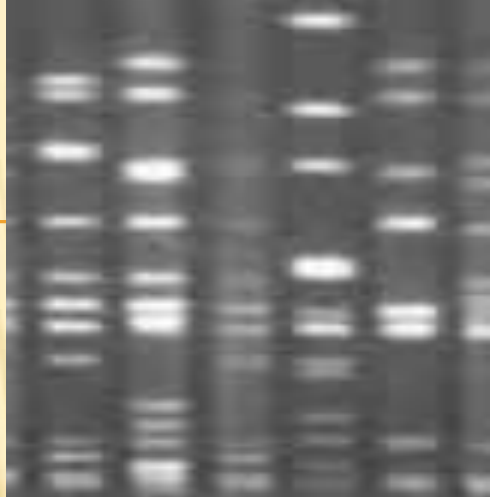
No blood transfusion within the past three months before the test.

Decay of the tissue sample(controversial**)**

SAMPLES FOR DNA FINGERPRINTING

- ✗ Blood
- ✗ Semen
- ✗ Saliva
- ✗ Sweat
- ✗ Urine
- ✗ Hair
- ✗ Skin
- ✗ Mucus
- ✗ Tissue

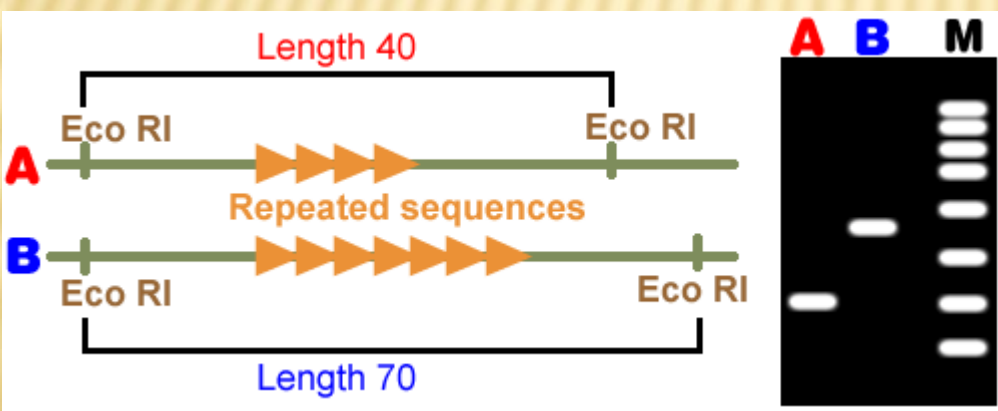
DNA ANALYSIS TECHNIQUE



**Polymerase
Chain Reaction
PCR**

**Restriction
Fragment Length
Polymorphism**

Southern blot



STEPS

Group of enzymes are produced by bacteria, that cleave DNA molecule at specific base sequence

1. It uses the restriction enzymes to cut DNA.
2. DNA fragments of different lengths are produced.
3. Fragments are separated with the different lengths to provide a pattern of bands by electrophoresis.
4. Cover specific radioactive probes over the gel. The probes contain a match for the DNA sequence that the test is looking for.
5. Put a film under the gel to record.
6. DNA fingerprints are now ready for analysis and comparison.

Thank you

Thank you



Thank you

Thank you