

Biotechnology Gel Electrophoresis

Comparing cut up DNA

- How do we compare DNA fragments?
 - ♦ separate fragments by size
- How do we separate DNA fragments?
 - ♦ run it through a gelatin
 - ♦ gel electrophoresis
- How does a gel work?

Gel electrophoresis

- A method of separating DNA in a gelatin-like material using an electrical field
 - ♦ DNA is negatively charged
 - ♦ when it's in an electrical field it moves toward the positive side

Gel electrophoresis

- DNA moves in an electrical field...
 - ♦ size of DNA fragment affects how far it travels
 - small pieces travel farther
 - large pieces travel slower & lag behind

DNA molecules of different lengths separate, the shortest moving farthest

Gel electrophoresis

DNA & restriction enzyme

wells

gel

power source

completed gel

longer fragments

shorter fragments

Uses: DNA fingerprint

- Why is each person's DNA pattern different?
 - ♦ sections of "junk" DNA
 - doesn't code for proteins
 - made up of repeated patterns
 - ♦ CAT, GCC, and others
 - ♦ each person may have different number of repeats
 - many sites on our 23 chromosomes with different repeat patterns

GCTTGTAAACG GCCTCATCATCATTCGCCGGC C TAC GCTT CGAACATTGCCGGAGTAGTAGTAAGCGCCGGATGCGAA

GC TTG TAA CGGCATCATCATCATCATCATCGCCGCTACGCTT CGAACATTGCC GTAGTAGTAGTAGTAGTAGTAGGCCGGATGCGAA

Uses: Forensics

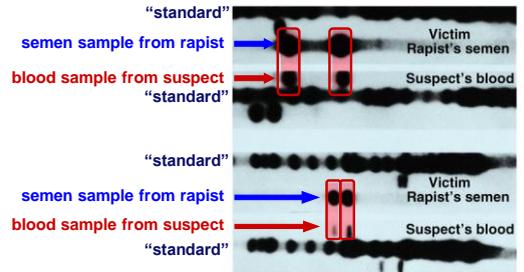
- Comparing blood samples on defendant's clothing to determine if it belongs to victim

◆ DNA fingerprinting



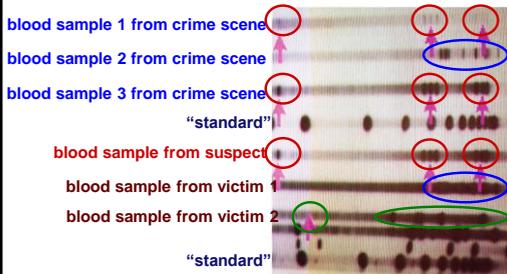
Uses: Forensics

- 1st case successfully using DNA evidence
 - ◆ 1987 rape case convicting Tommie Lee Andrews



Uses: Forensics

- Evidence from murder trial
 - ◆ Do you think suspect is guilty?



Any Questions?

