Forensic Applications of DNA Fingerprinting

Anth 5 / Prof. Waters
DNA Fingerprinting

A method used to identify an individual by his/her particular sequence of base pairs

- Commonly used to determine parentage and identify crime suspects
- Since most DNA base pairs are identical from one person to another, forensic scientists compare DNA segments known to vary among individuals
- Allows scientists to determine whether or not two or more DNA samples are from the same person, related people or unrelated people
How it’s Done

• DNA is cut into pieces by restriction enzymes (bacteria that cut apart DNA base pairs) and poured into a gel where an electrical charge is applied (known as gel electrophoresis)

• Different DNA pieces have different charges and respond differently to the electric field, resulting in distinctive patterns of DNA between individuals

• Since humans have >3 billion base pairs, and to avoid an overlapping smear of bands in a gel, only a small number of segments are compared (from loci with known variations)
In this example, DNA from a crime scene is compared with samples from 4 possible suspects. The DNA was cut up into smaller pieces and separated in a gel. The DNA markers from suspect 3 match those left at the scene of the crime, betraying the guilty party:
Gel Electrophoresis