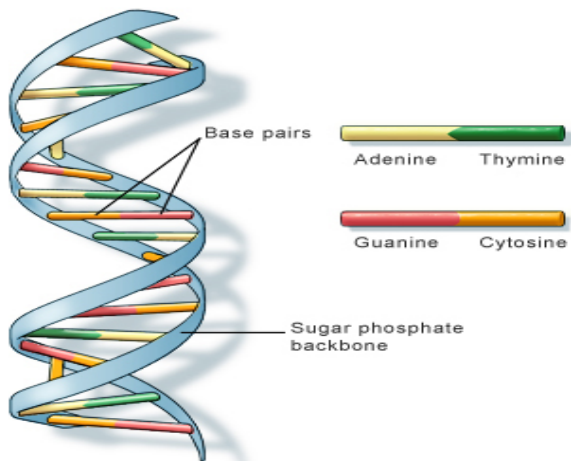


DNA evidence: two important features

match between two DNA profiles

frequency of the DNA profile in question

The molecule of DNA



U.S. National Library of Medicine

DNA as a double-series of letters

...ATTAAGGAATAAGAGGGAAATTA AAAAGG...

...TAATTCCTTATTCTCCCTTTAATTTTCC...

Combinatorics: With roughly 3 billion sites on the human DNA, there are $4^{3,000,000,000}$ combinations. Greater than 10^{100} .



Alec Jeffreys discovered DNA fingerprinting on the morning of September 1984.

Variable Number Tandem Repeats (VNTRs)

VNTRs are regions of the DNA in which a given sequence of letters is repeated a number of times.

E.g. sequence AGA is repeated five times:

—————...AGA-AGA-AGA-AGA-AGA...—————

The number of repetitions varies widely from one individual to another, but it is constant for a given person.

VNTR regions	repetitions
D3S1258	16,18
VWA	15,20
FGA	24,26
D8S1179	28,30
D2S11	10,16
D18S51	10,13
D5S818	11,11
D72820	12,15

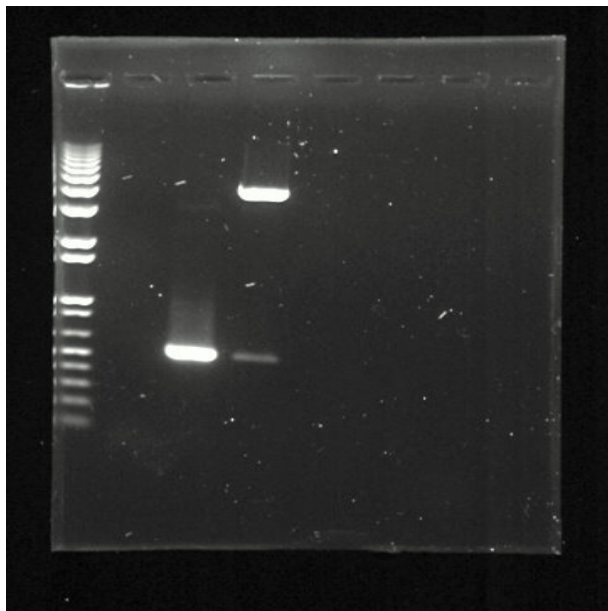
Declaring a match

A **match** between **two VNTR regions of DNA** is declared when they have the same number of repetitions of the sequence in question.

A **match** between **two DNA profiles** is declared when all VNTR regions of interest are shown to have the same number of repetitions of the sequence in question.

(Usually 10–15 VNTR regions are considered to declare a match.)

Number of repetitions = length of the VNTR region



A match for a single VNTR region

