

Murder in McKeesport



Biological evidence



DNA analysis



PowerPlex® 16 STR

Partial DNA profiles
obtained for both
the gun and the cap

Human review results



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Match to Leland Davis




Black	420	Black	5.7 quadrillion
Caucasian	500	Caucasian	9.3 quadrillion
Hispanic	470	Hispanic	1.8 quadrillion

Prosecutor question



What is the true match information of the evidence to the suspect?

TrueAllele operator

STR evidence data
fsa genetic analyzer files

↓

- Replicate computer runs for each item
- Three unknown mixture contributors
- Degraded DNA was considered

↓

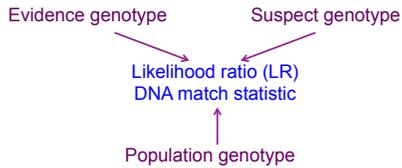
Evidence genotypes
probability distributions



Cybergenetics

TrueAllele report

Genotype probability distributions



TrueAllele DNA match

LR match to Leland Davis



Black	18.6 billion	Black	89 quadrillion
Caucasian	12.1 billion	Caucasian	420 quadrillion
Hispanic	3.37 billion	Hispanic	73.5 quadrillion



Trial preparation



- case report
- direct examination
- PowerPoint slides
- background reading
- other questions

TrueAllele reports 2 & 3

2. Is Dominick Haynes in the DNA evidence?
Answer: No – million factor against.

3. Is anyone else in both DNA evidence items?
Answer: No – Leland Davis is the only one.





No pretrial admissibility hearing

TrueAllele precedent

Commonwealth of Pennsylvania v. Kevin James Foley

Superior Court, 2012



Computer Interpretation of Quantitative DNA Evidence

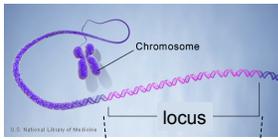
Commonwealth v Leland Davis
August, 2012
Pittsburgh, Pennsylvania

Mark W Perlin, PhD, MD, PhD
Cybergenetics, Pittsburgh, PA



Cybergenetics © 2003-2012

DNA genotype



mother allele

ACGT repeated word

father allele

A genetic locus has two DNA sentences, one from each parent.

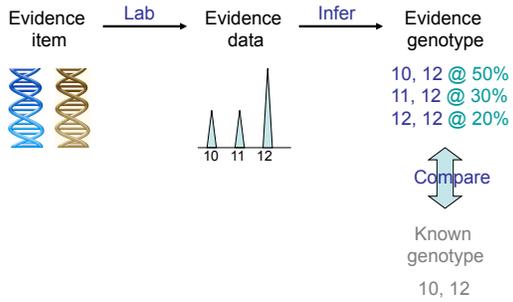
An **allele** is the number of repeated words.

A **genotype** at a locus is a pair of alleles.

8, 9

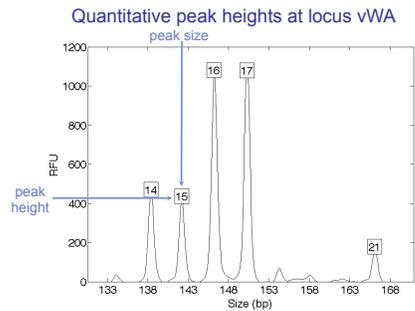
Many alleles allow for many many allele pairs. A person's genotype is relatively unique.

DNA evidence interpretation

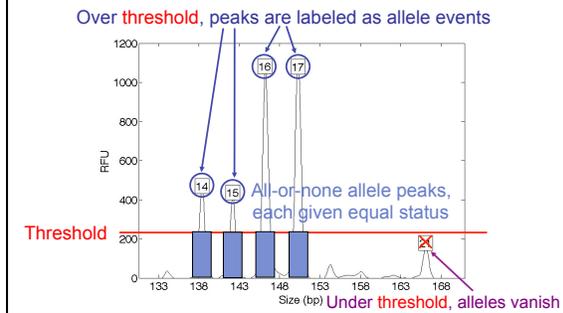




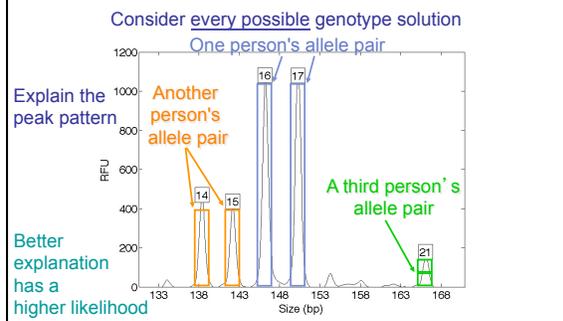
Computers can use all the data



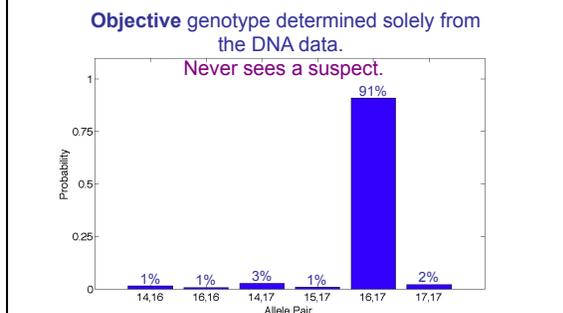
People may use less of the data

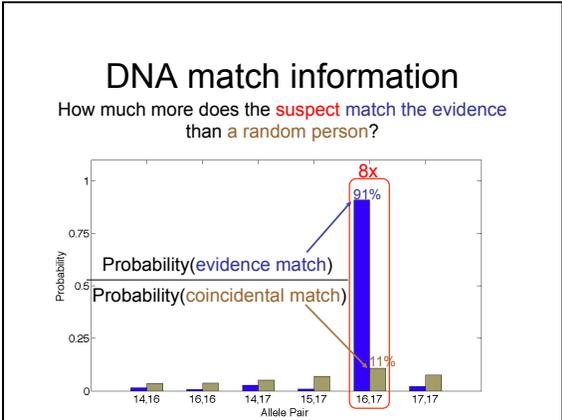


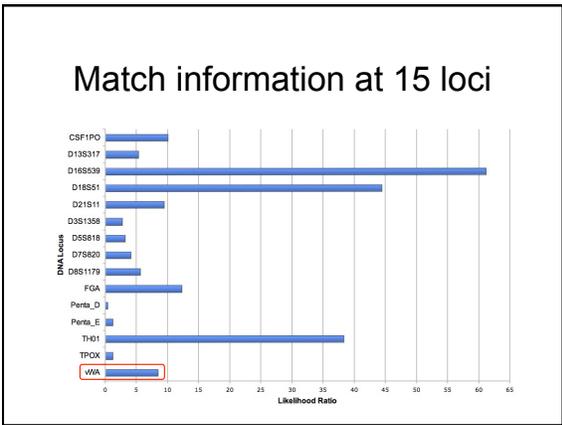
How the computer thinks



Evidence genotype









Is the suspect in the evidence?

A match between the **handgun** and Leland Davis is:

- 18.6 billion times more probable than a coincidental match to an unrelated **Black** person
- 12.1 billion times more probable than a coincidental match to an unrelated **Caucasian** person
- 3.37 billion times more probable than a coincidental match to an unrelated **Hispanic** person



Is the suspect in the evidence?

A match between the **baseball cap** and Leland Davis is:

89 quadrillion times more probable than a coincidental match to an unrelated **Black** person

420 quadrillion times more probable than a coincidental match to an unrelated **Caucasian** person

73.5 quadrillion times more probable than a coincidental match to an unrelated **Hispanic** person

Is anyone else in both items of evidence?



There is no indication that any person, other than Leland Davis, contributed their DNA to both items of evidence.

Verdict



Leland Davis was convicted of third degree murder and weapons charges in the 2008 McKeesport slaying of Tamir Thomas.

His sentence was 23 years.

More about TrueAllele

<http://www.cybgen.com/information>



- Courses
- Newsletters
- Newsroom
- Presentations
- Publications

<http://www.youtube.com/user/TrueAllele>
TrueAllele YouTube channel



Cybergenetics



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