

To include or not to include: the extent is the question

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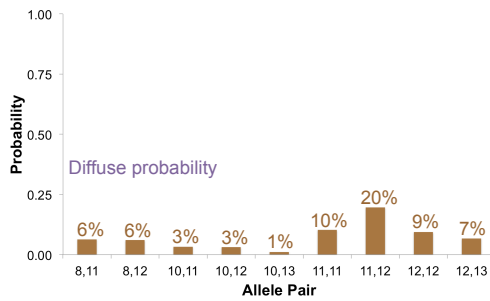


Cybergenetics

Cybergenetics © 2003-2017

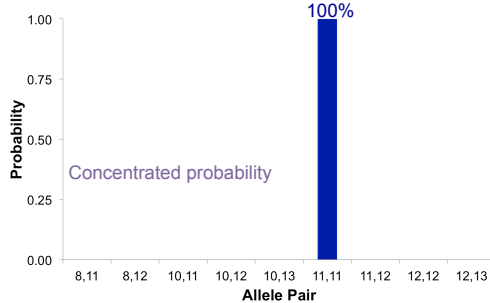
Random genotype

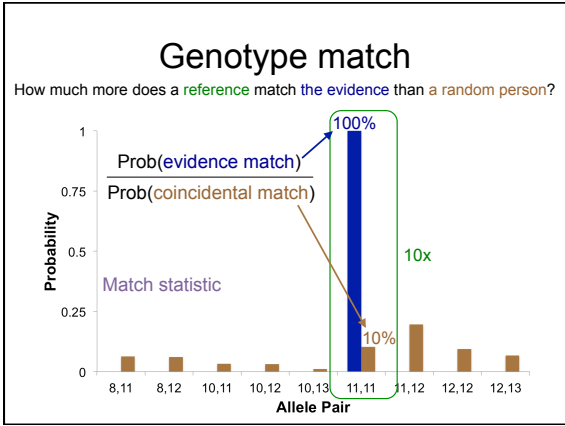
Probability of a random person having a specific allele pair



Single source genotype

Evidence genotype for single source DNA

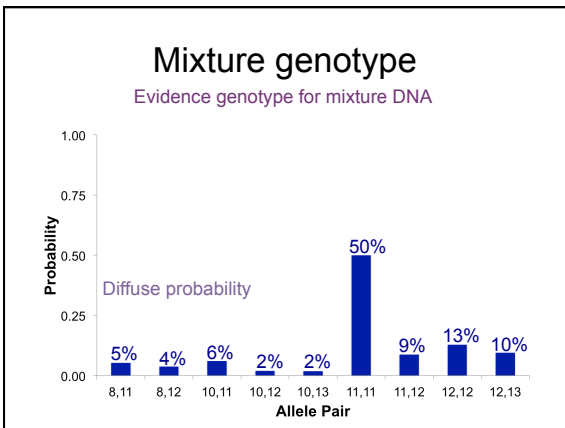


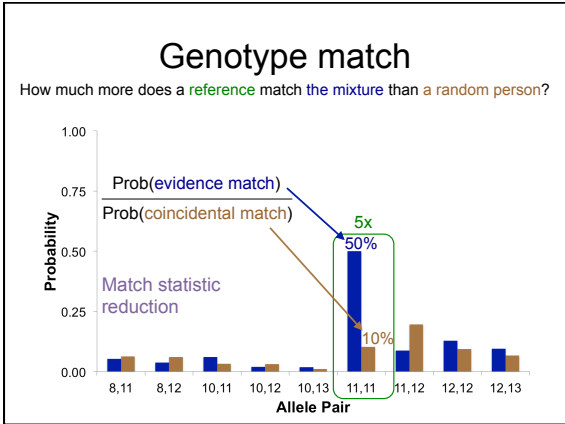


Is the reference in the evidence?

A match between the evidence and the reference is:

10 times more probable than coincidence at this one DNA location





Is the reference in the mixture?

A match between the mixture evidence and the reference is:

5 times more probable than coincidence at this one DNA location

Wolfe sisters homicide

On February 6, 2014, Susan Wolfe (44) and her younger sister Sarah (38, left) were killed in their East Liberty home in Pittsburgh.

Commonwealth v. Allen Wade

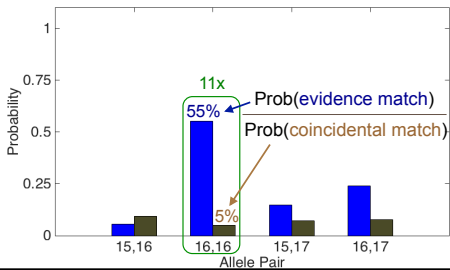
Allen Wade was charged with various counts of criminal homicide, robbery, theft, and firearms violations

DNA evidence was collected from many items



DNA match information

How much more does the suspect match the fingernails than a random person?



Is the suspect in the evidence?

Calculated at the 15 loci tested

A match between the fingernails and Allen Wade is:

6.06 trillion times more probable than coincidence

Computer match statistics

TrueAllele found 17 matches

Hat	65.3 thousand	Allen Wade
Cup	20.5 thousand	Susan Wolfe
Fingernails	6.06 trillion	Allen Wade
Gear shift	9.37 million	Sarah Wolfe
Seat lever	385 billion	Sarah Wolfe
Knit hat	25.7 thousand	Allen Wade
Sock	300	Sarah Wolfe

DNA matches lead to verdict...

Allen Wade Found Guilty On All Counts In East Liberty Sisters' Slaying

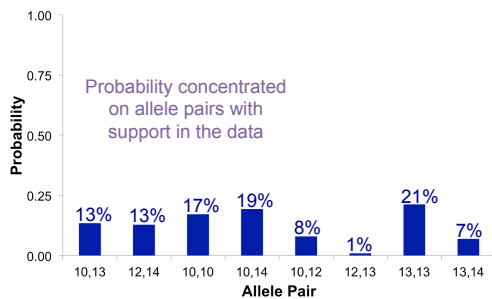
CBS News, May 23, 2016

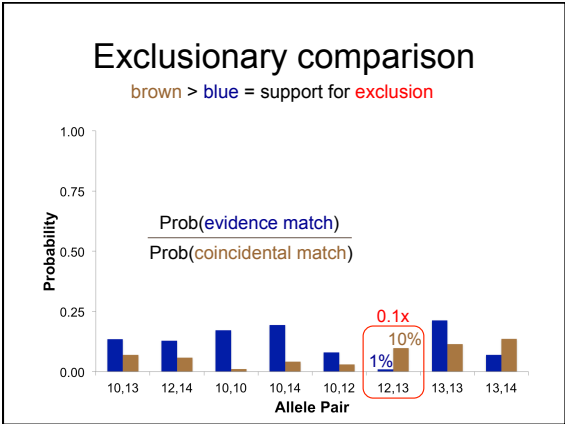
PITTSBURGH (KDKA/AP)

- A man accused of killing two sisters who lived next door to him in East Liberty has been found guilty on all counts.
- Allen Wade was accused of shooting Sarah and Susan Wolfe after they returned from work on Feb. 6, 2014, apparently to steal a bank card.
- On Monday morning, a jury found Wade guilty of first-degree murder, robbery, burglary and theft by unlawful taking.

Mixture genotype

Mixture genotypes have diffuse probability





Is the reference in the mixture?


A match between the **mixture evidence** and the **reference** is:

10 times **less** probable than coincidence at this one DNA location


Michael Ciannella, Jr.

Defendant with no prior record maintained his innocence and never admitted guilt

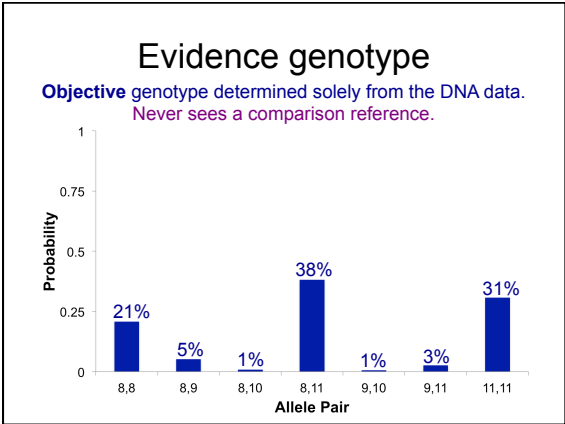
- Cybergentics contacted on July 18, 2016
- Data received July 19, 2016
- Preliminary results sent on July 20, 2016

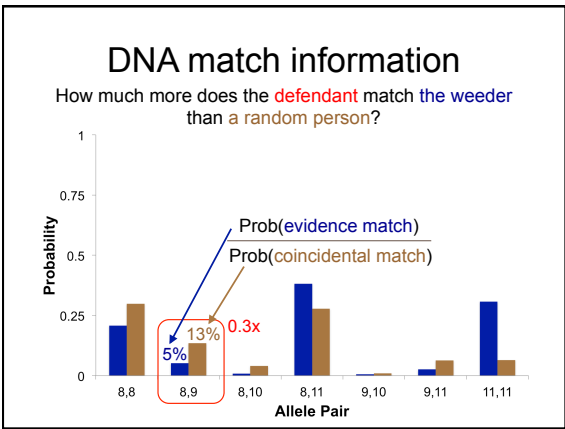


Breaking and entering charge



DNA found on weeder tool





Is the defendant in the evidence?

Calculated at all 15 loci tested

A match between the weeder and Michael Ciannella, Jr. is:

2.44 billion times less probable than coincidence

Case outcome

- In September 2016, a report with exclusionary results was issued
- The defense discussed the DNA results with the prosecution
- In November 2016 – Mr. Ciannella was given pretrial probation
- Case will be removed from trial list to be dismissed in one year

Indiana v. Darryl Pinkins

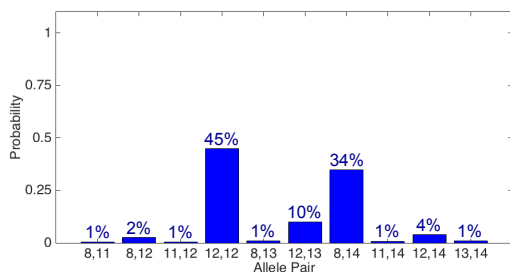
1989 – 5 men raped an Indiana woman
Darryl Pinkins and 2 others misidentified
1991 – wrongfully convicted, 65 year sentence

2001 – DNA mixture evidence 2 contributors
found, not the accused
but 5 were needed, post-conviction relief denied



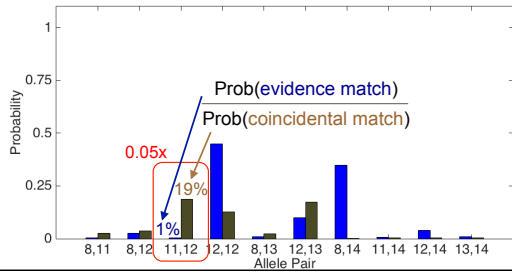
Evidence genotype

Objective genotype determined solely from the DNA data.
Never sees a comparison reference.



DNA match information

How much more does the **defendant** match the **jacket** than a **random person**?



Is the reference in the evidence?

Calculated at the 9 loci tested

A match between the **jacket** and **Darryl Pinkins** is:

1.1 million times **less** probable than coincidence

Computer analysis

The TrueAllele computer:

1. compared *evidence with evidence*
2. calculated *exclusionary match statistics*
3. revealed 5% *minor mixture contributor*
4. *jointly analyzed* DNA mixture data
5. showed three perpetrators were *brothers*

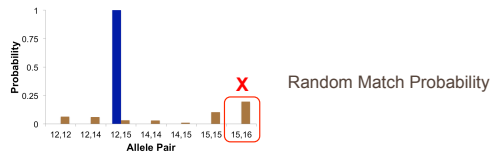
found 5 unidentified genotypes,
defendants not linked to the crime

Pinkins exonerated

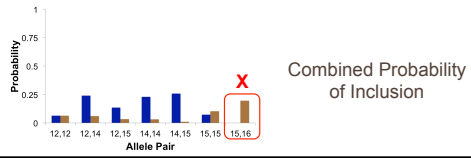


Some of the data

In or out, no in-between



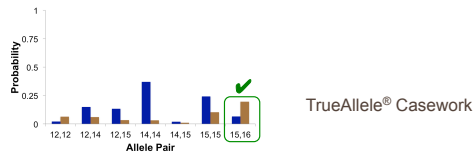
Random Match Probability



Combined Probability of Inclusion

All of the data

Objective, thorough



TrueAllele® Casework

Using all the data leads to more accurate DNA results

More information

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



- Courses
- Newsletters
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- Webinars

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



Cybergenetics



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