

# Machines can work it out: Automated TrueAllele® workflow

Mid-Atlantic Association of Forensic Scientists  
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Pittsburgh, PA



Cybergenetics

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## Technology



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## TrueAllele automation

While I am here, the computer  
is solving DNA mixture problems

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|------------|--|
| Versatile  | Accepts most sequencer and PCR kit data                      |
| Productive | Parallel processing works on multiple samples simultaneously |
| Fast       | Results ready in hours                                       |

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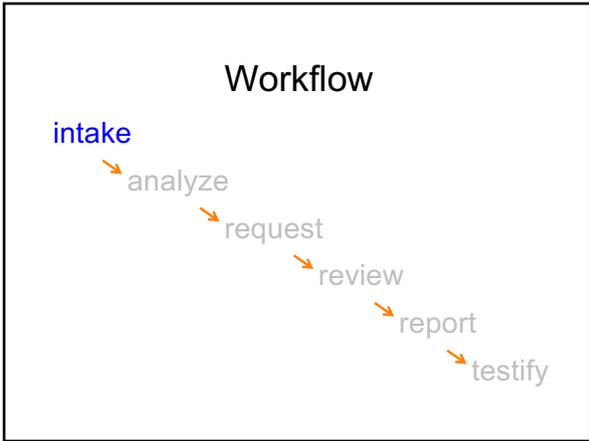
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### Case

Data too complex for lab interpretation

- Sexual assault
- 2 evidence items
- 2 references
- PowerPlex® Fusion
- AB 3500

Forensic questions

- Is the suspect's DNA present on the victim's neck?
- Is the victim's DNA present on the suspect's underwear?

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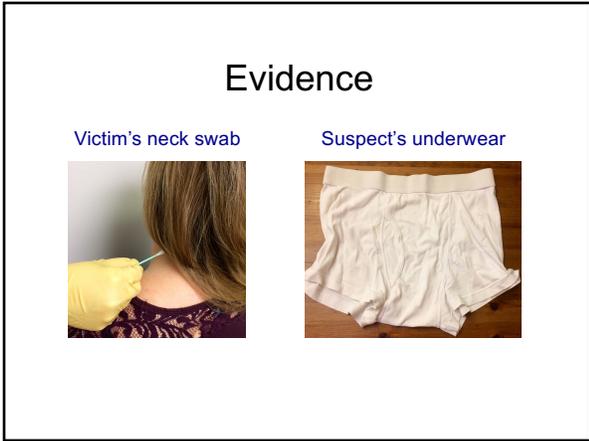
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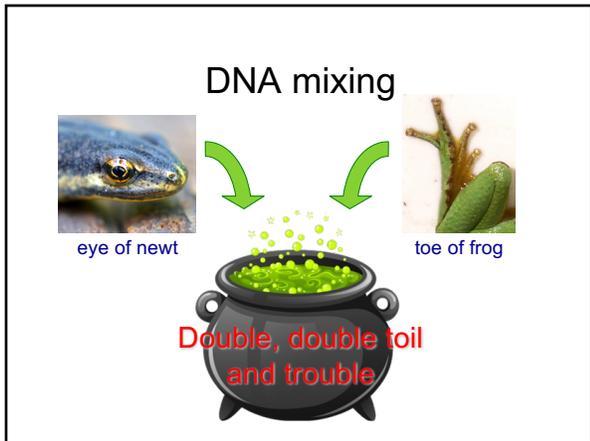
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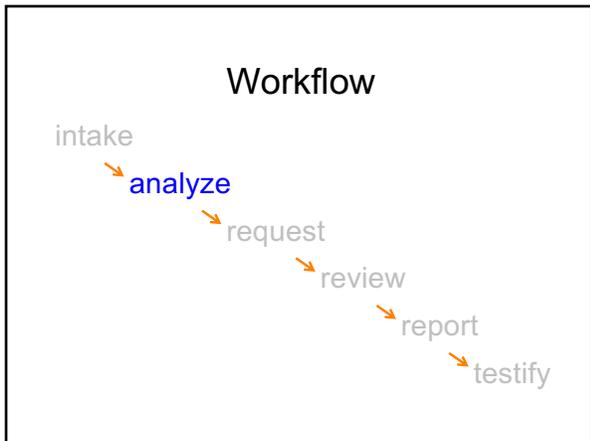
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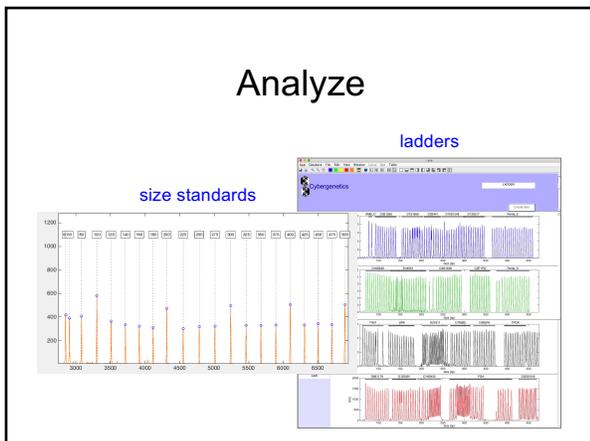
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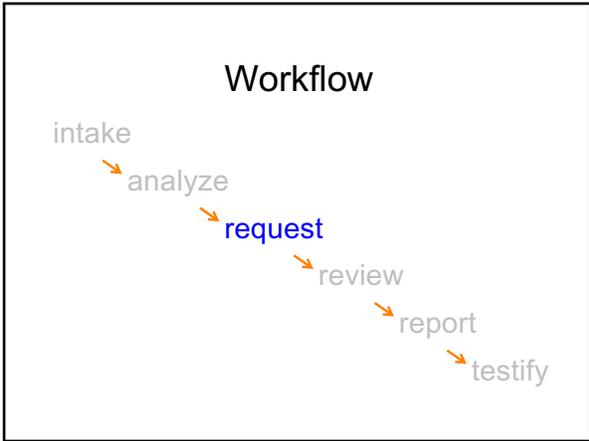
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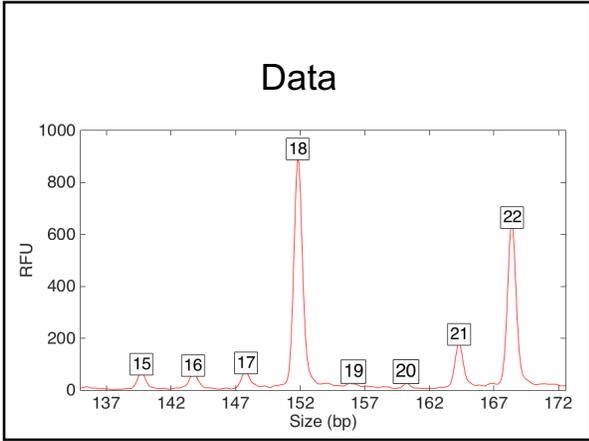
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### Question

The screenshot shows a software interface with DNA profiles on the left and a table of contributor counts on the right. Blue arrows point from the profiles to the counts.

Profile 1	3 contributors	3
Profile 2	3 contributors	3
Profile 3	4 contributors	4
Profile 4	4 contributors	4

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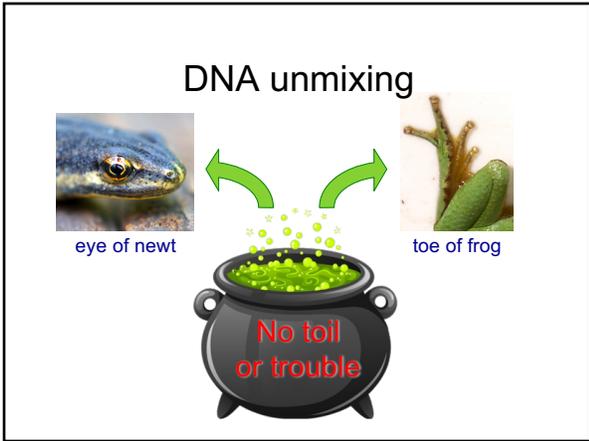
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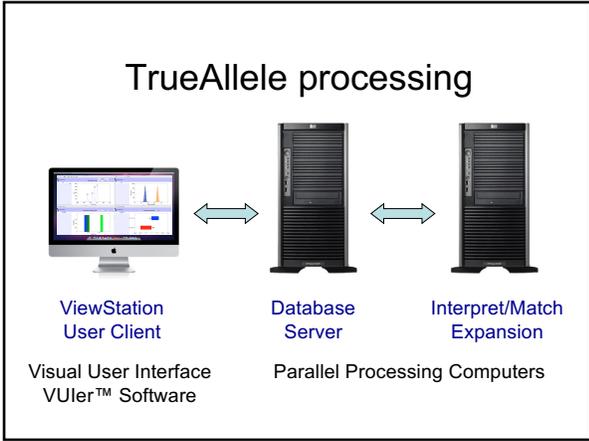
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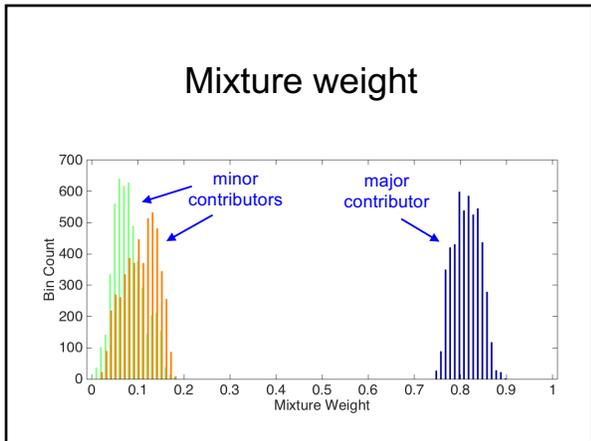
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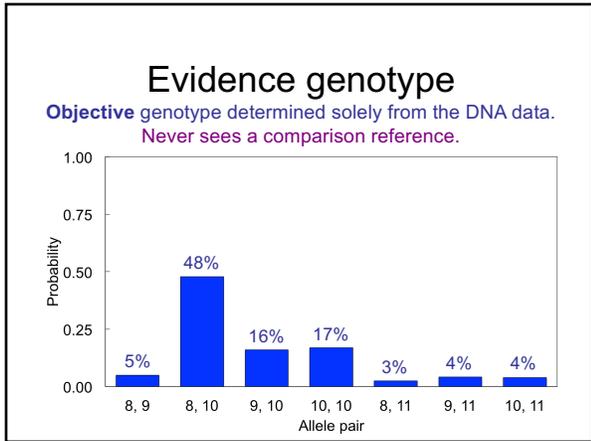
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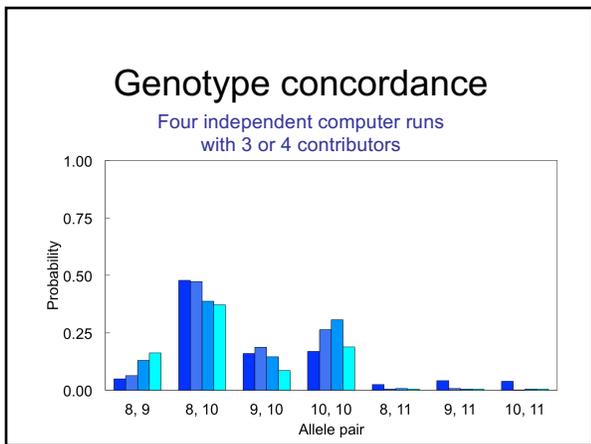
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### Match statistics

Item	Description	K1	K2
		Victim	Suspect
Q1	Victim' s neck	nonillion	trillion
Q2	Suspect' s underwear	billion	octillion

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### TrueAllele® computer technology

- Accurate      34 validation studies, 7 published
- Objective     Workflow removes human bias
- Accepted     Reported in 37 states, used by labs
- Transparent   Give math, software (4GB DVD)
- Neutral       Can statistically include or exclude

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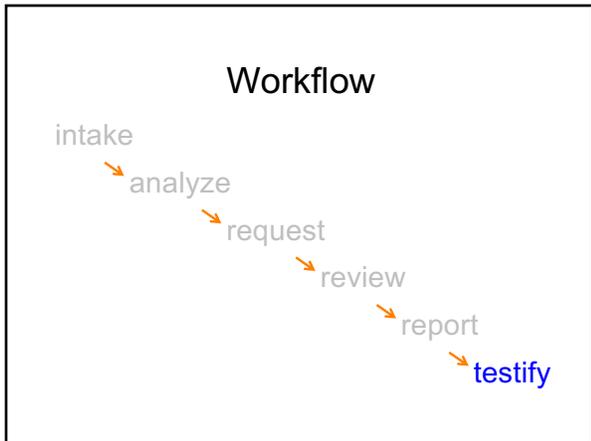
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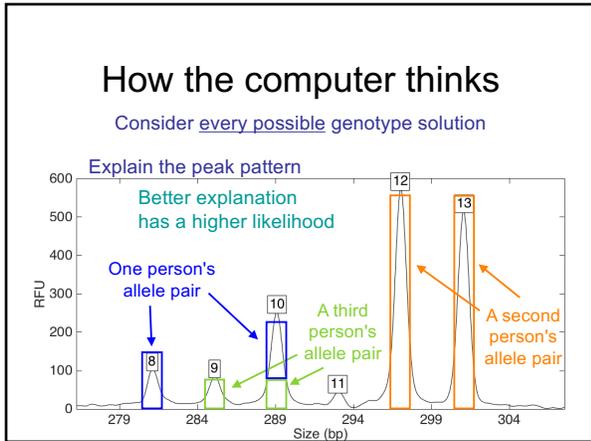
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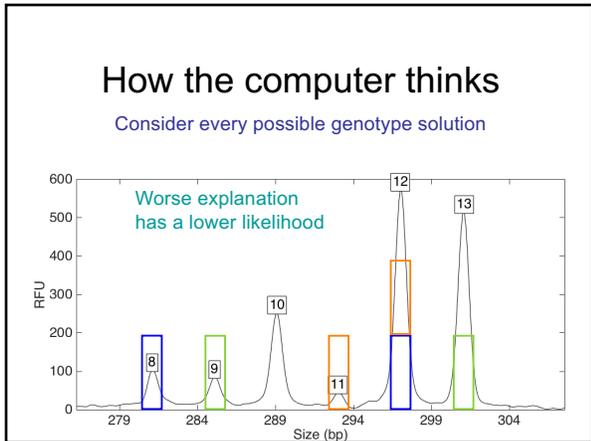
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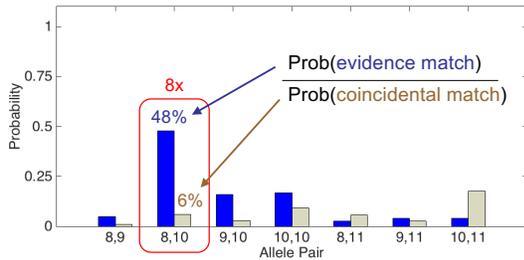
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## DNA match information

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




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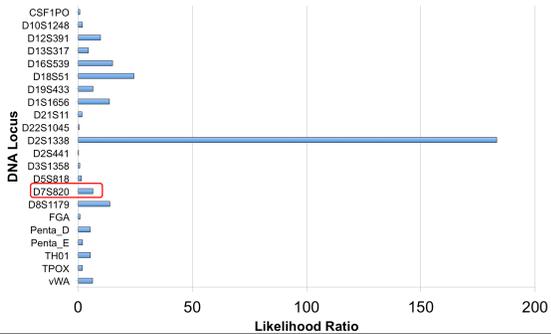
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## Match information at 22 loci




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## Is the suspect in the evidence?

A match between the victim's neck and the suspect is:

41.9 trillion times more probable than a coincidental match to an unrelated African-American person

8.45 trillion times more probable than a coincidental match to an unrelated Caucasian person

1.75 trillion times more probable than a coincidental match to an unrelated Hispanic person

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## Case outcome

Prosecutor submitted the case to Cybergenetics via free screening offer

Cybergenetics sent the prosecutor preliminary results in 2 weeks

Prosecutor told Cybergenetics 3 weeks later that the suspect pled guilty

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### Allegheny County: 59 cases, 13 trials, 4 exonerations

Crime	Evidence	Defendant	Outcome	Sentence
rape	clothing	Ralph Skundrich	guilty	75 years
murder	gun, hat	Leland Davis	guilty	23 years
rape	clothing	Akaninyene Akan	guilty	32 years
murder	shotgun shells	James Yeckel, Jr.	guilty plea	25 years
murder	fingernail	Anthony Morgan	guilty	life
weapons	gun	Thomas Doswell	guilty plea	1 year
bank robbery	clothing	Jesse Lumberger	guilty	10 years
drugs	gun	Derek McKissick	guilty plea	2 1/2 years
drugs	gun	Steve Morgan	guilty plea	2 1/2 years
murder	door, clothing	Calvin Kane	guilty plea	20 years
murder	fingernail, clothing	Allen Wade	guilty	life
murder	gun	Jaykwaan Pinckney	guilty plea	10 years
child rape	clothing	Dhaque Jones	guilty plea	6 years
shooting	gun	Anthony Jefferson	guilty plea	4 years
weapons	gun	Zachary Blair	guilty plea	15 years
weapons	gun	Delmingo Williams	guilty plea	3 years
incest rape	clothing	Terry L.	guilty	40 years
bank robbery	hat	Robert Schatzman	guilty	1 1/2 years
weapons	gun	Rashawn Walker	guilty	1.5 years
robbery	hat	Lauren Peak	guilty plea	1 year
rape	body cavity	Freddie Cole	guilty plea	2 years
murder	gun	Chaz White	guilty plea	4 years
sex crime	clothing	Christopher Stavish	guilty plea	2 1/2 years
murder	gun	Jake Knight	guilty	life

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## More information

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



- Courses
- Newsletters
- Newsroom
- Presentations
- Publications
- Webinars

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



Cybergenetics



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