

Preserving DNA Information

National Association of Medical Examiners
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Cybergenetics

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Blairsville Dentist Dr. John Yelenic



As Murder Victim

An autopsy photograph presented in the talk showed deep knife wounds to the victim's ear, neck and back. The neck wound was compounded by extensive jagged lacerations from a glass window.

Apr 2006: Death in home by exsanguination

State Trooper Arrested



Nov 2007: Kevin Foley charged with crime

Fingernail DNA Evidence

An autopsy photograph presented in the talk showed a deep defensive knife wound to the back of the victim's right hand. The DNA evidence was extracted from under the indicated fingernails.

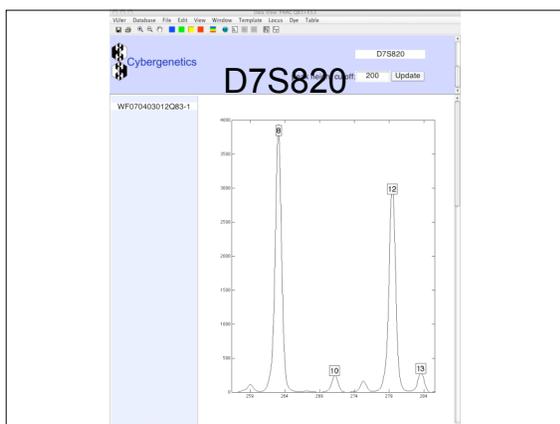
Feb 2008: 7% DNA component matches suspect

Three DNA Match Scores

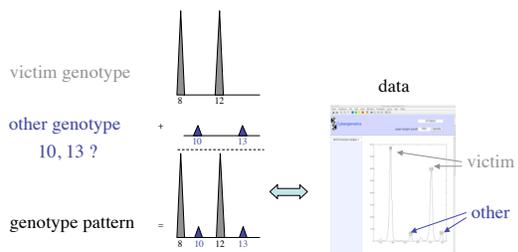
<u>Score</u>	<u>Method</u>
13 thousand	FBI Lab
23 million	Dr. Cotton
189 billion	TrueAllele

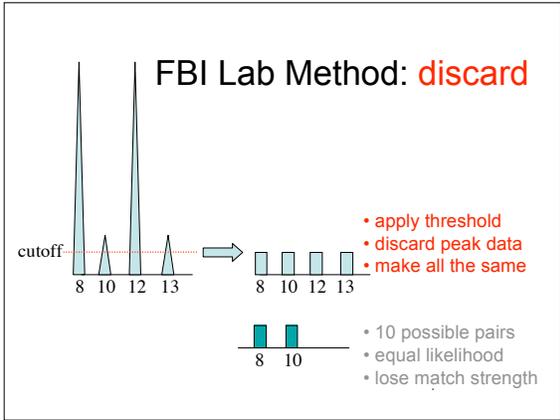
Different Interpretation Methods

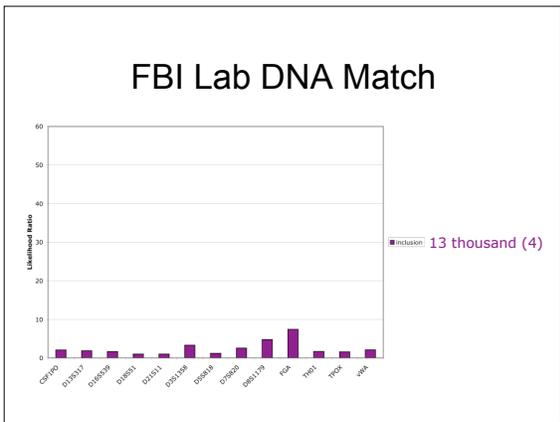
Data Used	FBI Lab	Dr. Cotton	TrueAllele
victim profile	NO	YES	YES
preserve data	NO	NO	YES

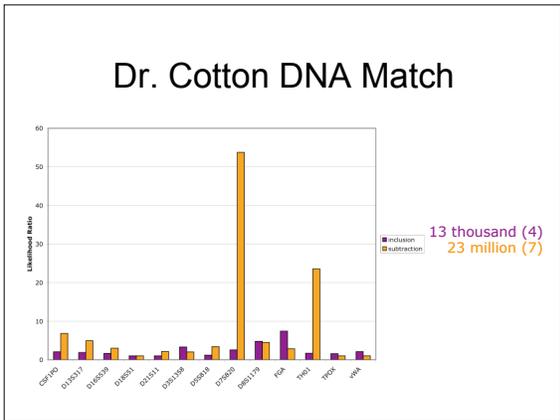


TrueAllele Method: **preserve**

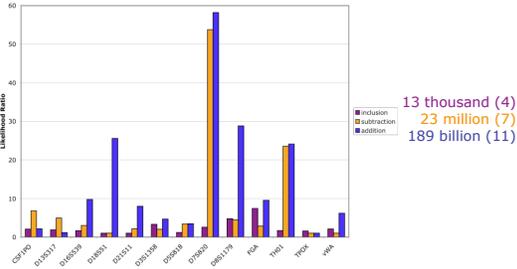








TrueAllele DNA Match



Frye: General Acceptance in the Relevant Community

- Quantitative STR Peak Information
- Genotype Probability Distributions
- Computer Interpretation of STR Data
- Statistical Modeling and Computation
- Likelihood Ratio Literature
- Mixture Interpretation Admissibility
- Computer Systems for Quantitative DNA Mixture Deconvolution
- TrueAllele Casework Publications

Indiana Gazette.com

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Jury convicts trooper of dentist slaying

Published: Thursday, March 19, 2009 12:46 AM EDT
 An Indiana County Court jury this evening convicted state trooper Kevin Foley of first degree murder in the April 13, 2006, slashing death of Blairsville dentist John Yelenic.

"John Yelenic provided the most eloquent and poignant evidence in this case," said the prosecutor, senior deputy attorney general Anthony Krastek. "He managed to reach out and scratch his assailant," capturing the murderer's DNA under his fingernails.

www.cybgen.com/information/news_fall2009.shtml

DNA Interpretation Varies

National Institute of Standards and Technology
Two Contributor Mixture Data, Known Victim

Some Differences in Reporting Statistics

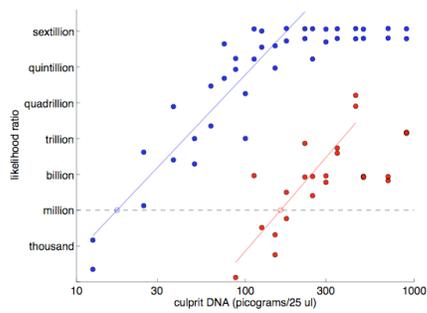
LabID	Kits Used	Cases		
		Caucasians	African-Americans	Hispanics
30	ProPlus/Collier	1.18E+15	2.13E+14	3.09E+15
34	ProPlus/Collier	2.48E+11	2.64E+08	9.00E+10
33	ProPlus/Collier	2.94E+08	1.12E+08	1.74E+09
6	ProPlus/Collier	40,000,000	3,500,000	260,000,000
9	ProPlus/Collier	1.14E+07	1.97E+07	1.54E+08
79	ProPlus/Collier	930,000	47,000	1,350,000
16	ProPlus/Collier	434,600	31,710	399,100

213 trillion (14)

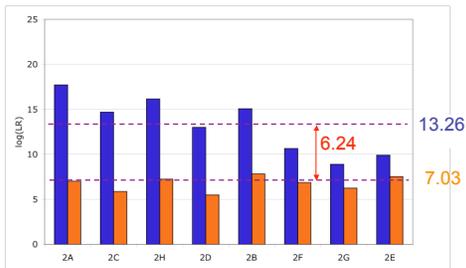
31 thousand (4)

Remember that these labs are interpreting the same MIX05 electropherograms

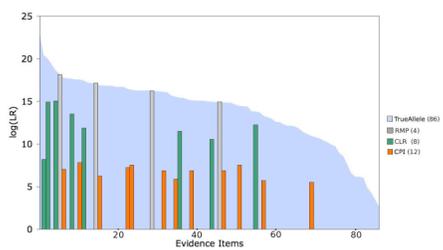
Preserve vs. Discard



Preserve vs. Discard



Preserve vs. Discard



Conclusions

- DNA interpretation varies greatly
- human limitations *discard* data
- computers *preserve* information
- average loss: *factor of one million*
- "inconclusive" cases can be solved