


Topics and Techniques for Forensic DNA Analysis
Continuing Education Seminar

Introductions


NYC OCME
Dept of Forensic
Biology

New York City, NY
March 25, 2009



Dr. John M. Butler
National Institute of
Standards and Technology

john.butler@nist.gov



Outline for Today's Training

- Introductions
- Literature Management and Organizational Skills

BREAK


- Capillary Electrophoresis Fundamentals and Troubleshooting

LUNCH BREAK

- STR Analysis

BREAK

- Mixture Interpretation



Dr. John M. Butler


<http://www.cstl.nist.gov/biotech/strbase/butler.htm>

Experience

- University of Virginia/FBI Laboratory (1992-1995)
 - Work performed in Bruce McCord's lab
- NIST NRC Postdoc (1995-1997)
- GeneTrace Systems Inc (1997-1999)
- NIST Human Identity Project Leader (1999-present)


Contact Information
john.butler@nist.gov
301-975-4049

- Ph.D. dissertation (Aug 1995): "Sizing and quantitation of polymerase chain reaction products by capillary electrophoresis for use in DNA typing"
- *Forensic DNA Typing* textbook (now in its 2nd Edition)
- STRBase website: <http://www.cstl.nist.gov/biotech/strbase/>
- Family: wife Terilynne and 6 children
- Hobbies: reading, writing, and making PowerPoint slides




NIST History and Mission

- National Institute of Standards and Technology (NIST) was created in 1901 as the National Bureau of Standards (NBS). The name was changed to NIST in 1988.
- NIST is **part of the U.S. Department of Commerce** with a mission to develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life.
- NIST supplies over 1,300 Standard Reference Materials (SRMs) for industry, academia, and government use in **calibration of measurements**.
- **NIST defines time for the U.S.**

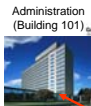


\$603 for 3 jars



DNA typing standard

NIST Gaithersburg Campus




Administration (Building 101)

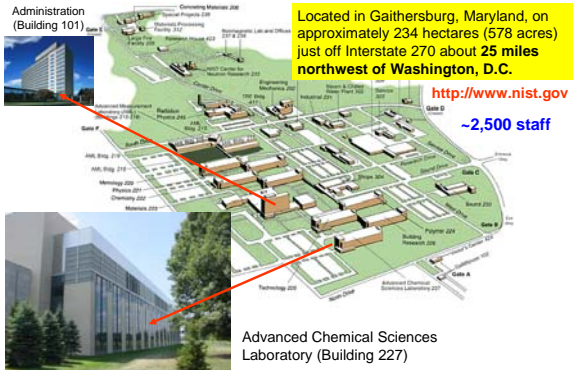
Located in Gaithersburg, Maryland, on approximately 234 hectares (578 acres) just off Interstate 270 about 25 miles northwest of Washington, D.C.

<http://www.nist.gov>

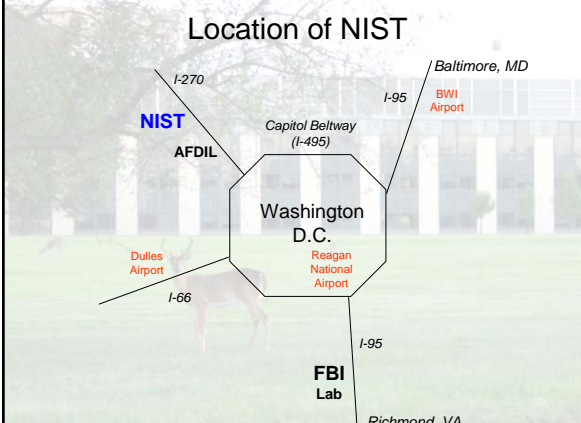
~2,500 staff



Advanced Chemical Sciences Laboratory (Building 227)



Location of NIST



Washington D.C.

Capitol Beltway (I-495)

I-270 (NIST location)

I-95 (Baltimore, MD, BWI Airport)

I-66 (Dulles Airport)

I-95 (FBI Lab, Richmond, VA)

Introductions

NYC OCME Forensic Biology Continuing Education Seminar

March 25, 2009

NIST Human Identity Project Team

John Butler **Margaret Kline** **Jan Redman** **Pete Vallone** **Becky Hill** **Amy Decker** **Dave Duewer**

Former Project Team Members

Mike Coble **Chris DeAngelis** **Jill Appleby** **Rich Schoske** **Christian Ruitberg** **Dennis Reeder**

AFDIL **Medical School** **NC SBI** **Air Force** **Pharma** **Retired/ABI**

NIST Human Identity Project Team

...Bringing traceability and technology to the scales of justice...

John Butler (Group Leader) **Amy Decker** **Becky Hill** **Margaret Kline** **Jan Redman** **Pete Vallone**

And many wonderful collaborators...

Dave Duewer (data analysis) **Angie Dolph** (summer 2007) **Michelle Burns** (summer 2008+)

Since 2000:
 >100 publications
 >250 presentations
 >30 training workshops

Funding from the **National Institute of Justice (NIJ)** through NIST Office of Law Enforcement Standards

Our team publications and presentations are available at:
<http://www.cstl.nist.gov/biotech/strbase/NISTpub.htm>

National Institute of Justice
 The Research, Development, and Evaluation Agency of the U.S. Department of Justice

Current Areas of NIST Effort with Forensic DNA

- Standards**
 - Standard Reference Materials
 - Standard Information Resources (STRBase website)
 - Interlaboratory Studies
- Technology**
 - Research programs in SNPs, miniSTRs, Y-STRs, mtDNA, qPCR
 - Assay and software development, expert system review
- Training Materials**
 - Review articles and workshops on STRs, CE, validation
 - PowerPoint and pdf files available for download

<http://www.cstl.nist.gov/biotech/strbase/NIJprojects.htm>

Training Materials Available on STRBase

<http://www.cstl.nist.gov/biotech/strbase/training.htm>

STR Training Materials

PowerPoint slides for figures from *Forensic DNA Typing (2nd Edition)* [181 slides, 8.72 Mb file]

NIJ DNA Section Training Manual (2.5 Mb pdf file) for the Missouri State Highway Patrol Laboratory - an example of informative insight, required reading, and expectations for DNA analysis and technicians in training - provided by **Earl Montgomery** of the Missouri State Highway Patrol Crime Laboratory

PowerPoint Presentations and Slide Shows

- Background Information (20 slides)
- STR Technology (13 slides)
- 2-Chromosomal STRs (40 slides)
- From lab notes by John Butler at Cambridge Healthtech Institute's Fourth Annual DNA Forensics Meeting June 1, 2000
- NIJ 2005 Lab (37 slides)
- NIJ 2005 Lab (37 slides)
- Training on STR Typing Using Commercial Kits and ABI 3130XL **Fact 1** (44 slides) **Fact 2** (44 slides)
- Margaret C. Kline, Janita W. Jordan, John M. Butler October 22-26, 2001
- John Butler and Bruce McCord workshop at the American Academy of Forensic Sciences (Seattle, WA) February 20, 2006**
 - STR Biology, Methods, and Metrics (69 slides, 5.4 Mb file)
 - Capillary Electrophoresis Instrumentation, Theory and Application (73 slides, 5.4 Mb)
 - Validation Aspects to Consider on Emerging a New STR Kit "CinLent" (91 slides, 9.1 Mb)
 - CE Troubleshooting (73 slides, 5.5 Mb)
 - STR Mutation Investigations (46 slides, 2.3 Mb)
 - DNA Quantitation with Peakless qPCR and Low Copy Number Issues (63 slides, 3.8 Mb)
 - Y-STRs and mtDNA (17 slides, 2.1 Mb)

Contributors to These Workshop Slides

Bruce McCord **Mike Coble** **Becky Hill** **Angie Dolph** **Amy Decker**

Florida International University **AFDIL** **NIST** **Marshall U./NIST** **NIST**

CE **miniSTRs** **mixtures**

NIST and NIJ Disclaimer

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Points of view are mine and do not necessarily represent the official position or policies of the US Department of Justice or the National Institute of Standards and Technology.

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