


Advanced Topics in Forensic DNA Analysis

---


# Introductions

---

New Jersey State Police  
**Training Workshop**  
 Hamilton, NJ  
 December 5-6, 2006



**Dr. John M. Butler**  
 National Institute of  
 Standards and Technology  
[john.butler@nist.gov](mailto:john.butler@nist.gov)




---

---

---

---

---


---

---

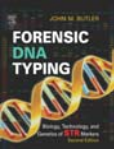
---

---

---



**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 2<sup>nd</sup> 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.**



\$532 for 3 jars



DNA typing standard

---

---

---

---

---

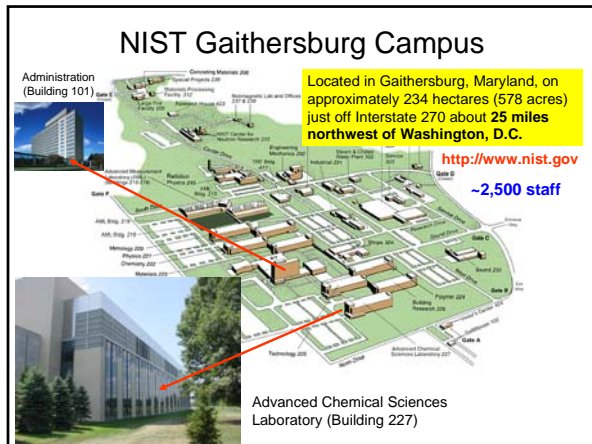
---

---

---

---

---



---

---

---

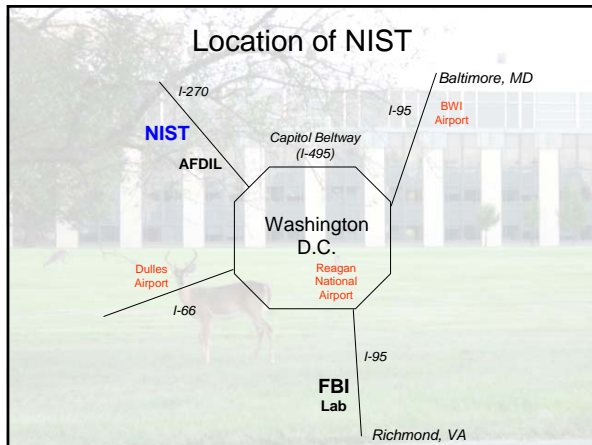
---

---

---

---

---



---

---

---

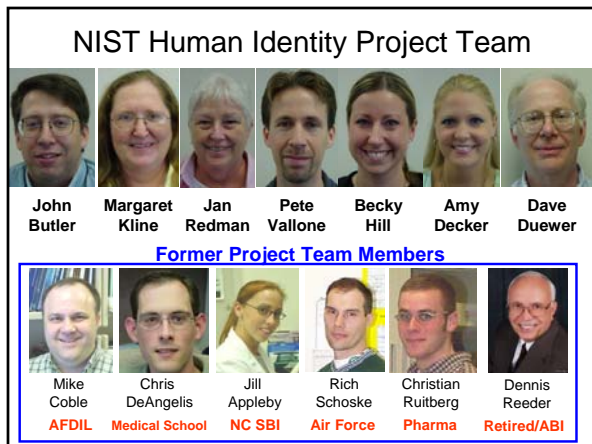
---

---

---

---

---



---

---

---


---

---

---

---

---

 **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
- **Training Materials**
  - Review articles and workshops on STRs, CE, validation
  - PowerPoint and pdf files available for download

---

---

---


---

---

---

---

---

 Team Impact

- **27 publications** (published or submitted) since Jan 2006
- **45 presentations** and **10 workshops** to the community since Jan 2006
- **Training workshops:** AAFS, MAAFS, MAFS, NEAFS, OCME, MASP, NYSP, MN BCA (slides available on STRBase)
- **PDI Workshops:** Validation, mtDNA, qPCR

All NIST publications and presentations available on STRBase:  
<http://www.cstl.nist.gov/biotech/strbase/NISTpub.htm>

---

---

---

---

---

---

---

---

AAFS Workshop #6 (Feb 2006, Seattle)  
**Advanced Topics in STR DNA Analysis**  
Instructors: John Butler and Bruce McCord

*For DNA analysts using the ABI 310 or ABI 3100 who would like to better understand the underlying issues and science involved with STR DNA typing*

- STR Biology, Markers, and Methods
- Capillary Electrophoresis Instrumentation: Theory and Application
- Validation Aspects to Consider in Bringing a New STR Kit "On-line"
- CE Troubleshooting
- STR Mixture Interpretation
- DNA Quantitation with Real-Time qPCR
- Low-copy Number Issues
- Y-STRs and mtDNA

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

---

---

---

---

---

---

---

---





**Outline for Workshop**

<p><b>Day 1</b></p> <ul style="list-style-type: none"> <li>• Introductions</li> <li>• CE Fundamentals</li> <li>• CE Troubleshooting</li> </ul> <p>LUNCH</p> <ul style="list-style-type: none"> <li>• Mixture Interpretation</li> <li>• qPCR and LCN</li> </ul>	<p><b>Day 2</b></p> <ul style="list-style-type: none"> <li>• miniSTRs</li> <li>• Validation Essentials</li> <li>• Statistics &amp; Pop Gen</li> </ul> <p>LUNCH</p> <ul style="list-style-type: none"> <li>• mtDNA</li> <li>• Y-Chromosome</li> </ul>
--	--

*My Goal is to Answer YOUR Questions – So Please Ask Them...*

---

---

---

---

---

---

---

---

**Background of Participants...**

Name  
 Experience (years) with DNA typing  
 Something memorable about yourself  
 What you hope to learn from this workshop

?

---

---

---

---

---

---

---

---

**NIST and NIJ Disclaimer**

**Funding:** Interagency Agreement 2003-IJ-R-029  
 between the **National Institute of Justice** and **NIST**  
 Office of Law Enforcement Standards

**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.

Certain commercial equipment, instruments and materials are identified in order to specify experimental procedures as completely as possible. In no case does such identification imply a recommendation or endorsement by the National Institute of Standards and Technology nor does it imply that any of the materials, instruments or equipment identified are necessarily the best available for the purpose.

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

---

---

---

---

---

---

---

---