


Y-Chromosome and Mitochondrial DNA Analysis

Introductions


NEAFS 2006 Workshop
Rye Brook, NY
November 1, 2006



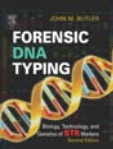
**Northeastern Association
of
Forensic Scientists**

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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)

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- 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 and writing






Dr. Michael D. Coble
<http://www.cstl.nist.gov/biotech/strbase/Coble.htm>

Experience

- Armed Forces DNA Identification Lab/GWU (1996-2003) - [mtDNA](#)
 - Work performed with Tom Parsons (AFDIL)
- NIST NRC Postdoc (2003-2005) - [miniSTRs](#)
- AFDIL, Research Section Chief (2006-present)

Contact Information
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- Ph.D. dissertation (Dec 2003): "The Identification of Single Nucleotide Polymorphisms in the Entire Mitochondrial Genome to Increase the Forensic Discrimination of Common HV1/HV2 Types in the Caucasian Population"
- Family: wife Karen and 3 children
- Hobbies: reading and [UNC basketball](#)



Understanding the Audience Here

- Where is everyone from?
 - Which states?
 - State lab?
 - Local lab?
 - Private lab?
- Experience level?
 - Less than 1 year?
 - 1-3 years?
 - >3 years?
- STR kits in use?
 - Profiler Plus/COfiler
 - Identifier
 - PowerPlex 16
- Instrumentation in use?
 - ABI 310
 - ABI 3100/3130xl
- Software in use?
 - GeneScan/Genotyper
 - GeneMapperID

Background of Participants...

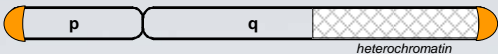
Name
 Laboratory
 Experience (years) with DNA typing
 Something memorable about yourself
 What you hope to learn from this workshop

?

Primary Sources for Material Covered in this Workshop

- Butler, J.M. (2003) Recent developments in Y-short tandem repeat and Y-single nucleotide polymorphism analysis. *Forensic Sci. Rev.* 15:91-111.
- Edson, S.M., Ross, J.R., Coble, M.D., Parsons, T.J., and Barritt, S.M. (2004) "Naming the Dead — Confronting the Realities of Rapid Identification of Degraded Skeletal Remains." *Forensic Sci. Rev.* 16:64-89.
- Butler, J.M. (2005) *Forensic DNA Typing, 2nd Edition: Biology, Technology, and Genetics of STR Markers*. Elsevier: New York.
- NIST STRBase website: <http://www.cstl.nist.gov/biotech/strbase/>

These workshop materials will be made available at <http://www.cstl.nist.gov/biotech/strbase/training.htm>



**The Y Chromosome:
A Final Frontier in Human Identity Testing**

Alan Redd
University of Arizona

John Butler
National Institute of Standards and Technology

Promega Meeting mtDNA/Y Chromosome Workshop
October 9, 2002

Speakers for the mtDNA section were Walther Parson, Mike Coble, and Tom Parsons

Outline for Workshop

Introductions
Lineage Markers vs. Standard STR Testing

- Y-Chromosome (John)

LUNCH

- Mitochondrial DNA (Mike)

Review & Answer Questions

Y-Chromosome and mtDNA Analysis
Wednesday, November 1, 2006 9:00am-5:00pm

- The use of short tandem repeat (STR) markers is now widespread in forensic DNA typing laboratories. However, interest is rapidly growing in Y-chromosome and mitochondrial DNA (mtDNA) polymorphisms because of certain advantages that these DNA markers bring to the field of human identification. Y-STR markers can enable recovery of the male perpetrator's profile from a mixture of excess female DNA in situations where differential extraction is not possible. mtDNA testing results are more likely to be successful than regular nuclear DNA markers in cases involving highly degraded DNA samples because of the higher copy number of mtDNA in human cells. Mitochondrial DNA is maternally inherited while Y-chromosome DNA is passed on directly from father to son (paternally inherited). The direct inheritance of these lineage markers makes them useful in missing persons investigations where reference samples may be obtained from closely related individuals. This workshop will cover the structure, function, genetic loci, available assays, and statistical issues associated with Y-chromosome and mtDNA analysis.
