NCFS, OSAC, and NIST: More Acronyms and Action from the U.S. Government in Forensic Science

John M. Butler, Ph.D.
National Institute of Standards and Technology
Background Information on NIST

- Started in 1901 with roots back to the Constitution
- Name changed to National Institute of Standards and Technology (NIST) from National Bureau of Standards in 1988
- Primary campus in Gaithersburg, Maryland (just outside of Washington, D.C.)
- Part of the U.S. Department of Commerce
- >3,000 employees and >2,000 associates
- Supply >1300 reference materials
- Defines official time for the U.S.
NIST: A Premier Scientific Institution

A world-leading measurement science and standards program

- Work resulting in 4 + 1 Nobel Prizes since 1997
- Kyoto Prize winner in 2011
- MacArthur Fellowship winners in 2003 and 2013
- National Medal of Science winners in 1998 and 2007
- ~10 National Academy Members
- ~120 National Society Fellows
- ~60 National/International Awards/year

Debbie Jin
2003 MacArthur Genius Grant
2013 L’Oreal/UNESCO “For Women in Science” award

Bill Phillips
1997 Nobel Prize in Physics

Eric Cornell
2001 Nobel Prize in Physics

John Hall
2005 Nobel Prize in Physics

David Wineland
2007 National Medal of Science 2012 Nobel Prize

Dan Shechtman
2011 Nobel Prize in Chemistry
based on work while Visiting Scientist at NIST

John Cahn
1997 National Medal of Science and 2011 Kyoto Prize in Materials Science
U.S. Innovation Agenda – NIST has an increasing role

Examples of NIST Programs Addressing National Priorities:

- Advanced Communications
- Advanced Manufacturing
- Climate Assessment
- Cybersecurity
- Energy
- **Forensic Science**
- Healthcare
- Nanotechnology
Major Assets are People

- ~3,000 Employees; 1800 Scientists and Engineers
- ~2,800 Associates and Facilities Users
- ~400 NIST Staff on ~1,000 national and international standards committees

NIST has two main campuses……

- Gaithersburg, MD
  - 62 buildings; 578 acres
- Boulder, CO
  - 26 buildings; 208 acres

+ two sites housing NIST radio stations:
  - Ft. Collins; 390 acres
  - Kauai; US Navy 30 acre site

and six joint institutes

- JILA – atomic, molecular, and optical physics
- JQI – quantum science
- IBBR – biotech – adv. therapeutics
- HML – marine bioscience
- NCCoE – cyber security
- CHMaD – “materials by design”

NIST FY 2013 Congressional Appropriations

$763M

- Scientific and Technical Research Services
- Industrial Technology Services
- Construction of Research Facilities

Plus
~$120 M from other Government Agencies
~$50 M for other reimbursable services
NIST Early History in Forensic Science Research

• 1913 - Wilmer Souder was asked to calibrate some precision measuring devices sent to him by famed handwriting expert Albert Osborn

• By the 1930s – Souder was recognized as a pioneer researcher in questioned documents, handwriting, typewriting, ballistics, and firearms

• Was instrumental in setting up the FBI Technical Laboratory in 1932
Forensics at NIST

NIST has a long and rich history of work in support of law enforcement

Currently providing research and measurement services such as validated test methods, Standard Reference Materials, and Reference Data in areas such as:

- crime scene investigations
- computer forensics
- fire investigations
- drug detection
- drunk driving testing
- biometrics (fingerprints and handwriting analysis)
- firearms/ballistics
- standards for body armor, nonlethal weapons
- explosives detection technologies
- sports integrity/fairness
- genetics and DNA-based identification

Support the Departments of Defense, Justice, and Homeland Security in carrying out their programs.
Forensic Science – Under the Microscope

- NAS report – Feb 2009

- White House Subcommittee on Forensic Science (SoFS) – July 2009 to Dec 2012

- **DOJ/NIST MOU** – Mar 2013
  - NCFS (National Commission on Forensic Science)
  - OSAC (Organization of Scientific Area Committees)

- Pending Legislation (Senate)
  - Leahy Bill (Justice)
  - Rockefeller Bill (Commerce)

- FY14 NIST Budget
  - +$3M from DOJ to administer OSAC

Criminal Justice and Forensic Science Reform Act (Leahy Bill)

Forensic Science and Standards Act (Rockefeller Bill)
NIST and Other Federal Efforts in Forensic Science

• NIST-DOJ Partnership
  – MOU signed March 2013 by NIST Director and Attorney General
  – Formed National Commission on Forensic Science (NCFS) and guidance groups → Organization of Scientific Area Committees (OSAC)

• White House Office of Science & Technology Policy (OSTP)
  – National Science & Technology Council Subcommittee on Forensic Science (NSTC SoFS) operated from July 2009 to Dec 2012
  – White papers to be released soon
  – OSTP research working group with NSF, NIST, and DOJ meeting since Sept 2013
National Commission on Forensic Science

A Federal Advisory Committee for the U.S. Department of Justice
What is a Federal Advisory Committee?

The Federal Advisory Committee Act of 1972 and its amendments provide strict rules including:

• Meeting notices are posted in the Federal Register prior to each meeting

• Meeting are open to the public

• Public comments are encouraged and accepted

• Meeting minutes and other relevant documents are available online at http://www.facadatabase.gov/ (Committee 83353)
National Commission on Forensic Science (NCFS)

- **Purpose**: to create impactful policy recommendations to improve forensic science
- **Membership**: 37 commissioners from 21 states covering broad range of stakeholders
- **Leadership**: co-chaired by DOJ and NIST
- **Meetings**: quarterly, open to public (& webcast)
- **Subcommittees**: six formed initially
- **Website**: [www.justice.gov/ncfs](http://www.justice.gov/ncfs) (as of May 2014)

February 3-4, 2014 was the first meeting of the National Commission on Forensic Science

37 Commissioners + DOJ/NIST Leadership Team (with ~100 public attendees)

First meeting was not webcast but future ones will be
Duties of the National Commission on Forensic Science (NCFS) per its Charter

Duties include:

1. To recommend priorities for standards development to the Attorney General;

2. To review and recommend that the Attorney General endorse guidance identified or developed by subject-matter experts;

3. To develop proposed guidance concerning the intersection of forensic science and the courtroom;

4. To develop policy recommendations, including a uniform code of professional responsibility and minimum requirements for training, accreditation and/or certification;

5. To consider the recommendations of the National Science and Technology Council’s Subcommittee on Forensic Science;

6. To identify and assess the current and future needs of the forensic sciences to strengthen their disciplines and meet growing demands.

Commission Leadership and Support

**DOJ Co-Chair**

James M. Cole  
Deputy Attorney General

**DOJ Vice-Chair**

Nelson Santos  
Deputy Assistant Administrator for the Office of Forensic Sciences at the Drug Enforcement Administration

**NIST Co-Chair**

Patrick D. Gallagher  
NIST Director & Acting, Deputy Secretary of Commerce

**NIST Vice-Chair**

John M. Butler  
NIST Fellow & Special Assistant to the Director for Forensic Science

Brette Steele  
Designated Federal Official

Robin Jones  
Program Manager
NCFS Membership

• **37 commissioners and ex-officio members**
  – Selected from >300 applicants
  – Represent diverse backgrounds, extensive experience, and come from 21 states

• Professors of biochemistry, chemistry, pathology, physics, sociology, statistics, and law (including a Nobel laureate and National Medal of Science recipient)

• Crime laboratory directors

• Judges, prosecutors, and defense attorneys

• Sheriff, detective, coroner, medical examiner, victims’ advocate, and defendants’ rights advocate
NCFS Commissioners & Ex-Officio Members

Vice-Chairs: John M. Butler, Ph.D. (NIST) and Nelson A. Santos (DOJ)

Suzanne Bell, Ph.D.
Frederick Bieber, Ph.D.
Thomas Cech, Ph.D.
Cecelia Crouse, Ph.D.
Gregory Czarnopys
M. Bonner Denton, Ph.D.
Vincent DiMaio, M.D.
Troy Duster, Ph.D.
Jules Epstein
Stephen Fienberg, Ph.D.
Andrea Ferreira-Gonzalez, Ph.D.
John Fudenberg
S. James Gates, Jr., Ph.D.
Dean Gialamas
Paul Giannelli
Susan Howley
Hon. Barbara Hervey
Ted Hunt
Linda Jackson

John Kacavas
Pamela King
Mark LeBeau, Ph.D.
Julia Leighton
Hon. Bridget McCormack
Peter Neufeld
Phil Pulaski
Matthew Redle
J. Michael Salyards, Ph.D.
Sheriff Ryant Washington

David Honey, Ph.D.
Marilyn Heustis, Ph.D.
Gerald LaPorte
Patricia Manzolillo
Hon. Jed Rakoff
Frances Schrotter
Kathryn Turman
Mark Weiss, Ph.D.
# Members of the National Commission on Forensic Science (NCFS)

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<tr>
<th>Name</th>
<th>Title and Affiliation</th>
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<tr>
<td>Suzanne Bell</td>
<td>Professor of Chemistry</td>
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<td>Frederick Bieber</td>
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<td>Thomas Cech</td>
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<td>Professor of Chemistry and Geosciences</td>
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<td>Cecelia Crouse</td>
<td>Palm Beach County Sheriff's Office Crime Laboratory</td>
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<td>Dean Gialamas</td>
<td>Los Angeles County Sheriff's Department</td>
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<td>Virginia Department of Forensic Science</td>
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<td>Fluvanna County Sheriff's Office</td>
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<td>Phil Pulaski</td>
<td>New York City Police Department</td>
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<tr>
<td>Nelson Santos</td>
<td>Drug Enforcement Administration (DEA) Laboratory</td>
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<td>Greg Czarnopys</td>
<td>Alcohol, Tobacco, Firearms and Explosives (ATF) Lab</td>
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<td>Gerry LaPorte</td>
<td>Office of Investigative and Forensic Sciences, NIJ</td>
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<td>Marc LeBeau</td>
<td>Federal Bureau of Investigation (FBI) Laboratory</td>
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<td>David</td>
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<td>National Intelligence for Science and Technology</td>
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<td>Marilyn</td>
<td>Huestis</td>
<td>Chemistry and Drug Metabolism, NIDA, NIH</td>
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<td>United States Postal Inspection Service</td>
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<td>Department of Defense</td>
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<td>National Center for Victims of Crime</td>
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<tr>
<td>Peter</td>
<td>Neufeld</td>
<td>Innocence Project</td>
</tr>
<tr>
<td>Fran</td>
<td>Schrotter</td>
<td>American National Standards Institute</td>
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MEETING ONE: February 3-4, 2014

Open to public (~100 public attendees)
Welcoming remarks by Co-Chairs and John Holdren, Assistant to the President for Science and Technology

AGENDA ITEMS:
• Judge Harry Edwards reflections on the NAS report
• BJS Census of Publicly Funded Crime Laboratories
• White House Subcommittee on Forensic Science
• Organization of Scientific Area Committees (NIST)
• NCFS priority topics and establishment of subcommittees

Materials from the first NCFS meeting are available:
NCFS Co-Chairs and OSTP Director address the first Commission meeting

NIST Director
Pat Gallagher

Deputy Attorney General
James Cole

OSTP Director
John Holdren
Judge Harry T. Edwards (co-chair of the 2009 NAS Report) addresses the National Commission on Forensic Science at its first meeting on February 3, 2014.
Informational Briefings

• Judge Harry Edwards spoke on findings from the 2009 NAS report

• Bureau of Justice Statistics researcher Matt DuRose reviewed the 2009 census of U.S. forensic laboratories
White House Subcommittee on Forensic Science committee chairs discuss outcome of work conducted from 2009 to 2012

Patricia Manzolillo  
U.S. Postal Service Forensic Laboratory

Dean Gialamas  
LA County Sheriff’s Office Crime Lab

Jeff Salyards  
Defense Forensic Science Center

Gerry LaPorte  
National Institute of Justice

Accreditation & Certification  
Proficiency Testing  
Research & Development  
Documentary Standards
Mark Stolorow (NIST) introduces the Organization of Scientific Area Committees (OSAC) plan

For more information, see http://www.nist.gov/forensics/osac.cfm
Commission discussions were led by Vice-Chairs John Butler (NIST) and Nelson Santos (DOJ)
MEETING TWO: May 12 – 13, 2014

Open to public and webcast

AGENDA ITEMS:

• Ethics, Human Factors and Cognitive Bias in Forensic Science
• OSAC Update/Report
• Subcommittee Reports

Those interested in attending the meeting in person must register online at http://conferences.csrincorporated.com using conference code: 2014-107P no later than 5:00 p.m. (EST) May 5, 2014.

See https://www.federalregister.gov/articles/2014/04/22/2014-09101/notice-of-federal-advisory-committee-meeting
6 Initial NCFS Subcommittees

1. Accreditation and Proficiency Testing
2. Interim Solutions
3. Medico-legal Death Investigation
4. Reporting and Testimony
5. Scientific Inquiry and Research
6. Training on Science and Law
NCFS SUBCOMMITTEE
Accreditation and Proficiency Testing

Co-Chairs:
• **Linda Jackson**, Director, Virginia Department of Forensic Science
• **Patricia Manzolillo**, Director, U.S. Postal Service Forensic Laboratory

ISSUES:
• Role of accreditation and proficiency test programs in quality managing systems
• Standards for accreditation and proficiency testing
• Technological innovations
• Implementation challenges
NCFS SUBCOMMITTEE
Interim Solutions

Co-Chairs:
• **Dean Gialamas**, Crime Laboratory Director, Los Angeles County Sheriff’s Office Scientific Services Bureau
• **Peter Neufeld**, Co-Director, Innocence Project

ISSUES:
• Reporting requirements
• Root cause analysis
• Terminology
• Expressing limitations of results
NCFS SUBCOMMITTEE
Medicolegal Death Investigation

Co-Chairs:
• **John Fudenberg**, Assistant Coroner, Clark County Office of the Coroner/Medical Examiner
• **Dr. Vincent Di Maio**, Consultant in Forensic Pathology

ISSUES:
• Accreditation
• Certification
• Education and training requirements
• Mass fatality management/disaster victim identification
• Missing persons/unidentified dead
NCFS SUBCOMMITTEE
Reporting and Testimony

Co-Chairs:
• The Hon. Jed Rakoff, U.S. District Court, Southern District of New York
• Matt Redle, Sheridan County (WY) Prosecuting Attorney's Office

ISSUES:
• Uniformity in reporting
• Components of a forensic report
• Terminology
• Characterization of results
NCFS SUBCOMMITTEE
Scientific Inquiry and Research

Co-Chairs:
• Dr. Suzanne Bell, Associate Professor of Chemistry, West Virginia University
• Dr. Jeff Salyards, Director, Defense Forensic Science Center

ISSUES:
• Foundational research supporting forensics
• Fragmentation of research programs
• Advanced technologies
• Physical vs. social science research in forensics
NCFS SUBCOMMITTEE
Training on Science and Law

Co-Chairs:
• Dr. Jim Gates, Professor of Physics, University of Maryland
• The Hon. Barbara Hervey, Texas Court of Criminal Appeals

ISSUES:
• Uniform programs for educating lawyers and judges on forensic science
• Uniform programs for educating forensic scientists on legal issues
• Collaborative training environments
NCFS & OSAC General Relationship
NCFS CONTACT INFORMATION

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Robin.W.Jones@usdoj.gov
Organization of Scientific Area Committees (OSAC)

Forensic discipline-specific guidance groups administered by NIST
Scientific Working Groups (SWGs)

- Some forensic disciplines had their own scientific working groups, while others did not
- Some received travel support for their work, some did not
- Very little sharing of best practices between SWGs, and very few common resources
- Documents that were developed were of variable quality and did not share common definitions
- Inconsistent training, standards, protocols, ……
Individual SWGs vs. Organized Effort

- funded support
- enforceable standards
- unified effort
- greater influence and impact

OSAC
Department of Justice

**Policy focused**
*Limited Term (FACA)*

- Attorney General
- National Commission on Forensic Science (NCFS)

NIST

**Practice focused**
*Ongoing (Forensic Science Quality Infrastructure)*

- Organization of Scientific Area Committees (OSAC)
- Forensic Science Standards Board (FSSB)

Outputs

- Forensic Science Code of Practice
  - Process & technical merit
    - FSSB Registry of Approved Standards
  - Technical merit
    - List of SAC Approved Best Practices and Guidelines

Accreditors

- Appropriate ISO/IEC documents, e.g. 17011

Laboratories

- Appropriate ISO/IEC documents and discipline-specific approved standards and documents
Organization of Scientific Area Committees (OSAC)

http://www.nist.gov/forensics/osac.cfm

- Formerly called “guidance groups” to replace SWGs
- Information collected and shared
  - SWG chairs (June 18, 2013)
  - Notice of Inquiry (Sept 27 to Nov 26, 2013)
  - NCFS (Feb 4, 2014)
  - AAFS and webcast (Feb 18, 2014)

- **Membership applications now being accepted**
- OSAC membership to be selected during Spring/Summer 2014
Notice of Inquiry (NOI) Responses Received

- **82 responses received**
  - 12 SWGs commented
  - 15 other groups including ASCLD, CAC, CFSO, IAI, Innocence Project, NACDL
  - More than a dozen labs and a half dozen companies
  - Individuals from 21 states and four countries (UK, Canada, Germany, and Australia)

- **Public posting of comments on NIST.gov/forensics**

- **Highlights:**
  - *Practitioner voice should be a major player*
  - *Strongly urged to include all forensic science disciplines*
  - *Concern about funding (no “pay-to-play” fees)*
  - *Interest in consistent and open support for web postings*
  - *Interest in face-to-face and virtual meetings*
  - *Encouragement to include existing professional organizations*
• **LRC** composed of up to 10 judges, lawyers, and legal experts who provide guidance about the legal ramifications of forensic standards under development and input on presentation of forensic results to the legal system.

• **QIC** composed of up to 15 standards experts, quality systems managers, laboratory managers, and accreditation and certification specialists who are responsible for writing and updating the Forensic Science Code of Practice.

• **HFC** composed of up to 10 psychologists, quality systems managers, and usability experts who provide guidance on the influence of systems design on human performance and on ways to mitigate errors in complex tasks.
Scientific Area Committees (SACs)

- Sets priorities for subcommittee work and enables a bigger picture view on topics like report wording and statistical analysis
- Recommends (to FSSB) creating, merging, or abolishing subcommittees
- SAC meetings will be open to the public and agendas made available prior to meetings
SAC Membership

Each SAC is comprised of up to 15 members including

- Subcommittee chairs
- Representatives of professional forensic science organizations appropriate to the scientific area (e.g., AAFS, AFTE, IAI, NAME, and SOFT)
- Researchers
- Measurement scientists (including statisticians, epidemiologists, etc.)
SAC Subcommittees

Where the real work will happen
Many aspects and participants may map to current SWGs

- Develops and vets formal documents to be submitted for approval by SAC (in case of guidelines) or SAC & FSSB (in case of standards)
- Communicates activities and progress to SACs
- Subcommittee deliberations are not public
Subcommittee Membership

Each subcommittee has a maximum membership of 20 voting members (and up to 5 invited guests per meeting)

- Distribution goal of
  - ~70% practitioner* (20% federal, 30% state & local, 20% civil or other),
  - 20% researchers (including statisticians, epidemiologists, etc.), and
  - 10% R&D technology partners and providers

* Practitioner is defined as someone actively doing or managing casework
Organization of Scientific Area Committees (OSAC)

Forensic Science Standards Board (FSSB)

Legal Resource Committee (LRC)

Quality Infrastructure Committee (QIC)

Human Factors Committee (HFC)

SAC Biology/DNA
- DNA Analysis Sub1
- DNA Analysis Sub2
- Wildlife Forensics Sub

SAC Chemistry/Instrumental Analysis
- Controlled Substances Sub
- Fire Debris and Explosives Sub (lab)
- Geological Materials Sub
- Gun Shot Residue Sub
- Materials (Trace) Sub
- Toxicology Sub

SAC Crime Scene/Death Investigation
- Anthropology Sub
- Disaster Victim Identification Sub
- Dogs and Sensors Sub
- Fire Scene and Explosives Sub
- Medical/Legal Death Investigation Sub
- Odontology Sub

SAC IT/Multimedia
- Facial Identification Sub
- Imaging Technologies Sub
- Speaker Recognition Sub

SAC Physics/Pattern
- Blood Stain Pattern Analysis Sub
- Friction Ridge Sub
- Firearms & Toolmarks Sub
- Footwear & Tire Tread Sub
- Questioned Documents Sub

SAC = Scientific Area Committee
Sub = Subcommittee
OSAC Membership

- **Initial selection of FSSB, LRC, QIC, HFC and SACs will be by NIST-DOJ leadership-membership committee**
- SAC subcommittee members will be selected by FSSB and SACs (after review by NIST-DOJ committee)
  - FSSB will define term-limits and plan to apply uniformly
  - NIST scientists will participate as standards and coordination experts as appropriate in the FSSB, SACs, and subcommittees

- **Planned Timeline**
  - Solicit applications and recruit potential OSAC members starting in April/May 2014
  - Appoint FSSB and meet in June
  - Appoint LRC, QIC, HFC and SAC membership in July
  - Select subcommittee membership in August (with NIST-DOJ review)
  - Conduct OSAC training virtually over the summer via webinar
  - Hold in-person meeting in November 2014
OSAC Membership

• See OSAC website
  – https://www.nist.gov/forensics/osac-application.cfm

• Apply before May 11, 2014 11:59 PM Eastern

OSAC will consist of a Forensic Science Standards Board, three resource committees, five scientific area committees and 23 subcommittees. **NIST needs between 500 and 600 subject matter experts representing a balance of experience and perspectives to serve on OSAC.** An OSAC term will be three years, although the initial appointees will serve terms of two, three or four years so that subsequent members are appointed on a staggered basis.
NIST Forensic Science Research Efforts

Assisting the forensic science community through:

• Scientific and technical advances
• New analytical tools and supporting infrastructure
• Scientific validation of currently applied instrumentation and methods
• Evaluation of models, methods, and standards
• Performance and validation studies to define and estimate error rates
NIST Forensic Science Program

- Focus for internal NIST research funds are currently in four areas:
  - DNA
  - Digital evidence
  - Ballistics
  - Statistics
The Future of Forensic DNA
is Similar to the Olympic Motto of
“Swifter, Higher, Stronger”

- Rapid DNA
- New Loci & Assays
- Expert Systems
- Next-gen sequencing
- Mixture Analysis

Resources Training Action
Position of Forensic STR Markers on Human Chromosomes

13 CODIS Core STR Loci

1997

Core STR Loci for the United States

Sex-typing
Expanding the U.S. CODIS Core Loci


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CODIS Core Loci Working Group
Formed in May 2010 to make recommendations to FBI CODIS Unit

Douglas Hares (Chair) – FBI
John Butler – NIST
Cecelia Crouse – FL PBSO
Brad Jenkins – VA DFS
Ken Konzak – CA DOJ
Taylor Scott – IL SP

major reasons for expanding the CODIS core loci in the United States:

1. To reduce the likelihood of adventitious matches [7] as the number of profiles stored at NDIS continues to increase each year (expected to total over 10 million profiles by the time of this publication). There are no signs that this trend will slow down as States expand the coverage of their DNA database programs and increase laboratory efficiency and capacity.

2. To increase international compatibility to assist law enforcement data sharing efforts.

3. To increase discrimination power to aid missing persons cases.
Three major reasons for expanding the CODIS core loci in the United States

- To reduce the likelihood of adventitious matches as the number of profiles stored at NDIS continues to increase each year

- To increase international compatibility to assist law enforcement data sharing efforts

- To increase discrimination power to aid missing persons cases
STR Marker Layouts for New U.S. Kits

PowerPlex Fusion

2012

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24plex (5-dye)

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Penta E

GlobalFiler

2012

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24plex (6-dye)

SE33

22 core and recommended loci + 2 additional loci

2012
DNA Mixture Detected with PowerPlex Fusion (24plex STR kit)

22 autosomal STR loci need to be interpreted...(+50% over current 15 STRs)

Data courtesy of Becky Hill (NIST)
Rapid DNA

• IntegenX and NetBio/GE Health have instruments that can produce STR profiles in <90 minutes from swab to result

• Ted Hunt’s (Kansas City prosecutor) talk at AAFS noted that speed brings other challenges and emphasized the need for better communication between detectives, crime scene investigators, prosecutors, and the laboratory
Next-Generation Sequencing (NGS)

- Illumina (MiSeq) and Life Technologies (PGM) enable massively parallel sequencing
- mtDNA genome sequencing can be performed
- STR allele sequencing enables internal sequence differences (sub-alleles) to be characterized
- Current work flows are more complicated, require more DNA, and generate significantly more data
Rapid DNA and NGS Research in the Applied Genetics Group at NIST
Peter Vallone, Erica Butts, Katherine Gettings, and Kevin Kiesler

Rapid DNA

• Testing the NetBio (ANDE/DNA Scan) and IntegenX (RapidHit 200) instruments
• Supporting the FBI R-DNA SWGDAM committee developing guidelines for the use of R-DNA instrumentation in labs
• Support developmental validation studies for both platforms

Next-Generation Sequencing

• NIST is using both the Illumina MiSeq and Life Tech Ion Torrent PGM NGS platforms
• Performing sequencing on mitochondrial SRMs 2392 and 2392-I
• Typing identity and ancestry SNPs on the PGM platform
• Starting work on STR typing of the MiSeq platform
Forensic DNA Typing Textbooks Have Set the Standard for the Field

1st Edition
Jan 2001
335 pages

2nd Edition
Feb 2005
688 pages

3rd Edition (3 volumes)
Sept 2009
520 pages
Aug 2011
704 pages
Sept 2014
~700 pages

Language Editions

Chinese (2007)

Japanese (2009)

Chinese (2013)
Steps in Forensic DNA Testing

Gathering the Data

Collection/Storage/Characterization → Extraction/Quantitation → Amplification/Marker Sets → Separation/Detection → Data → Stats → Report

Interpretation

Understanding Results Obtained & Sharing Them

Advanced Topics: Methodology

Advanced Topics: Interpretation

August 2011

September 2014
Acknowledgments

Past and present funding from National Institute of Justice and the FBI to the Applied Genetics Group

Slides and Discussions

• **NCFS**: Robin Jones, Nelson Santos, Brette Steele
• **OSAC**: Mark Stolorow, John Paul Jones
• **NIST Research**: Sue Ballou, Rich Cavanagh
• **Forensic DNA**: Pete Vallone, Mike Coble & Becky Hill (NIST Applied Genetics Group)
• **SWGDAM Autosomal STR Interpretation Committee**

Contact info:

**john.butler@nist.gov**  
301-975-4049

Thank you for your attention!
Materials from the first NCFS meeting are available: