

Scientific Analysis on DNA Analysis Methods (SWGDM) January 2015 Report

January 13-15, 2015

Fredericksburg, Virginia

I. Agenda:

Please see Attachment 1.

II. Meeting Synopsis:

Tuesday, January 13, 2015

SWGDM Chairman (Chair), Anthony Onorato, welcomed the attendees and reviewed administrative matters including Committee assignments and the Conflict of Interest Statements for new Invited Guests. With respect to the Conflict of Interest Statements, the Chair noted that this Statement was intended to make the SWGDAM members and invited guests aware of those instances when they should advise the Chair of a potential conflict of interest. The Chair explained that the Chair Report will be posted on the SWGDAM web site and it provides specific details about SWGDAM documents over a one year period. The Chair noted that the DRAFT Guidelines for the Collection and Serological Examination of Biological Evidence (Serology Guidelines) were posted for public comment and that about double the number of public comments were received as had been for the previous documents posted for public comment.

The Chair provided an update on the Ad Hoc Working Group on Probabilistic Genotyping noting that the group met on Monday and finalized DRAFT guidance for the validation of probabilistic genotyping software that will be presented by Tamyra Moretti on Wednesday. This will begin the 30 day technical review period under the Bylaws and committees and attendees are encouraged to provide their comments to the Committee Chair Tim Zolandz.

The Chair explained that the Serology Guidelines would be presented on Thursday by Jocelyn Carlson, QA Committee Chair. Revisions were made to address public comments and it would be up to the body to determine if these were minor or substantive revisions. If not substantive revisions, the Executive Board could review and approve the Guidelines at this meeting.

Technical Session

Jodi Irwin of the FBI's DNA Support Unit presented on Next Generation Sequencing (NGS) for Expanded DNA Capabilities. Ms. Irwin explained the following components of NGS: amplicon library preparation, cluster generation and sequencing. Ms. Irwin noted that NGS provides high throughput and is useful with very low amounts of DNA. Ms. Irwin described the instruments that are currently used for NGS as well as the markers that may be tested (STRs, mtDNA, identity SNPs). Ms. Irwin stated that the information gain with NGS will be valuable for cases where only a few alleles are generated using capillary electrophoresis.

Mike Coble of the National Institute of Standards and Technology presented the Advantages and Applications of Probabilistic Approaches to Genotyping. Dr. Coble explained the semi-continuous and continuous approaches and advantages of the probabilistic models. He noted that all approaches use the Likelihood Ratio (LR) and that it is important to present this properly. A question was raised concerning CPI and it was discussed that CPI is effective and appropriate in compliance with the Quality Assurance Standards. Dr. Coble explained considerations for implementing a probabilistic method in the laboratory and emphasized the need for training.

Thomas Callaghan, Chief Biometric Scientist at the FBI Laboratory presented a Rapid DNA Performance Update and Arrestee Enrollment Concept. Dr. Callaghan noted that a number of single source specimens had been analyzed over two instruments with several instrument and software upgrades and that NIST was conducting a Rapid DNA Maturity Assessment. Dr. Callaghan explained that a change in Federal law is needed to take DNA records from booking stations and search them against what will be forensically enabled DNA records. He described the CODIS and R-DNA enrollment process, including the concept of operations for DNA automation in Federal booking stations.

Peter Vallone, Leader of the Applied Genetics Group at NIST presented on STR Sequence Variation and Nomenclature Considerations. Dr. Vallone described the NGS activities at NIST that include: population samples, amplification and library preparation, sequencing and bioinformatics. He noted that sequencing the forensic STR loci uncovers sequence variation in certain loci. Dr. Vallone summarized that nomenclature guidelines and allele frequency databases are needed for implementation. Potential nomenclature possibilities include locus, length, sequence, and flank variants.

Douglas Hares, the FBI's NDIS Custodian (CODIS Unit) presented on CODIS Sequence-Based Search Strategies. Dr. Hares noted that sequencing of STR repeat regions presents the same nomenclature issues as mitochondrial DNA (mtDNA), such as consistent naming conventions as well as how to address insertions and deletions. Dr. Hares noted

that the experience with mtDNA data indicate the sequence strings are most effective for database comparisons and the use of haplotypes is the most effective way to describe mtDNA. Dr. Hares explained that CODIS currently searches mtDNA data by haplotypes.

Dawn Herkenham with Leidos presented on Genetic Privacy Laws. Ms. Herkenham reviewed the following Federal laws and their privacy protections: Freedom of Information Act, the Privacy Act, the Americans with Disabilities Act, the Health Insurance Portability and Accountability Act and the Genetic Information Nondiscrimination Act. Ms. Herkenham also discussed the regulation of genetic tests, research and participation in the National DNA Index System. Ms. Herkenham provided a general overview of State privacy laws and described specific provisions in State DNA database laws relating to genetic privacy.

Sara H. Katsanis, with the Science and Society team at Duke University presented on Strategies for Handling Sensitive Data and Building Public Trust. Ms. Katsanis described the numerous human genetic identification applications as well as the social implications. She explained her findings with co-author Jennifer Wagner on the characterization of the CODIS Core Loci. Ms. Katsanis reviewed the history of avoiding sensitive genetic information in forensics, including relevant State database provisions. Ms. Katsanis reviewed several data collection projects and surveys relating to the public perception of the use of genetic information for law enforcement purposes.

Enid Camps, a Deputy Attorney General in the California Department of Justice, presented on Establishing the Record for Scientific Evidence. Ms. Camps described the admissibility standards of *Frye* and *Daubert*, including practical considerations for the description of evolving technologies.

Wednesday, January 14, 2015

The Chair introduced Tamyra Moretti of the FBI Laboratory's Support Unit to provide a review of the SWGDAM Guidelines for the Validation of Probabilistic Genotyping Systems. The Chair noted that the Ad Hoc Working Group had initially been tasked with providing guidance on validation and interpretation. After consultation with the Chair, it was determined that interpretation guidance would be tasked to the Autosomal STR Committee and the Working Group will list those items to be addressed in the guidance. Dr. Moretti reviewed the validation document in detail and SWGDAM members had an opportunity to provide comments during that review.

Following that review and comment, the following SWGDAM Committees met for the remainder of the day¹:

- Autosomal STR Committee
- CODIS Committee
- Enhanced Detection Methods Committee
- Quality Assurance Committee
- Rapid DNA Committee
- Y-STR Committee
- Next Generation Sequencing Working Group

A round table discussion was held Wednesday evening that included discussion on a possible serial contamination, an update on a program to address the testing of sex assault kits, and NGS and STR mixtures.

Thursday, January 15, 2015

The Chair opened the Thursday morning session by introducing Jocelyn Carlson, QA Committee Chair, for a review of the revisions made to the Serology Guidelines following the public comment period. Ms. Carlson stated that six laboratories provided comments. Ms. Carlson reviewed revisions to Sections 4, 5, 8, 10, 11, and 16. There was a consensus among the SWGDAM attendees that these revisions were minor and non-substantive in nature. Since these revisions were non-substantive, the SWGDAM Executive Board agreed that there was no need to post the revised document for public comment and approved the posting of the Serology Guidelines on the SWGDAM web site.

The following Committees/Working Groups provided updates: Autosomal STRs, CODIS, Enhanced Detection Methods, Next Generation Sequencing, Quality Assurance, Rapid DNA and Y-STRs.

Update Session

Dawn Herkenham provided a Legislative Update on Federal and State legislation that included states' arrestee laws and litigation. Of recent note, a California Court of Appeal in *People v. Buza*, held that the DNA collection at arrest provisions were invalid under the California State Constitution. Ms. Herkenham noted that Mississippi and Rhode

¹ The Ad Hoc Working Group on Probabilistic Genotyping met on Monday, January 12, 2015.

Island enacted laws to collect DNA samples from arrestees and that Utah and Wisconsin amended their arrestee collection laws. Ms. Herkenham also reviewed State evidence processing and inventory laws.

Col. Dr. Roman Hradil presented an update on ENFSI activities. Col. Hradil described the Monopoly Programme for 2014 as including a project for combining various databases and research on forensic document examination and, if there were sufficient resources, empowering genetic DNA databases for the interpretation of next generation sequencing profiles. He reviewed the available and relevant DNA publications from the ENFSI DNA Working Group (database management, contamination, validation, training and quality assurance).

Dr. Douglas Hares provided an update on the CODIS Core Loci Validation Project. Dr. Hares noted that NDIS contained over 14 million DNA records at one point during 2014 but, as a result of California removing its arrestee DNA records, now has a total of approximately 13.4 million DNA records. Dr. Hares stated that the proposed implementation date for the 20 CODIS Core Loci is January 1, 2017 and that the required notification of that proposal was provided to Congress. The plan is for the CODIS Unit to work with the SWGDAM CODIS Committee to develop guidance on implementation. Dr. Hares announced the CODIS Conference will be November 17-18, 2015 with a Technical Leader meeting to be held on November 16, 2015 (to be coordinated by Susannah Kehl) and a State Administrator meeting to be held on November 19, 2015.

Dr. Mike Coble presented an update on the following NIST activities: SRM 2391c Certificate of Analysis is being updated (and will include Y-STRs) for January 2015; Supply for SRM 2372a expected to be exhausted in 2017 and studying Digital PCR; Rapid PCR papers; possible development of protocol for making standards traceable to NIST SRM 2391c; Rapid DNA Maturity Assessment and preliminary data; NGS Support studies; review of recent publications and presentations as well as upcoming workshops and webcasts.

Ms. Minh Nguyen with the National Institute of Justice's (NIJ) Office of Investigative and Forensic Sciences provided an update on NIJ's Forensic Technology Working Group and funding opportunities. The Forensic Technology Working Group has established their FY2015 goals and needs. Ms. Nguyen also reviewed numerous funding opportunities that are available at www.nij.gov. Ms. Nguyen explained a new National Research Council project on NIJ that will be occurring over the next year. She reviewed the NIJ funded research and development programs on sequencing, probabilistic approaches and Rapid DNA.

Dr. George Herrin, Chair of the Biology/DNA Scientific Area Committee (SAC) described the organizational structure of the SACs and provided an update on the Biology SAC. Dr. Herrin noted that there is 27% participation of SWGDAM members on the DNA Analysis Committees although the goal was not to replicate SWGDAM. Dr. Herrin explained how the OSAC has established the Standards and Guidelines Registries and is reviewing the existing documentation to determine what will be maintained. Dr. Herrin noted that standards will go to a standards development organization and once approved, will be placed on the Registry. He encouraged participation in this process.

Dr. John Butler, NIST Fellow and Special Assistant to the Director of Forensic Science at NIST, updated the participants on the National Commission on Forensic Science, a Federal Advisory Committee for the U.S. Department of Justice (DOJ). Dr. Butler noted that the National Commission's fifth meeting would be January 29-30, 2015. Dr. Butler explained that NIST would be announcing a Forensic Science Center of Excellence focusing on pattern and digital evidence in March 2015. He described the Subcommittees and where meeting materials and documents and draft work products are available (<http://www.justice.gov/ncfs/work-products>). Dr. Butler concluded with a review of his SWGDAM participation as Dr. Butler will, beginning at the July 2015 meeting, be the OSAC representative at SWGDAM.

The Chair advised that Jeff Nye agreed to serve as Co-Chair of the SAFER Working Group and that the SAFER Working Group may be meeting on the Monday preceding the July 2015 SWGDAM meeting. The Chair adjourned the meeting and announced that the next meeting would be held the week of July 14 - 16, 2015.

III. Attendees:

Please see Attachment 2.

IV. Final Reports:

The SWGDAM Executive Board approved the final report on the Guidelines for the Collection and Serological Examination of Biological Evidence for posting on the SWGDAM web site.

V. Next Meeting:

The next meeting will be held July 14 - 16, 2015.



SWGDM REGULAR MEETING

January 12 - 15, 2015

AGENDA

Monday, January 12, 2015 (PRE-REGULAR MEETING SESSION)

9:00 AM – 2:00 PM Ad Hoc Working Group on Probabilistic Genotyping

Tuesday, January 13, 2015

8:00 AM Chair and Vice Chair Meeting

8:30 AM Welcome and Business Matters

TECHNICAL SESSION: THE NEXT GENERATION - RAPID-DNA ANALYSIS AND HIGH-THROUGHPUT SEQUENCING

9:00 AM Advantages and Applications of NGS Technology – Jodi Irwin

10:30 AM BREAK

10:45 AM Advantages and Applications fo Probabilistic Approaches to Genotyping – Michael Coble

11:30 AM Rapid-DNA Usage in the Laboratory – Thomas Callaghan

12:30 PM LUNCH

2:00 PM Sequence-Based Search Strategies and Nomenclature Considerations – Peter Vallone

2:45 PM CODIS Sequence-Based Search Strategies – Douglas Hares

3:15 PM BREAK

3:30 PM Statutes Governing Genetic Privacy – Dawn Herkenham

4:15 PM Strategies for Handling Sensitive Data and Building Public Trust – Sara Katsanis



SCIENTIFIC WORKING GROUP

DNA ANALYSIS METHODS

- 5:00 PM Establishing the Record for Scientific Evidence in the Courtroom – Enid Camp
5:45 PM ADJOURNMENT

Wednesday, January 13, 2015

COMMITTEE OF THE WHOLE SESSION

- 8:30 AM Review of the proposed SWGDAM Guidelines for the Validation of Probabilistic Genotyping Software – Probabilistic Genotyping Working Group

COMMITTEE BREAKOUT SESSIONS

- 9:30 AM Committee Break-Out Sessions
12:00 PM LUNCH
1:00 PM Committee Break-Out Sessions
5:00 PM ADJOURNMENT

ROUND TABLE SESSION

- 6:00 PM Moderator: Russell Vossbrink

Thursday, January 14, 2015

- 8:00 AM Review and Discussion of the Public Comments on the *SWGDM Guidelines for the Collection and Serological Examination of Biological Evidence*
9:00 AM Committee Progress Updates
 Autosomal STR – John Butler
 CODIS – Deedra Hughes
 Enhanced Detection Methods – Eugene Lien
 Next Generation Sequencing – John Tonkyn
 Quality Assurance – Jocelyn Carlson



SCIENTIFIC WORKING GROUP

DNA ANALYSIS METHODS

Committee Progress Updates continued

Rapid DNA – Peter Vallone

Y-STR – Tamyra Moretti

10:30 AM BREAK

UPDATE SESSION

10:45 AM Legislative Update – Dawn Herkenham

11:45 PM LUNCH

1:15 PM ENFSI Update – Roman Hradil

1:45 PM CODIS Core Loci Expansion Update – Douglas Hares

2:15 PM NIST Update – Mike Coble

3:15 PM BREAK

3:30 PM NIJ Update - Minh Nguyen

4:15 PM National Commission on Forensic Science Update – John Butler

BUSINESS SESSION

4:30 PM Chair Report – Tony Onorato

5:00 PM ADJOURNMENT

SWGDM January 2015 Meeting
Attendees [Members, Invited Guests (IG) and Presenters]

SWGDM Chair

Anthony Onorato
FBI Laboratory

SWGDM Vice Chair

Russell Vossbrink
Arizona Department of Public Safety

Executive Board Members

Angelo Della Manna
Alabama Department of Forensic Sciences

Brian Hoey
Missouri State Highway Patrol

Eric Pokorak
FBI Laboratory

Gary Sims
California Department of Justice

SWGDM Executive Secretary

Dawn Herkenham (IG)
Leidos

SWGDM Members and Invited Guests

Jack Ballantyne (IG)
University of Central Florida

Suzanne Barritt-Ross (IG)
Armed Forces DNA Identification Lab
(AFDIL)

Todd Bille (IG)
Bureau of Alcohol, Tobacco and Firearms

John Buckleton (IG)
Institute of Environmental Science &
Research

John Butler (IG)
National Institute of Standards and
Technology (NIST)

Thomas Callaghan (IG)
FBI Laboratory

Jocelyn Carlson (IG)
FBI Laboratory

Chris Carney
FDLE – DNA Database

Michael Coble (IG)
NIST

Seth Faith (IG)
NC State University

Neil Fernandopulle (IG)
Centre of Forensic Sciences

Russell Gettig (IG)
NYS Police Forensic Investigation Center

Katherine Butler Gettings (IG)
NIST

Ann Marie Gross
Minnesota Bureau of Criminal
Apprehension

Lisa Grossweiler (IG)
FBI Laboratory

Douglas Hares (IG)
FBI Laboratory

Brian Harmon (IG)
California Department of Justice

Bruce Heidebrecht
Maryland State Police

George Herrin, Jr. (IG)
Georgia Bureau of Investigation

Roman Hradil (IG)
ICP (Institute of Crimnalistics Prague)

Bill Hudlow (IG)
California Department of Justice

Deedra Hughes
Mississippi Crime Laboratory

Jodi Irwin (IG)
FBI Laboratory

Clark Jaw (IG)
FBI Laboratory

Elizabeth Johnson
U.S. Army Crime Lab

J. Janice Joslin (IG)
Oklahoma State Bureau of Investigation

Kristy Kadash (IG)
Jefferson County Regional Crime Lab

Susannah Kehl (IG)
FBI Laboratory

George Li
Virginia Department of Forensic Science

Eugene Lien
NYC Office of the Chief Medical Examiner

Beth Ann Marne
Pennsylvania State Police

Charla Marshall (IG)
AFDIL

Scott McWilliams (IG)
Wyoming State Crime Laboratory

Gary J. Molina (IG)
Texas Dept. of Public Safety Crime Lab

Shawn Montpetit (IG)
San Diego Police Department

Tamyra Moretti
FBI Laboratory

Dave Morissette (IG)
Royal Canadian Mounted Police (RCMP)

Elizabeth Morris (IG)
Austin Police Department

Steven Myers
California Department of Justice

Mary Lou Nicholson (IG)
RCMP Biology

Jeffrey Nye
Michigan State Police

Dixie Peters (IG)
University of North Texas Health Science
Center

John Planz
University of North Texas Health Science
Center

Taylor Scott
Illinois State Police

Joel Sutton
U.S. Army Crime Lab

John Tonkyn
California Department of Justice

Peter Vallone (IG)
NIST

Stacy Warnecke (IG)
Kentucky State Police

January 2015 Presenters

Enid Camps
California Department of Justice

Sara Katsanis
Duke University

Minh Nguyen
National Institute of Justice