
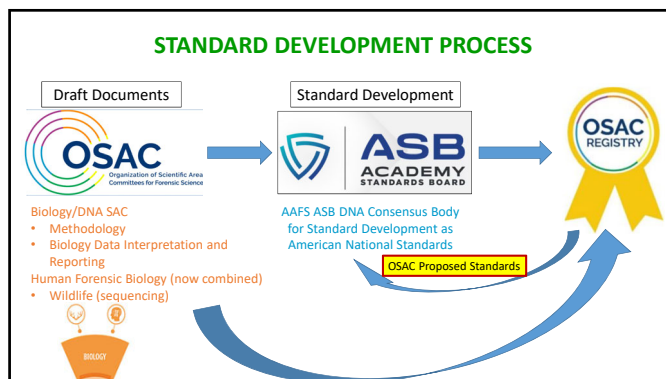


**Green Mountain
DNA Conference**

**THE EXPANDING SCOPE OF STANDARDS & BEST
PRACTICE RECOMMENDATIONS FOR FORENSIC
TESTING LABORATORIES USING HUMAN
SEROLOGICAL AND DNA TESTING METHODS**

Charlotte J Word, PhD
Burlington, VT
July 25, 2023



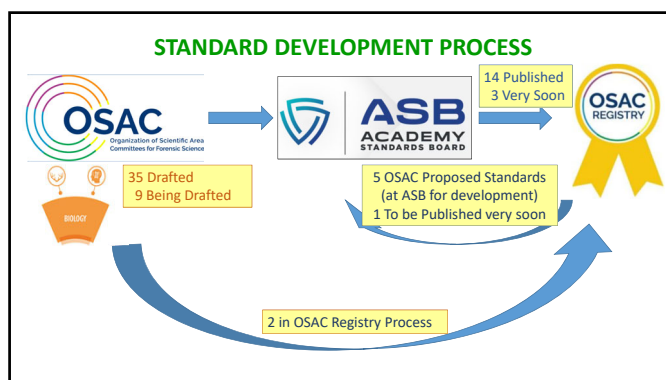
STANDARDS AND BEST PRACTICE RECOMMENDATIONS

Standard = Lists *Requirements* with “shall”
Best Practice Recommendations (BPR) = Lists *Recommendations* with “should”

Approved by ANSI and published by the ASB:
<https://www.aafs.org/academy-standards-board>

OSAC Registry <https://www.nist.gov/organization-scientific-area-committees-forensic-science/osac-registry>







**STANDARDS AND BEST PRACTICE RECOMMENDATIONS
USE IN LABORATORIES**

Written to be used in conjunction with other documents

- FBI Quality Assurance Standards
- ISO 17025
- Accreditation Requirements (e.g., ANAB)
- SWGDAM Guidelines

**AVAILABLE FOR IMPLEMENTATION IN
LABORATORIES**

SEROLOGY/BIOLOGY



Validation Studies and Protocols

- 1) ANSI/ASB Standard 077, *Standard for the Development and Internal Validation of Forensic Serological Methods*, First Edition, 2020
- 2) OSAC 2021-S-0028, *Standard for Use of Serological Testing Methods Associated with Forensic Investigations* (currently under development with ASB DNA Consensus Body)

Training

- 1) ANSI/ASB Standard 110, *Standard for Training in Forensic Serological Methods*, First Edition, 2020



AVAILABLE FOR IMPLEMENTATION IN LABORATORIES



DNA

Validation Studies and Protocols

- 1) ANSI/ASB Standard 018, *Standard for Validation of Probabilistic Genotyping Systems*, First Edition, 2020*
- 2) ANSI/ASB Standard 020, *Standard for Validation Studies of DNA Mixtures, and Development and Verification of a Laboratory's Mixture Interpretation Protocol*, First Edition, 2018* (5 year anniversary)
- 3) ANSI/ASB Standard 040, *Standard for Forensic DNA Interpretation and Comparison Protocols*, First Edition, 2019*
- 4) ANSI/ASB Best Practice Recommendation 114, *Best Practice Recommendations for Internal Validation of Software Used in Forensic DNA Laboratories*, First Edition, 2022 (in OSAC Registry approval process)
- 5) ANSI/ASB Standard 038, *Standard for Internal Validation of Forensic DNA Analysis Methods*, First Edition, 2020



AVAILABLE FOR IMPLEMENTATION IN LABORATORIES



DNA

Validation Studies and Protocols

- 1) OSAC 2020-N-0007, *Best Practice Recommendations for the Management and Use of Quality Assurance DNA Elimination Databases in Forensic DNA Analysis* (Best Practice Recommendation 171 with ASB) (in final stages for publication as an ANSI/ASB BPR)
- 2) OSAC 2020-S-0004, *Standard for Interpreting, Comparing and Reporting DNA Test Results Associated with Failed Controls and Contamination Events* (Standard 175 with ASB) (currently under development with ASB DNA Consensus Body)
- 3) OSAC 2021-S-0029, *Standard for Familial DNA Searching* (currently under development with ASB DNA Consensus Body)



STANDARDS AND BEST PRACTICE RECOMMENDATIONS UNDER DEVELOPMENT BY ASB

DNA

Validation Studies

- 1) Standard 039, *Standard for Internal Validation of Human Short Tandem Repeat Profiling on Capillary Electrophoresis Platforms*
- 2) Best Practice Recommendation 129, *Best Practice Recommendations for Internal Validation of Human Short Tandem Repeat Profiling on Capillary Electrophoresis Platforms*



AVAILABLE FOR IMPLEMENTATION IN LABORATORIES



DNA

Training - General & STRs

- 1) ANSI/ASB Standard 022, *Standard for Forensic DNA Analysis Training Programs*, First Edition, 2019
- 2) ANSI/ASB Standard 023, *Standard for Training in Forensic DNA Isolation and Purification Methods*, First Edition, 2020
- 3) ANSI/ASB Standard 116, *Standard for Training in Forensic DNA Quantification Methods*, First Edition, 2020
- 4) ANSI/ASB Standard 115, *Standard for Training in Forensic Short Tandem Repeat Typing Methods using Amplification, DNA Separation, and Allele Detection*, First Edition, 2020



STANDARDS AND BEST PRACTICE RECOMMENDATIONS UNDER DEVELOPMENT BY ASB

DNA

Training - General and STRs

- 1) Standard 154, *Standard for Training on Testimony for Forensic Biology* (soon to be published, will need to be submitted to OSAC Registry)
- 2) Standard 091, *Standard for Training in Analysis of Forensic Short Tandem Repeat (STR) Data*
- 3) Standard 078, *Standard for Training in Forensic Autosomal Short Tandem Repeat (STR) and Y-STR Data Interpretation and Comparison*
- 4) Standard 081, *Standard for Training in the Use of Statistics in Interpretation of Forensic DNA Evidence*
- 5) Standard 080, *Standard for Training in Forensic DNA Reporting and Review*
- 6) Standard 079, *Standard for Training in the Use of Combined DNA Index System (CODIS)*



AVAILABLE FOR IMPLEMENTATION IN LABORATORIES



DNA

Training - Sequencing Methods

- 1) ANSI/ASB Standard 130, *Standard for Training in Forensic Amplification Methods for Subsequent Capillary Electrophoresis Sequencing*, First Edition, 2021
- 2) ANSI/ASB Standard 131, *Standard for Training in Forensic DNA Sequencing Using Capillary Electrophoresis*, First Edition, 2021
- 3) ANSI/ASB Standard 140, *Standard for Training in Forensic Human Mitochondrial DNA Analysis, Interpretation, Comparison, Statistical Evaluation, and Reporting*, First Edition, 2021



STANDARDS AND BEST PRACTICE RECOMMENDATIONS UNDER DEVELOPMENT BY ASB

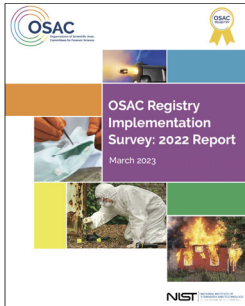
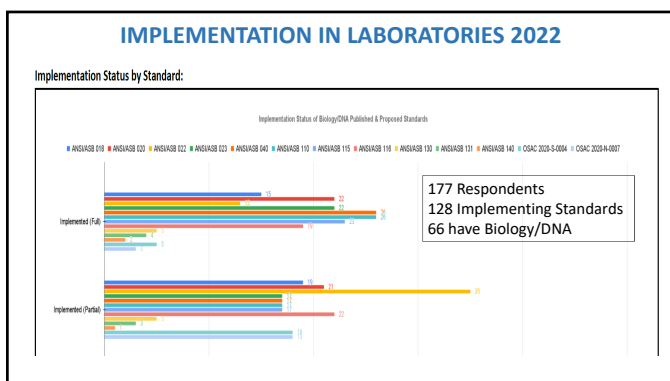
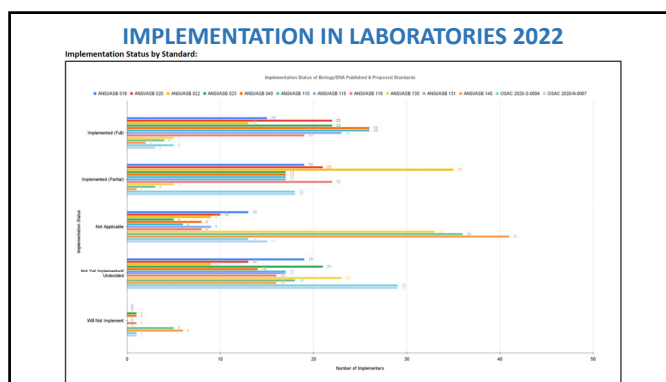
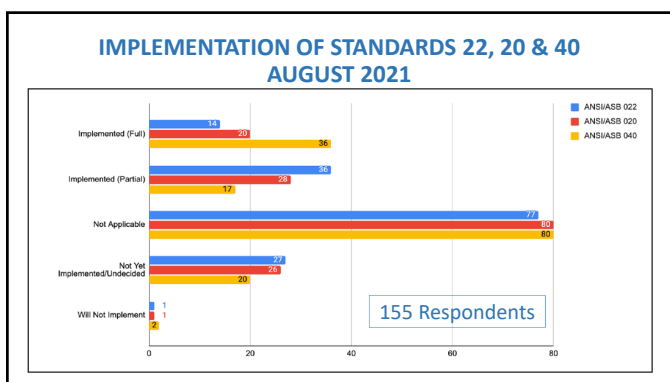
DNA

Contamination, Statistics, Quality Control

- Standard 041, *Formulating Propositions for Likelihood Ratios in Forensic DNA Interpretations*
- Standard 123, *Standard for Routine Internal Evaluation of a Laboratory's DNA Interpretation and Comparison Protocol* (soon to be published, will need to be submitted to OSAC Registry)
- Standard 136, *Forensic Laboratory Standard for Prevention, Monitoring, and Mitigation of Human DNA Contamination*
- Standard 139, *Reporting DNA Conclusions* (very close to being published)



IMPLEMENTATION IN LABORATORIES

STANDARDS AND BEST PRACTICE RECOMMENDATIONS UNDER REVIEW FOR LISTING ON THE OSAC REGISTRY AS PROPOSED STANDARDS


- OSAC 2021-S-0003, *Standards for Setting Analytical and Stochastic Thresholds for Applications to Forensic DNA Casework Using Electrophoresis Platforms*
- OSAC 2022-S-0024, *Best Practice Recommendations for Evaluative Forensic DNA Testimony*



DOCUMENTS CURRENTLY BEING DRAFTED AT OSAC

Validation

- Standard for Internal Validation of Genetic Analysis on NGS/MPS Platforms
- Standard for the Internal Validation of DNA Extraction Methods
 - Best Practice Recommendations for the Internal Validation of DNA Extraction Methods
- Standard for the Internal Validation of Human DNA Quantification
 - Best Practice Recommendations for the Internal Validation of Human DNA Quantification
- Standard for the Internal Validation of Automated Platforms
 - Best Practice Recommendations for the Internal Validation of Automated Platforms
- Best Practice Workflows for Efficient Sampling and Direct to DNA of Sexual Assault Kits
- Appendix Exemplar for Reports



RESOURCES AVAILABLE





AAFS
AMERICAN ACADEMY OF
FORENSIC SCIENCES
EST. 1948



OSAC
Organization of Scientific Area
Committees for Forensic Science





ASB
ACADEMY
STANDARDS BOARD

STANDARDS CHECKLISTS

Checklists provide a tool to allow a forensic science service provider to evaluate the level of standard implementation and/or audit conformance to a standard. Each checklist, provided in Excel, uses a standardized format that also allows flexibility when used.

<https://www.aafs.org/research-insights-featured-standards-resources-and-training/checklists>


STANDARD 040 ASSESSMENT GUIDE

Assessment Guide for ANSI/ASB Standard 040,
Standard for Forensic DNA Interpretation and Comparison Protocols, First Edition, 2019

INTRODUCTION
This Assessment Guide is to be used by laboratory staff for self-assessment or by an assessment team for evaluating whether the laboratory has met the Requirements listed in Section 4 of the ANSI/ASB Standard 040, Standard for Forensic DNA Interpretation and Comparison Protocols, First Edition, 2019.

Provides Detailed Instructions and an Excel Worksheet for Documenting the Assessment Process


<https://www.nist.gov/system/files/documents/2022/07/19/ASB%2040%20Assessment%20Guide%20032222.pdf>



FACTSHEETS

The AAFS Standards Factsheets provide a concise summary of each standard and facilitate broader understanding. They also highlight the purpose of a standard, why it is needed, and the benefits of adoption.

https://www.aafs.org/research-insights-featured/search?_page=1&keywords=factsheets&_limit=7&topic=66



FACTSHEET FOR ANSI/ASB STANDARD 018
Standard for Validation of Probabilistic Genotyping Systems, First Edition, 2020

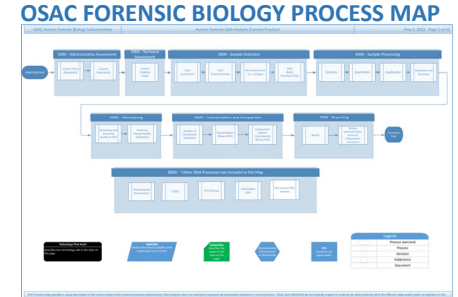
WHAT IS AN AAFS STANDARD FACTSHEET? Fact sheets summarize the contents of forensic science standards. They are intended to provide a concise summary of the standard for the public or professional audience.

WHAT IS THE PURPOSE OF THIS STANDARD? The purpose of this standard is to provide a minimum level of proficiency for the use of probabilistic genotyping software. It is intended to provide a minimum level of proficiency for the use of probabilistic genotyping software. It is intended to provide a minimum level of proficiency for the use of probabilistic genotyping software.


WHY IS THIS STANDARD IMPORTANT? WHAT ARE ITS BENEFITS? The standard provides a minimum level of proficiency for the use of probabilistic genotyping software. It is intended to provide a minimum level of proficiency for the use of probabilistic genotyping software. It is intended to provide a minimum level of proficiency for the use of probabilistic genotyping software.

HOW IS THIS STANDARD USED AND WHAT ARE THE KEY ELEMENTS? The standard provides a minimum level of proficiency for the use of probabilistic genotyping software. It is intended to provide a minimum level of proficiency for the use of probabilistic genotyping software. It is intended to provide a minimum level of proficiency for the use of probabilistic genotyping software.

OSAC FORENSIC BIOLOGY PROCESS MAP



https://www.nist.gov/system/files/documents/2022/05/05/OSAC%20Forensic%20Biology%20Process%20Map_5.5.22.pdf




PROMEGA ARCHIVED WEBINAR SERIES 

DNA Standards and Best Practices Developed by OSAC and ASB

- Part 1: The Process
- Part 2: Mixture Interpretation Validation, and Protocol Development and Verification (Standards 20 & 40)
- Part 3: Training Standards Overview (Standards 22 & 23)
- Part 4: ANSI/ASB Standard 018, Standard for Validation of Probabilistic Genotyping Systems



<https://www.promega.com/resources/webinars/#q=forensic%20DNA%20standards&sort=%40webinarstartdate%20ascending>

ADDITIONAL RESOURCES

Academy Standards Board 

Information and Education

<https://www.aafs.org/academy-standards-board/information-education>

 **HOW TO GET INVOLVED** 

- 1) Join OSAC Human Forensic Biology Subcommittee to draft new standards (<https://www.nist.gov/organization-scientific-area-committees-forensic-science/apply-join-osac>)
- 2) Attend meetings and join ASB DNA Consensus Body to develop standards and assist with the revisions at the 5 year anniversary (<https://www.aafs.org/academy-standards-board/calendar>)
- 3) Review documents during Public Comment Period at ASB and OSAC and suggest revisions (<https://www.aafs.org/academy-standards-board>; <https://www.nist.gov/organization-scientific-area-committees-forensic-science/standards-open-comment>)
- 4) Implement Standards in your laboratory (<https://www.nist.gov/organization-scientific-area-committees-forensic-science/osac-registry-implementation>)

THANK YOU!!!

Brian Adams	Robin Cotton	George Herrin	Bruce McCord	Garrett Siginoto
Rob Allen	Heather Coyle	Brian Higgins	Stacy McDonald	Rachel Singer
Tabitha Bandy	James Curran	Jennifer Honkanen	Amy McGuckian	Christie Smith
Bicka Barlow	Angelo Della Manna	Susan Horan	Heather McKiernan	Janel Smith
Howard Baum	Phil Danielson	Nicholas Hughes	Andrew McWhorter	Carl Sobierajski
Jason Befus	Marsha Deltz	Amy Jeanguenat	Amber Moss	Melissa Staples
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Jerilyn Conway	Ann Marie Gross	Desmond Lun	Peg Schwartz	Erika Ziemak
Kathleen Corrado		Michael Marclano	Taylor Scott	Candy Zuegger

Funding for the factsheets, checklists and partial funding for this presentation are made possible through the following financial assistance award 70NANB21H097 awarded to AAFS from U.S. Department of Commerce, National Institute of Standards and Technology.

Green Mountain DNA Conference








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NIST-AAFS Cooperative Agreement

Factsheets Training Checklists



Training, tools and resources made possible through the following financial assistance award 70NANB21H097 awarded to AAFS from U.S. Department of Commerce, National Institute of Standards and Technology