IMPLEMENTATION OF FORENSIC DNA AND SEROLOGY STANDARDS AND BEST PRACTICE RECOMMENDATIONS

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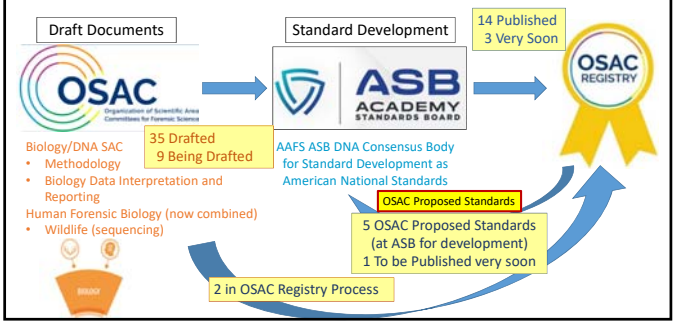
Denver, CO
September 20, 2023

STANDARD DEVELOPMENT PROCESS



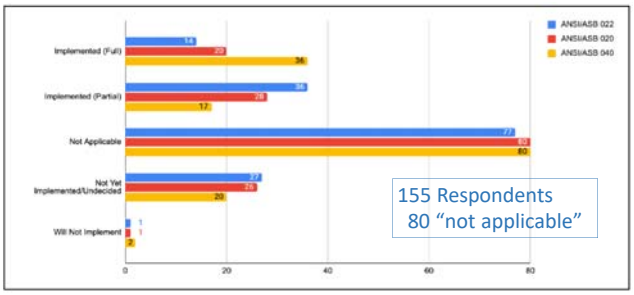
OSAC REGISTRY IMPLEMENTATION SURVEYS

2021 Survey
- Assessed the state of implementation of 46 standards on the OSAC Registry through March 2021
- 155 responses included in the data analysis (80 N/A for DNA)
- Estimating ~75 labs with Serology/Biology and/or DNA
- Detailed report published February 2022

2022 Survey
- Assessed the state of implementation of 95 standards on the OSAC Registry through June 2022
- 177 responses included in the data analysis
- 66 with Serology/Biology/DNA
- Detailed report published March 2023

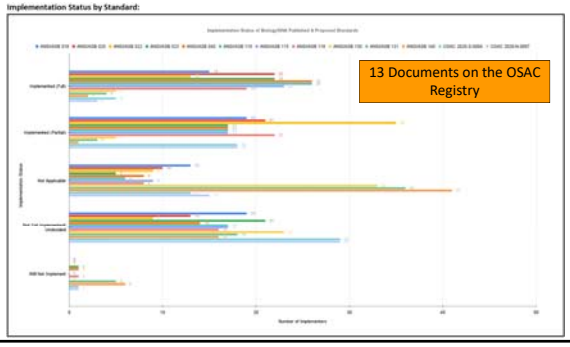
OSAC https://www.nist.gov/osac/osac-registry-implementation-survey

IMPLEMENTATION OF STANDARDS 22, 20 & 40 AUGUST 2021



155 Respondents
80 "not applicable"

IMPLEMENTATION IN LABORATORIES – 2022

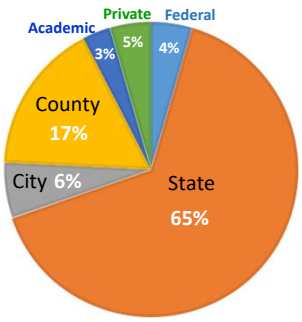


13 Documents on the OSAC Registry

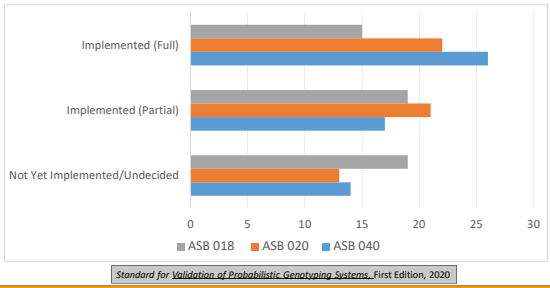
IMPLEMENTATION IN U.S. LABORATORIES – 2022

Biology/DNA
66 Labs

177 Respondents
128 Implementing Standards



VALIDATION STUDIES & PROTOCOLS: IMPLEMENTATION – 2022

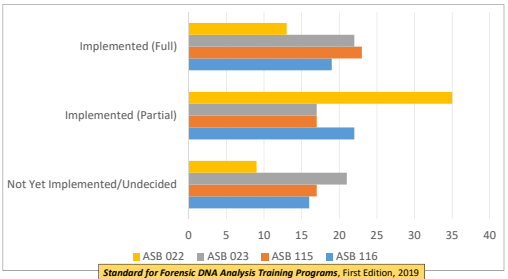


Standard for Validation of Probabilistic Genotyping Systems, First Edition, 2020

Standard for Validation Studies of DNA Mixtures, and Development and Verification of a Laboratory's Mixture Interpretation Protocol, First Edition, 2018

Standard for Forensic DNA Interpretation and Comparison Protocols, First Edition, 2019

TRAINING STANDARDS: IMPLEMENTATION – 2022



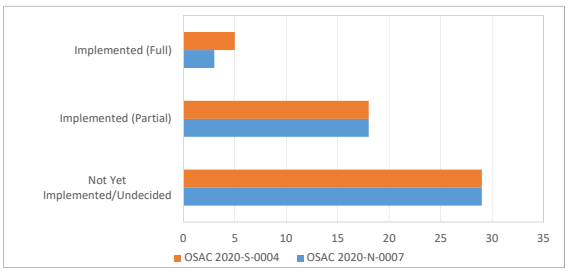
Standard for Forensic DNA Analysis Training Programs, First Edition, 2019

Standard for Training in Forensic DNA Isolation and Purification Methods, First Edition, 2020

Standard for Training in Forensic Short Tandem Repeat Typing Methods using Amplification, DNA Separation, and Allele Detection, First Edition, 2020

Standard for Training in Forensic DNA Quantification Methods, First Edition, 2020

OSAC PROPOSED STANDARDS: IMPLEMENTATION – 2022



Standard for Interpreting, Comparing and Reporting DNA Test Results Associated with Failed Controls and Contamination Events (ASB Standard 175)

Best Practice Recommendations for the Management and Use of Quality Assurance DNA Elimination Databases in Forensic DNA Analysis (ASB BPR 171)

AVAILABLE FOR IMPLEMENTATION

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 as Standard 187)

Training

1) ANSI/ASB Standard 110, *Standard for Training in Forensic Serological Methods*, First Edition, 2020 (26 implemented in 2022 survey)

AVAILABLE FOR IMPLEMENTATION

DNA

Validation Studies and Protocols

1) ANSI/ASB Standard 038, ***Standard for Internal Validation of Forensic DNA Analysis Methods***, First Edition, 2020
2) 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)*
3) OSAC 2021-S00021, *Forensic Autosomal STR DNA Statistical Analyses – General Protocol, Protocol Verification, and Case Record Requirements* (currently under development with ASB DNA Consensus Body as Standard 186)
4) OSAC 2021-S-0029, *Standard for Familial DNA Searching* (currently under development with ASB DNA Consensus Body as Standard 199)

AVAILABLE FOR IMPLEMENTATION

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

OSAC REGISTRY IMPLEMENTATION OPEN ENROLLMENT

- OSAC has transitioned to an "open enrollment" format to annually assess the state of implementation of standards on the OSAC Registry.
- Establishes a yearly cadence (summer) and opportunity for FSSPs to **update or initiate** an *OSAC Registry – Standards Implementation Declaration Form.*
- Data will be used to prepare reports covering the number of new and updated declaration forms, general implementation trends, and which standards are being implemented.
- OSAC will continue to accept declaration forms throughout the year but is designating this open enrollment period as a way for FSSPs to standardize their annual voluntary declaration submissions or updates.
- Can submit even if have implemented only 1 standard!!

https://www.nist.gov/organization-scientific-area-committees-forensic-science/osac-registry-implementation-open

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.

STANDARDS RESOURCES & TRAINING

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

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

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 ANSB/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

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

STANDARDS AND BEST PRACTICE RECOMMENDATIONS UNDER DEVELOPMENT BY ASB

DNA

Contamination, Statistics, Quality Control

1) 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)
2) Standard 139, *Reporting DNA Conclusions* (soon to be published, will need to be submitted to OSAC Registry)
3) Standard 041, *Formulating Propositions for Likelihood Ratios in Forensic DNA Interpretations*
4) Standard 136, *Forensic Laboratory Standard for Prevention, Monitoring, and Mitigation of Human DNA Contamination*

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)*

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

1) OSAC 2021-S-0003, *Standards for Setting Analytical and Stochastic Thresholds for Applications to Forensic DNA Casework Using Electrophoresis Platforms*

2) OSAC 2022-S-0024, *Best Practice Recommendations for Evaluative Forensic DNA Testimony*

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*

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
- Appendix Exemplar for Reports

RESOURCES AVAILABLE

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STANDARDS AND BEST PRACTICE RECOMMENDATIONS

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

OSAC Organization of Scientific Area Committees for Forensic Science

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OSAC FORENSIC BIOLOGY PROCESS MAP

OSAC

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

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!!!

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Eric Buel
Jason Bundy
Lynn Burley
John Butler
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Amber Carr
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Jessica Cino
Michael Coble
Jillian Conte
Jerilyn Conway
Kathleen Corrado
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Phil Danielson
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Janel Smith
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Erika Ziemak
Candy Zuleger

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Beth Ordeman

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