NEW STANDARDS AND BEST PRACTICE RECOMMENDATIONS FOR FORENSIC DNA TESTING

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ISHI INTERNATIONAL SYMPOSIUM ON HUMAN IDENTIFICATION WASHINGTON D.C. OCT. 31-NOV. 3, 2022

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STANDARDS AND BEST PRACTICES

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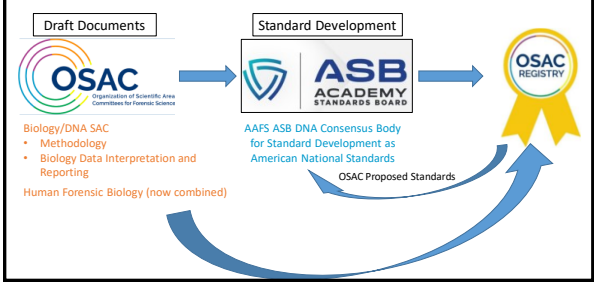
STANDARD DEVELOPMENT PROCESS



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AVAILABLE FOR IMPLEMENTATION IN LABORATORIES

Validation Studies

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
3) ANSI/ASB Standard 038, *Standard for Internal Validation of Forensic DNA Analysis Methods*, First Edition, 2020
4) ANSI/ASB Standard 040, *Standard for Forensic DNA Interpretation and Comparison Protocols*, First Edition, 2019
5) ANSI/ASB Standard 077, *Standard for the Development and Internal Validation of Forensic Serological Methods*, First Edition, 2020
6) ANSI/ASB Best Practice Recommendation 114, *Best Practice Recommendations for Internal Validation of Software Used in Forensic DNA Laboratories, First Edition, 2022* *(just published, not yet submitted to OSAC Registry)*

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

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AVAILABLE FOR IMPLEMENTATION IN LABORATORIES (cont'd)

Training

1) ANSI/ASB Standard 022, ***Standard for Forensic DNA Analysis Training Programs***, First Edition, 2019
2) ANSI/ASB Standard 110, *Standard for Training in Forensic Serological Methods*, First Edition, 2020
3) ANSI/ASB Standard 023, *Standard for Training in Forensic DNA Isolation and Purification Methods*, First Edition, 2020
4) ANSI/ASB Standard 116, *Standard for Training in Forensic DNA Quantification Methods*, First Edition, 2020
5) ANSI/ASB Standard 115, *Standard for Training in Forensic Short Tandem Repeat Typing Methods using Amplification, DNA Separation, and Allele Detection*, First Edition, 2020
6) ANSI/ASB Standard 130, *Standard for Training in Forensic Amplification Methods for Subsequent Capillary Electrophoresis Sequencing*, First Edition, 2021
7) ANSI/ASB Standard 131, *Standard for Training in Forensic DNA Sequencing Using Capillary Electrophoresis*, First Edition, 2021
8) ANSI/ASB Standard 140, *Standard for Training in Forensic Human Mitochondrial DNA Analysis, Interpretation, Comparison, Statistical Evaluation, and Reporting*, First Edition, 2021

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AVAILABLE FOR IMPLEMENTATION IN LABORATORIES (cont'd)

OSAC Proposed Standards*

1) OSAC 2020-S-0004, *Standard for Interpreting, Comparing and Reporting DNA Test Results Associated with Failed Controls and Contamination Events* (Standard 175 with ASB)

2) 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)

* currently under development with ASB DNA Consensus Body

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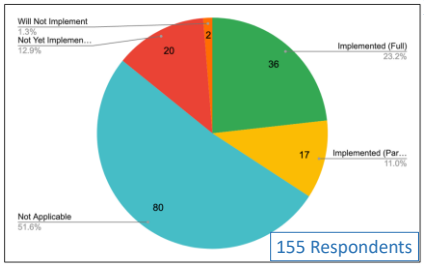
IMPLEMENTATION OF STANDARD 040 IN LABORATORIES – AUGUST 2021



70% of labs implementing

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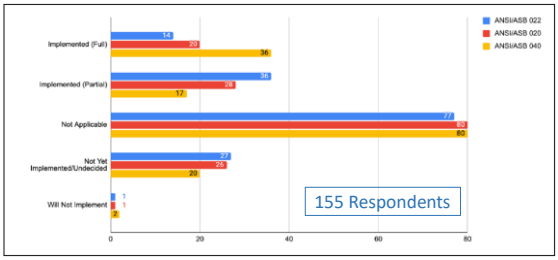
IMPLEMENTATION OF STANDARDS 22, 20 & 40 AUGUST 2021



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STANDARDS AND BEST PRACTICE RECOMMENDATIONS UNDER DEVELOPMENT BY ASB

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*

Training

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

ASB ACADEMY STANDARDS BOARD

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STANDARDS AND BEST PRACTICE RECOMMENDATIONS UNDER DEVELOPMENT BY ASB (cont'd)

Contamination, Statistics, Quality Control

1) Standard 041, *Formulating Propositions for Likelihood Ratios in Forensic DNA Interpretations*
2) Standard 123, *Standard for Routine Internal Evaluation of a Laboratory's DNA Interpretation and Comparison Protocol*
3) Standard 136, *Forensic Laboratory Standard for Prevention, Monitoring, and Mitigation of Human DNA Contamination*
4) Standard 139, *Reporting DNA Conclusions*

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

1) OSAC 2021-S-0003, *Standards for Setting Analytical and Stochastic Thresholds for Applications to Forensic DNA Casework Using Electrophoresis Platforms*
2) OSAC 2021-S-0021, *Forensic Autosomal STR DNA Statistical Analyses – General Protocol, Protocol Verification, and Case Record Requirements*
3) OSAC 2021-S-0028, *Standard for Use of Serological Testing Methods Associated with Forensic Investigations*
4) OSAC 2021-S-0029, *Standard for Familial DNA Searching*
5) OSAC 2022-S-0024, *Best Practice Recommendations for Evaluative Forensic DNA Testimony*

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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

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RESOURCES AVAILABLE

Promega

AAFS AMERICAN ACADEMY OF FORENSIC SCIENCES EST. 1948

OSAC Organization of Scientific Area Committees for Forensic Science

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STANDARDS CHECKLISTS

STANDARDS RESOURCES & TRAINING

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

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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

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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

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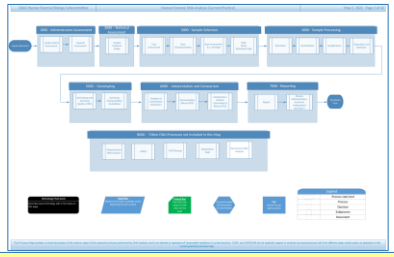
OSAC FORENSIC BIOLOGY PROCESS MAP

OSAC



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

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PROMEGA ARCHIVED WEBINAR SERIES

Promega

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

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ADDITIONAL RESOURCES

Academy Standards Board

Information and Education

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

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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

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THANK YOU!!!

Brian Adams, Rob Allen, Bicka Barlow, Howard Baum, Jason Befus, Susan Berdine, Todd Bille, Charles Brenner, Lisa Brewer, Tebah Browne, Ryan Buchanan, John Buckleton, Eric Buel, Jason Bundy, Lynn Burley, John Butler, Tom Callaghan, Kris Cano, Amber Carr, Jessica Charak, Jessica Cino, Michael Coble, Jillian Conte, Jerilyn Conway, Kathleen Corrado, Robin Cotton, Heather Coyle, James Curran, Angelo Della Manna, Phil Danielson, Marsha Deitz, Julie Demarest, Mary Jones Dukes, Lisa Dziegielewski, Debbie Epstein, Seth Faith, Erin Forry, Julie French, Jennifer Friedman, Susan Friedman, Kristen Fripp, Bill Gartside, Peter Gill, Simone Gittelson, Debra Glidewell, Jessica Goldthwaite, Susan Greenspoon, Catherine Grgicak, Kyra Groeblinghoft, Ann Marie Gross, George Herrin, Brian Higgins, Jennifer Honkanen, Susan Horan, Nicholas Hughes, Amy Jeanguenat, Malena Jimenez, Joanna Johnson, Kristine Kadash, Tim Kalafut, Rebekah Kay, Marla Kaplan, Susannah Kehl, Jarrah Kennedy, Phil Kinsey, Jody Koehler, Melissa Kotkin, Melissa Lavigne, Eugene Lien, Amy Lee, Steve Lee, Sarah Lewis, Chris Lindberg, Mark Loudon-Brown, Desmond Lun, Michael Marciano, Bruce McCord, Stacy McDonald, Amy McGuckian, Heather McKiernan, Andrew McWhorter, Amber Moss, Bonnie Mountain, Shawn Montpetit, Kim Murga, Steven Myers, Jennifer Naugle, Craig Nolde, Jeff Nye, Craig O'Conor, Robert Sean Oliver, Beth Ordeman, Christopher Piwonka, Daniele Podini, Mechthild Prinz, Robyn Ragsdale, Margaret Sanger, Kristin Schelling, Nadja Schreiber Campo, Melissa Schwandt, Peg Schwartz, Taylor Scott, Garrett Sgimoto, Christie Smith, Janel Smith, Carl Sobieralski, Melisa Staples, Melissa Sudderth, Joel Sutton, Jane Taupin, Pete Vallone, Susan Walsh, Amy Watroba, Bruce Weir, Steven Weitz, Susan Welti, Christian Westring, Charlotte Word, Darren Wright, Elisa Wurmbach, Brian Young, Tim Zolandz, Sandy Zabell, Caroline Zervos, Erika Ziemak, Candy Zuleger

Funding for the factsheets, checklists and partial funding for this presentation are made possible through the following financial assistance award 70NANB21H097awarded to AAFS from U.S. Department of Commerce, National Institute of Standards and Technology.

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