Human Factors in Forensic DNA Interpretation - A series of draft recommendations

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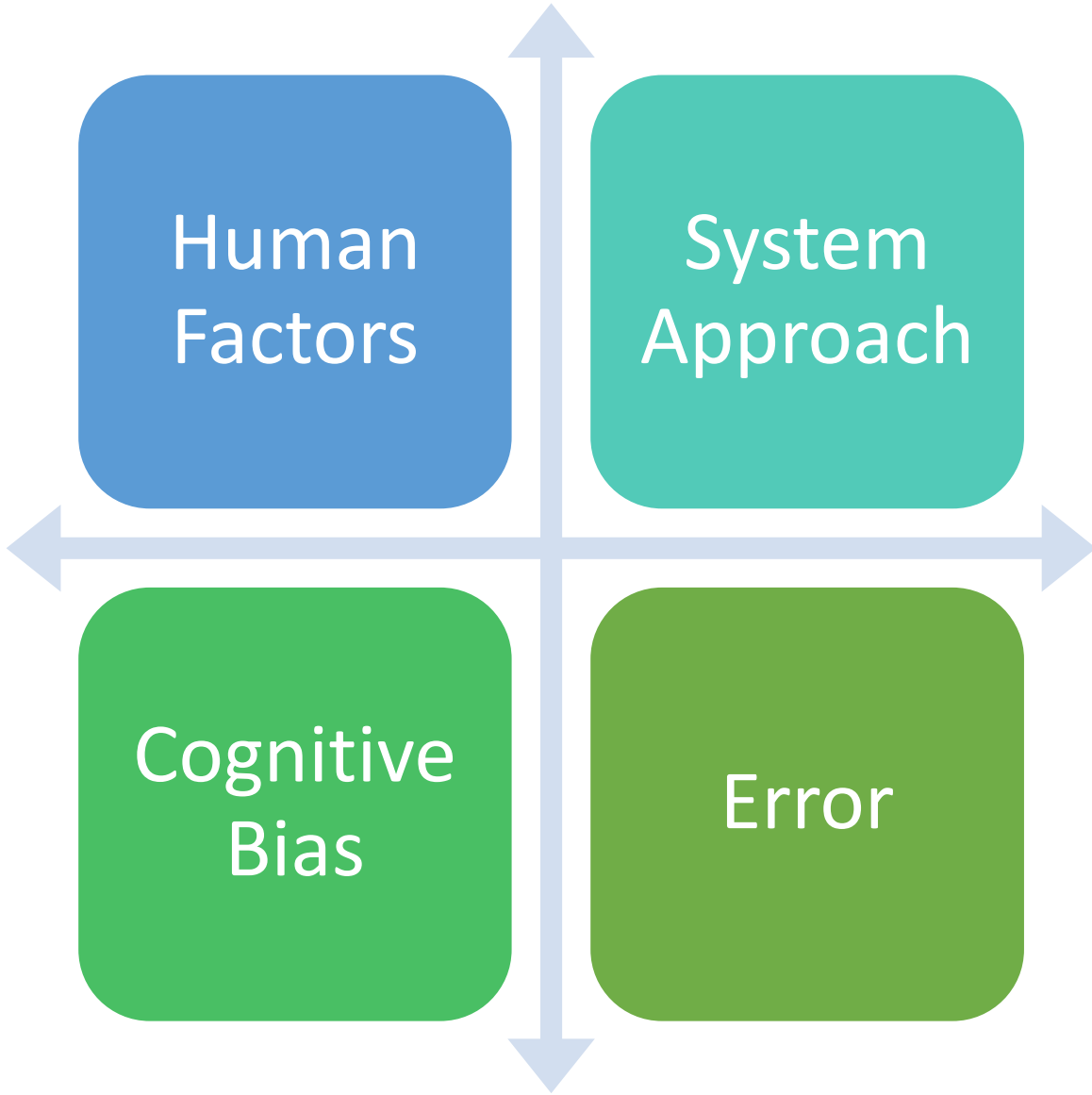
Expert Working Group Series on Human Factors in Forensic Sciences

Concepts underpinning Human Factors in Forensic DNA Interpretation



Summary of Draft Report

3.5 years in the making

12 chapters

350+ pages

700+ citations

45 draft recommendations

Draft Report Chapters

- Interpretation
- Quantitative and Qualitative Ways to Express DNA Results
- Reporting
- Pre-Trial Preparation and Testimony
- How and When Questions in DNA Analysis
- Quality Control & Quality Assurance
- Education, Training, and Professional Credentialing
- Management
- Work Environment
- Research Culture and Research Needs

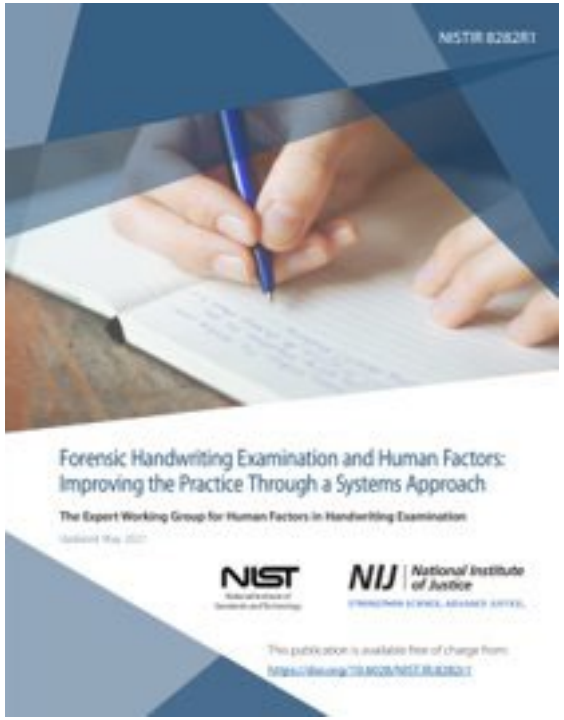
Expert Working Group Series on Human Factors in Forensic Science

Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach

A comprehensive discussion of how human factors relate to all aspects of latent print examinations.

Published Feb 9, 2012: https://doi.org/10.6028/NIST.IR.7842

Forensic Handwriting Examination and Human Factors: Improving the Practice through a Systems Approach



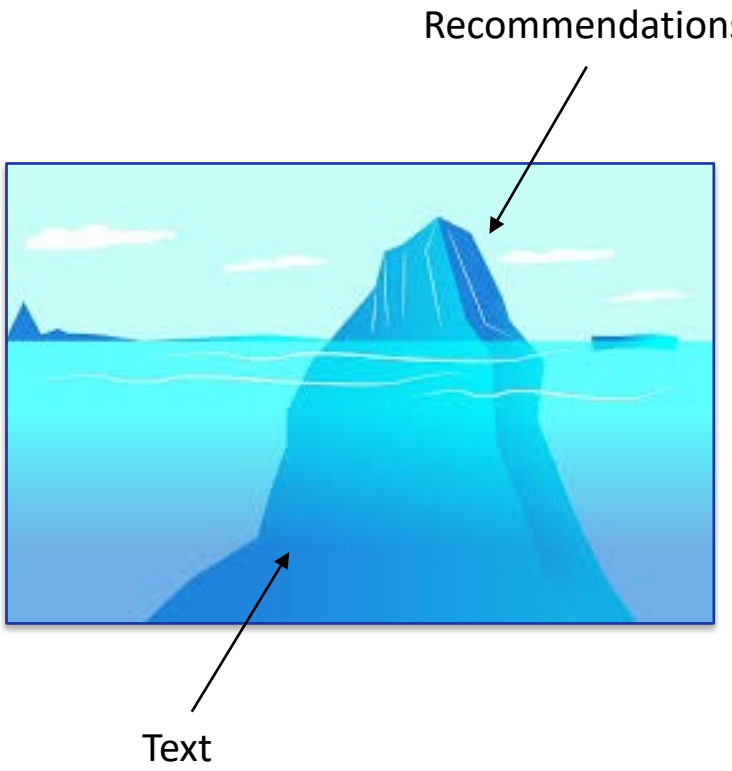
A comprehensive discussion of how human factors relate to all aspects of forensic handwriting examinations.

Published Jun 1, 2021: https://doi.org/10.6028/NIST.IR.8282r1

Nature of Draft Recommendations Disclaimer

The recommendations to be presented during this presentation are in **draft form** and may not represent the final language used within the published report.

Recommendations are important, but the **full text discussions emulate the extensive in-depth conversations that working group members engaged in throughout the formulation of this content**. Each draft recommendation presented today will be accompanied by a glimpse of the rationale of the surrounding draft text.



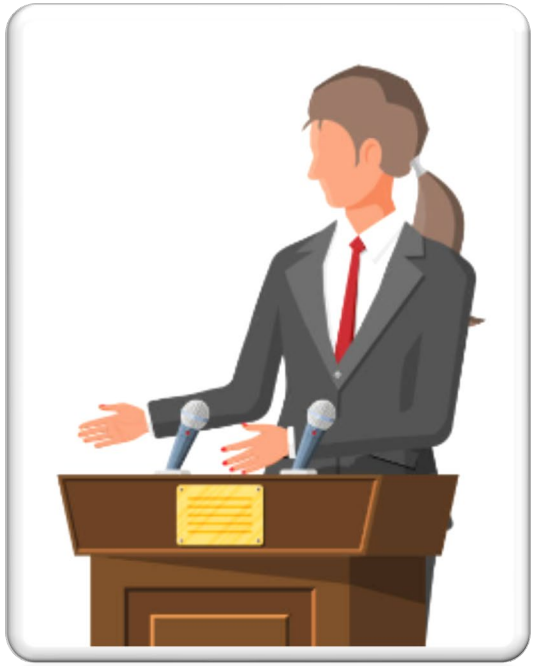
HUMAN FACTORS
in Forensic DNA Interpretation

Quantitative & Qualitative Ways to Express DNA Results

Words are hard, the right words are even harder

Chapter Highlights

- **Source Attribution – Why this problematic**
- **The Likelihood Ratio**
- **Other Quantitative Forms**
- **Qualitative Expressions of DNA Comparisons**



Quantitative & Qualitative Ways to Express DNA Results

DRAFT RECOMMENDATION 4.5:

DNA analysts should report the numerical value of the DNA comparison when assigning likelihood ratios rather than using qualitative terms such as match, included, consistent with, and cannot be excluded that end-users can misunderstand. It is acceptable to express excluded if the DNA analyst is transparent about how they reached that opinion and outline the limitations of such a conclusion.

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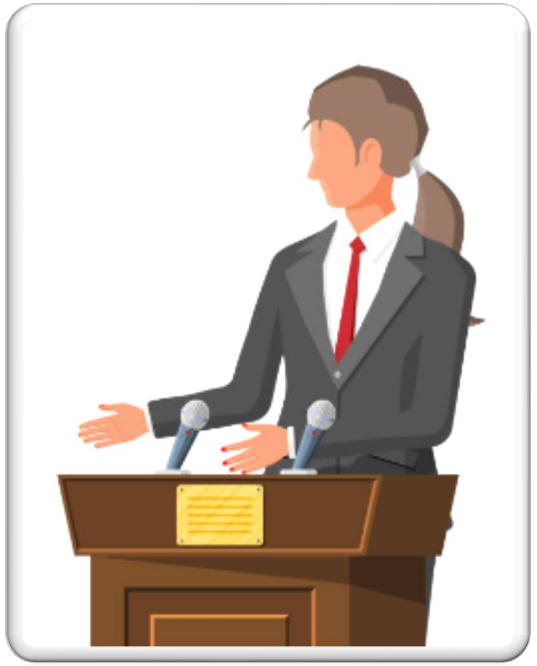
in Forensic DNA Interpretation

How & When Questions in DNA Analysis

Transfer, Persistence, Prevalence and Recovery

Chapter Highlights

- **Applying Knowledge about DNA Transfer**
  - **Proposed responses to how or when questions**
- **A Path Forward**
  - **Education**
  - **International Experiences**
  - **Invest in Research**
  - **Understand the Risks**



How & When Questions in DNA Analysis

DRAFT RECOMMENDATION 7.1:

DNA experts should only provide background information about the mechanics of DNA transfer, persistence, prevalence, and recovery, and should not opine about the possibility or probability of direct or indirect transfer having occurred for any given DNA sample(s) in a case.

HUMAN FACTORS
in Forensic DNA Interpretation

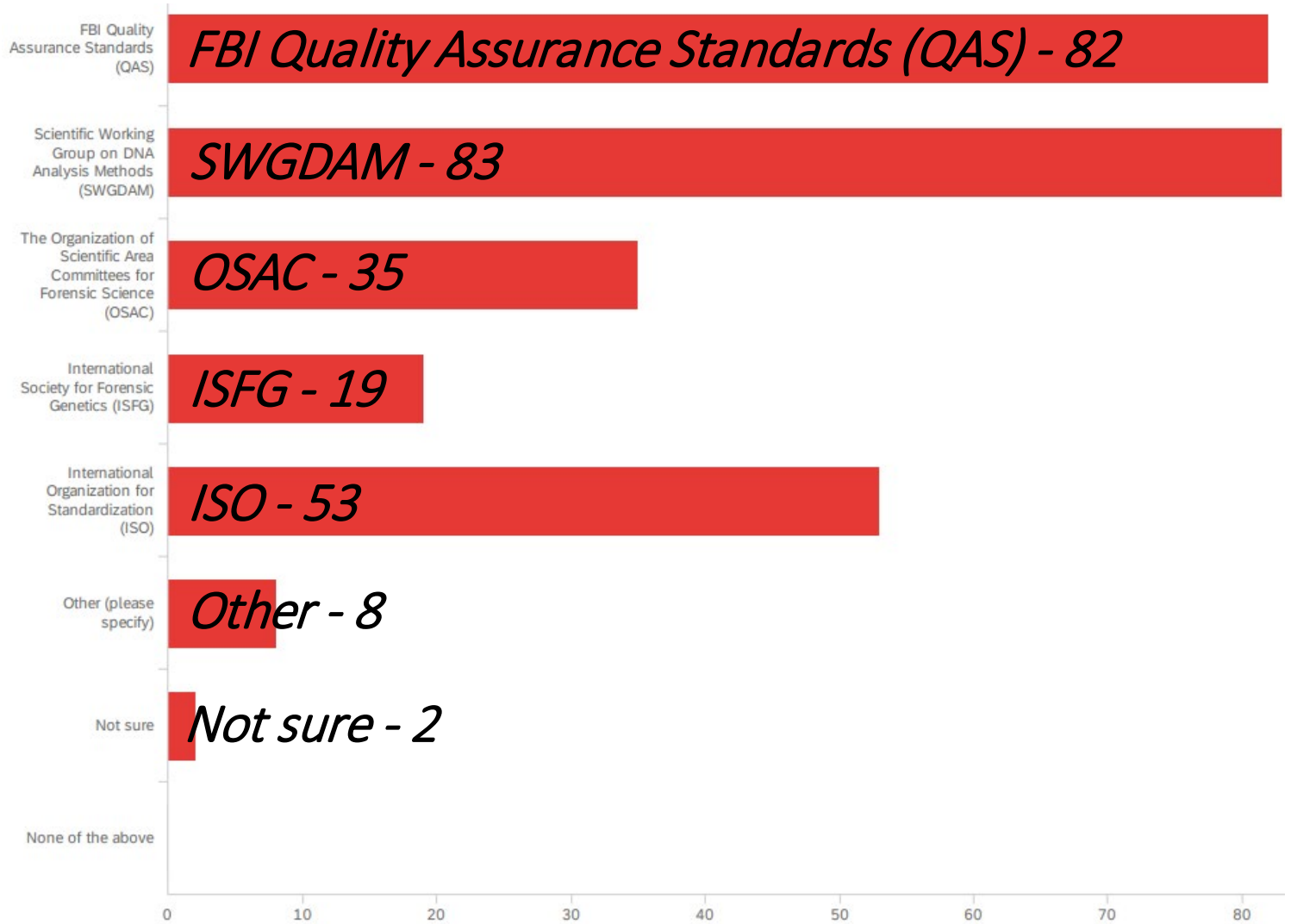
Education, Training, & Professional Credentialing

Who needs assistance with training?

Education, Training, & Professional Credentialing – Draft Recommendation 9.2 *Rationale*

DNA Technical Leader Survey Q7.4

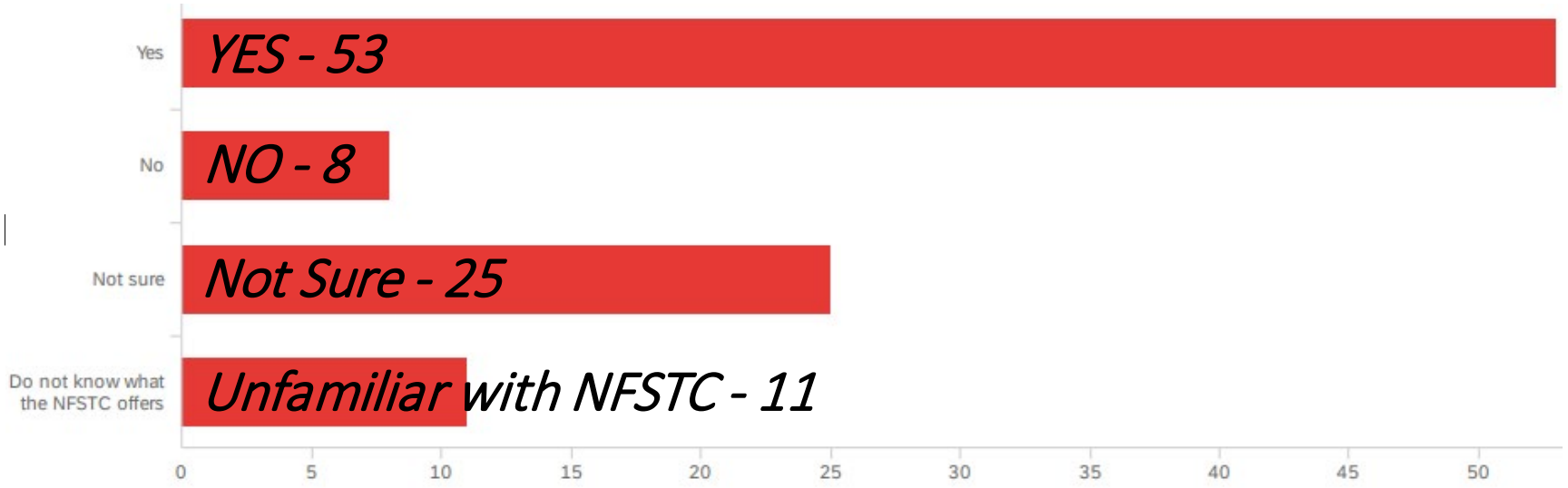
In choosing content for your laboratory's DNA analyst training program, did your laboratory follow recommendations from any of the following groups?



Education, Training, & Professional Credentialing – Draft Recommendation 9.2 *Rationale*

DNA Technical Leader Survey Q7.8

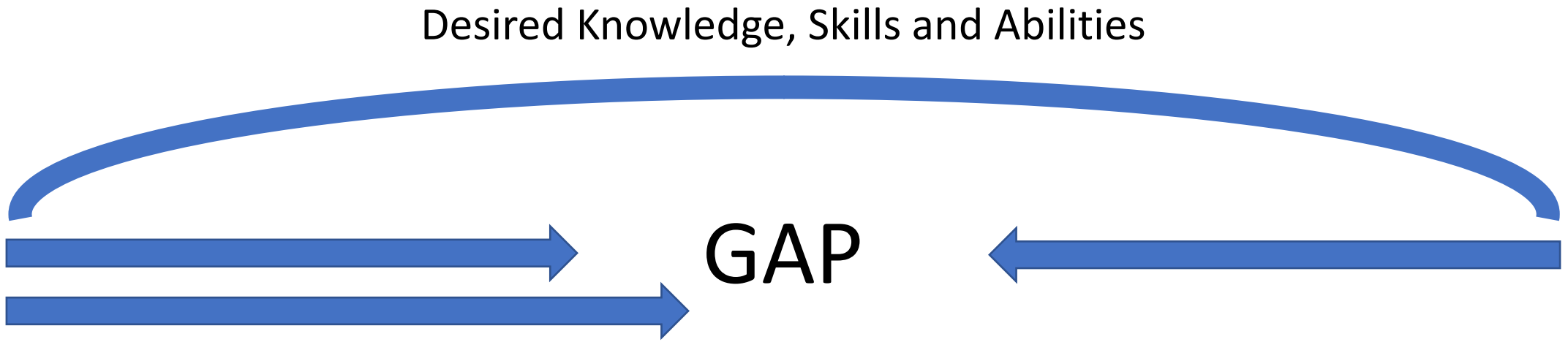
Would you like to see more national training efforts similar to progra offered by the National Forensic Science Technology Center (NFSTC)?



Education, Training, & Professional Credentialing – Draft Recommendation 9.2 *Rationale*

- There are addressable gaps in the current state of educating and training for U.S.-based DNA analysts
- Solutions needed to move towards increased standardization and independence from local FSSPs
- There are steps that the community can take to move towards standardization before a National Forensic DNA Training Consortium (NFDTC) is established

Education, Training, & Professional Credentialing – Draft Recommendation 9.2 *Rationale*



General Education –Molecular Biology, Biochemistry, Genetics, Statistics

On the job training – LIMS, Evidence in-take, Robotics, Moot Court

Education, Training, & Professional Credentialing

DRAFT RECOMMENDATION 9.2:

To reduce variability in education and training practices and increase quality and consistency of forensic DNA testing and interpretation, a federal nonregulatory agency or non-profit organization should develop a National Forensic DNA Training Consortium with the mission to provide standardized and high-quality education and training for technical (e.g., DNA analysts, DNA Technical Leaders) and quality personnel. This National Forensic DNA Training Consortium should offer the training needed for onboarding new forensic science service provider personnel as well as continuing education opportunities. Both offerings should include assessment components, written and practical as appropriate.

HUMAN FACTORS

in Forensic DNA Interpretation

Research Needs

How can research be more approachable.

Research Needs

DRAFT RECOMMENDATION 12.1: Researchers and education and training providers should invest effort to empirically determine how much research engagement, and in what form, is sufficient to ensure DNA analysts demonstrate appropriate levels of research-related awareness.

Research Needs

DRAFT RECOMMENDATION 12.2: All individuals and entities involved in forensic DNA analysis research should participate in Open Science practices and take steps to resolve barriers to increase the transparency and accessibility of research for consumers at all stages of research within the field of DNA analysis.

Expert Working Group Next Steps…

- This EWG is currently between Stage III and Stage IV of the report development process and will be entering the final external and internal reviewer feedback adjudication process
- Anticipated publication of the final report is the end of June 2023

Resources

OSAC's Forensic Biology Process Map for Human DNA Analysis

FIND MORE HERE
https://www.nist.gov/spo/forensic-science-program/process-mapping

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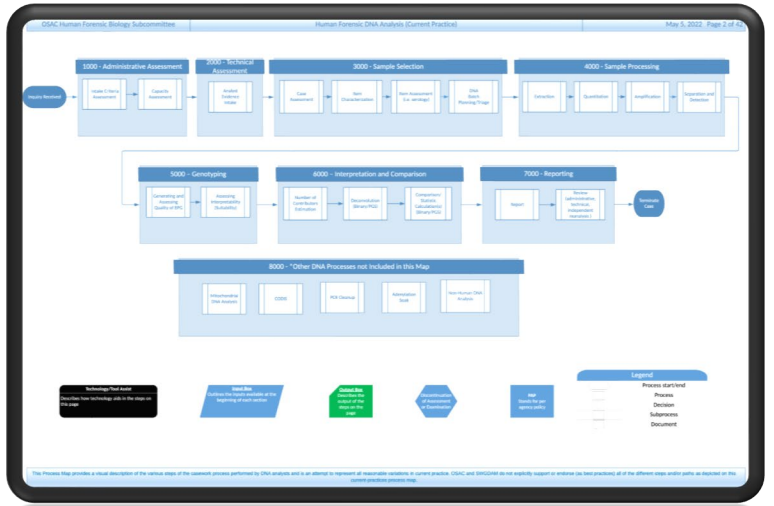

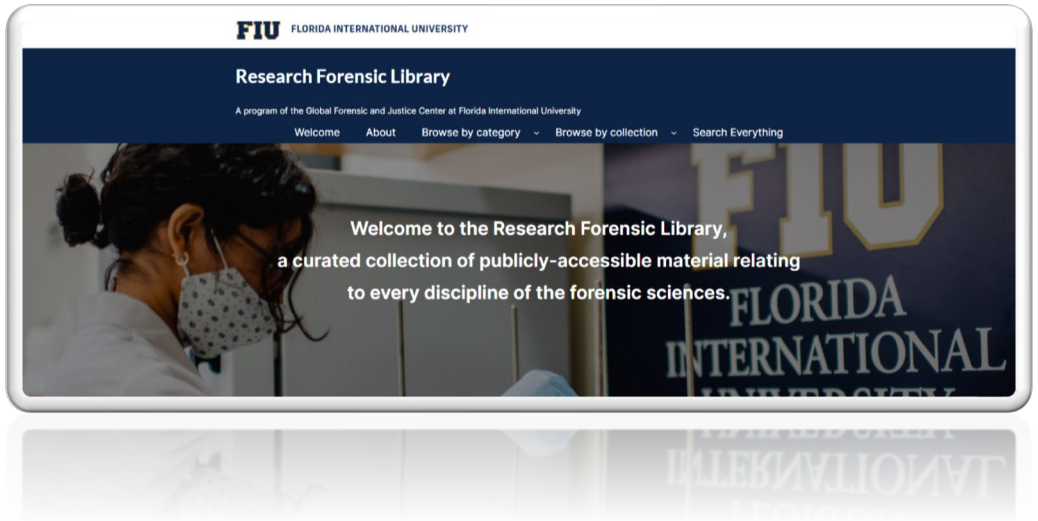

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Research Forensic Library @ FIU

FIND MORE HERE
https://forensiclibrary.org

Final Thoughts and Q&A

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