



Laboratory Analysis of Biological Evidence and the Role of DNA in Sexual Assault Investigations

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Course Description

This comprehensive module explores the complex role of DNA in a sexual assault investigation, beginning with an examination of certain assumptions that influence both discussions and policy initiatives in this area. Training explores alternative sources of DNA evidence and their potential significance or impact on a sexual assault investigation.

The module also includes a series of complex case examples illustrating many of the points and providing the opportunity to apply what you have learned to a variety of scenarios. The scenarios include a synopsis of the sexual assault and a SANE report from the victim's medical forensic examination, along with other supplemental materials, such as: a search warrant, suspect examination reports, clothing documentation forms, documentation of the objective symptoms of drug facilitated sexual assault, and sample laboratory service requests for both toxicology and DNA analysis.

A number of resources and tools are provided that can be easily adapted for use by law enforcement agencies. As with all the other modules in the OLTl, this new module on DNA can be printed if you prefer to review the material on paper. However, the information provided for the case examples will be limited in the print version. Although you will be able to print out the case information and interactive questions, you will only be able to review the answers and subsequent discussion in the online format. Therefore, we highly recommend that you complete this module online if at all possible.

Estimated time for completion: 32 hours

OVW Grant Funding

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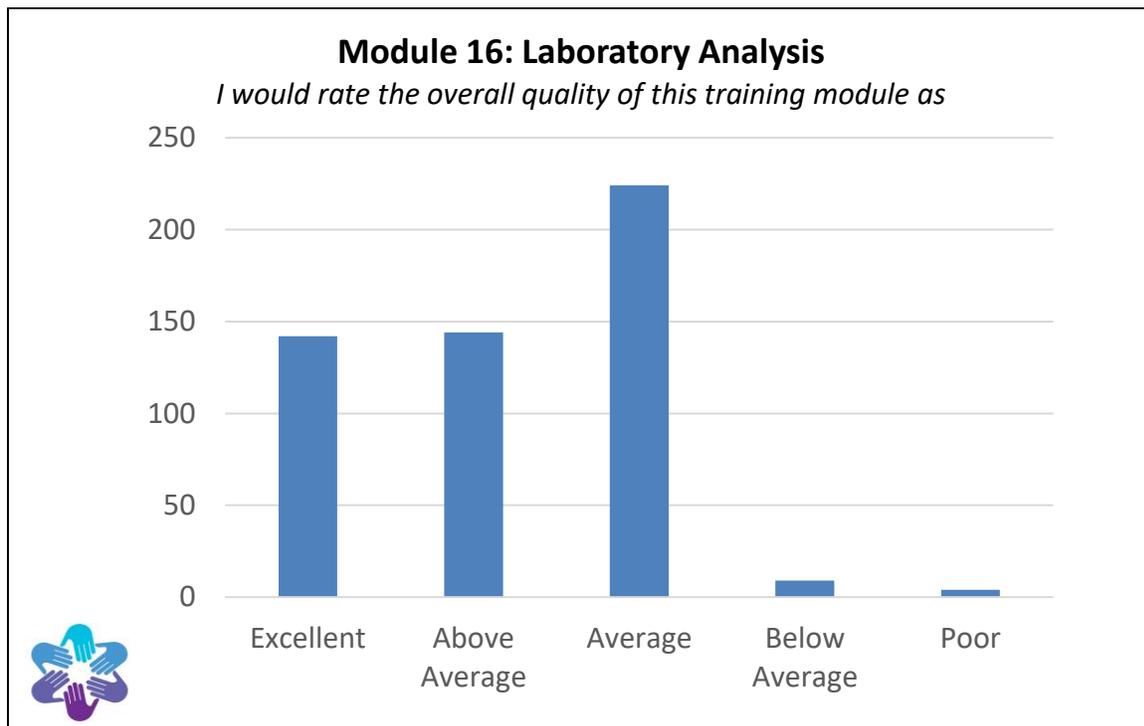
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Expert Contributions

OLTI training content is created and updated with input from professionals in a variety of disciplines, including law enforcement, prosecution, health care, victim advocacy, and related fields. Please see the acknowledgements page of each module, for a list of the individuals who served as contributing authors or expert reviewers.

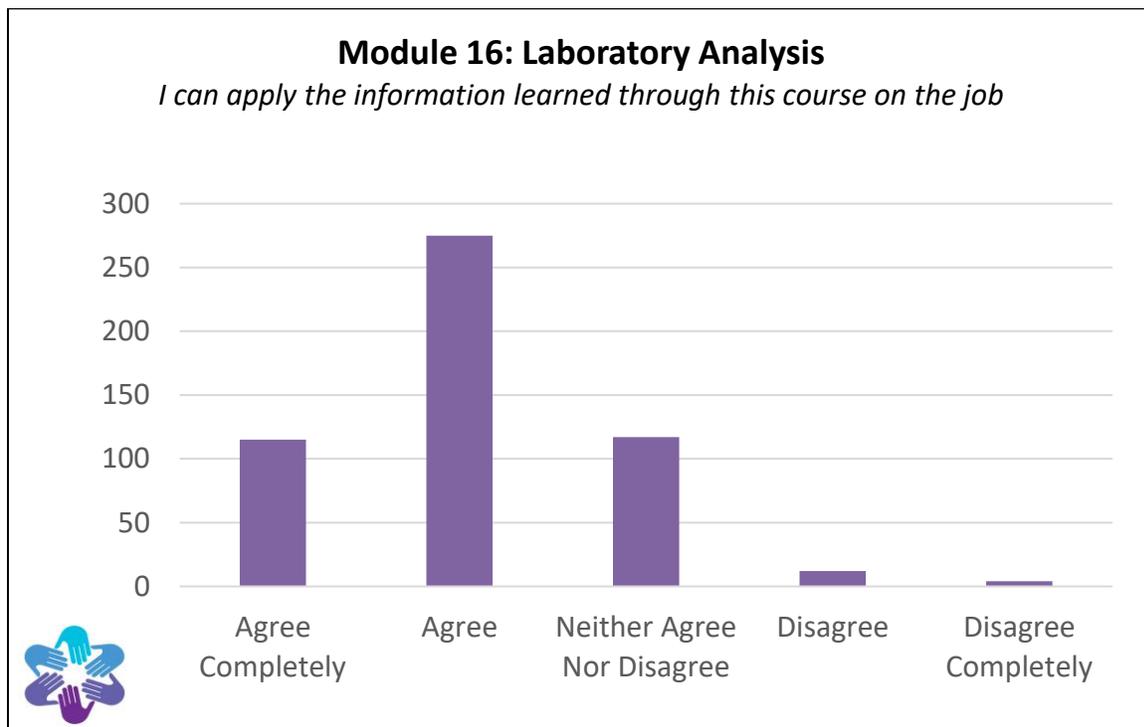
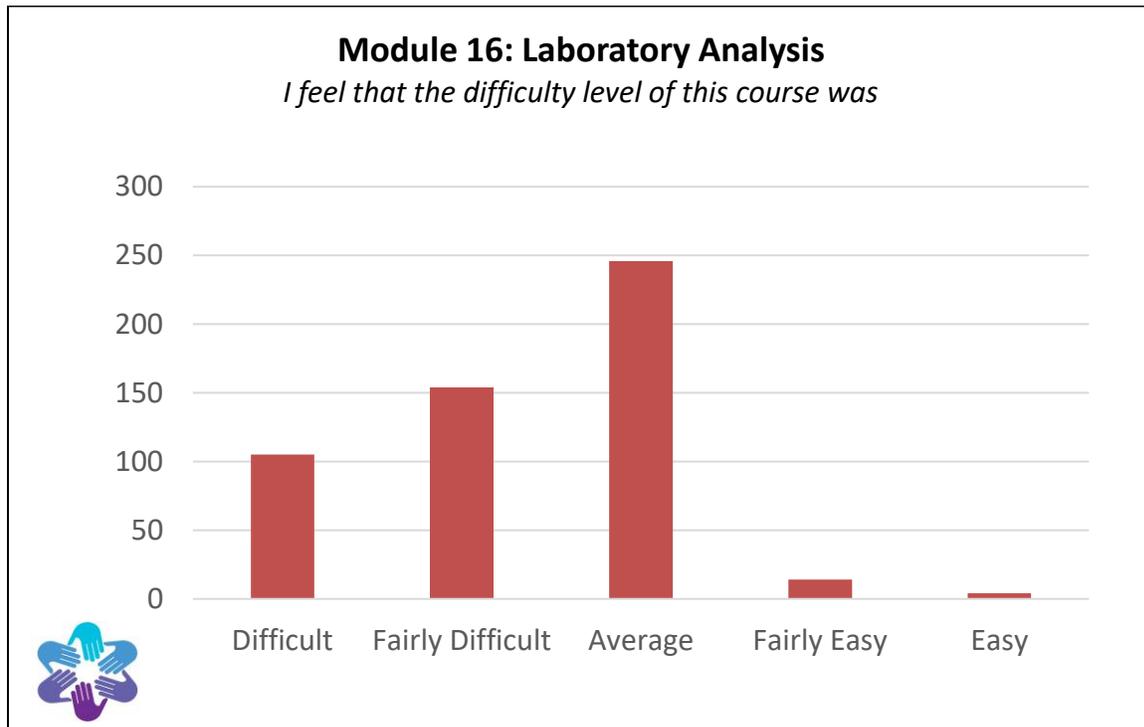
Course Evaluations

At the end of each module participants are asked a number of questions, including the overall quality of the module, as well as its difficulty. They are also asked to indicate how likely they are to apply the information they learned on the job. Their responses are summarized in the following charts.



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75% “agree completely” or “agree” that they can apply what they learned on the job.

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Course Objectives

At the end of this training module, the learner will be better able to:

- Demonstrate the importance of a competent, thorough investigation in a sexual assault case, including the use of DNA analysis.
- Describe what the Combined DNA Index System (CODIS) is and explain how local, state, and national levels of the database function.
- Explain the need for evidence collection, including a forensic examination of the victim and suspect, clothing, photographs, and other evidence from the crime scene.
- Describe how law enforcement investigators screen the evidence collected in a sexual assault case and identify what is likely to be the most important or probative, given a specific sexual assault scenario.
- Through case examples, illustrate how probative biological screening and DNA testing can assist in the development of a case.
- Prepare to submit a comprehensive request for analytic services to the laboratory, and ensure that the request contains all the essential elements.
- Explain the two-step process taken by laboratories to analyze biological evidence in a sexual assault case, which includes: (1) Screening to identify and localize potentially probative evidence, and (2) Developing a DNA profile.
- Articulate a basic understanding of the various DNA tests available.
- Describe the content of various laboratory reports (e.g., screening and DNA profiling results) and explain the purposes they serve.
- Articulate a basic understanding of the statistical frequencies associated with a DNA profile and explain what they mean.

Course Outline

- I. Part I. Essential Concepts and Historical Context – DNA Profiles and Databases
 - a. Serological Analysis
 - b. Advent of DNA Technology
- II. Combined DNA Index System (CODIS)
 - a. Offender DNA Profiles
 - b. Forensic DNA Profiles
 - c. Growth of CODIS Indices
 - d. Identifying a “Hit”
- III. Three Tiers of CODIS: Local, State, and National
 - a. Local DNA Index System (LDIS)
 - b. State DNA Index System (SDIS)
 - c. National DNA Index System (NDIS)

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- d. Putting It All Together
- IV. Part II: DNA Testing and Technology
 - a. Step 1: Screening
 - b. Step 2: DNA Typing
 - c. Restriction Fragment Length Polymorphism (RFLP)
 - d. Polymerase Chain Reaction (PCR)
 - e. Transition and Resource Crisis
 - f. A New PCR Tool: Y-STR Testing
 - g. Selective Degradation
 - h. Mitochondrial DNA: The Other Type of DNA
 - i. Comparing DNA Types and Testing
 - j. Looking to the Future
- V. Part III: Case Example of a Multi-State Series
- VI. And the Lessons Learned
 - a. Case Example of James Allen Selby
 - b. The Lessons and the Goal
 - c. If the Selby Case Happened Today
 - d. Looking Back and Moving Forward
- VII. Part IV: Purposes and Recommended Practices for DNA Evidence
 - a. Types of Biological Evidence
 - b. Sources of Biological Evidence
 - c. Primary Purposes of DNA Evidence
 - d. Which Evidence is Likely to be Most Probative?
 - e. Obtaining a Forensic Examination of the Suspect
 - f. Evaluating Evidence and Prioritizing Analysis
 - g. Submitting a DNA Request to the Laboratory
 - h. Reporting DNA Results and Complicated Statistics
 - i. Interpreting Conclusions
 - j. Evidence Consumption and Small Samples
- VIII. Part V: Recommendations for Policies and Practices
 - a. 1. Test Evidence Based on the Assault History
 - b. 2. Improve Communication with Laboratories
 - c. 3. Encourage Victim Access to Medical Forensic Exams
 - d. 4. Expand the Use of Suspect Examinations
 - e. 5. Exclude Consensual Partners
 - f. 6. Do Not Submit Evidence if the Victim Has Not Talked With Law Enforcement
 - g. 7. Provide Specialized Training on DNA
 - h. 8. Consider Establishing a Specialized Unit
 - i. 9. Ensure that All Qualifying Profiles are in CODIS

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- j. 10. Develop Policies and Protocols for Evidence Retention, Storage, and Destruction
- k. 11. Establish a Computerized Tracking System
- l. 12. Collect Data on Case Processing and Outcomes
- m. 13. Invest in Forensic Laboratories
- n. 14. Improve DNA Technologies