



### **B105 Forensic Biology Under the Microscope**

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The goal of this presentation is to help forensic analysts identify and recover minute quantities of biological material from evidence with the aid of a dissecting microscope when necessary.

This presentation will impact the forensic science community by demonstrating the successful production of screening results and DNA profiles from biological evidence collected with the aid of a dissecting microscope that may otherwise have gone untested.

Attendees will learn about techniques that have been developed for recovering DNA from tiny amounts of evidence. The recovery of biological material, with samples merely millimeters in size, presents unique challenges in DNA processing. Without the proper techniques, many laboratories may overlook the value of testing minute amounts of biological evidence. Biological material from physical evidence may be difficult to access, potentially wedged in the cracks of the piece of evidence or trapped in the weave of a fabric. Somewhere between the analysis of DNA from a single cell and large quantities of blood, bone, or tissue is the realm of biological evidence that can be visualized and recovered using a dissecting microscope.

Over the past 17 years, DNA Solutions® has developed tools and techniques that allow enough biological material to be recovered from these types of difficult samples for screening and DNA analysis. Manual DNA isolation techniques have been coupled with sensitive Short Tandem Repeat (STR) kits to produce unique DNA profiles from some evidence that might have gone untested. Casework examples will be presented, ranging from the processing and recovery of residual biological evidence from medical trocars that were used in surgery to the successful production of a DNA profile from a tiny speck of blood identified on a pill from a large chain pharmacy. The processes used to successfully perform DNA analysis from traces of dried mucus on a handkerchief that had been recovered from within a commercial food product will be outlined, as well as the determination of the wearer of a set of clothes covered in the victim's blood following a brutal murder. Finally, the development of a DNA profile from hollow point bullets after the bullets had been cleaned for ballistics matching and stored for more than four years will be described. The DNA profiles were able to be matched to the victim, confirming their origin. Each of these cases highlights the tools (micromanipulators) and techniques (vacuum systems) developed at DNA Solutions® and used to successfully recover minute amounts of biological evidence and produce data critical to the investigations surrounding each case.

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### **Forensic Biology, Dissecting Microscope, Minute Evidence**