

**ADDRESSING THE SIGNIFICANCE OF A CRIME SCENE DNA PROFILE
WHEN THE IDENTITY OF THE DONOR IS NOT AN ISSUE**

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As forensic DNA analysis has evolved, the questions concerning its evidentiary significance have also evolved. Issues raised concerning identity are becoming less common and are being replaced by issues such as transference, persistence and contamination i.e. explaining the DNA evidence. In order to be able to assist the investigator and the court the scientist must be able to carefully assess the potential significance of the DNA evidence in the context of different case scenarios. The process of case assessment and the application of hypothesis testing form a major component of the expertise of a reporting scientist at The Centre of Forensic Sciences (CFS).

As the list of samples that have yielded a DNA profile and the ability to obtain profiles from smaller and smaller quantities of DNA improves, the application of hypothesis testing becomes increasingly challenging. Hypothesis testing being at the core of all examinations conducted in our laboratory is a requirement that has been supported by a judicial enquiry (The Kaufman Commission) of the criminal justice system in the province of Ontario. One of the recommendations included “The Scientific Method” which states the following:

The ‘scientific method’ means that scientists are to work to vigorously challenge or disprove a hypothesis, rather than to prove one. Forensic scientists should be instructed to adopt this approach, particularly in connection with a hypothesis that a suspect or accused is forensically linked to the crime.

This poster will present three casework examples where this approach was used at different stages of the investigation.

Scenario 1 illustrates this approach at the early stages of the investigation. A 30-year-old female deceased is found fully clothed on her bed. Cause of death is determined to be manual strangulation. The investigators take two swabs from the side of the deceased’s neck. The significance of a mixed DNA profile obtained was addressed in the context of a hypothesis derived from information provided by the investigators.

Scenario 2 the legal evaluation of the significance of a mixed DNA profile obtained from a mask left at the scene of an armed robbery exemplifies the in trial assessment when there is a change in the hypothesis being tested.

Scenario 3 required a research study to address the significance to be placed upon the DNA results in a case. An 83-year-old female deceased is found in her apartment. Cause of death is determined to be strangulation. The significance of finding a foreign DNA profile in the victim’s fingernail scrapings was addressed in the research study. This study was designed to assess the frequency of finding foreign DNA profiles in the fingernail scrapings collected from co-habiting individuals.