



### **E5 Of Poppy Seeds, Blue Nitro, and Succinylmonocholine: How Advances and Discoveries in Science May Change the Interpretation of Lab Testing Results and Courtroom Testimony**

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The aim of this presentation is to illustrate for the Jurisprudence Community how, in the course of trial, accurate scientific test results can unintentionally be misinterpreted or even misrepresented.

This presentation will impact the forensic community and/or humanity by demonstrating past and recent discoveries such as cases involving the finding of Succinylmonocholine in embalmed, exhumed and fresh human autopsy tissues. Scientific evidence and decisions from admissibility hearings that affected the acceptance of the scientific evidence.

The aim of this presentation is to illustrate for the Jurisprudence Community how, in the course of trial, accurate scientific test results can unintentionally be misinterpreted or even misrepresented. However, it also shows how emerging discoveries and the current leaps and bounds of forensic science are leading to better understanding of the scope and limits inherent in the reasonable scientific certainty (not absolute, nor even beyond a reasonable doubt) of forensic expert interpretative opinion based on test results which are highly accurate today, but may well be superseded by the progress of science tomorrow.

Throughout the history of forensic science, techniques have been developed to identify and measure vanishingly small quantities of toxicological and other relevant substances, and then forensic scientists are tasked with interpreting the meaning of this scientific evidence in court. DNA molecules can be extracted from evidence and amplified to identify their individual human originator who may be the perpetrator or have had nothing to do with the crime. Sinister traces of illegal drugs and poisons found in human biological fluids and tissues may be evidence of homicidal intent or they may turn out to be of natural origin. The dose makes the poison – a little may just be natural, but a lot may mean an unnatural death – homicide.

Finding evidence of acute arsenic poisoning from a urine test for elemental arsenic may turn out to be due to a large seafood meal containing non-toxic organic arsenic. The test truly revealed the total concentration of arsenic, but it failed to reveal the form the arsenic was in and therefore, its origin. True test result – false interpretation.

This presentation focuses on past and recent discoveries such as cases involving the finding of Succinylmonocholine in embalmed, exhumed and fresh human autopsy tissues. Scientific evidence and decisions from admissibility hearings that affected the acceptance of the scientific evidence will be explored. The outcome and process of these cases will be compared with previous cases in which substances were found that were deemed to be evidence of a crime or a murder and later determined to be present naturally or from inadvertent exposure that was not criminal or intentional.

In many such cases, the analytical chemistry and ultimate results were correct, valid and accurate, however, their interpretation changed when scientific information emerged that helped to explain, cast doubt or cast a shadow over the interpretation of the presence of these substances. Although there was no attempt to hide facts or ignore facts, in light of emerging new scientific evidence, the conclusions had to be reevaluated and reinterpreted.

#### **Scientific Evidence, Reinterpretation, New Science**