A103 Effect of Hydrogen Peroxide Pre-Treatment on the Results of Subsequent Phenolphthalein Presumptive Test for Blood

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After attending this presentation, attendees will learn that pretreatment with hydrogen peroxide greatly inhibits subsequent phenolphthalein testing producing a false negative reaction. The audience will be led through the experimental strategy leading to the reported results and an explanation of why subjecting a sample to more then one presumptive test for blood should be approached with care.

This presentation will impact the forensic community by demonstrating a possible interaction between the presumptive tests for blood and will help analysts select a proper approach when more than one presumptive test needs to be performed.

Agencies have adopted different presumptive tests for blood in their standard procedures. It is not uncommon for more than one presumptive test to be performed in situations when an evidence item is analyzed by more than one agency. Each agency will attempt to identify the presumptive presence of a substance according to their own procedure. This raises the possibility of interference or incompatibility of the presumptive tests. Most of the presumptive tests for blood are based on the peroxidase-like catalytic activity of hemoglobin and the use hydrogen peroxide as an oxidant. Pretreatment with hydrogen peroxide is standard practice in immunohistochemistry when blocking the endogenous peroxidase activity of the specimen is desired.

Therefore, a study was carried out to assess the potential effect of pretreatment with hydrogen peroxide on the sensitivity of a subsequently performed phenolphthalein test, routinely used as a presumptive test for blood in the Harris County Medical Examiner's Office Forensic Biology Laboratory.

The results demonstrated that pretreatment with hydrogen peroxide greatly inhibited subsequent phenolphthalein testing producing a false negative reaction. The likely mechanism is the inhibition of the endogenous peroxidase activity of hemoglobin. Since most of the presumptive tests for blood rely on the hemoglobin endogenous peroxidase activity and use hydrogen peroxide as an oxidant, care should be taken when subjecting a sample to more then one presumptive test.

An example from casework where samples were treated with fluorescein prior to submission to the laboratory is presented. Results of presumptive, confirmatory, and DNA testing will be presented. Additional studies on the effect of sample pre-treatment with hydrogen peroxide and/or phenolphthalein testing on subsequent confirmatory testing such as ABAcard® Hematrace® will also be discussed.

Presumptive, Fluorescein, Phenolphthalien

 ** Presenting Author*