

## **Quantitative and Qualitative Analysis of Minute Levels of Saliva in Expired Blood Stains**

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This research was conducted to investigate the ability of SALIgAE® to accurately detect the presence, and quantity, of trace amounts of saliva within expired bloodstain patterns. Currently, the only accepted method of classifying an expired bloodstain pattern is the presence of air bubbles in the stain. Following IRB approval and informed consent, venous blood and saliva was collected from the volunteer. The sensitivity of the SALIgAE® solution was first tested with dilutions of saliva:ddH<sub>2</sub>O, and saliva:venous blood, ranging from 1:1 to 1:1,000,000. Four individual expired stains were then created by the volunteer coughing blood onto a surface. A grid was drawn on over the stain where 42 resulting bloodspots from each stain were chosen for analysis using the SALIgAE® solution, via visual color change and a spectrophotometric reading. The sensitivity of SALIgAE® with dilutions of saliva:ddH<sub>2</sub>O, and saliva:venous blood produced positive color changes up to 1:1,000 for both, which confirms the claims made. Of the 168 individual spots tested from the four stains, a total of 50 stains produced positive color changes. The 50 positive reactions had salivary amylase concentrations ranging 0.00µg/mL to 0.28µg/mL. The results of this study highlight the ability of SALIgAE® to detect the presence of minute quantities of saliva mixed with blood. This reveals the SALIgAE® method to be an ideal candidate for the differentiation of expired spatter and impact spatter, therefore overcoming a significant challenge facing bloodstain pattern analysts.

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### Brief Bio:

I am a sophomore studying forensic science from Clifton Park, New York. I am currently on the E-Boards for Forensic Science Student Association, St. Jude Up Til Dawn, and University of New Haven's Love Your Melon Crew.

