



Criminalistics Section

Louisiana State Police Crime Lab

Latent Blood Enhancement

CSI Unit

WHAT

Latent Blood Enhancement is the process of detecting and documenting minute or trace amounts of blood within a scene or on a surface with the use of forensic light sources and reagents. Even though invisible to the human eye, blood cells may still be present in old or cleaned/washed surfaces and can be enhanced, observed, documented, and collected for analysis.

HOW

Latent Blood Enhancement is performed by crime scene investigators who are trained and responsible for identifying, enhancing, documenting trace amounts of suspected blood within a scene, and determining important scene elements from analyzing their deposition and location. This analysis is done with the use of specific blood enhancing reagents and forensic alternate light sources.

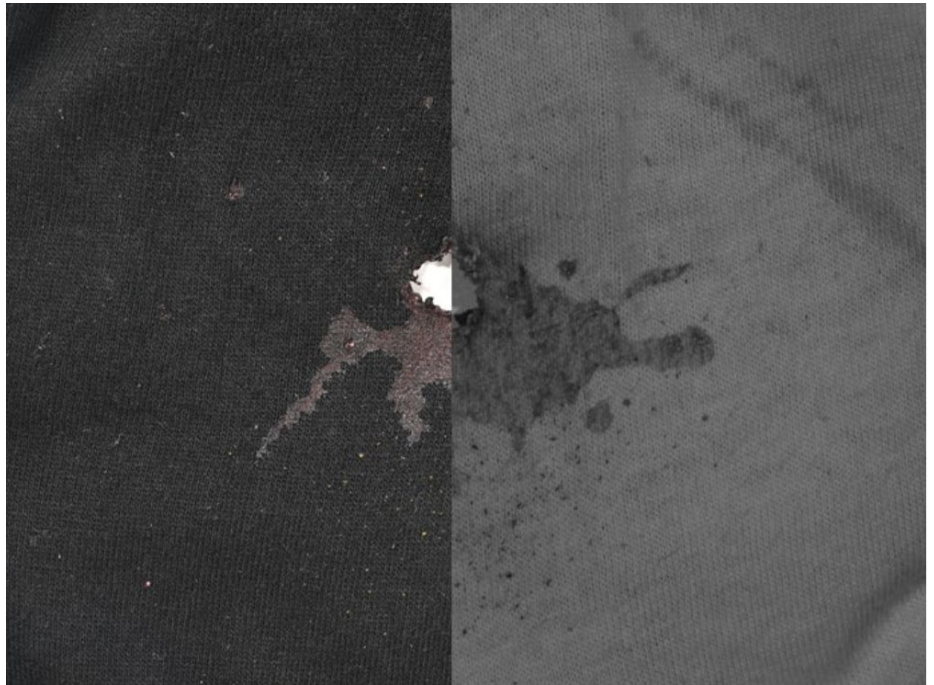
The laboratory's CSI Unit first searches the scene for any suspected bloodstains. Any stain can be chemically tested for the presence of blood using phenolphthalein. However, stains may still be present even when not visible. Blood enhancing reagents may be used to visualize these invisible bloodstains. The most commonly used reagent is a luminol-based reagent called BlueStar. When BlueStar is applied to an area with trace amounts of blood, it glows a bright blue-green. Other reagents include LeucoCrystal Violet and Amido Black, which stains latent blood a dark blue or purple color for visualization. Other methods include using alternate light sources (ALS), such as infrared light, to visualize blood on dark or multi-colored surfaces which otherwise may not be visible.

Once detected, latent blood is documented using photography, and samples can be collected for DNA Analysis. Impressions or fingerprints in suspected blood can be enhanced, photographed, and collected for further analysis by the Latent Print Comparison Unit or the Impressions Comparison Unit.

WHY

By identifying suspected blood in locations or on objects, the laboratory can aid investigations with information revealed including whose blood it is and how it was applied. Since blood can be a rich source of information, finding it often greatly aids the investigation.

Latent Blood Enhancement



Staffing

Six analysts are currently authorized for Bloodstain Pattern Analysis that are assigned to the CSI Unit. There are an additional fourteen analysts from multiple disciplines throughout the lab that are currently authorized to assist in on-scene documentation of bloodstains.

Classifications

In latent blood detection, there can be negative reactions, positive reactions, false positive reactions, and false negative reactions. Negative reactions indicate that no latent blood was detected when using an ALS or blood reagent. Positive reactions indicate that latent blood was detected when using an ALS or blood reagent. False positive reactions indicate that even though a reaction is occurring when using an ALS or a blood reagent, it may not in fact be blood. False negative reactions occur when there is no indication of latent blood when it may, in fact, be present. Further testing at the laboratory may be needed to confirm a false positive or false negative reaction.

Chemiluminescence - the emission of light that occurs as a result of certain chemical reactions that produce high amounts of energy lost in the form of photons when electronically excited product molecules relax to their stable ground state.

Interesting Facts

Blood has the physical characteristic of absorbing most wavelengths of light; therefore, when using an ALS, blood will appear black in color. Blood enhancing reagents such as LCV can be used on porous and non-porous surfaces to enhance and develop possible finger and shoe/foot impressions on surfaces.

Luminol-based blood detecting reagents react with blood by causing it to luminesce in a bright or dull intense blue chemiluminescence in low-light conditions, and will be slow to fade. False positive reactions will fluoresce in a bright white chemiluminescence, and will fade quickly. These reagents can produce a chemiluminescence when reacting to some household detergents such as bleach and substances that contain copper or some other metals.