



A93 The Screening of Buccal Swab Samples With Ninhydrin Solution Results in Improved Cell Collection and STR Success Rates

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After attending this presentation, attendees will gain an understanding of using ninhydrin solution as an efficient and inexpensive method for the screening and processing of problem buccal swab samples.

This presentation will impact the forensic community by demonstrating an effective method to rapidly screen and locate the highest concentration of buccal cells on buccal collectors.

A method to rapidly screen and locate the highest concentration of buccal cells on a buccal collector by using ninhydrin solution will be presented. The occasional failure of buccal swab samples to amplify and generate complete STR profiles is a commonly encountered problem for forensic DNA databanking laboratories. Buccal swab sampling failure can be associated with either the incorrect swabbing of the inner cheek, which results in a non-uniform cell collection and lack of DNA sample, and/or the punching of buccal collectors from areas that do not contain any buccal cells because the areas of high concentration of cells cannot be seen. Both of these failures lead to the need to repeat extraction and amplification processes.

Currently there are no methods in the field that allow for a quick screening process to determine where the highest concentrations of cells are located on a swab. Ninhydrin sprays are commonly utilized in the development of latent fingerprints by detecting the amino acids left on paper substrates. It was theorized that the areas of swiped buccal collectors containing high concentrations of buccal cells and therefore, amino acids, would exhibit darker staining patterns than other areas of the swab when sprayed with this chemical.

Random selections of buccal sample swabs were sprayed with a ninhydrin solution to test for the presence and location of buccal cells on the swabs. A total of 1,425 buccal collectors were tested during this study, and with this new method of ninhydrin screening, the overall first time amplification success rate was improved from 88% to 96%; the second trial amplification rate resulted in 100%. Serial dilution tests of saliva show positive correlations between color intensities and the amount of DNA present on swabs. The darker a swab region stains, the greater the chance there will be substantial amounts of buccal cells/DNA in that area. These results suggest that the spraying of buccal samples with a ninhydrin solution is an effective, efficient, and inexpensive method for the screening and processing of problem buccal swab samples. In addition, 22 month storage tests have shown no long term destructive consequences from ninhydrin spraying.

DNA Profiling, Ninhydrin, Databanking