D15 Validation Results From the European Project FEARID on Forensic Ear Print Identification

Ivo Alberink, PhD; and Arnout C. Ruifrok, PhD, Netherlands Forensic Institute, Volmerlaan 17, Rijswijk, 2288 GD, Netherlands*

After attending this presentation, attendees will understand quality issues concerning a standardized operating procedure for collecting ear prints.

This presentation will impact the forensic community and/or humanity by presenting validation issues concerning the strength of evidence of ear prints.

As part of the Forensic Ear Identification (FearID) research project, which aims at obtaining estimators for the strength of evidence of ear prints found on crime scenes, a sample of ear prints has been collected. The method of ear print collection will have critical consequences for the subsequent analysis and results.

The project has produced a report stating the standard operating procedure (SOP) for taking the prints. This describes in detail e.g. what equipment to use, when and how to clean surfaces of the equipment, how to lift the ear prints and how to instruct ear print donors. In this way it should be guaranteed that when using different equipment, investigators, locations etcetera, the circumstances do not influence the prints too much.

When lifting an ear mark from a scene of crime, an investigating officer will first dust the area of the print. After this a "lifter" will be used to extract the mark from the surface. In the Netherlands, to this end the medium Black Gel Lifter (BGL) is used mostly. Ear prints (marks) gathered thus are referred to as *second-generation* prints. In addition to this, there are methods of taking ear prints not via a surface but immediately off the ear, thus producing *first generation* prints. For the validation experiment, besides using the medium BGL, we also took prints using the first generation method referred to as Inkless Impression Kit (IIK).

Two fundamental issues concerning the design of the operating procedure for taking ear prints, and the applicability of the eventual results, are the following:

1. *Repeatability:* Are ear prints from the same individual, taken repeatedly under the same circumstances by the same operator sufficiently similar?
2. *Reproducibility:* Are ear prints from the same individual, taken repeatedly under different circumstances by different operators sufficiently similar?

The answers to these questions provide information about the quality of the procedure.

An experiment has been performed to investigate the above. In order to evaluate the outcomes of the experiment, features were needed to decide when two prints are "alike." We note that finding such features is the main topic of the project, so it was not clear beforehand which features are most appropriate.

Using both mean grey-value and anatomical measures for the comparison of prints, clear effects can be seen of country, donor, donor ear, operator and consecutive runs on the resulting ear prints when using the medium BGL. For the medium IIK operator and run effects are less when using mean grey-value and not significant when using anatomical measures.

Since it does not seem to be feasible to further adjust the procedure, we are currently exploring features that are less sensitive to country, operator and run effects.

Ear Print Identification, Validation, Operating Procedure

 ** Presenting Author*