DNA ANALYSIS FOR DVI AND OTHER IDENTIFICATION PURPOSES. EVALUATION OF THE COPAN 4N6FLOQSWABS™ FOR COLLECTION OF BLOOD OR TISSUE SAMPLES.

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Currently, samples from deceased individuals received for DNA-identification are whole blood (EDTA), different soft tissues or bone/teeth. The sample of choice depends on the degree of fragmentation or decomposition of the body. In this study the goal was to evaluate the COPAN 4N6FLOQSwabs™ for collection of samples for DNA-identification purposes, regardless the degree of decomposition. Forensic pathologists from four centers of pathology and forensic medicine in Norway have been participating in this case study. In a total of 80 cases, pairs of samples (blood and muscle tissue) were collected on COPAN 4N6FLOQSwabs™ (containing antimicrobial action) and placed directly back into the plastic container. Each case was categorized by the pathologist according to the degree of decomposition; not decomposed (n=59), partly decomposed (n=13) and highly decomposed (n=8). Reference samples (EDTA-blood in tubes) were collected from 51 of the deceased.

The EZ1 Advanced XL from QIAGEN was used for DNA-extraction, using the Investigator kit for the 4N6FLOQSwabs with blood or muscle tissue and the Blood kit for the reference blood samples. All samples were analyzed on ABI 3130 Genetic Analyzer with PowerPlex®16HS (16 markers, standard PCR and analysis conditions: 1µl template, 25µl reaction mix, 10+22 PCR cycles, and 5 sec. injection time) and Promega ESX17 (17 markers, standard conditions: 1µl template, 25µl reaction volume, 28 PCR cycles and 5 sec. injection time). Samples that did not show a reliable, complete PCR-profile with standard conditions were subjected to a second amplification under extended PCR and analysis conditions (PowerPlex®16HS extended conditions: 18µl template, 25µl reaction volume, 10+24 PCR cycles, 15 sec. injection time. ESX17 extended conditions: 18µl template, 25µl reaction volume, 30 PCR cycles, 5 sec. injection time).

Results

In 74 of the 80 cases, the DNA-profiles achieved from the COPAN 4N6FLOQSwabs™, demonstrated either a reliable profile in complete accordance with the profiles from the reference blood samples (50 cases) or , if no reference sample was available (14 cases), a reliable, full profile for both blood and muscle tissue. In 6 cases, the DNA-profiles achieved from both the COPAN 4N6FLOQSwabs™ and the corresponding reference samples demonstrated a variable degree of success.

Conclusions:

Our results demonstrate that the use of the COPAN 4N6FLOQSwabs™ for collection of samples from deceased individuals for DNA- identification purposes, will facilitate the sampling procedure at the mortuary, streamline the DNA-extraction procedure in the lab and give very good quality DNA-profiles both from blood on swab and swabs applied on muscle tissue. In all cases, a reliable, full DNA-profile was obtained from blood on swab in at least one of the

Promega kits included in the study. The blood on swab samples demonstrated in this respect a 100 % success rate, and the muscle on swab samples a 97,5 % success rate. The Promega ESX17 kit tends to be slightly more sensitive than the Promega PowerPlex®16HS.

This study also indicate that the use of the COPAN 4N6FLOQSwabs™ for sampling at the site of an incident involving a large number of body parts, would be a suitable method. ⌘