EFFECT OF TWO DIFFERENT NYLON FLOCKED SWABS (FLOQSWABS™) WITH OR WITHOUT SURFACTANT ON SENSIBILITY OF HEXAGON OBTI AND HEMDIRECT HUMAN BLOOD DETECTION TESTS.

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Among the biological traces found at a crime scene, bloodstains are the most commonly screened. Most of the forensic laboratories use a preliminary test (e.g. Hemastix) in combination with an immunological confirmatory test (e.g. Hexagon Obti or Hemdirect).
These immunological tests are highly sensitive and reliable but false negatives still exist. For example, detergents can affect their sensibility.

Nylon flocked swabs (FLOQSwabs™**)** are a good alternative to common rayon swabs. In the forensic area, these flocked swabs seem to improve the DNA typing for vaginal sampling. Moreover, these swabs are ethylene oxide treated. Ethylene oxide is a very efficient sterilizing and DNA decontaminant agent.

In our previous validation study, we have observed that sampling with 4N6FLOQswabs reduces by a factor of at least 100 the detection threshold of blood using the Hexagon Obti and Hemdirect immunological test. Using Raman spectrometry and infrared spectral analyses, we identified the presence of sulfosuccinate ester on the genetic 4N6FLOQswabs. Manufacturer (Copan, Italy) confirmed that the fiber used for these swabs contains low amount of sodium dodecyl sulfate for better hydrophilicity.

In order to improve the 4N6FLOQswabs to use also with immunological assays besides molecular testing, we are working in close collaboration with Copan to validate a new production of 4N6FLOQswabs suitable for both molecular and immunological assays. we tested the 4N6FLOQswabs that contain SDS, and a new production of 4N6FLOQswabs and a line of a Human DNA free FLOQswabs™ (hDNA) marked as Medical Devices used for diagnostic testing. Using various dilution of blood, we tested the compatibility between these two new flocked swabs with the two immunological blood detection strip.

For the hexagon Obti, the highest dilution enabling positive signal detection using the two new swabs,new production of 4N6FLOQswabs or hDNA flocked swabs, was 8.10^5. In comparison, the highest dilution allowing blood detection after 10 minutes was 100 for the previous 4N6FLOQswabs and 1.10^4 for rayon swabs. Hook effect was observed for dilution below 500 for the two new flocked swabs.

In an identical study, we obtained very similar results using the Hemdirect test from Seratec.
These results show that the Copan improved production of 4N6FLOQswabs and the Human DNA free FLOQswabs™ can be used with the Hexagon Obti and Hemdirect detection strip.