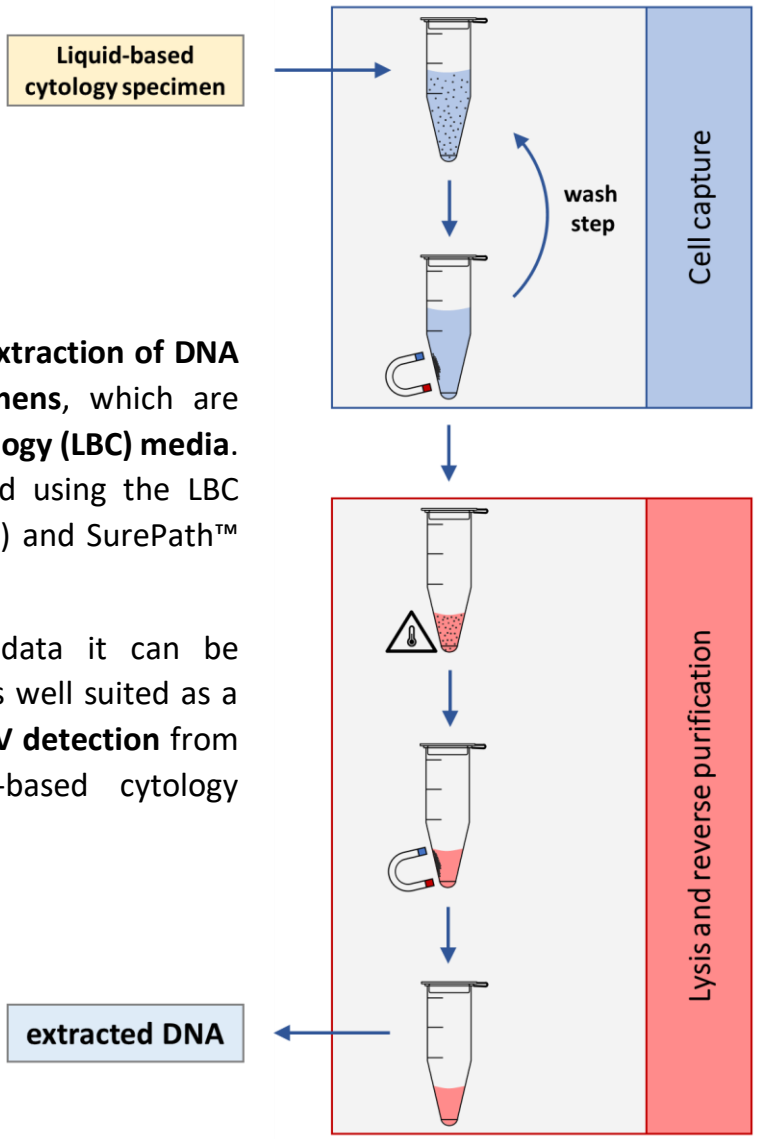
Application Note

2021-02

Related product

This application note is related to **SwiftX™ DNA** (SXD-25).



Summary

SwiftX™ DNA was applied for **extraction of DNA from** human epithelial **specimens**, which are suspended **in liquid-based cytology (LBC) media**. The data have been generated using the LBC media PreservCyt® (see page 2) and SurePath™ (see page 3).

Based on the experimental data it can be concluded that **SwiftX™ DNA** is well suited as a DNA extraction method **for HPV detection** from swabbed material in liquid-based cytology media.

DNA extraction from PreservCyt® samples

Swabs from epithelial tissue were suspended in PreservCyt solution, a commonly used sample collection and transport medium for Human Papilloma Virus (HPV) analysis. Papilloma viruses are strictly intraepithelial pathogens, which are dependent on the host cell's DNA expression during keratinocyte differentiation (Pinidis *et al.* (2016) Maedica 11:48).

The DNA of PreservCyt specimens (400µL sample volume) was extracted using the SwiftX™ DNA kit (ca.no. SXD-25) following the instructions in Protocol 2 and Protocol 3, respectively. Both protocols enable to capture and concentrate cells from liquid samples before nucleic acid extraction. In those cases where Protocol 2 was used, an additional wash step was performed after cell binding step. The cells were lysed by 10 minutes incubation at 95°C in a heat block. This releases the cellular human DNA as well as the viral DNA of potentially present HPV. After the lysis, cell debris and potential inhibitors were removed from the lysate by reverse purification. As a reference, paired samples were extracted using the QIAGEN DNA Mini kit following the instructions of the manufacturer. The amount of extracted human DNA was quantified using a commercial real-time PCR kit (QIAGEN Investigator Quantiplex).

Figure 1 shows that SwiftX DNA enables a robust and efficient extraction of DNA from samples in PreservCyt solution, which contains about 50% methanol. Both, Protocol 2 (including a wash step) and Protocol 3 of SwiftX DNA are suitable for extraction of epithelial samples in PreservCyt LBC solution.

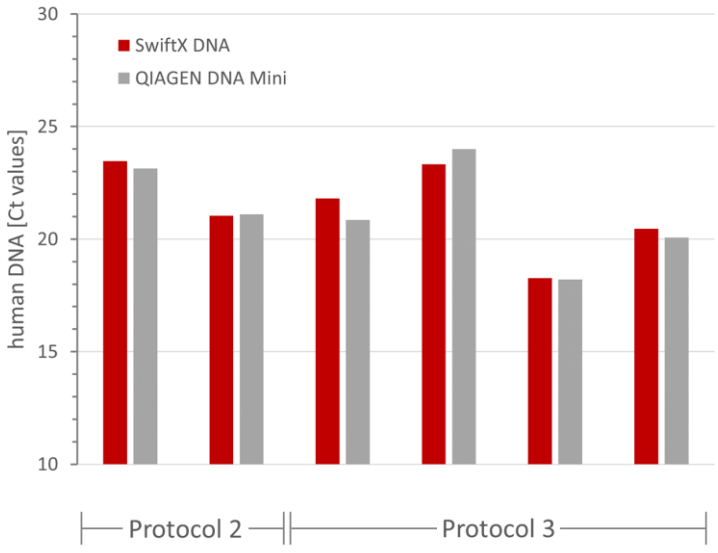


Fig. 1: DNA yield from PreservCyt samples using different protocols of SwiftX DNA in comparison to QIAGEN DNA Mini kit.

DNA extraction from SurePath™ samples

Swabs from epithelial tissue were suspended in SurePath solution, another commonly used sample collection and transport medium for HPV diagnostics. The DNA of the SurePath samples was extracted and analyzed as described in the previous section on PreservCyt DNA extraction.

Figure 2 shows that both protocols are suitable for analysis of samples in SurePath solution, which contains a mixture of ethanol, methanol, isopropanol and small amounts of formaldehyde. Furthermore, the data prove that Protocol 3 delivers significantly better results than Protocol 2 and clearly outperforms the reference DNA extraction kit.

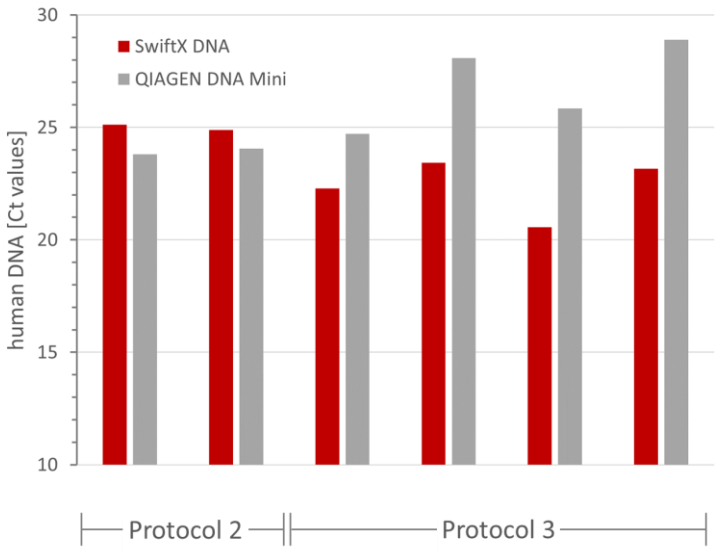


Fig. 2: DNA yield from SurePath samples using different protocols of SwiftX DNA in comparison to QIAGEN DNA Mini kit.

Figure 3 shows the amplification data of the internal control of the real-time PCR kit as amplified in no-template-controls as well as in presence of the different DNA extracts. Samples extracted using SwiftX DNA show very consistent Ct values for the internal control target with a narrow overall variation range.

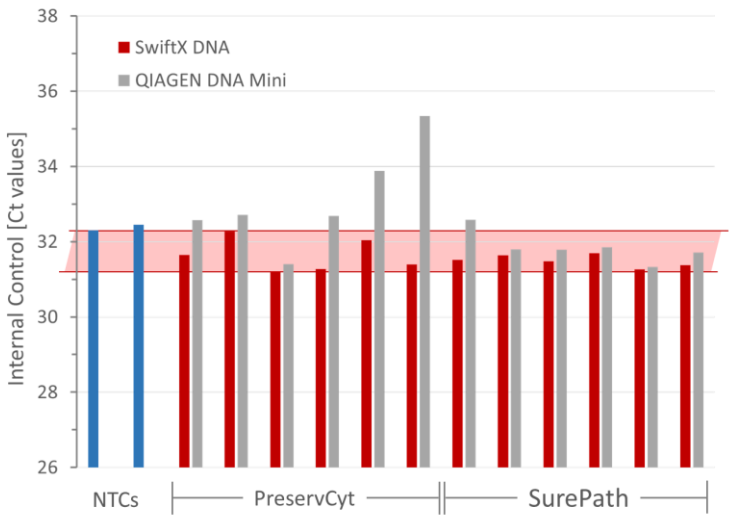


Fig. 3: Amplification of internal control DNA of no-template-controls as well as of samples extracted from LBC media.