

COMPARISON OF FOUR DIFFERENT DNA EXTRACTION METHODS FOR BLOOD IMPREGNATED ON CLASSIC FTA® CARD

T. Sathirapatya¹, W. Worrakitirungsi¹ and K. Vongpaisarnsin^{1,2}

¹Department of Forensic Medicine, Faculty of Medicine, Chulalongkorn university

²Forensic Serology and DNA, King Chulalongkorn memorial hospital and Thai red cross society

Whatman FTA (Flinder's Technology Associates) cards are primarily used for DNA sample preservation in forensic community. The chemical in FTA card has the ability to lyse cells, inactivate bacterial and viruses and also preserve DNA sample. The major advantage of FTA cards is DNA sample can be stored at room-temperature for a long period of time. However, some downstream DNA analysis, real-time PCR approach or NGS library preparation, are incompatible with FTA card punches and thus DNA must be eluted from the card into a soluble solution. Here, we explored four different DNA extraction methods for blood impregnated on classic FTA card. Two enzyme-based extraction methods, Methanol method¹ and forensicGEM® Storage Card extraction kit (Zygem)² and two magnetic bead-based methods, DNA IQ™ System (Promega)³ and PrepFiler™ Forensic DNA Extraction Kit (Applied Biosystems)⁴ were studied in 2 different groups (patient's blood and postmortem blood). The DNA quantity and quality were assessed using Quantifiler™ Human Quantification kit (Applied Biosystems). In the overall, postmortem sample gave higher DNA concentration when compared to others. All four extraction methods showed similar DNA concentration tendency when compared in each sample. PrepFiler™ Forensic DNA Extraction Kit (Applied Biosystems) demonstrated the highest yield.

References

¹Johanson H.C., Hyland V., Wicking C., and Sturm R.A. DNA elution from buccal cells stored on Whatman FTA Classic Cards using a modified methanol fixation method. *BioTechniques* 2009 46:4, 309-311

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⁴https://assets.thermofisher.com/TFS-Assets/LSG/manuals/cms_053966.pdf