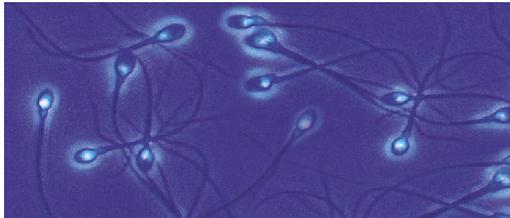


When is it useful?

Sperm Elution is the standard method of extraction for all sexual assault cases submitted to Cellmark. Using Sperm Elution we consistently see better recovery of spermatozoa and an increase in the quality of DNA profiles compared to those obtained with previous methods.

In addition to the benefits for current casework these developments have also allowed our scientists to re-think their expectations in relation to cold cases.

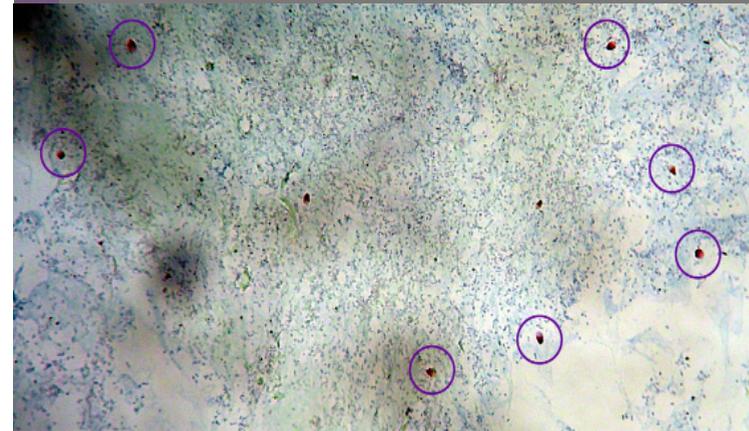


Sperm Elution can and has recovered spermatozoa from samples where previously no, or only a few spermatozoa have been found. This has allowed us to assist in resolving recent cases as well as those that have remained undetected for years.

Many of Cellmark's police customers have already benefitted from Sperm Elution. With its increased recovery of spermatozoa and improved DNA profiles it is helping us to assist forces in the investigation of their undetected sexual assault cases.

IDENTIFICATION
INTERPRETATION
INNOVATION

SPERM ELUTION - cleaner, faster, better, stronger



Specialist expertise
in recovery, analysis
& interpretation

IDENTIFICATION
INTERPRETATION
INNOVATION

Introduction

Sperm Elution, developed by Cellmark Forensic Services, is a novel method of recovering spermatozoa from swabs and fabrics which significantly improves recovery, produces stronger DNA results and helps police forces improve the detection of sexual offences.

Previously used extraction methods involved laborious microscope slide searching and lengthy DNA extraction. Slides were often difficult to search and there was usually an expectation of mixed DNA profiles. Data collected by the Association of Forensic Service Providers' Body Fluid Forum (BFF) in 2008 identified that spermatozoa yields of less than 30% were typically found in UK Forensic laboratories. With Sperm Elution Cellmark's recovery rate from swabs has risen to almost 80%.

This unique recovery system, when combined with Cellmark's other services such as extended Acid Phosphatase (AP) testing and its world leading specialist DNA services, offers a compelling combination for forces investigating sexual offences.

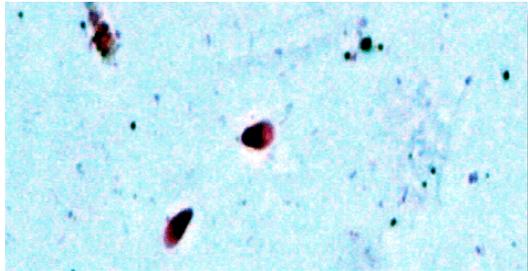
S P E R M E L U T I O N - c l e a n e r , f a s t e r , b e t t e r , s t r o n g e r

Case study 1

This was an undetected sexual offence case, where the complainant was unsure if she had been assaulted and therefore the nature of penetration, if any, was unknown. The complainant advised that she had not been sexually active for a number of months.

Prior to submission of exhibits to Cellmark, a trace amount of spermatozoa on the low vaginal swabs had been detected by another laboratory. Using increased cycle PCR a full female profile had been obtained, with no indications of DNA from an additional/male source.

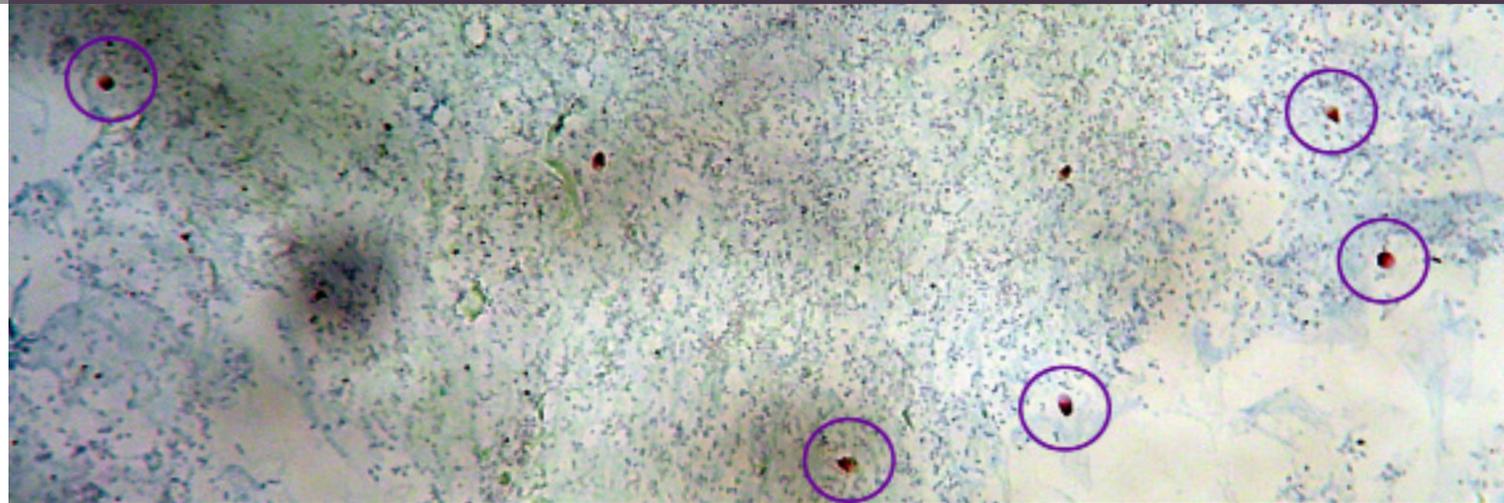
When the swabs from the case were sent to Cellmark they were re-extracted using Sperm Elution.



The re-extracted material was sent for routine (28 Cycle SGM+) DNA analysis. A mixed DNA profile was obtained indicating the presence of DNA from the complainant as well as an unknown male.

The male profile obtained was of sufficient quality for comparison to DNA profiles held on the National DNA Database (NDNAD) and for subsequent statistical comparison.

The force was very pleased to have progressed the case from the status of 'No male profile' to a 'Male profile suitable for speculatively searching against the NDNAD'.



Sperm Elution

Cleaner microscope slides and DNA extracts

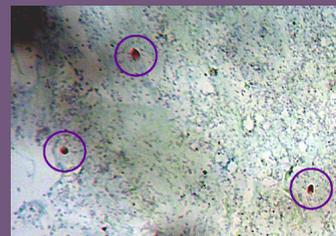
Better separation of spermatozoa from other cellular material

Faster identification of spermatozoa on microscope slides

Increased recovery of spermatozoa from swabs – approximately 80%

Increased recovery of spermatozoa from fabrics – approximately 40%

Quicker DNA processing and stronger male DNA profiles



Previous FSP extraction

More difficult to search microscope slides and expectation of uninterpretable DNA mixtures

Laborious microscope slide searching and lengthy DNA extraction

Inefficient cell separation of spermatozoa from other cellular material

Poor recovery of spermatozoa from sexual assault swabs (less than 30% identified by BFF study in 2008)

More likely to see weak/mixed DNA profiles



Case study 2

A young girl alleged that she had been sexually abused and raped by her foster father and that the incidents had occurred over a number of years, in her bedroom and in her foster father's car.

The foster father denied any sexual activity with her. Items were submitted to Cellmark, including a large number of items from the vehicle, carpet samples from her bedroom and a selection of condoms which had been recovered from the hedgerow of the layby, where sexual intercourse was alleged to have taken place.

The carpet samples were examined and DNA profiled following Sperm Elution. Semen was found on all of the carpet samples. A sample of one was tested which matched the profile of the complainant's foster father.

A condom, recovered over one month after the last alleged intercourse was examined and found to contain semen inside. Using Cellmark's Sperm Elution technique, the profile obtained was found to match the suspect.

Semen was also found to be present on the outside of the condom. After applying Cellmark's Sperm Elution technique a mixed DNA profile matching both the suspect and the complainant was produced. Sperm Elution gave a cleaner separation of semen from the other cells. Without it, the presence of large quantities of male DNA from the sperm may have swamped the female profile from the outside of the condom.

The combination of the suspect's semen detected on the carpet samples and DNA matching the suspect and complainant from the same condom, was considered to be very strong evidence.

Positive results for child abuse cases, particularly where allegations include historic events, are rare and so the force considered this to be a very good outcome.