



## SCIENTIFIC REVIEW

### Forensic DNA Analysis

### Forensic and Scientific Services

#### Overall Findings

In my opinion the protocols and methods used at Queensland Health for the examination of SAIKs and other items relating to alleged sexual assaults as detailed in the documents listed above are fit for purpose and in line with best practice for this type of examination.

The methods are clearly written, and would enable a worker to follow them accurately. Appropriate background information and reading sources are given. While some of the references are a little old (eg those given on p11 of *Examination for and of Spermatozoa*) this is inevitable with well-established techniques, and more recent references are generally included. It may be useful to do a literature search to ensure that the reference lists are up-to-date.

The information supplied on the *SAIK Medical Form* should allow correct examination and analysis decisions to be made.

I have made comments on specific aspects of the information and documents below. None of these comments should be taken as contradicting my general findings. In addition, when I state that information is missing, it may be in a document that I have not read.

I note that all the protocols supplied contain useful details on protocol amendments. I have been advised that the entry for July 2010 in *Examination for and of Spermatozoa QIS #17189v13* indicates a process improvement that took place at that time.

#### Introduction

I have been asked to carry out a review of the processing of sexual assault investigation kits (SAIKs) in the Forensic DNA Analysis laboratory of Queensland Health. I was originally provided with electronic copies of:

*AP paper – False Positive Investigation;*

*Procedure for Examination of Sexual Assault cases QIS #32106v4;*

*The Acid Phosphatase Screening Test for Seminal Stains QIS#17186v12;*

*Examination for and of Spermatozoa QIS #17189v13;*

and, *Detection of Azoospermic Semen in Casework Samples QIS17185v10.*

These documents provided me with an overview of the specific issue of negative controls in the acid phosphatase test and technical details of the basic examination of SAIKs and analysis protocols of items related to cases of alleged sexual assaults.

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I later asked for and received electronic copies of:

*Examination of items QIS #17142v13;*

*Microscopy of smears QIS #17037v17;*

*SAIK Medical Form QIS #31281v5;*

and, *SAIK Details Record QIS #23898v6.*

These documents provided me with additional information relating to the examination of items other than the SAIKs, and also proformas that allowed me to assess information collected during the examinations, and information given to the analysts that would inform their examination and analysis strategies.

I made limited comparison of these documents with the corresponding SOPs in use at ESR for medical examination kits (MEKs) and the location and identification of semen. Minor differences in approach and methodology have been essentially ignored.

#### **"AP paper – False Positive Investigation"**

This investigation was occasioned by the finding of a negative control used in the AP test giving a positive result. The investigation clearly established that the effect was repeatable and an appropriate outcome, that is the removal and replacement of the paper used as the negative control, determined.

#### **Procedure for Examination of Sexual Assault cases QIS #32106v4**

- *Section 3* Care should be taken over the use of phrases like "semen negative", as we are actually saying that none was detected. You do this in your AP screening information.
- *Section 4* is excellent, and very helpful to the analyst.
- Although the triaging process as laid out in 6.1 is quite restrictive, it is clear and assists the analyst in decision-making. Nothing is disposed of at this stage.
- *Section 6.2* I would recommend that you consider stopping scraping stains. You run the risk of damp or dry dust aerosols and this is an H&S issue and also a possible source of contamination.

#### **Examination for and of Spermatozoa QIS #17189v13**

- *Section 4* – The lack of biphasicity is a clear distinguishing characteristic between spermatozoa and yeasts.
- *Appendix 2* – although you give details of the various studies considering the persistence of motile and non-motile spermatozoa in the genital tract, there does not appear to be anything that says how an analyst uses this data. There are also no details regarding persistence in the anus or mouth.



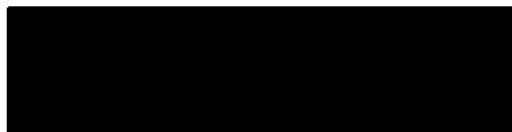
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**Detection of Azoospermic Semen in Casework Samples QIS17185v10**

- Section 6.2 – I don't know what "ambiguous" means.
- There does not appear to be detail on how to report positive or negative results
- There is quite a lot of work in the literature about p30 being found in breast milk, urine, tears and so on, which may be useful regarding interpretation and reporting.

**Examination of items QIS #17142v13**

- See above with respect to scraping stains.
- This is a complex document and very process-focussed. Without observing examinations and data entry, it is difficult to comment on it. However, as with the other documents reviewed, it appears fit for purpose.
- Section 9 – this would be very useful to an examiner.



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