

PF Ref:

FORENSIC SCIENCE LABORATORY

Joint Biology Report

Case against ***** (DOB)

We, **** and ****, Forensic Scientists, authorised by the Secretary of State for Scotland to make reports for the purposes of Section 280 (4) of the Criminal Procedure (Scotland) Act, 1995, hereby state that on the * 2010, items were received for examination.

HEALTH & SAFETY CONSIDERATIONS

Some items examined for this report are contaminated with biological material (e.g. blood, semen, urine, faeces, etc). The condition of these items represents a potential health risk. Consequently they have been sealed into polythene bags with hazard tape. Every effort has been made to display the areas of these items most relevant to this report, including areas from which samples have been removed for further testing.

There may have been items submitted to the laboratory that have not been examined. These items, although not in polythene bags or identified by hazard tape, should be treated in the same way as those, which are.

These bags should not be opened in a courtroom or other public place, and the contents examined or demonstrated, without adequate precautions being taken.

INFORMATION RECEIVED

We understand on the ****, it is alleged that the accused forced entry to the home address of the complainer and assaulted him by hitting him to the shins repeatedly with a hammer and by punching and kicking him to the face and body.

We understand that the complainer had bleeding injuries to his shins, an injured nose and that no weapon was recovered.

The examination of the items in this case, our interpretation of the findings and our conclusions are based on the above information. If any element of this information is inaccurate, or if further relevant information comes to light, then our interpretation of the findings must be re-evaluated. This may be more useful to the court if undertaken in advance of the trial.

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PURPOSE

The purpose of our examination was to determine if there was any scientific evidence to assist in addressing whether the accused assaulted the complainer, as alleged. We have sought to do this by:

- Examining the clothing taken from the accused for blood and blood patterns.
- Comparing any DNA profiles obtained from selected bloodstains to DNA profiles obtained from reference samples in order to determine from whom the blood may have originated.

TECHNICAL ISSUES

Blood Pattern Terminology

‘**Spots and splashes**’ are terms used to describe the types of bloodstains created when wet blood breaks up into droplets, travel through the air and are deposited on an item. The size, shape and distribution of the spots and splashes may give an indication of the force used to create the droplets of blood and the direction and distance travelled from their source. The types of action, which can cause wet blood to break up into droplets, include:

- Impact into wet blood
- Expiration of wet blood
- Blood being cast from a person / object wet with blood

Generally small and minute droplets of blood do not travel far through the air. Therefore, their presence on an item indicates that the item has been close to wet blood when the blood was caused to break up.

A **drip** of blood is a term used to describe blood that has fallen under the effect of gravity.

A **contact bloodstain** is created when a surface wet with blood comes into direct contact with another surface resulting in the transfer of blood.

If we cannot determine how a particular blood ‘mark’ has been deposited on an item, i.e. through direct contact or when blood has travelled through the air, it is described as a **bloodstain**.

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DNA PROFILING

DNA is found in most cells in the human body. It is a complex chemical that carries genetic information in a coded form, half of which is inherited from each parent.

A person's DNA is the same in all their body fluids, so the DNA in a person's blood will be the same as that in other cells such as semen, saliva, skin and hair roots. Each person's DNA is unique with the exception of identical twins.

The technique used analyses 10 different regions of human DNA. Analysis of these regions gives a high degree of discrimination. A full DNA profile consists of 20 DNA types. A test is also included to indicate the sex of the individual from whom the DNA originated.

The results are examined to determine if the DNA came from a single source or if DNA from more than one person is present. This is referred to as a mixed DNA profile. A mixed DNA profile can contain more DNA from one person than the other, and is then said to have a major and a minor DNA component.

It is not unusual for the DNA profile of an individual to be detected on clothing that they have been wearing.

Occasionally, the analysis may be unsuccessful at one or more regions resulting in a partial DNA profile or no profile at all.

If any of the DNA types of an individual are different from those of a case stain, that person can be excluded as a possible source. If, however, the same DNA profile is obtained from a crime sample and a reference sample, then the profiles are said to match. The significance of obtaining a match between a crime stain and an individual's DNA profile is statistically assessed. This is done by using an appropriate database to estimate the probability of obtaining this match by chance from an unrelated individual.

EXAMINATION AND RESULTS

REFERENCE SAMPLES

Evidential mouth swabs labelled 'complainer 3.3.09'.

Evidential mouth swabs labelled 'accused 3.3.09'.

DNA was extracted and profiled from the reference samples and DNA profiles that were different from each other were obtained.

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ITEM RELATING TO ACCUSED

1 x jacket worn by acc labelled 'worn by acc 3/3 09'.

The jacket was examined and found to be extensively bloodstained. Many small and minute spots and splashes of blood and contact bloodstains were found on the front and sleeves. Reactions indicating the presence of blood were obtained from the inside of the pockets, however, no blood was visible.

DNA was extracted and profiled from a minute spot of blood (1A) on the upper right front. The DNA profile obtained matched the DNA profile of the complainer.

We have estimated a probability of 1 in more than 1 billion for obtaining this matching DNA profile if the DNA from blood 1A originated from another male unrelated to the complainer.

INTERPRETATION

In our opinion the pattern of bloodstaining and the corresponding DNA results from 1A are consistent with the wearer of the jacket having been close to a source of the complainer's wet blood when it was forced to break up and travel through the air.

The types of action which can cause this type of pattern include:

- Impact into wet blood
- Expiration of wet blood
- Blood being cast from a person / object wet with blood

Generally small and minute droplets of blood do not travel far through the air. Therefore, their presence on an item indicates that the item has been close to wet blood when the blood was caused to break up.

CONCLUSION

In our opinion the scientific findings are consistent with the accused having assaulted the complainer.

ITEMS NOT EXAMINED

Several other items of clothing from the accused were also received in relation to this Joint Report, however they were not examined.

Signature
Name
Qualification
Date