5.3 Copycat

Briefing sheet

In this activity you will learn about plagiarism and why it is wrong.

1 What does plagiarism mean?

2 Do you think plagiarism is over emphasised? Give a reason for your answer.

3 These three extracts have been taken from the *New Scientist* article: 'Controversial forensic DNA test gets the green light'. Below each is a way of rephrasing the extract. Can you spot which one in each case has not been plagiarised?

Extract 1

> Although Caddy's report backs the science behind the analysis, it criticises the lack of uniformity in the way that police forensics teams collect and interpret DNA evidence, and the lack of awareness that contamination with DNA could falsify matches.

i Even though Caddy's report backs the science behind the analysis, it doesn't back the lack of uniformity in the way that forensics teams collect and translate DNA evidence, and the fact they are not aware that contamination with DNA can falsify matches.

ii Caddy has said that forensic teams do not all collect and interpret the evidence that they find. There is also the added problem of forensic teams not realising that contamination with other DNA can lead to the wrong conclusion.

iii Caddy's report might have supported the analysis' science, but it criticises the lack of uniformity in the forensics team's collection and interpretation of DNA evidence, and that contamination with DNA could falsify matches.

5.3 Copycat

Briefing sheet

Extract 2

> There are also technical problems with the process caused either by the unexpected appearance in DNA profiles of extra chunks of DNA, or the disappearance of chunks that should be there. The former is caused by contamination, the latter because working with such tiny quantities means sometimes the amplification enzymes miss bits of DNA.

i Sometimes through contamination we find that there are DNA sequences that are not supposed to be in the profile. Alternatively, the amplification enzymes miss sections of DNA and these sections will not appear in the profile.

ii There are technical difficulties with the process when there is either a sudden appearance of extra chunks of DNA, or the disappearance of bits that were meant to be there. The first appearance is because of contamination, the disappearance is because of working with small amounts so the amplification enzymes miss chunks of DNA.

iii The technical problems which occur are caused by contamination where there is the unexpected appearance of extra chunks of DNA, or the disappearance of chunks which should be there, which is caused by working with such tiny amounts of DNA, that the enzymes don't work properly.

Extract 3

> As to the technique itself, the panel said it was satisfied that the three organisations offering the service to the police in the UK had each taken the required steps to ensure reliability and repeatability, even though the validations hadn't been independently peer-reviewed and published.

i Regarding the technique itself, the panel were happy that the three organisations offering the service to the UK police force had made sure that they had ensured reliability and repeatability, even though this had not been independently published and peer-reviewed.

ii The panel says of the technique, that it was satisfied that those organisations offering the service to the police had each taken the required steps to ensure reliability and repeatability without independent peer review and publication.

iii All reliable techniques are usually written up, submitted for publication and undergo the peer-review process. However in this case the panel stated that the organisations offering the technique had done more than enough to make sure that results would be reproducible and accurate.

5.3 Copycat

Briefing sheet

4 Have a look at the abstract entitled 'Application of plant DNA markers in forensic botany' (http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6T6W-4JVTCDC-1&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=d5019bda6ff843f2b4603f109bf0f4aa). Read it, and ask your teacher or look up the terms you do not understand. Turn over the abstract so that you can no longer see it and then write down what you remember in your own words.

5 In your group, discuss how similar to the original your 'remembered' versions are. Then agree and write down three key points for avoiding plagiarism in your work. You should consider methods of taking notes and remembering which are less likely to result in exact repetition of sources.

5.3 Copycat

Resource

Controversial forensic DNA test gets the green light

April 2008

A super-sensitive method of DNA fingerprinting has been declared fit for purpose by a panel of UK experts.

"We are happy that the science is sound and secure, and that the systems have been properly validated and are fit for purpose," said Brian Caddy of the University of Strathclyde, UK, and head of the panel which published its report on 11 April.

The low-template DNA technique has seen increasing use because it works on picogram amounts of DNA – that's the amount found in as few as four or five human cells. Conventional DNA only works at nanogram levels, where there are about 160 cells or more, the number in a tiny speck of blood.

The UK government commissioned the study after severe criticism of the technique last year. A suspected terrorist, Sean Hoey, was acquitted of planting a bomb in Omagh, Northern Ireland, that killed 29 people in 1998.

The trial judge criticised the technique and Northern Ireland police suspended its use.

National standards

The technique is still used in mainland Britain, however, and has helped solve high-profile international cases, such as the murder in 2003 of Swedish MP, Anna Lindh, and the murder in 2001 of Briton Peter Falconio in the Australian outback.

Although Caddy's report backs the science behind the analysis, it criticises the lack of uniformity in the way that police forensics teams collect and interpret DNA evidence, and the lack of awareness that contamination with DNA could falsify matches.

It recommends introduction of national standards to correct this, and courses to train forensics teams how to collect and handle DNA for LTD analysis.

The default, according to co-author Adrian Linacre, also of the University of Strathclyde, should be that samples are collected on the assumption that they might at some point be subjected to LTD analysis.

Extreme caution

To avoid contamination of samples either at the crime scene or in the laboratory, collection kits should be standardised and guaranteed to be DNA-free, through treatment with chemicals such as ethylene oxide.

There are also technical problems with the process caused either by the unexpected appearance in DNA profiles of extra chunks of DNA, or the disappearance of chunks that should be there. The former is caused by contamination, the latter because, working with such tiny quantities means sometimes the amplification enzymes miss bits of DNA.

Another problem is that the enzymes can be inhibited by innocuous substances such as blue dyes in denim jeans.

The panel therefore warns that results from LTD analysis should be interpreted with extreme caution in court cases, and expert witnesses should go no further than simply saying that the profile matches that of a defendant.

5.3 Copycat Resource

The report says juries should always be told that "the nature of the original starting material is unknown, that the time when the DNA was transferred cannot be inferred, and that the opportunity for secondary transfer is increased in comparison to standard DNA profiling".

Validation needed

"It is inappropriate to comment upon the cellular material from which the DNA arose or the activity by which the DNA was transferred," it continues.

As to the technique itself, the panel said it was satisfied that the three organisations offering the service to the police in the UK had each taken the required steps to ensure reliability and repeatability, even though the validations hadn't been independently peer-reviewed and published.

However, the panel said that for the method to be accepted internationally, it needed to be validated by an international panel.

"The lack of clear, explicit consensus reflects the extremely challenging nature of the analysis," says the report. "At the same time, it is clear that the need to articulate such a consensus at national and, ideally, at international level is pressing."

Linacre said that use of the technique is definitely spreading – it is now used in the Netherlands, Germany, New Zealand and Australia, as well as in the UK and in parts of the US.

From: *New Scientist* magazine

http://www.newscientist.com