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## DNA under legal microscope

- Chris Merritt, Legal affairs editor
- From: The Australian
- March 30, 2010 12:00AM

### WHEN juries listen to scientific experts in court, they usually believe what they hear. But should they?

In the case of DNA evidence, the High Court of Australia is about to hear a case that will determine whether the nation's criminal justice system has been sold a pup.

If the justice system has indeed been placing too much faith in DNA evidence, this High Court decision could raise doubts about hundreds of criminal convictions.

Instead of convicting people based on hard scientific evidence, this case could indicate that courts have been sending people to prison based on nothing more compelling than statistical analysis.

Just over two weeks ago, the High Court agreed to hear an appeal by Benjamin James Forbes over his conviction in the Australian Capital Territory - based solely on DNA evidence - on a charge of unlawful sexual intercourse without consent.

This man's argument will come as a shock to those who might have thought the science of DNA analysis was clear-cut.

His silk, Peter Hastings QC, plans to argue that DNA evidence cannot, by itself, be used to convict people on criminal charges because it cannot show conclusively that two samples of genetic material are from the same person.

He will argue that DNA evidence can only show a degree of probability of a match. And because of that, the crucial DNA evidence against Forbes could never prove his guilt beyond reasonable doubt.

If Hastings succeeds, DNA evidence will carry far less weight in the criminal justice system. It will still be used, but people will no longer be convicted based solely on the strength of an expert's evidence about the outcome of DNA tests.

Criminologist Paul Wilson of Bond University believes the Forbes case is extremely significant. "It should lead to a complete overhaul across the nation of how DNA is not just being interpreted, but also collected and analysed," he says.

If that happens, the impact on criminal justice could be profound. A paper issued this month by the Australian Institute of Criminology found that DNA evidence has a powerful impact on jurors, even though they struggle to understand the

implications of the evidence.

The AIC paper cites a 2008 study in which jurors who served on six criminal trials in NSW revealed they had difficulty understanding the DNA evidence but nevertheless returned guilty verdicts.

Another study indicated that "juries were 23 times more likely to vote guilty in homicide cases and 33 times more likely to vote guilty in sexual assault cases when DNA evidence was admitted", the AIC paper says.

The weight given to DNA evidence has been hotly debated for some time.

For the past decade, the Innocence Project at Griffith University has been criticising the fact that federal and state prosecutors rely on assertions by scientists of "partial" DNA matches.

Criminal lawyer Chris Nyst, who co-founded the Innocence Project, says the Forbes appeal holds out the hope that the High Court could provide some national direction on the applicable standards for DNA evidence.

"What's going on is the accepted standards are not being reached and despite this, prosecutors are still using DNA evidence to say, 'It's not a match using acceptable standards but we say it's still a match; we call it a partial match,' " Nyst says.

There are other problems. Wilson says evidence based on very small samples of genetic material - sometimes just a few cells - is no longer used in Britain, but is still routinely used in Australia.

It is this type of DNA evidence, known as "low copy DNA", that helped convict Bradley John Murdoch of the 2001 murder of British tourist Peter Falconio in the Northern Territory.

Its use was suspended in Britain two years ago, but Wilson says it is still used in most Australian jurisdictions.

In January, the use of DNA evidence in Victoria was suspended for a month after prosecutors conceded there had been a substantial miscarriage of justice.

Victorian man Fara Jama, 22, had been wrongly convicted of rape based solely on the basis of a DNA sample that was later found to have been contaminated.

The Forbes prosecution also placed great weight on DNA. The victim could not identify her attacker but an expert witness said a semen stain on her clothing provided "extremely strong" evidence that Forbes was the source of this material.

In the book *Five Drops of Blood*, Wilson and co-author Dianne McInnes argue that Queensland spiritualist Andrew Fitzherbert should not have been convicted of the 1998 murder of veterinarian Kathleen Marshall based only on DNA evidence. Their book questioned the quality of the DNA evidence in that case. "Relying solely on DNA evidence for a conviction is very dangerous," Wilson tells *The Australian*.

Australian Council for Civil Liberties president Terry O'Gorman has long been concerned that juries were being blinded by science, when experience had shown serious problems had arisen when courts convicted people based only on DNA evidence.

He is also concerned that police in Australia had adopted a different approach to their international counterparts. Instead of giving forensic scientists a key role during investigations so they could eliminate potential suspects, Australian police were simply handing over evidence for analysis at the end of an investigation.

Even when genetic material is tested properly, Wilson says he is still troubled by the fact that DNA evidence has difficulty taking account of the genetic traits of particular ethnic groups, such as Aborigines.

DNA evidence merely states the statistical probability of a particular set of genetic markers from a given sample appearing in a sample from someone else within the community. It does not take account of the possibility that these markers might be more common in some ethnic groups than in the community at large, he says.

In the Forbes case, the DNA evidence that was presented to the jury did not state that there was an exact match between Forbes's DNA and the material found on the victim's clothing.

Because the human genome is so large, a complete analysis of the genome for a possible match was not possible. Evidence

presented in the Forbes case was based on a comparison of 10 genetic "markers" within each sample.

Wilson says in the past the number of markers examined has tended to vary from state to state and over time. In the Forbes case, expert testimony was given that the term "partial DNA profile" means that information is not present at all 10 locations.

The DNA evidence was that the markers found in the genetic material on the victim's clothing, when compared to the distribution of those markers throughout the general population, were from Forbes.

Wilson says that the probability of one sample of DNA being considered to be a good match depends on the number of samples of DNA from throughout the community that formed the database for the testing laboratory.

This meant that the reliability of DNA evidence - while better than most other forensic science evidence - was still limited.

In the Forbes case, the DNA tests were conducted by the biological criminalistics section within the Australian Federal Police, which holds 620 individual DNA samples that have been collected from throughout the ACT.

Simon Walsh, who was a scientific adviser within that division, gave evidence that it was important to recognise that DNA is no more than a statistical probability, not evidence of an exact match.

"We're able to use those probabilities . . . as a way of estimating, if you like, the commonality or in many cases, the rarity of a particular profile in a particular population," Walsh told the court.

"But they can't be used as an exact number. They are estimates. They are statistical estimates only. And they aren't real numbers, they aren't real observations.

"So it's important not to translate them, from the estimates that they are, to actual real expectations or real numbers."

While the issue is complicated, the essence of what the High Court is being asked to determine is: "If DNA is found, is it either a match pursuant to international standards or is it not a match?"

The Innocence Project's Nyst says the High Court appeal highlights the fact that the public had been under a misapprehension about the reliability of evidence based on DNA testing.

"The problem with this is that it introduces proof by probability, which is a very substantial encroachment on the time-honoured standard of proof that has been applied in this country," Nyst says.

"The man in the street believes that the crown has to prove someone is guilty beyond any reasonable doubt.

"What is happening now is DNA evidence is introducing the concept of proof by probability."

He says the debate over the use of DNA evidence was similar to the erosion taking place in the rigour that prosecutors once applied to the use of fingerprint evidence.

"The High Court's intervention in this issue has been a long time coming," Nyst says.

"We have raised this issue at a political level but no one thought it was important enough. Now that the High Court is seized of the issue, the Innocence Project and many defence lawyers around the country are hoping for some direction from the court."

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