

Letters to the Editor

Am. J. Hum. Genet. 51:1164–1165, 1992

The Forensic DNA Brouhaha: Science or Debate?

To the Editor:

Over the last several years, we have seen the criticisms of the use of forensic DNA typing change dramatically. Critics have argued for what they consider improvements in laboratory protocols, calling for such things as the performance of mixing experiments (Lander 1989), use of monomorphic markers to correct possible bandshifting, the elimination of ethidium bromide, and the use of narrower match criteria. Critics have also voiced concerns about the possibility of human error and, in connection with this, have decried the current level of proficiency testing undertaken by the forensic labs (Hagerman 1990). Another group of critics have focused only on population genetics issues, questioning the sufficiency of the methods by which the labs attach statistical significance to matching DNA profiles (Lewontin and Hartl 1991). These criticisms have appeared in scientific literature and, more important, in sworn testimony given by defense experts in murder and rape cases in which DNA testing has been performed.

While the criticisms may differ in substance, there is a common theme to the concerns: forensic DNA profiling is fine, so long as it is done correctly. In other words, there is no claim that there should be a wholesale rejection of the technique or that forensic DNA testing rests on unsound scientific theory. There is simply an abundance of suggestions on how to improve the process, coming primarily from those who them-

selves have never actually performed forensic analyses.

As lawyers, we do not feel qualified to address the scientific merit of specific concerns, such as the use of ethidium bromide. But as participants in a criminal justice system that is ultimately concerned with the question of guilt versus innocence, we are in a position to ask this question, If the scientist who is assisting the defense in a DNA case believes that DNA testing can be done, and done correctly, then why doesn't that scientist redo the test "correctly" in that case to see whether the result is consistent with the result from the prosecution's DNA testing lab? When everybody agrees that the test can and should be done and when the ultimate concern is whether the procedure has falsely implicated a particular suspect, why debate issues relating to the *possibility* of human error or *possible* laboratory artifacts without first checking to see whether there is some real problem in the case at hand? This question has been posed to some of the more frequent guest critics. The response routinely is that the defense has retained them only to critique the evidence offered by the prosecution. This response begs the question! Before these scientists became defense experts, they were scientists. It is their scientific expertise that qualifies them to testify, not their skills of rhetoric and debate. The clear implication of their testimony is that some aspect of the prosecution's evidence may be suspect. What better way to resolve any ambiguity than the scientific way—by retesting?

While the possibility of human and/or laboratory error certainly deserves the attention of scientists at

some place and time, why should the legal system be consumed by it as a hypothetical concern when, in a real case, the defense expert can simply retest the evidence, using a protocol satisfactory to that expert, and determine whether there truly was a human error or a laboratory artifact? Great care is taken to preserve evidence for defense reanalysis. Crime lab freezers are bulging at the seams with biological evidence for the defense to analyze, yet these analyses are rarely performed. At a time when public funds are scarce, it would cost substantially less to reanalyze the evidence than it would cost to fund a legal debate about the initial analysis. Defense experts routinely reanalyze or retest evidence in other forensic science areas such as ballistics, hair and fiber comparisons, and serology. Why shouldn't we expect the same in the case of DNA testing?

One thing is clear to anyone who has followed the courtroom debates over DNA testing: the number of cases in which the defense actually retested, or even attempted to retest, the crime scene evidence by using the RFLP technique pales in comparison with the number of cases in which crime scene evidence was available and only the hypothetical debate over possible problems was waged. Beyond the availability of crime scene evidence for retesting, it is important to remember that, in every case, there is an abundant and available supply of DNA from any living individuals believed to be involved in the case, such as the suspect or the victim. Thus, the defense can always retest a significant portion of the evidence and gain knowledge about whether the known samples were mistyped or mishandled. This can prove to be very significant in the context of a particular case. For example, in the *United States v. Yee* case, the defense claimed that the DNA test performed by the FBI truly excluded the suspect, because the defense claimed the suspect was mistyped by the FBI as being homozygous at a particular marker when, according to the defense, the suspect was truly heterozygous at that marker. The suspect's DNA was certainly available to the defense experts in *United States v. Yee*, yet no evidence of a retest of the suspect's DNA was presented by the defense. Instead, the debate about possible human and/or laboratory error was waged at the cost of well over \$200,000 in public funds.

In short, the critical issue in every DNA case is whether the procedure has falsely or correctly implicated a suspect in that case, not whether there is a possible problem with ethidium bromide or some

other minutiae. If scientists involved in testifying in DNA cases recognize this point and insist that a retest be performed before they commit to simply criticizing the work already done, we would see a refocusing of the courtroom debate to issues that more directly relate to the ultimate issue of guilt versus innocence. We would see defense experts performing more independent DNA tests and testifying less about possible problems. We submit that this would be in the best interest of nearly everyone involved in the criminal justice system, including suspects and victims alike.

JAMES WOOLEY* AND ROCKNE P. HARMON†
 *Assistant United States Attorney, Department of Justice Strike Force, Cleveland; and †Senior Deputy District Attorney, Alameda County, CA

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 0002-9297/92/5105-0027\$02.00

Am. J. Hum. Genet. 51:1165-1168, 1992

The Ceiling Principle Is Not Always Conservative in Assigning Genotype Frequencies for Forensic DNA Testing

To the Editor:

In forensic DNA typing for individual identification, when a suspect's DNA pattern matches that from a crime scene specimen, a crucial step is the assignment of a probability that the specimen genotype would match that of a person randomly selected from the population of potential perpetrators. On the presumption that a suspect is innocent until proved guilty, a method of assigning a probability to a suspect's genotype, given the same genotype from a crime specimen, should be conservative in the sense that the assigned probability should be greater than or equal to the true