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UNRAVELLING THE DNA CONTROVERSY: *PEOPLE v. WESLEY*,* A STEP IN THE RIGHT DIRECTION

Denise A. Filocomo**

INTRODUCTION

The time has come when scientific truth must cease to be the property of the few, when it must be woven into the common life of the world.¹

On March 29, 1994, the New York Court of Appeals ruled in *People v. Wesley*² that forensic deoxyribonucleic acid ("DNA")³ evidence was admissible in criminal trials.⁴ Although New York trial and intermediate appellate courts previously held DNA evidence admissible, the state's highest court never confronted the issue before *Wesley*.⁵ In finding that "DNA evidence was . . .

* 83 N.Y.2d 417, 633 N.E.2d 451, 611 N.Y.S.2d 97 (1994).

** Brooklyn Law School Class of 1996. The author expresses gratitude to Brooklyn Law School Professor Mary Falk.

¹ Jean Louis Rodolphe Agassiz, *Methods of Study in Natural History* (1863), reprinted in JOHN BARTLETT, *FAMILIAR QUOTATIONS* 509 (Emily Morison Beck ed., 15th ed. 1980).

² 83 N.Y.2d 417, 633 N.E.2d 451, 611 N.Y.S.2d 97 (1994).

³ Deoxyribonucleic acid ("DNA") is the active genetic material of organisms, usually double-stranded, which carries the coded messages of heredity in every living thing, including plants, animals, humans and microorganisms. The chemistry of DNA acts as a universal code, allowing DNA to transcribe the "coded" messages of heredity which genes carry. NATIONAL RESEARCH COUNCIL, *DNA TECHNOLOGY IN FORENSIC SCIENCE* 2, 6 (1992).

⁴ *Wesley*, 83 N.Y.2d at 425, 633 N.E.2d at 455, 611 N.Y.S.2d at 101.

⁵ *Id.* at 422, 633 N.E.2d at 453, 611 N.Y.S.2d at 99; see also *People v. Golub*, 196 A.D.2d 637, 601 N.Y.S.2d 502 (2d Dep't 1993); *People v. Huang*, 145 Misc. 2d 513, 546 N.Y.S.2d 920 (Crim. Ct. 1989).

generally accepted as reliable,"⁶ the New York court applied the test articulated in *Frye v. United States*,⁷ requiring that a scientific procedure or principle have acquired "general acceptance" by the relevant scientific community before it can be admitted into evidence.⁸ The result of the court's holding in *Wesley* was to abolish the pretrial DNA hearings in New York,⁹ at which courts decide, based on expert testimony, whether a particular scientific theory is reliable as intended for its purpose so that it may be

⁶ *Wesley*, 83 N.Y.2d at 425, 633 N.E.2d at 455, 611 N.Y.S.2d at 101; see also Richard H. Girgenti & M. Dawn Herkenham, *The Future for Admissibility of DNA Evidence in New York Court Proceedings*, 211 N.Y. L.J. 1 (1994).

⁷ 293 F. 1013 (D.C. Cir. 1923). In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786 (1993), the Supreme Court ruled that the Federal Rules of Evidence have superseded the *Frye* standard in federal courts; Rule 402 provides the baseline: "All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or by other rules prescribed by the Supreme Court pursuant to statutory authority. Evidence which is not relevant is not admissible." 113 S. Ct. at 2793-94 (quoting 28 U.S.C. § 402 (1975)).

⁸ 293 F. at 1014 ("[W]hile courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs."); see also George W. Clark, *Forensic DNA Typing* at 1 (1994) (unpublished outline, District Attorney's Office, San Diego County, Cal.) (on file with *Journal of Law and Policy*) ("The requirement of general acceptance exists due to judicial fear that 'lay jurors tend to give considerable weight to 'scientific' evidence when presented by 'experts' with impressive credentials.'" (citing *People v. Kelly*, 17 Cal. 3d 24, 31-32 (Cal. 1976))).

⁹ See *Wesley*, 83 N.Y.2d at 426, 633 N.E.2d at 456, 611 N.Y.S.2d at 102. The court of appeals noted that the standard set forth by the Supreme Court in *Daubert* was not controlling in *Wesley*, and that if pretrial hearings were held for novel scientific evidence, the standard to be applied in New York is the *Frye* test. *Id.* at 423 n.2, 633 N.E.2d at 454 n.2, 611 N.Y.S.2d at 100 n.2. The court of appeals also rejected the Supreme Court's contention that the *Frye* test was too "rigid" in its application, and that the Federal Rules "relax . . . traditional barriers." *Id.*

Since *Wesley*, nine other jurisdictions have similarly held that no pretrial *Frye* hearing is required before DNA evidence is admitted at trial: Arizona, Colorado, Iowa, Michigan, Missouri, Ohio, South Carolina, Texas and West Virginia. Amicus Curiae Brief for the Respondent at 14 n.10, *Wesley*, 83 N.Y.2d 417, 633 N.E.2d 451, 611 N.Y.S.2d 97 (1994) (No. 18).

accepted into evidence in a particular case.¹⁰ The court decided that because the Restriction Fragment Length Polymorphism ("RFLP")¹¹ method of DNA analysis is no longer considered "novel," and the *Frye* test only governs scientific evidence which is novel, there is no longer a need to conduct lengthy and costly reliability hearings.¹²

The *Wesley* decision may inevitably serve to clarify and facilitate the introduction of DNA evidence in jurisdictions across the nation, but only if significant changes take place. This Comment discusses the use of DNA in forensic science, including its importance and the controversy that currently exists surrounding its use in criminal trials. In addition, this Comment reviews the factual background and plurality opinion of *People v. Wesley* and analyzes this controversial New York Court of Appeals decision. Finally, this Comment proposes that Congress standardize and regulate laboratory testing techniques, making *Wesley* a stepping stone for other jurisdictions, focusing especially on statistics used to calculate the probabilities of a match between a suspect and the population at large.

¹⁰ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 21 ("[T]here are two main tests for admissibility of scientific information through experts.") (citing *Frye*, 293 F. 1013 and FED. R. EVID. 702).

¹¹ Restriction Fragment Length Polymorphisms ("RFLPs") are assemblies of DNA fragments which vary in length, and constitute vital instruments in analyzing and identifying DNA samples. NATIONAL RESEARCH COUNCIL, *supra* note 3, at 3. The more recent technique of analyzing DNA is the Polymerase Chain Reaction ("PCR") technique. The PCR amplification technique takes place on a desktop machine and can analyze smaller fragments of a specimen than the RFLP technique in a fraction of the time and yield similar results as the RFLP technique. Jim Schefter, *DNA Fingerprints on Trial*, POPULAR SCI., Nov. 1994, at 60, 62-64. PCR is still considered a novel technique, as improvements are needed in its automated sequencing technology; also, the technique has not yet operated on larger sequencing variability databases, which the RFLP method does. NATIONAL RESEARCH COUNCIL, *supra* note 3, at 43-44. Currently, PCR is relied on only to definitively exclude a suspect from investigation or to signal the need for the more accurate RFLP testing to be conducted on a specimen. Schefter, *supra*, at 90.

¹² See *Wesley*, 83 N.Y.2d at 424, 633 N.E.2d at 455, 611 N.Y.S.2d at 101. The court did not, however, discuss the reliability of the PCR technique.

I. DNA USE IN FORENSIC SCIENCE

DNA, the basic building block of life, houses the hereditary information in every human being and controls how the predetermined characteristics, unique to each individual, will manifest themselves.¹³ The DNA of every single human being is distinct, except in the case of identical twins, whose DNA is the same.¹⁴ Since the noted scientists James Watson and Francis Crick "unravelling" the structure of DNA in 1953, the world has witnessed one scientific triumph after another with the molecule,¹⁵ the most recent being the use of DNA to definitively link suspects to crimes. DNA testing has been heralded as the "breakthrough" that could transform and revolutionize the world of criminal law.¹⁶ The tests can determine with unprecedented accuracy whether a given suspect

¹³ Elizabeth M. Bezak, Note, *DNA Profiling Evidence: The Need for a Uniform and Workable Evidentiary Standard of Admissibility*, 26 VAL. U. L. REV. 595, 603 (1992); see also PAUL C. GIANNELLI & EDWARD J. IMWINKELRIED, SCIENTIFIC EVIDENCE 602 (1986). DNA is found in the nucleus of an individual's body cells (with the exception of red blood cells) and is made up of base pairs known as nucleotides. The base pairs are adenine, guanine, thymine and cytosine, and the vertical order in which the bases pair along the twisted DNA double spiral, or helix, determines a person's genetic code. Each person has a unique genetic pattern because the base pairs within an individual's body cells differ slightly from that of another individual at specific sites, called "variations" or "polymorphisms." The basis of DNA profiling is established when the variations are compared. Bezak, *supra*, at 603-04; see also GIANNELLI & IMWINKELRIED, *supra*, at 602-03.

¹⁴ Bezak, *supra* note 13, at 603. Because scientists have yet to discover a feasible and cost-efficient way to extract and analyze an individual's entire DNA structure without causing irreparable harm to that person, it is possible that another individual or individuals will have the same DNA pattern as the person studied at the random locations sampled. See Lee Thaggard, Note, *DNA Fingerprinting: Overview of the Impact of the Genetic Witness on the American System of Criminal Justice*, 61 MISS. L.J. 423, 427-28 (1991).

¹⁵ Schefter, *supra* note 11, at 62.

¹⁶ See William C. Thompson & Simon Ford, *DNA Typing: Acceptance and Weight of the New Genetic Identification Tests*, 75 VA. L. REV. 45, 75 (1989).

could have been the source of a blood or semen stain, a tiny piece of tissue, or even a single strand of hair.¹⁷

¹⁷ See *id.* at 74-75. DNA "typing" in criminal cases is an outgrowth of its use in medicine to diagnose and analyze disease-causing genes, where geneticists compare a patient's DNA with that of family members to study inheritance patterns. NATIONAL RESEARCH COUNCIL, *supra* note 3, at 6.

The technique referred to as "DNA fingerprinting" was developed by Professor Alec Jeffreys in the 1980s. DNA fingerprinting is another term for "DNA typing." It is referred to as "fingerprinting" because in Great Britain, where the term originated, "fingerprinting" connoted absolute accuracy, which is precisely what Dr. Jeffreys, a British scientist and professor at Leicester University, was hailing forensic DNA typing to be throughout England. NATIONAL RESEARCH COUNCIL, *supra* note 3, at 28; see also Thaggard, *supra* note 14, at 425. It is significant to note that DNA fingerprinting is even more accurate than the traditional dermatoglyphics fingerprinting, the process routinely employed by law enforcement and government agencies in society, because DNA fingerprinting relies upon one's immutable genetic make-up, whereas dermatoglyphic fingerprinting relies upon the number and structure of "ridges" on an individual's fingerpad. NATIONAL RESEARCH COUNCIL, *supra* note 3, at 29, 31. Since Dr. Jeffreys perfected DNA fingerprinting in 1985, various scientists have developed significantly different techniques. Thaggard, *supra* note 14, at 425.

The most common method of DNA profiling is the RFLP analysis. RFLP analysis can be broken down into seven sequential steps, any one of which could compromise the validity of the entire test if conducted improperly: (1) DNA is extracted from the sample by washing and treating it with enzymes and chemicals; (2) the DNA's long chains are cut into fragments by "restriction enzymes," which operate as biological scissors, producing a large number of DNA pieces called "restriction fragments," which vary in length; (3) the fragments are sorted using a method referred to as "electrophoresis," whereby the DNA is placed in gel, an electrical current is applied to the gel and the fragments are pulled in size length toward the positive electrode; (4) a "permanent copy" of the fragments is made by transferring DNA from the gel to a nylon membrane in a method called "Southern Blotting," at which point the strands unzip and separate into single strands; (5) the DNA membrane is bathed in probes (short pieces of DNA tagged with radioactive particles), each probe containing a genetic sequence that seeks out and binds to a complementary DNA sequence made from the DNA fragments of the victim or sample found at the crime scene; (6) the DNA membrane is placed against an X-ray film, and radiation from the DNA probes registers on the film as dark bands, the position of each print indicating the location of a variation unique to each individual; and (7) the DNA prints from the victim or crime scene are compared, visually and mechanically, to the suspect's sample in order to determine a "match," which may indicate an increased probability of the suspect's guilt. See Thompson & Ford, *supra* note

The first criminal conviction in the world based in part on forensic DNA evidence occurred in a rape case in Great Britain in 1985.¹⁸ In *Andrews v. State*, the Florida District Court of Appeal found DNA testing reliable, resulting in the first criminal conviction based on DNA evidence in the United States.¹⁹ Subsequently, DNA typing has been offered as evidence in criminal trials in the United States with increasing frequency, revolutionizing the manner in which criminal investigations are conducted.²⁰

Although lauded by forensic scientists as a tremendous improvement over other identification techniques employed by law enforcement officials,²¹ such as traditional fingerprinting,²² the application of DNA profiling has been hotly debated since its introduction into the courtroom.²³ Proponents argue that the power

16, at 64-76; see also NATIONAL RESEARCH COUNCIL, *supra* note 3, at 36-40.

¹⁸ See Thaggard, *supra* note 14, at 431. Britain's Scotland Yard successfully used DNA to secure a guilty plea by Robert Melias on November 13, 1985 after obtaining a DNA sample match. Law enforcement agents did this simply by explaining to Melias how accurate DNA testing is and how easily the results can identify an individual's genetic make-up once a sample is taken from a crime scene and tested in a laboratory. See Thaggard, *supra* note 14, at 431. In 1986, Colin Pitchfork became the first criminal to be convicted *primarily* on the basis of DNA evidence, after a mass-blood screening of all the males in a particular region of England was ordered by the police upon the suggestion of Dr. Jeffreys. Scheffer, *supra* note 11, at 62.

¹⁹ 533 So. 2d 841 (Fla. Dist. Ct. App. 1988) (affirming defendant's rape conviction and 78-year prison sentence, based on DNA fingerprinting test on semen obtained from vaginal swab of victim).

²⁰ See Sharon Begley et al., *Blood, Hair and Heredity*, NEWSWEEK, July 11, 1994, at 24, 25. For example, federal investigators were able to link one of the suspects in the World Trade Center bombing to the crime by analyzing his saliva from an envelope that he had sealed and sent to officials forewarning them of the disaster. See Scheffer, *supra* note 11, at 64.

In addition, DNA is now widely used by defense attorneys attempting to clear clients who, arguably, have been wrongfully convicted or accused of a crime. "The Innocence Project" at Cardozo Law School was created by Barry Scheck to assist other attorneys in this venture. Thus far, through the efforts of Professor Scheck and the project's efforts, eight prisoners have been freed after DNA tests proved that they were innocent. See Scheffer, *supra* note 11, at 64.

²¹ See Begley et al., *supra* note 20, at 25.

²² See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 29.

²³ See Begley et al., *supra* note 20, at 25.

of a DNA print to identify a suspect as the perpetrator, or to definitively exclude the suspect, comes from its precision, which is immensely greater than standard blood, semen, or hair analyses.²⁴ On the other hand, critics of DNA testing contest the accuracy of the statistical calculations derived and employed by the Federal Bureau of Investigation ("FBI"), which purportedly attempt to determine, with precision, the probability that a DNA sample from another individual in society will "match" the sample analyzed. These critics argue that not only are the FBI calculations inflated to downplay the chances of a mismatch, but there is a greater likelihood than is purported by the FBI that another individual could have committed a particular crime.²⁵ Detractors also charge that testing laboratories are not subject to mandatory quality controls, often leading to inadequate and inaccurate results.²⁶ Ultimately, however, DNA, "the master molecule of life,"²⁷ has become so inextricably entwined with criminal investigations that courts can no longer ignore evidence of genetic matches.

II. *PEOPLE V. WESLEY*²⁸

A. *Facts*

On September 15, 1987, the police found the raped and murdered body of seventy-nine-year-old Helen Kendrick in her apartment in Albany, New York.²⁹ On the afternoon of her murder, George Wesley, a fellow client at the Albany City Hostel,³⁰ visited Kendrick in her apartment.³¹ After caseworkers

²⁴ See Begley et al., *supra* note 20, at 24.

²⁵ See Shannon Brownlee, *Science Takes the Stand*, U.S. NEWS & WORLD REP., July 11, 1994, at 29, 29.

²⁶ *Id.* at 29-30.

²⁷ Schefter, *supra* note 11, at 60.

²⁸ 83 N.Y.2d 417, 633 N.E.2d 451, 611 N.Y.S.2d 97 (1994).

²⁹ *Id.* at 420, 633 N.E.2d at 453, 611 N.Y.S.2d at 99.

³⁰ See *id.* The Albany City Hostel is an organization devoted to servicing the needs of developmentally challenged adults in the greater Albany, New York area. *Id.*

³¹ *Wesley*, 83 N.Y.2d at 421, 633 N.E.2d at 453, 611 N.Y.S.2d at 99.

found a bloodied shirt with hair follicles on it, a bloodstained undergarment and bloodstained pants during a routine check of Wesley's apartment, police questioned Wesley.³² He gave an implausible account of how the deceased sustained her injuries and how his clothes became soiled.³³ DNA tests revealed that the blood on Wesley's shirt matched Kendrick's, and Wesley was indicted on charges of second degree murder, first degree rape, attempted sodomy in the first degree and second degree burglary.³⁴

During the pretrial hearing, the trial court found the DNA evidence admissible.³⁵ After Wesley was convicted,³⁶ he moved to vacate the judgment, arguing that "during the time that [had] passed since the defendant-appellant's trial the use of the DNA [f]ingerprinting process [had] been more closely scrutinized by . . . experts."³⁷ Wesley relied on the fact that the very same experts who testified at his trial as to the reliability of DNA evidence subsequently testified at other trials that the procedures employed by Lifecodes³⁸ were flawed.³⁹ The trial court denied Wesley's motion,⁴⁰ the appellate division affirmed the lower court's ruling, and the New York Court of Appeals allowed Wesley to appeal his conviction.⁴¹

³² *Id.* at 420, 633 N.E.2d at 453, 611 N.Y.S.2d at 99.

³³ *Id.* at 421, 633 N.E.2d at 453, 611 N.Y.S.2d at 99.

³⁴ *Id.* at 420, 633 N.E.2d at 453, 611 N.Y.S.2d at 99.

³⁵ *People v. Wesley*, 140 Misc. 2d 306, 308-09, 533 N.Y.S.2d 643, 644-45 (Sup. Ct. 1988).

³⁶ Record at 233-34. The jury found Wesley guilty on all counts and he was sentenced to a term of imprisonment having a minimum of 38 1/3 years and a maximum of life. *Id.* at 232.

³⁷ *Id.* at 233.

³⁸ Lifecodes, a private laboratory, is one of the three largest laboratories that conducts DNA fingerprinting. See Roger Parloff, *How Barry Scheck and Peter Neufeld Tripped Up the DNA Experts*, AM. LAWYER, Dec. 1989, at 50, 51. The other two laboratories which conduct the majority of DNA testing in the United States are Cellmark Diagnostics and the FBI in Quantico, Virginia. *Id.*

³⁹ Record at 233. At the time of Wesley's first trial, these experts had no knowledge of this information. *Id.*

⁴⁰ *People v. Wesley*, 140 Misc. 2d 306, 332, 533 N.Y.S.2d 643, 659 (Sup. Ct. 1988).

⁴¹ Record at 232-34.

B. The Majority Opinion

The court of appeals, faced with the issues of “whether DNA profiling evidence . . . is admissible in [New York] State and, if so, whether it should have been admitted against [the] defendant,”⁴² affirmed the appellate division’s ruling that DNA profiling evidence is admissible in New York State and was properly admitted in the case against George Wesley.⁴³ The majority reached this conclusion by determining that the RFLP method of analyzing DNA evidence had been generally accepted as reliable by the scientific community, and that the testing laboratory, Lifecodes, committed no error in this case.⁴⁴ The court reaffirmed the test articulated in *Frye v. United States*⁴⁵ as the appropriate standard for determining admissibility of novel scientific evidence in New York,⁴⁶ but also acknowledged, as can be construed through the powerful language of the plurality opinion, that pretrial *Frye* admissibility hearings on the RFLP method of DNA testing were no longer necessary.⁴⁷ As a consequence, the court of appeals effectively removed DNA from consideration as a “novel” scientific concept.

⁴² *People v. Wesley*, 83 N.Y.2d 417, 420, 633 N.E.2d 451, 452, 611 N.Y.S.2d 97, 98 (1994).

⁴³ *Id.* at 420, 633 N.E.2d at 452-53, 611 N.Y.S.2d at 98-99.

⁴⁴ *Id.* at 425, 633 N.E.2d at 455, 611 N.Y.S.2d at 101.

⁴⁵ 293 F. 1013, 1014 (D.C. Cir. 1923).

⁴⁶ *Wesley*, 83 N.Y.2d at 422, 633 N.E.2d at 454, 611 N.Y.S.2d at 100.

⁴⁷ *See id.* at 424, 633 N.E.2d at 455, 611 N.Y.S.2d at 101. The majority stated that “[t]here [is] sufficient evidence in the record to support the hearing court’s determination on general reliability as a matter of law and [this] determination comported with generally accepted scientific authority.” In a concurring opinion, Chief Judge Judith Kaye further solidified the majority’s conclusion, stating that “[o]nce a scientific procedure has been proved reliable, a *Frye* inquiry need not be conducted each time such evidence is offered.” *Id.* at 435, 633 N.E.2d at 462, 611 N.Y.S.2d at 108 (Kaye, C.J., concurring).

It is also relevant to note that the majority did *not* hold that it is the role of the court to determine whether the foundation of the DNA evidence offered is true; that decision is left to the finder of fact. *See Wesley*, 83 N.Y.2d at 425, 633 N.E.2d at 455, 611 N.Y.S.2d at 101.

In reaching its conclusion, the court gave tremendous deference to a 1989 article by William C. Thompson⁴⁸ and Simon Ford,⁴⁹ which concluded that "[t]he use of simple visual comparisons to determine whether two prints match is widespread in biology and appears to be well accepted."⁵⁰ The court was further persuaded by the fact that, at the time of the trial in 1988, the procedures administered by the Lifecodes laboratory had been accepted as precise and professional in twenty-two criminal trials.⁵¹ Furthermore, the court of appeals, affording great deference to expert testimony on the reliability of statistical population studies, found that the trial court correctly admitted the DNA evidence, primarily because no peer review articles discrediting the RFLP procedures used by Lifecodes existed at the time of the trial.⁵² The court refused to impose a "special test on scientific evidence,"⁵³ thus sounding the death-knell for *Frye* hearings on the admissibility of DNA evidence in New York.

C. The Concurrence

Wesley, however, was a hard-fought decision arrived at by a three-judge majority, a two-judge concurrence via separate opinion

⁴⁸ Assistant Professor, University of California, Irvine. A.B., University of Southern California, 1976; J.D., University of California, Berkeley, 1982; Ph.D., Stanford University, 1984.

⁴⁹ Research Scientist, University of California, Irvine. B.S., University of Leeds (U.K.), 1977; Ph.D., University of Bristol (U.K.), 1981.

⁵⁰ Thompson & Ford, *supra* note 16, at 45, 75.

⁵¹ *Wesley*, 83 N.Y.2d at 425-26, 633 N.E.2d at 456, 611 N.Y.S.2d at 102 (discussing Thompson & Ford, *supra* note 16, at 48).

⁵² *Id.* at 427, 633 N.E.2d at 457, 611 N.Y.S.2d at 103. Three expert witnesses for the prosecution, Dr. Richard J. Roberts, Dr. Kenneth K. Kidd and Dr. Sandra Nierzwicki-Bauer, reviewed Lifecodes' laboratory protocols and concluded that the procedures used by Lifecodes in its DNA fingerprinting were generally accepted as reliable and accurate by the relevant scientific community. To determine this, Dr. Kidd actually visited Lifecodes and observed how the laboratory conducted its testing. *Id.* at 426, 633 N.E.2d at 456, 611 N.Y.S.2d at 102.

⁵³ *Id.*

and a two-judge abstention.⁵⁴ Chief Judge Judith Kaye's concurrence lends powerful support to the decision and raises points on DNA reliability that cannot be ignored. Although Chief Judge Kaye agreed that Wesley's conviction should have been affirmed, she disagreed with the majority's finding that the DNA bloodstain analysis should have been admitted into evidence at trial.⁵⁵ The Chief Judge wrote a separate opinion "out of concern, for future cases, that the principles governing admission of novel scientific evidence be correctly articulated and applied."⁵⁶

Chief Judge Kaye parted company with the majority's application of the steps employed by laboratories to examine a DNA sample for criminal purposes.⁵⁷ She was not satisfied that, at the time of George Wesley's trial in 1988, the technique used in RFLP DNA analysis was widely accepted by the relevant scientific community, but did agree with the majority that the technique had gained sufficient acceptance by 1994 so as to render it reliable.⁵⁸ Chief Judge Kaye placed tremendous importance on the fact that in 1988, Lifecodes, along with Cetus and Cellmark, performed virtually all of the DNA testing for use in criminal investigations and at trials.⁵⁹ Therefore, she concluded that the trial court should have focused on the general reliability of the RFLP DNA process, and not, as it did, on the techniques employed by Lifecodes.⁶⁰

⁵⁴ Judges Joseph Bellacosa and Richard Simons concurred with Judge George Bundy Smith, author of the opinion. Chief Judge Judith Kaye concurred in a separate opinion, receiving support from Judge Carmen Beauchamp Ciparick. Judges Vito Titone and Howard Levine, for reasons unstated, took no part in the decision. *Id.* at 446, 633 N.E.2d at 468, 611 N.Y.S.2d at 114.

⁵⁵ *Id.* at 435, 633 N.E.2d at 461, 611 N.Y.S.2d at 107 (Kaye, C.J., concurring).

⁵⁶ *Id.* (Kaye, C.J., concurring).

⁵⁷ *Id.* at 436, 633 N.E.2d at 462, 611 N.Y.S.2d at 108 (Kaye, C.J., concurring).

⁵⁸ *Id.* at 436, 445, 633 N.E.2d at 462, 467, 611 N.Y.S.2d at 108, 113 (Kaye, C.J., concurring).

⁵⁹ At the time of *Wesley*, aside from the FBI's laboratory, the only testing laboratories in the country for forensic DNA samples were Cellmark, Lifecodes and Cetus. *Id.* at 438, 633 N.E.2d at 463, 611 N.Y.S.2d at 109 (Kaye, C.J., concurring).

⁶⁰ *See id.* at 440, 633 N.E.2d at 464, 611 N.Y.S.2d at 110 (Kaye, C.J., concurring).

Thus, in declaring the Lifecodes procedures acceptable, the trial court needed to do more than simply compare Lifecodes' procedures with those guidelines offered as reliable by leading scientists.⁶¹

Chief Judge Kaye feared that the trial court prematurely accepted as reliable revolutionary scientific techniques.⁶² Of particular concern to the chief judge was the possibility that DNA evidence, at the time of Wesley's trial in 1988, actually was unreliable.⁶³ Such premature acceptance, then, could have resulted in a multitude of defendants being wrongfully convicted between 1988 and the time of the court of appeals decision.⁶⁴ This concern is valid, especially when one considers that no laboratory was authorized by the commissioner of the New York City Department of Health to conduct DNA testing until 1992.⁶⁵

Furthermore, the FBI itself did not consider using the technique until 1989, one year after Wesley's trial, and very little, if any, peer review supporting or refuting general acceptance existed in the field.⁶⁶ Disagreeing with the majority, Chief Judge Kaye averred that the absence of such peer review does not automatically indicate general acceptance of a scientific principle, but instead may be evidence of insufficient information on the subject to evaluate it in any great depth.⁶⁷ She concluded, however, that "[b]ecause of the overwhelming evidence of [Wesley's] guilt,"⁶⁸ the use of DNA evidence against him was harmless.⁶⁹ At least in the case of Wesley, there had been no mistaken conviction.

⁶¹ *Id.* at 436-37, 633 N.E.2d at 462, 611 N.Y.S.2d at 108 (Kaye, C.J., concurring).

⁶² *See id.* at 440, 633 N.E.2d at 464, 611 N.Y.S.2d at 110 (Kaye, C.J., concurring).

⁶³ *Id.* (Kaye, C.J., concurring).

⁶⁴ *See id.* (Kaye, C.J., concurring).

⁶⁵ *Id.* (Kaye, C.J., concurring).

⁶⁶ *Id.* (Kaye, C.J., concurring).

⁶⁷ *See id.* at 439, 633 N.E.2d at 464, 611 N.Y.S.2d at 110 (Kaye, C.J., concurring).

⁶⁸ *Id.* at 444, 633 N.E.2d at 467, 611 N.Y.S.2d at 113 (Kaye, C.J., concurring).

⁶⁹ *Id.* (Kaye, C.J., concurring).

Interestingly, in 1988, Lifecodes was only licensed to "conduct genetic tests of amniotic fluid."⁷⁰ The chief judge noted that the DNA evidence admitted against Wesley in his murder trial would have been inadmissible in New York on a question of paternity because there was no general acceptance of DNA paternity testing in 1988, the time of the trial.⁷¹ Thus, Chief Judge Kaye argued that the same DNA test results used in a murder trial in 1988 could not be found to have gained scientific acceptance because no laboratory was commissioned *at that time* to conduct such forensic DNA analyses; testing laboratories at the time were only licensed to conduct paternity analyses on DNA, and not even that procedure was generally accepted as reliable by geneticists.⁷²

III. A STEP IN THE RIGHT DIRECTION

The *Wesley* decision recognizes the importance of DNA evidence and acknowledges the magnitude of its potential impact on the criminal justice system. In holding that RFLP identification evidence is reliable in both theory and practice, the court of appeals properly removed this form of DNA analysis from the "novel" scientific evidence category and consequently rendered *Frye* hearings for RFLP analysis unnecessary.⁷³ The majority articulated that New York courts should rely on more "traditional standards of relevancy and the need for expertise."⁷⁴ Although *Wesley's*

⁷⁰ *Id.* at 440-41, 633 N.E.2d at 465, 611 N.Y.S.2d at 111 (Kaye, C.J., concurring).

⁷¹ *Id.* at 441, 633 N.E.2d at 465, 611 N.Y.S.2d at 111 (Kaye, C.J., concurring).

⁷² *See id.* at 440-41, 633 N.E.2d at 464-65, 611 N.Y.S.2d at 110-11 (Kaye, C.J., concurring).

⁷³ *See id.* at 425-26, 633 N.E.2d at 456, 611 N.Y.S.2d at 102.

⁷⁴ *Id.* at 426, 633 N.E.2d at 456, 611 N.Y.S.2d at 102. The *Wesley* decision represents a major change from the previous standard governing DNA admissibility in New York, as established in *People v. Castro*, 144 Misc. 2d 956, 545 N.Y.S.2d 985 (Sup. Ct. 1989). In *Castro*, the court enunciated a three-pronged test for the admissibility of DNA identification evidence, which it hailed as an expansion of *Frye*, because the court was firmly convinced that "passing muster under *Frye* alone" was insufficient. *Id.* at 959-60, 545 N.Y.S.2d at 987. The test asked the following questions: (1) "Is there a theory, which is generally

determination of DNA reliability is not unique among state courts, the decision far exceeds the rulings of any other high state court in obviating pretrial DNA *Frye* hearings.⁷⁵

Chief Judge Kaye's powerful concurrence suggests that *Wesley* was the right decision in the wrong case. However, while the Chief Judge's reasoning is valid, it is motivated by concern for the precedential value of *Wesley*, in considering other novel scientific techniques as they arise. She is concerned that in another situation, the court may find an absence of controversy which it will perceive as an endorsement of general acceptance, when in fact it indicates the "prematurity of admitting this evidence" because "[i]nsufficient time had passed for competing points of view to emerge."⁷⁶ In such a situation, unlike with DNA testing, the process may not actually even be generally accepted at the present time, presenting an increased danger of wrongful conviction.⁷⁷ None of these

accepted in the scientific community, which supports the conclusion that DNA forensic testing can produce reliable results?"; (2) "Are there techniques or experiments that currently exist that are capable of producing reliable results in DNA identification and which are generally accepted in the scientific community?"; and (3) "Did the testing laboratory perform the accepted scientific techniques in analyzing the forensic samples in this particular case?" *Id.* at 958-59, 545 N.Y.S.2d at 987. In *Castro*, the court concluded that the general procedure of DNA forensic identification passed its expanded *Frye* test, but held that the procedures employed by the Lifecodes laboratory did not meet the generally accepted standards of reliability, and as a result, excluded from evidence Lifecodes' result of a "match." *Id.* at 979, 545 N.Y.S.2d at 999.

⁷⁵ See *Wesley*, 83 N.Y.2d at 436, 633 N.E.2d at 461-62, 611 N.Y.S.2d at 107-08. Courts in 23 jurisdictions, using the *Frye* standard, have declared DNA evidence admissible: Colorado, Florida, Georgia, Hawaii, Illinois, Iowa, Kansas, Maryland, Minnesota, Missouri, New Hampshire, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Texas, Virginia, Washington, West Virginia and Wyoming. Amicus Curiae Brief for Respondent, at 14 n.9, *Wesley* (No. 18). Although leaning toward unquestioned admissibility, California remains unsettled on the issue of DNA reliability. See *id.* at 14.

⁷⁶ *Wesley*, 83 N.Y.2d at 439, 633 N.E.2d at 464, 611 N.Y.S.2d at 110 (1994) (Kaye, C.J., concurring).

⁷⁷ Chief Judge Kaye is especially concerned in cases where evidence gleaned by the technique in question constitutes a significant part of the evidence, unlike in *Wesley*, where, even without the DNA evidence, there was compelling proof of the defendant's guilt (e.g., *Wesley*'s own contradictions upon police questioning and his familiarity with the victim and her apartment). See *id.* at

concerns has any impact on the determination of the majority in this case that RFLP DNA evidence is generally accepted as reliable by the relevant scientific community.

A. DNA Evidence Is Reliable

The court of appeals in *Wesley* accurately noted that “[t]he use of simple visual comparisons to determine whether two prints match is widespread in biology and appears to be well-accepted”⁷⁸ A 1992 National Research Council study supports this result in concluding that “[t]here is no scientific dispute about the validity of the general principles underlying DNA typing.”⁷⁹ The National Research Council Committee on DNA Technology in Forensic Science (the “Committee”), which published the study, was formed in 1989 and first met in January 1990 to attempt to answer questions concerning DNA profiling.⁸⁰ The Committee, which consisted of twelve members from the scientific and legal communities, addressed the general appropriateness of DNA technology in forensic science, its applicability to the courtroom, the need to develop data collection and analysis standards and ethical, legal and social issues surrounding DNA profiling.⁸¹ Specifically, the Committee stated that “[t]he reliability of DNA

420-421, 633 N.E.2d at 453, 611 N.Y.S.2d at 99.

⁷⁸ *Id.* at 425-26, 633 N.E.2d at 456, 611 N.Y.S.2d at 102 (quoting Thompson & Ford, *supra* note 16, at 75).

⁷⁹ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 51.

⁸⁰ *See* NATIONAL RESEARCH COUNCIL, *supra* note 3, at 1-2.

⁸¹ *See* NATIONAL RESEARCH COUNCIL, *supra* note 3, at 1-2. Members of the Committee included: Dr. Victor A. McKusick, The Johns Hopkins Hospital (chairman); Dr. Paul B. Ferrara, Virginia Division of Forensic Sciences, Department of General Services; Dr. Haigh H. Kazazian, The Johns Hopkins Hospital; Dr. Mary-Claire King, University of California, Berkeley; Dr. Eric S. Lander, Whitehead Institute for Biomedical Research; Dr. Henry C. Lee, Director, Forensic Science Laboratory, Connecticut State Police; Dr. Richard O. Lempert, University of Michigan Law School; Dr. Ruth Macklin, Albert Einstein College of Medicine; Dr. Thomas G. Marr, Cold Spring Harbor Laboratory; Dr. Philip R. Reilly, Shriver Center for Mental Retardation; Dr. George F. Sensabaugh, Jr., University of California, Berkeley; and U.S. District Judge Jack B. Weinstein, Eastern District of New York. *See* NATIONAL RESEARCH COUNCIL, *supra* note 3, at 173-76.

evidence will permit it to exonerate some people who would have been wrongfully accused or convicted without it,"⁸² as well as to secure convictions of other suspects.⁸³

As noted in *Wesley*, the general proposition that DNA profiling is a reliable scientific technique has not been rejected. Rather, courts have denied admission of DNA evidence in particular cases because: (1) the laboratory conducting the testing had failed to comply with accepted voluntary industry protocol; or (2) the court found the population statistics used in calculating probabilities of random matches to be inaccurate.⁸⁴ Thus, it is not the general reliability of DNA typing used in criminal cases that is often called into question, but the particular conduct of a testing laboratory in analyzing a sample.

⁸² NATIONAL RESEARCH COUNCIL, *supra* note 3, at 156.

⁸³ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 156.

⁸⁴ See *People v. Wesley*, 83 N.Y.2d 417, 430, 633 N.E.2d 451, 458, 611 N.Y.S.2d 97, 104 (1994); see also *People v. Watson*, 629 N.E.2d 630, 634, 644 (Ill. App. Ct. 1994) (accepting the reliability of DNA profiling, but stating that "the particular methodology used by the FBI to generate a probability of one in ninety million was not generally accepted by the relevant scientific community, namely population geneticists"), *overruled in part by* *People v. Heaton*, 640 N.E.2d 630, 636 (Ill. App. Ct. 1994) (The standard of review, held to be *de novo* in *Watson* was ruled to be abuse of discretion. As such, only the "record as it existed in the trial court at the time [it] made its determination" could be considered on review.) (citation omitted); *State v. Schwartz*, 447 N.W.2d 422, 428 (Minn. 1989) (accepting use of forensic DNA typing, but declaring that because the laboratory did not comport with appropriate standards and guidelines, "the test results lack foundational adequacy and . . . are thus inadmissible").

Prior to *Wesley*, New York courts that denied admission of DNA evidence found that the laboratory performing the testing failed to comply with generally accepted procedures. For example, in *People v. Keene*, 156 Misc. 2d 108, 591 N.Y.S.2d 733 (Sup. Ct. 1992), the court refused to admit DNA evidence at trial because the "practice of using monomorphic probes to correct for band shift [was not] a generally accepted test among molecular geneticists." *Id.* at 120, 591 N.Y.S.2d at 740. In *People v. Castro*, 144 Misc. 2d 956, 545 N.Y.S.2d 985 (Sup. Ct. 1989), the court refused, as a matter of law, to admit DNA evidence on the grounds that "[t]he testing laboratory failed in several major respects to use the generally accepted scientific techniques and experiments for obtaining reliable results, within a reasonable degree of scientific certainty." *Id.* at 980, 545 N.Y.S.2d at 999.

The one constant battleground over the reliability of DNA evidence involves statistical calculation, which generally take into account ethnicity and race in determining the probability of a match.⁸⁵ The statistical evaluations, for which there is no one formula, operate by determining the frequency, via empirical studies, at which a particular blood type and, consequently, DNA structures within those types, are distributed throughout a given ethnic population.⁸⁶ The system currently in use, belonging to the FBI, calls for scientists, when analyzing a sample for potential use at trial, to estimate the proportion of people in a given ethnic population who have the same combination of DNA patterns.⁸⁷

The major controversy surrounding the use of such statistics has focused on the FBI's failure, when deriving the statistics, to take into account various subpopulations which exist within a certain race or ethnicity (i.e., a Caucasian and a Korean may produce offspring, who are, in turn, neither wholly Caucasian nor Korean).⁸⁸ In other words, in most cases, scientists can only identify the suspect as belonging to a broad ethnic population.⁸⁹ While the National Research Council recognized the existence of

⁸⁵ Harlan Levy, *DNA: Race, Ethnicity and Statistical Evidence*, 206 N.Y. L.J. 1 (1991).

⁸⁶ GIANNELLI & IMWINKELRIED, *supra* note 13, at 605. For instance, it is estimated that 43% of the population has type O blood, 40% type A, 14% type B and 3% type AB. GIANNELLI & IMWINKELRIED, *supra* note 13, at 605.

⁸⁷ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 44.

⁸⁸ See Kenneth R. Kreiling, Review-Comment, *DNA Technology in Forensic Science*, 33 JURIMETRICS J. 449, 478 (1992). The Committee chose to give only cursory recognition to the issue of the lack of FBI statistics encompassing subpopulations, despite the recent flux of studies which indicate that the statistics formulated by the FBI are, in fact, too broad in scope. See *id.* at 477.

⁸⁹ *State v. Passino*, 640 A.2d 547 (Vt. 1994) illustrates the potential inherent weakness of the current method of statistical calculation. In *Passino*, the defendant was slightly less than one-half Abenaki and part French Canadian and Italian ancestry. The FBI had no database for Native Americans in North America, thus casting Passino into the Caucasian database, where inaccurate gene frequencies were calculated. The trial court refused to admit the DNA evidence, but the Vermont Supreme Court held that the defendant was "considerably prejudiced by the preclusion of the . . . DNA evidence," and ordered that he be given a new trial, despite the arguable inconsistencies in the FBI statistics used to convict Passino. *Id.* at 552; see Kreiling, *supra* note 88, at 478, n.128.

subpopulations, it determined that "[i]t is possible to provide conservative estimates of population frequency, without giving up the inherent power of DNA typing,"⁹⁰ thereby solidifying its acceptance of DNA as reliable.⁹¹

B. Pretrial Frye Hearings Are No Longer Necessary for DNA

After hailing DNA as reliable, the New York Court of Appeals determined that disputes involving the reliability of RFLP DNA testing have now been settled by experts, so that the *Frye* standard is no longer applicable to DNA.⁹² The court's holding was sound because the *Frye* standard only requires pretrial admissibility hearings on scientific evidence which is novel;⁹³ it is now widely accepted that DNA is *not* novel.⁹⁴

Amidst all of the confusion surrounding DNA admissibility, one must keep in mind that "a courtroom is not a research laboratory."⁹⁵ Although *Frye* hearings enable the law to "progress in cadence"⁹⁶ with the advances of science, they potentially have the effect of excluding evidence that is helpful.⁹⁷ The *Wesley* court wisely recognized this limitation when it concluded that once a procedure has been generally accepted as reliable by the relevant scientific community,⁹⁸ courts do not need to conduct a *Frye* hearing.⁹⁹ Specifically, the court heralded DNA as a device which

⁹⁰ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 80.

⁹¹ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 80.

⁹² See *People v. Wesley*, 83 N.Y.2d 417, 435-36, 633 N.E.2d 451, 461-62, 611 N.E.2d 97, 107-08 (1994) (Kaye, C.J., concurring).

⁹³ *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

⁹⁴ E.g., *State v. Davis*, 814 S.W.2d 593, 602-03 (Mo. 1991); *State v. Schwartz*, 447 N.W.2d 422, 424-25 (Minn. 1989); *Commonwealth v. Crews*, 640 A.2d 395, 400 (Pa. 1994).

⁹⁵ *United States v. Porter*, 618 A.2d 629, 634 (D.C. Cir. 1992) (quoting *United States v. Brown*, 557 F.2d 541, 556 (6th Cir. 1977)).

⁹⁶ *Davis*, 814 S.W.2d at 600.

⁹⁷ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 134.

⁹⁸ *People v. Wesley*, 83 N.Y.2d 417, 436, 633 N.E.2d 451, 462, 611 N.Y.S.2d 97, 108 (1994) (Kaye, C.J., concurring).

⁹⁹ *Id.*

can now be employed without a *Frye* hearing, with concurring support from Chief Judge Kaye, who stated that, "the general acceptability of [RFLP testing] . . . techniques is no longer an open question."¹⁰⁰

Constantly repeating *Frye* hearings on the same issue, when there clearly exists a general consensus on DNA testing's reliability, only wastes valuable "time, effort and money involved in litigating the admissibility of DNA evidence."¹⁰¹ Additionally, pretrial DNA hearings have resulted in a clash between scientists and attorneys.¹⁰² Scientists who enter the courtroom to fulfill a professional obligation exit finding their motives questioned and their integrity impugned.¹⁰³ Neither the laboratory nor the courtroom is well served by such pretrial brawls.

Furthermore, defense attorneys often hire scientists with questionable credentials, who earn substantial amounts of money by traveling from courtroom to courtroom "scour[ing] the data"¹⁰⁴ and testifying as to the unreliability of DNA technology.¹⁰⁵ Consequently, the focus at *Frye* hearings often is deflected from the scientific substance and placed instead on the self-interested players in the DNA game.

¹⁰⁰ *Id.* at 445, 633 N.E.2d at 467, 611 N.Y.S.2d at 113; *see also* Girgenti & Herkenham, *supra* note 6, at 1.

¹⁰¹ Rockne P. Harmon, *Legal Criticisms of DNA Typing: Where's the Beef?*, 84 J. CRIM. L. & CRIMINOLOGY 175, 175 (1993).

¹⁰² Leslie Roberts, *Science in Court: A Culture Clash*, 257 SCIENCE 732, 732 (1992).

¹⁰³ *Id.*

¹⁰⁴ Leslie Roberts, *Hired Guns or True Believers?*, 257 SCIENCE 735, 735 (1992).

¹⁰⁵ *Id.* One such example of a "hired gun" is Dr. Laurence Mueller, a population geneticist at the University of California, Irvine. Dr. Mueller has testified, on average, approximately once a month for the past few years, grossing over \$60,000 in 1991 alone from courtroom appearances. *Id.* Even other scientists are amazed to discover the amount of money that can be made from testifying for the defense at *Frye* hearings, despite the fact that it often means altering the truth about DNA reliability. *Id.* For instance, upon learning of how much a fellow colleague engaging in such courtroom antics was earning, Dr. Richard Lewontin of Harvard University commented, "I am having a hard time not dropping the phone. \$28,000? I thought these guys got \$1,000 or so." *Id.*

Nowhere is the courtroom DNA clash between attorneys and scientists better illustrated than in *United States v. Yee*,¹⁰⁶ a murder case in which Dr. Daniel Hartl,¹⁰⁷ a leading geneticist, testified for the defense.¹⁰⁸ Dr. Hartl took the stand and attempted to discredit the FBI's method of statistical calculations by calling the FBI results "misleading."¹⁰⁹ Specifically, Hartl suggested that the numbers resulting from the FBI's method of simply multiplying together the "frequencies with which each of several DNA markers occur in a given population" were far too high.¹¹⁰ Dr. Hartl supported his assertion with population data from a well-studied blood group marker,¹¹¹ only to discover that the prosecution had found information that rendered Hartl's data unreliable.¹¹²

Suddenly, Dr. Hartl felt that his reputation and entire career were on the line in this high-profile case, the cast of characters of which included some of the most prominent figures in the scientific and legal worlds.¹¹³ The federal prosecutor repeatedly asked Dr.

¹⁰⁶ 134 F.R.D. 161 (N.D. Ohio 1991). In *Yee*, three defendants were accused of murdering a record store clerk while the employee was making a night deposit at a bank. A DNA sample from Bonds' (one of the defendants) blood matched samples found in the victim's van and mixed with the victim's own blood at the murder site. The prosecution argued that Bonds did not murder the victim; rather, he injured himself during an assault incident with the victim and bled while driving the victim's van after the struggle. The defense, alternatively, argued that DNA testing was not reliable and should not be admitted as evidence. See Roberts, *supra* note 102, at 732.

¹⁰⁷ Dr. Hartl is the head of the genetics department at Washington University. He was extremely hesitant to testify at the trial and it took him four months to prepare for his appearance in court on July 31, 1991. See Roberts, *supra* note 102, at 733.

¹⁰⁸ Roberts, *supra* note 102, at 732.

¹⁰⁹ Roberts, *supra* note 102, at 733.

¹¹⁰ Roberts, *supra* note 102, at 733.

¹¹¹ Roberts, *supra* note 102, at 733.

¹¹² Roberts, *supra* note 102, at 732.

¹¹³ Some of the personalities included: Professors Peter Neufeld and Barry Scheck, Cardozo Law School; Professor David Hagerman, University of Colorado; Dr. Peter D'Eustachio, New York University Medical Center; Professor Conrad Gilliam, Columbia University; Professor Richard Lewontin, Harvard University; Doctor Kenneth Kidd, geneticist, Yale University; Dr. Thomas Caskey, Director of the Institute for Medical Genetics, Baylor College of Medicine; Professor Michael Conneally, Indiana University; and Professor

Hartl to admit that he had made a crucial error in relying upon the data, and Hartl eventually even went so far as to admit that the unreliability of his data was easily discernable to the eye of someone in his field of science.¹¹⁴ At the end of his testimony, Dr. Hartl told the judge presiding over the *Yee* case that he doubted if he would ever testify again.¹¹⁵

The *Wesley* solution to problems such as the *Yee* courtroom war works. Certainly, *Wesley* will not end the clashes between attorneys and scientists in other debated areas of science that are currently, or will in the future be considered novel.¹¹⁶ *Wesley* will, however, simmer the controversy as to whether DNA is reliable by automatically admitting crucial genetic evidence of a match before the jury enters the courtroom. Even as trial courts admit the RFLP method of DNA analysis into evidence without *Frye* hearings, judges will continue to review new scientific procedures and principles as they develop.¹¹⁷ Thus, there still remains a place in the New York judicial system for *Frye* hearings to determine the reliability of novel scientific concepts as they arise in the courtroom.

Stephen Daiger, University of Texas. Roberts, *supra* note 102, at 732-33.

¹¹⁴ Roberts, *supra* note 102, at 733.

¹¹⁵ Roberts, *supra* note 102, at 733.

¹¹⁶ Other areas of science which have been the subject of hot evidence debates in the courtroom include asbestos and toxic waste. What makes the DNA debate unique, however, is what is at stake: a defendant's freedom. See Roberts, *supra* note 102, at 732.

¹¹⁷ *People v. Wesley*, 83 N.Y.2d 417, 445, 633 N.E.2d 451, 467, 611 N.Y.S.2d 97, 113 (1994) (Kaye, C.J., concurring). One major problem with novel scientific evidence, however, is that courts often cannot determine, even with a pretrial *Frye* hearing, whether the evidence is reliable. Admissibility standards thus become fuzzy as courts cannot clearly draw the distinction between good science and "junk science." Scientific evidence is admitted in some cases, but not others, with variations occurring even within the same jurisdiction. See Hao-Nhien Q. Vu & Richard A. Tamor, *Of Daubert, Elvis, and Precedential Relevance: Live Sightings of a Dead Legal Doctrine*, 41 UCLA L. REV. 487, 487-88 (1993).

IV. BEYOND *WESLEY*: A PROPOSED SOLUTION

Notwithstanding the significance of *Wesley*, DNA is as controversial today as it was nearly a decade ago when it was first introduced into the courtroom.¹¹⁸ However, the New York case has the potential to enhance the status of DNA evidence in every jurisdiction, provided certain necessary measures are taken. First, laboratories conducting DNA testing need to be regulated by Congress. Second, and of equal importance, accredited laboratories, and, eventually, courts need to agree upon a method of statistical calculation for determining the probability of a DNA sample match. This method must take into account ethnic and racial subpopulations that exist within the larger population.

A. Regulation of Testing Laboratories

Laboratories that conduct DNA testing are not currently required to adhere to any standardized protocol.¹¹⁹ Given the complexity of the science involved, botches in testing are not uncommon and often go unrecognized in the absence of regulation.¹²⁰ In some instances, this allows geneticists who conducted a DNA analysis to confidently testify that a match has been found, while, unbeknownst to that tester, the determination was the result

¹¹⁸ See Brownlee, *supra* note 25, at 29.

¹¹⁹ Begley et al., *supra* note 20, at 25.

¹²⁰ Begley et al., *supra* note 20, at 25. Proponents of DNA testing do not dispute that the RFLP technique has flaws; rather, scientists admit that errors can arise with genetic testing. For example, if the sample is not adequately preserved from the crime scene, and instead is contaminated or partially destroyed, it becomes impossible to obtain a DNA fingerprint. See Thaggard, *supra* note 14, at 442. Other "[p]ossible sources of error include sloppy laboratory procedures, the materials used [by the laboratory], the quality of the DNA evidence, and the protocols used for calling a match." Richard Lempert, *Some Caveats Concerning DNA as Criminal Identification Evidence: With Thanks to the Reverend Bays*, 13 CARDOZO L. REV. 303, 323 (1991). In one study, the same DNA sample from a known source was sent to various testing laboratories, and the error rate of participating laboratories was 70%. *Id.* at 324.

of human or technical error.¹²¹ The impact upon the jury's deliberations can be devastating; a defendant could be imprisoned for life or receive the death penalty on the basis of faulty testing.

Courts should require standardization and regulation of laboratory procedures so that the forensic use of DNA can maintain and increase its credibility in the courtroom.¹²² Successful implementation of regulations by a controlling government agency, as well as strict court enforcement of the mandatory quality control standards, are essential to ensure that the criminal justice system will reap the powerful benefits of DNA.¹²³ The Minnesota Supreme Court supports this contention, determining in *State v. Schwartz*¹²⁴ that "appropriate [laboratory] standards and controls are essential in order to ensure reliable results."¹²⁵ All of the virtues for which DNA is praised in forensic science dissipate if laboratories upon whom both prosecutors and defense attorneys rely are allowed to operate free from scrutiny and, as a result, make crucial mistakes.

A mandatory quality assurance program¹²⁶ should be adopted by the federal government and could viably be modeled after the program recommended by the National Research Council

¹²¹ Lempert, *supra* note 120, at 325.

¹²² Courts commonly investigate procedures used by laboratories precisely because of the lack of standardization. In *United States v. Two Bulls*, 918 F.2d 56 (8th Cir. 1990), for example, the Eighth Circuit held that the trial court must determine whether testing procedures employed by a particular laboratory were conducted properly before that DNA sample was admitted into evidence. *Id.* at 62.

¹²³ See Thaggard, *supra* note 14, at 444.

¹²⁴ 447 N.W.2d 422 (Minn. 1989).

¹²⁵ *Id.* at 426. "[S]pecific DNA test results are only as reliable and accurate as the testing procedures used by the particular laboratory." *Id.* In *Schwartz*, the court found that several deficiencies existed in Cellmark's testing procedures and advocated standardization of protocol, using the guidelines that the FBI has established for itself as a measuring device. *Id.* at 426-27.

¹²⁶ "Quality assurance" is described by the National Research Council as "a documented system of activities or processes for the effective monitoring and verification of the quality of a work product." NATIONAL RESEARCH COUNCIL, *supra* note 3, at 98.

in 1992.¹²⁷ Through legislation, Congress should: (1) establish uniform accreditation procedures to govern practitioners and laboratories, with federal funds being allocated to assist in education, training and research;¹²⁸ (2) require all testing laboratories to document, in a standard written form, every procedural step taken during the analysis of a particular DNA sample;¹²⁹ (3) create a neutral federal agency to certify, license, govern and oversee laboratory compliance with the uniform procedures and administer sanctions to those laboratories that fail to meet the uniform standards;¹³⁰ and (4) require parties to submit to the court any test results, along with the written approval of the governing agency of the procedures and accuracy employed in a specific instance by the participating laboratory.¹³¹

¹²⁷ The Committee reviewed existing efforts of testing laboratories to standardize DNA testing through voluntary guidelines and found these efforts to be inadequate and insufficiently comprehensive because of their voluntary nature. See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 97-110.

In particular, the National Research Council proposed that some degree of standardization is essential to guarantee high standards in the forensic practice. The Committee further recommended that each laboratory write formal and detailed reports discussing the results of its testing procedure, and have external mechanisms, such as individual certification, laboratory accreditation and state and federal regulations, govern the industry. Finally, the Committee believed that in light of a "compelling public interest," the federal government should enact quality assurance regulation and create or delegate to an existing bipartisan government agency the responsibility of overseeing and monitoring testing laboratories which could allocate funds to support education, research and training. See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 108-09.

¹²⁸ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 99. The Committee advocates the implementation of an educational program that mirrors the Technical Working Group of DNA Analysis Methods ("TWGDAM"), a practitioners' group that comprises over 30 scientists from across the United States who work in DNA testing laboratories. The purpose of TWGDAM is to discuss the methods currently being used in the industry, any changes or new advances which may have recently developed, compare work products and share ideas on protocols. The FBI plays a key role in the operation of TWGDAM, funding, hosting and sharing in its frequent assemblies. NATIONAL RESEARCH COUNCIL, *supra* note 3, at 98.

¹²⁹ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 105.

¹³⁰ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 105-08.

¹³¹ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 105, 109.

The governing body should be neutral for two reasons: (1) a law enforcement agency lacks the appropriate experience in dealing with quality assurance in molecular genetics; and (2) a law enforcement agency can easily be perceived as an advocate for the use of DNA technology in criminal cases and oversight, thus, creating a possible bias in favor of prosecution.¹³² The National Research Council suggests that the Department of Health and Human Services ("DHHS"), with the assistance of the Department of Justice ("DOJ"), should be responsible for the oversight of national regulations. The National Research Council believes that DHHS is the appropriate agency because "it has experience in the regulation of clinical laboratories . . . and has extensive expertise in molecular genetics."¹³³ The DOJ needs to be involved, the National Research Council believes, because the ultimate issue with the forensic use of DNA is law enforcement.¹³⁴

Failure of the laboratory to receive approval from the governing agency should be viewed by the court as a *prima facie* showing that the laboratory did not comply with the nationally approved standards, and should preclude the court from admitting the DNA results into evidence in that case.¹³⁵ The governing agency could thus take the place of a *Frye* hearing so that judges would only need to look to the findings of the agency in reviewing whether DNA results are admissible.

At this time, however, the FBI is a "roadblock" to the implementation of standardization and regulation schemes.¹³⁶ First, the FBI is far from "neutral." As the largest and foremost crime-fighting organization in the United States, the FBI has an obvious interest in seeing defendants convicted. Second, although it does believe that standardization of laboratory techniques is necessary, the FBI has yet to agree with private testing laboratories as to what those standards should be.¹³⁷ Finally, although the FBI has pronounced itself the only body with sufficient expertise in the area

¹³² See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 107.

¹³³ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 107.

¹³⁴ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 107.

¹³⁵ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 109.

¹³⁶ Schefter, *supra* note 11, at 90.

¹³⁷ Schefter, *supra* note 11, at 90.

of DNA analysis to regulate the entire industry, the FBI is unwilling to assume such responsibility.¹³⁸ These reasons make the task of appointing a regulatory agency on DNA significantly more difficult, because the FBI simultaneously refuses to acknowledge the qualifications of any other outside agency.¹³⁹

B. *The Numbers Game*

In the current method of calculating the probability of a random match, the conclusions are based on the probability that particular genetic segments occur more frequently and randomly across certain ethnic and racial populations, rendering unlikely the probability of a match between a suspect's sample and a segment from another member of the suspect's population.¹⁴⁰ This method also needs revision,¹⁴¹ it ignores a "considerable body of evidence" which indicates that each ethnic group is comprised of subpopulations, with one subpopulation genetically distinct from another and from larger populations.¹⁴²

Over the next few years, the FBI and leading population geneticists must make a more discriminating effort to ascertain data that will make probability statements more accurate,¹⁴³ so that an innocent suspect who is racially or ethnically similar to that of a criminal is less likely to be wrongly convicted of a crime.¹⁴⁴ As

¹³⁸ Schefter, *supra* note 11, at 90.

¹³⁹ See Schefter, *supra* note 11, at 90.

¹⁴⁰ Schefter, *supra* note 11, at 90.

¹⁴¹ The courts have spoken out against the reliance by laboratories upon the current FBI statistical calculations. See, e.g., *State v. Clark*, 887 P.2d 572 (Ariz. Ct. App. 1994) ("Admitting evidence of DNA probability calculations . . . result[s] in a high potential for unfair prejudice."); *State v. Bloom*, 516 N.W.2d 159, 162 (Minn. 1994) (expressing concern that admission of population frequency statistics currently used will confuse jurors, as jurors will "hear impressive numbers that appear to quantify with precision the frequency of the DNA profile," followed by a "vague, non-quantitative discussion" on how the figures were arrived at).

¹⁴² Leslie Roberts, *Fight Erupts Over DNA Fingerprinting*, 254 SCIENCE 1721, 1722 (1991).

¹⁴³ *Id.* at 1723.

¹⁴⁴ William Tucker, *O.J.'s DNA in Court*, AM. SPECTATOR, Nov. 1994, at

the National Research Council stated, "[I]t is possible to provide conservative estimates of population frequency, without giving up the inherent power of DNA typing."¹⁴⁵

The National Research Council has also made sound proposals in this area which, if implemented, will help to dissolve the current controversy surrounding the use of statistics in DNA technology:¹⁴⁶ (1) direct sampling of ethnic and racial groups through a mixed population study, the resulting statistics being used to detect the presence of subpopulations within populations;¹⁴⁷ (2) use of the statistics to derive a set number of subpopulations which exist within each ethnic and racial population;¹⁴⁸ (3) discovery of repeating genetic patterns within each subpopulation which are distinct to that group;¹⁴⁹ and (4) calculation of separate statistics for each subpopulation to determine the probability of a match.¹⁵⁰ These recommendations are appropriately conservative so that they can be easily implemented once all the formalities are worked

24, 28.

¹⁴⁵ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 80.

¹⁴⁶ Currently, the National Research Council's findings are under attack by various geneticists who contend that the Committee "lacked expertise," primarily because there were no geneticists on the Committee. See Peter Aldhous, *Geneticists Attack NRC Report as Scientifically Flawed*, 259 SCIENCE 755, 755 (1993).

¹⁴⁷ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 80-81. The Committee does acknowledge, however, that "it is not feasible or reasonable to sample every subpopulation conceivable in the world." NATIONAL RESEARCH COUNCIL, *supra* note 3, at 83.

¹⁴⁸ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 81.

¹⁴⁹ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 81.

¹⁵⁰ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 82-85. This statistical calculation proposed by the National Research Council is the "ceiling principle." Specifically, it involves calculating the largest frequency for an allele (a particular gene found in individuals of a certain ethnic or racial population) in each population and subpopulation and using that frequency or five percent, whichever is larger, as the set number for that group to calculate the probability of a match. The same calculation is then performed on an individual and compared to the relevant population or subpopulation to determine the likelihood that another member of the group to which the individual belongs has the identical DNA pattern. See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 82-86.

through. Additionally, these recommendations are sufficiently robust so as to take advantage of the extraordinary power of individual identification provided by DNA typing.

The FBI must acknowledge that its present statistical system needs to be substantially reworked; specifically, the FBI needs to recognize and define the subpopulations which exist within larger populations, and adjust its figures accordingly to reflect those numbers. Recalculation of the numbers will better ensure society that another member of a defendant's racial or ethnic group, or a relative of the defendant, residing in the same area as the defendant, will also be considered as a possible source of the DNA found at a crime scene.¹⁵¹ It is crucial, however, that the jury understand and properly weigh the evidence; thus, it must be interpreted and presented accurately—first by scientists, second by attorneys.¹⁵²

C. Implementation: How Much and Who Bears the Burden?

The National Research Council's proposals, offered to improve the use of DNA in forensic science, are likely to raise concerns throughout society. A host of economic questions will attach themselves to the plan. For instance, who will bear the burden of absorbing costs of implementation and maintenance? What will be the role of private laboratories in meeting the costs of the new proposals? These concerns must be addressed before the changes can take place.

Admittedly, the "cost of the equipment, training and proficiency programs, supplies, and personnel [to implement the proposed changes] will be very large."¹⁵³ Initially, scientists will have to be

¹⁵¹ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 86-87; see also Lempert, *supra* note 120, at 308-09. It is well established that relatives, especially siblings, have very similar DNA patterns and can have identical patterns at various specific sites. Thus, if a defendant has 10 brothers, there is an increased likelihood that more than one brother would match the DNA evidence sample exactly. See Lempert, *supra* note 120, at 308-09.

¹⁵² Lempert, *supra* note 120, at 307.

¹⁵³ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153 (finding that the state of Virginia alone spent several million dollars between 1989 and 1990 to

trained so that they can certify colleagues, and this will cost a considerable amount of money.¹⁵⁴ An adequate quality assurance program will undoubtedly incur high costs in organization, implementation and operation.¹⁵⁵ Unfortunately, if DNA is to survive at criminal trials in the future, these costs are unavoidable.¹⁵⁶

The key to successful implementation of the proposals is effective allocation of funds. While thrusting the entire burden upon the federal government is far too overwhelming, private laboratories may be hesitant to spend millions of dollars to adhere to national standardization and regulation.¹⁵⁷ Therefore, shifting some of the costs, such as those for licensing, certification and accreditation procedures, onto the government, while encouraging private laboratories to continue to finance and conduct research and testing, is a viable solution. Laboratories will have some freedom from government scrutiny to innovate and capitalize on innovation, which are incentives to continue to participate in the DNA game.

To further cut costs to the private sector, laboratories could "set up regional and cooperative services"¹⁵⁸ and share information.¹⁵⁹ Realistically, it would be economically impossible for smaller private laboratories that want to perform DNA testing to set up their own facilities and properly train their employees.¹⁶⁰ Thus, a pooling of resources would not only reduce costs to both the interested smaller laboratories and the major ones,¹⁶¹ but would also increase the size and competitiveness of the DNA market.

A greater number of testing laboratories would facilitate the introduction of DNA evidence into trials. Courts would be able to turn to smaller accredited laboratories to test DNA evidence instead

implement changes in its forensic DNA program).

¹⁵⁴ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁵⁵ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁵⁶ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁵⁷ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁵⁸ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁵⁹ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁶⁰ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁶¹ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

of waiting for larger laboratories to emerge from a sea of backlogged samples. The FBI could maintain "a major DNA testing center,"¹⁶² where the agency would run its own analyses, while providing aid to other private laboratories that desire and have the capability to conduct testing and store samples and results. This partnership would further reduce the costs to private facilities,¹⁶³ but might raise privacy issues with regard to a powerful government body controlling the DNA process.¹⁶⁴

Although the National Research Council proposals appear costly, they will be no more expensive than the cost of present *Frye* hearings. In the long run, taxpayers will be spared the court costs of pretrial hearings, and clients and the public will be spared the expense for expert witnesses to testify about DNA reliability. Furthermore, early exclusion or identification of suspects through the use of DNA will ultimately reduce court costs and obviate trials in some criminal cases.¹⁶⁵

CONCLUSION

A DNA sample match has the power to erase any reasonable element of doubt that may exist in jurors' minds.¹⁶⁶ No other single piece of evidence is more persuasive than a trail of blood leading away from the crime scene that can be scientifically identified as belonging to the murderer.¹⁶⁷ Forensic scientists have recognized the value of DNA left at a crime scene and, as a result, DNA is currently used both as a powerful investigative tool and in courtrooms with increasing frequency.¹⁶⁸

*People v. Wesley*¹⁶⁹ demonstrates an appreciation by a court of the magnitude of importance of DNA in the criminal context.

¹⁶² NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁶³ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁶⁴ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 153.

¹⁶⁵ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 149.

¹⁶⁶ See Tucker, *supra* note 144, at 24.

¹⁶⁷ See Tucker, *supra* note 144, at 24.

¹⁶⁸ See Ranajit Chakraborty & Kenneth K. Kidd, *The Utility of DNA Typing in Forensic Work*, 254 SCIENCE 1735, 1735 (1991).

¹⁶⁹ 83 N.Y.2d 417, 633 N.E.2d 451, 611 N.Y.S.2d 97 (1994).

The New York Court of Appeals, in ruling that DNA evidence is reliable enough to eliminate pretrial admissibility hearings, has advanced DNA typing and secured its future use at trials.¹⁷⁰ This decision will ultimately facilitate the use of DNA evidence and may lead to other jurisdictions rendering similar decisions, as pretrial DNA hearings are lengthy, time-consuming, costly and serve only to repeatedly litigate the settled issue of reliability.

Despite the acceptance of DNA evidence in court cases such as *Wesley*, two major aspects of the forensic DNA procedure need alteration. First, a federal agency must regulate and standardize the licensing and certification of laboratory results,¹⁷¹ and implement a national quality assurance program.¹⁷² Second, it is essential that the current statistical method of determining the probability of a random match be updated to include ethnic and racial subpopulations that exist inside a larger population.¹⁷³ These measures, if implemented, could ultimately abolish pretrial DNA admissibility hearings across the United States.

Notwithstanding the importance of DNA technology in society, scientists should not be complacent with the current state of knowledge on DNA. Genetics is an exploding field and whatever objections can be raised today will probably be overcome tomorrow. As research by geneticists continues and expands in this field, the likelihood is great that someday DNA profiling will be admitted into evidence without any objections. These innovations will help to implicate accurately the guilty and to clear the innocent at criminal trials.¹⁷⁴

¹⁷⁰ See *id.* at 435-36, 633 N.E.2d at 461-62, 611 N.Y.S.2d at 107-08 (Kaye, C.J., concurring).

¹⁷¹ NATIONAL RESEARCH COUNCIL, *supra* note 3, at 107.

¹⁷² NATIONAL RESEARCH COUNCIL, *supra* note 3, at 98-99.

¹⁷³ See NATIONAL RESEARCH COUNCIL, *supra* note 3, at 79-81.

¹⁷⁴ See Tucker, *supra* note 144, at 26.

