Genetics and Justice: An Indigent Defendant's Right to DNA Expert Assistance

John Devlin
John.Devlin@chicagounbound.edu

Follow this and additional works at: http://chicagounbound.uchicago.edu/uclf

Recommended Citation
Available at: http://chicagounbound.uchicago.edu/uclf/vol1998/iss1/16

This Comment is brought to you for free and open access by Chicago Unbound. It has been accepted for inclusion in University of Chicago Legal Forum by an authorized administrator of Chicago Unbound. For more information, please contact unbound@law.uchicago.edu.
Genetics and Justice: An Indigent Defendant’s Right to DNA Expert Assistance

John Devlin†

The state of Alabama charged Edward Russell Dubose with three counts of capital murder. No one saw him commit the crime, but a prosecution expert testified at his trial that DNA evidence found at the scene matched Dubose’s DNA profile and that the odds of a random match were one in 500,000,000. After the trial court denied his requests for an expert to explain the shortcomings of DNA testing, the jury convicted Dubose and the court, following the jury’s recommendation, sentenced him to death.¹

In the decade following its first use in the courtroom,² DNA testing has become a powerful weapon in the arsenal of prosecutors.³ Media reports touting DNA test results as “genetic fingerprint[s]”⁴ have created an aura of infallibility around DNA testing and led many to hope that this technology would greatly increase the ability of prosecutors to secure criminal convictions.⁵ DNA experts help the government convict defendants by offering juries impressive scientific presentations that include very high statistical estimates.⁶

† B.A. 1993, Haverford College; J.D. 1998, University of Chicago


² Note, DNA Printing: The Unexamined “Witness” in Criminal Trials, 77 Cal L Rev 665, 666 (1989) (explaining that DNA testing was first used in court in 1987).

³ “The power of genetics was evident . . . when Timothy Spencer was executed in Virginia — the first person in America put to death on the basis of a DNA ‘fingerprint.’” Shannon Brownlee, et al, Science Takes the Stand, US News & World Rep 29, 30 (July 11, 1994). For more information on this case, see Spencer v Murray, 5 F3d 758 (4th Cir 1993).

⁴ See, for example, Anastasia Toufexis, Convicted by Their Genes: A New Forensic Test is Revolutionizing Criminal Prosecutions, Time 74 (Oct 31, 1988) (“Declares John Huss of Cellmark Diagnostics. . .: ‘Except for identical twins, one in 4 trillion or 5 trillion people might share the same genetic fingerprint.’”); Brownlee, Science Takes the Stand, US News & World Rep at 29 (“Like a fingerprint, a person’s entire genetic code is unique.”).

⁵ “Advocates claim the test will revolutionize the investigation of violent crimes . . .” Toufexis, Convicted by Their Genes, Time at 74.

⁶ See Cade v State, 658 S2d 550, 554 (Fla Dist App 1995) (noting that “scientific evidence received from an expert is impressive to a jury” and that “the use of DNA matching to prove identity is especially persuasive”); State v Pennell, 584 A2d 513, 519
or murder cases that carry the possibility of long prison sentences or even death. These crimes are more likely to provide the blood, skin, semen, or hair samples needed to perform DNA testing. In addition, the long prison sentences for these crimes justify the expense of processing DNA tests.

Despite the high hopes for this new technology, the use of DNA test results in the courtroom raises a number of problems. First, the complexity of the DNA testing process leaves significant room for laboratory error. In early DNA cases, a number of courts ruled that DNA testing was inadmissible due to sloppy laboratory practices. Second, accurate DNA testing does not provide an exact match of a suspect's entire DNA chain with a full DNA chain found at the crime scene. Rather, a DNA laboratory compares partial samples. Under the most common form of DNA testing, the laboratory then estimates the odds of a random match. These probability estimates make a profound impression on jurors but have ignited strong controversy within the scientific and legal communities because different statistical methods can produce widely divergent estimates. A less com-

(Del Super 1989) ("The danger of misleading a jury, confusing the issues, or of creating undue prejudice is extremely great when probabilities in the nature of 1 in 100 billion are expressed."); Dubose II, 662 S2d at 1196–97 ("DNA analysis and the resulting statistics can be extremely convincing evidence to jurors who have heard hours of expert testimony and statistics regarding the improbability of misidentification or other errors in the procedure."); Note, DNA Evidence in Criminal Trials: Modifying the Law's Approach to Protect the Accused from Prejudicial Genetic Evidence, 34 Ariz L Rev 829, 864–67 (1992) ("[J]urors tend to be overwhelmed by statistical evidence."); Paul C. Giannelli, Criminal Discovery, Scientific Evidence, and DNA, 44 Vand L Rev 791, 794 (1991) ("One researcher reported that approximately twenty-five percent of the jurors in trials involving scientific evidence stated that they would have delivered a verdict of not guilty instead of guilty if the evidence had not been introduced.") (footnote omitted).

Every one of the state court DNA cases in Part III C 1 involves murder or a sex crime — the vast majority either rape or murder — and carried long prison sentences or death.


See People v Castro, 545 NYS2d 985 (Bronx Cty Sup 1989). Following a twelve-week hearing that produced a 5,000-page record, the court found DNA evidence generally admissible, but held that "[t]he testing laboratory failed in several major respects to use the generally accepted scientific techniques and experiments for obtaining reliable results . . . ." Id at 999. See also People v Keene, 591 NYS2d 733, 740 (Queens Cty Sup 1992) (holding DNA evidence inadmissible because the specific laboratory procedure at issue was not generally accepted); State v Schwartz, 447 NW2d 422, 428 (Minn 1989) ("Because the laboratory in this case did not comport with [generally accepted standards], the test results lack foundational adequacy and, without more, are thus inadmissible.").

"[T]he justification for an inference that two identical DNA profiles come from the same person rests on probability calculations that employ principles of population genetics. Such calculations are, of course, subject to uncertainty." 1996 NRC Report at 10.

See note 6.

National Research Council, DNA Technology in Forensic Science 75 (National
mon form of DNA testing does not require the statistical estimate, but this technology lacks the same precision and has yet to prove its reliability.\textsuperscript{13}

Given these problems, a DNA expert can help a criminal defendant in four ways. First, a defense expert can search for possible error by the prosecution's testing laboratory. Second, a defense expert can conduct independent tests on any unused DNA samples. Third, a defense expert can testify at trial about the problems with DNA statistics and potentially offer the jury a lower probability estimate. Fourth, a defense expert can point out the shortcomings of the newer DNA testing method, if the prosecutor uses it. A defendant who cannot afford his own expert will lose these benefits unless the government provides one for him.

The current caselaw fails to provide a clear answer to whether an indigent defendant has the right to a DNA expert. Several state courts have addressed this issue without reaching a consensus. While a few provided the requested DNA expert,\textsuperscript{14} the majority did not, either because the defendant had not made a sufficient showing of scientific need\textsuperscript{15} or the amount of other evidence made the denial of expert assistance harmless error.\textsuperscript{16}

Although no federal court has considered this question, federal courts provide indigent defendants with a wide variety of assistance, including expert help. In Ake v Oklahoma,\textsuperscript{17} for example, the Supreme Court held that an indigent defendant has the right to a psychiatric expert if his sanity will be a significant factor at trial.\textsuperscript{18} The logic of that holding — premised on the defendant's interest in liberty and the potential for increased trial accuracy — extends to analysis of DNA test results. In addition, the Court has a long history of ensuring that an indigent defendant can mount an adequate defense.\textsuperscript{19} Applying the Supreme

\textsuperscript{13} Part I A explains the science behind DNA testing.

\textsuperscript{14} See, for example, Dubose II, 662 S2d at 1197; Cade, 658 S2d at 555.

\textsuperscript{15} See, for example, State v Edwards, 868 SW2d 682, 698 (Tenn Crim App 1993); Husske v Commonwealth, 476 SE2d 920, 926 (Va 1996), cert denied, 117 S Ct 1092 (1997).

\textsuperscript{16} Mosier v State, 462 SE2d 643, 647 (Ga App 1995).

\textsuperscript{17} 470 US 68 (1985).

\textsuperscript{18} Id at 82–83.

\textsuperscript{19} See Britt v North Carolina, 404 US 226 (1971); Gideon v Wainwright, 372 US 335 (1963); Douglas v California, 372 US 353 (1963); Draper v Washington, 372 US 487 (1963);
Court's principles, lower courts have granted requests for several different types of experts when the defendant has made a significant showing of scientific need.\textsuperscript{20}

This Comment argues that an indigent defendant charged with rape or murder should receive DNA expert assistance whenever the prosecution plans to use DNA evidence against him. Providing expert assistance helps ensure the accuracy of the final judgment (an especially important concern in the rape and murder cases at issue, which involve the death penalty or a long prison term),\textsuperscript{21} offers the jury a balanced perspective for assessing complicated and controversial DNA evidence, and checks the sloppy technical and statistical practices that sometimes plague DNA laboratories.\textsuperscript{22}

Part I of this Comment identifies the ways in which a DNA expert can assist an indigent defendant by examining the science of DNA testing and the statistical analysis of DNA test results. Part II reviews the legal backdrop for granting requests for DNA expert help, including state court decisions discussing this issue and federal cases laying out the rights of indigent defendants. Part III examines two alternative proposals: the use of neutral experts and the limitation of expert assistance to capital cases. Finally, this Comment endorses a rule that an indigent defendant charged with rape or murder should receive funds for a DNA expert whenever the prosecution seeks to use DNA evidence against him.

I. A DEFENSE EXPERT CAN HELP THE JURY UNDERSTAND THE SCIENCE BEHIND DNA TESTING

Either by testifying directly or by helping defense counsel prepare for cross-examination, a DNA expert can assist the defense team in four important ways.\textsuperscript{23} The first two areas of assis-

---


\textsuperscript{21} See note 7 and accompanying text.

\textsuperscript{22} See note 9.

\textsuperscript{23} For another view that indigent defendants have a right to DNA experts in at least some cases, see Note, The Indigent Criminal Defendant, DNA Evidence, and the Right to an Expert Witness: A Comparison of the Requirements of Due Process in State v Dubose
tance are common to all types of DNA testing. First, a DNA expert can review the documents prepared by the prosecution’s testing laboratory to ensure that the lab did not make any errors, a persistent problem in early DNA cases. Second, a defense expert can conduct independent testing on any unused samples to check the results.

The last two areas of assistance relate to the specific DNA testing method. The oldest and most common method of DNA testing, known as the Variable Number of Tandem Repeats (VNTR) method, requires a statistical analysis of its match results. A defense expert can review these statistical estimates for accuracy and potentially offer lower estimates. A newer method of DNA testing, known as the Polymerase Chain Reaction (PCR) method, does not require statistical analysis. Nevertheless, a defense expert can point out the unresolved questions about this developing technique.

A. An Introduction to Forensic DNA Testing

Understanding how a DNA expert can assist the defense team and ensure that a criminal defendant enjoys a fair trial requires knowledge of some basic terms and concepts involved in forensic DNA testing. Deoxyribonucleic acid, or DNA, contains all of the genetic information used to create the human body. Every cell in the body contains the same DNA, and this DNA re-

and Harris v State, 6 BU Pub Int L J 267 (1996). The note’s proposed solution for providing experts does not go far enough, see note 186, but does make persuasive arguments in favor of DNA experts generally.

24 The National Research Council, which has issued two reports on forensic DNA technology in the last six years, specifically noted the possibility for error in DNA testing laboratories: “Even with the best laboratory technique, there is intrinsic, unavoidable variability in the measurements; that introduces uncertainty that can be compounded by poor laboratory technique, faulty equipment, or human error.” 1996 NRC Report at 10 (cited in note 8).

25 See note 9 and accompanying text.

26 See Part I A for a more elaborate explanation of testing methods.

27 For a detailed explanation of the scientific principles behind forensic DNA testing, see Lorne T. Kirby, DNA Fingerprinting: An Introduction (Stockton 1990). Many excellent sources provide a layman’s explanation of the scientific concepts. These include 1996 NRC Report at 60–165 (cited in note 8); George Bundy Smith and Janet A. Gordon, The Admission of DNA Evidence in State and Federal Courts, 65 Fordham L Rev 2465, 2466 (1997); William C. Thompson and Simon Ford, DNA Typing: Acceptance and Weight of the New Genetic Identification Tests, 75 Va L Rev 45, 63–79 (1989); and Note, 34 Ariz L Rev 829, 832–47 (1992). Finally, a number of judicial opinions contain concise summaries of DNA testing. See, for example, People v Castro, 545 NYS2d 985, 988–95 (Bronx Cty Sup 1989); State v Morel, 676 A2d 1347, 1350–53 (RI 1996).
mains identical over a person’s life span. DNA consists of four organic bases: adenine, cytosine, guanine, and thymine. These bases join in specific pairs — adenine with thymine and guanine with cytosine — to form a DNA molecule. An individual gene contains thousands of these base pairs.

James Watson and Frances H. C. Crick first identified DNA in 1953, and DNA testing first entered the courtroom in 1987. The prevalence of DNA in the human body makes it an excellent tool for forensic analysis, as it can be found in hair, blood, semen, or skin cells left at a crime scene. Other than identical twins, no two people have the same DNA.

The techniques used in forensic DNA testing and the degraded state of most forensic samples, however, only allow analysts to examine differences in certain sections of the DNA. While more than 99 percent of all human genes are identical, other “polymorphic” genes — such as those for eye or hair color — vary between humans, with the different versions of these genes known as “alleles.” DNA testing analyzes the differences in several of these alleles to determine whether two partial DNA samples match.

1. The VNTR Method.

The oldest and most common method of DNA testing, known as the VNTR method, requires both a physical match between the evidence DNA and a suspect’s DNA, and a statistical analysis of the significance of the match. This process compares DNA segments, known as VNTRs, that have different lengths in different alleles. By examining a number of these segments, an analyst creates a DNA profile for the evidence DNA that can be compared against the same segments in the suspect’s DNA profile. The process of preparing a DNA sample for analysis involves several steps, from isolating the DNA in the sample to creating the re-

\[\text{Kirby, } \textit{DNA Fingerprinting} \text{ at 12–13 (cited in note 27); Thompson and Ford, 75 Va L Rev at 61–62 (cited in note 27).}\]
\[\text{Note, 34 Ariz L Rev at 832–33 (cited in note 27).}\]
\[\text{Smith and Gordon, 65 Fordham L Rev at 2466 (cited in note 27).}\]
\[\text{Id at 2465.}\]
\[\text{Note, 77 Cal L Rev at 666 (cited in note 2).}\]
\[\text{Kirby, } \textit{DNA Fingerprinting} \text{ at 51 (cited in note 27).}\]
\[\text{Smith and Gordon, 65 Fordham L Rev at 2465 (cited in note 27).}\]
\[\text{Note, 34 Ariz L Rev at 833–35 (cited in note 26); Thompson and Ford, 75 Va L Rev at 63 (cited in note 27); Castro, 545 NYS2d at 989.}\]

* "Corresponding sequences from the same genes in two different people differ by an average of less than one nucleotide in 1,000." 1996 NRC Report at 63 (cited in note 8) (citation omitted).*  
* Id.*
suiting "autorad" that the analyst uses for comparison. After preparing the samples, a technician must identify a match either visually or with a computer. At this stage, exculpatory testing — testing to determine that a suspect has not committed a crime — ends. If the bands or alleles do not match, then the evidence DNA did not belong to the suspect. If the analyst finds a match, then an expert in the field of population genetics must put the match result into context by determining the odds of a random match. In this sense, the term "match" is inaccurate because the DNA test has only shown that the suspect has the same DNA profile as the evidence DNA at selected VNTR sites, rather than matching his entire DNA profile with the evidence DNA.

Initially, population geneticists determined the odds of a random match using the "product rule," which produced low probability estimates that had an enormous influence on the process of preparing the samples, known as the restriction fragment length polymorphism (RFLP) method, contains six steps: isolation, fragmentation, separation, Southern transfer, hybridization, and autoradiography. For a more detailed explanation of the VNTR method, see Michael L. Baird, Analysis of Forensic DNA Samples by Single Locus VNTR Probes, in Mark A. Farley and James J. Harrington, eds, Forensic DNA Technology 39–49 (Lewis 1991); 1996 NRC Report at 65–69 (cited in note 8); and Smith and Gordon, 65 Fordham L Rev at 2468–70 (cited in note 27).

This Comment limits its scope to requests for expert assistance to counter inculpatory DNA testing. Defendants seeking exculpatory testing have a harder time proving that DNA is crucial to their case because they are not rebutting the government's introduction of DNA evidence. See State v Frazier, 1995 WL 654433, *6 (Del Super Aug 3, 1995) (defendant did not provide the court "with any factual basis for concluding that DNA testing would be useful to the defense"); State v Thomas, 586 A2d 250, 254 (NJ Super 1991) (court compelled FBI to perform DNA test requested by indigent defendant where the state's case was weak and the record supported at least a reasonable doubt of guilt); Commonwealth v Brison, 618 A2d 420, 425 (Pa Super 1992) (state should have provided DNA test for indigent defendant where main evidence was a victim identification of dubious validity).

In one case, however, a court allowed a DNA technician to testify about DNA match probabilities, even though he was not a population geneticist. State v Loftus, 1997 WL 745059, *6–8 (SD Dec 3, 1997).

Keirsey v State, 665 A2d 700, 708 (Md Spec App 1995), cert denied, 117 US 1480 (1997) (observing that the need to determine the odds of a random match "is why it is misleading to suggest that [DNA testing] produces a fingerprint").

Note, 34 Ariz L Rev at 841–42 (cited in note 27).

This determination involves two steps. First, a population geneticist determines the frequency of each allele within the general population by consulting a database of DNA samples. Second, the population geneticist applies the product rule, which states that, if the probability of the first variation is 1 in 10 and if the probability of the second variation is 1 in 10, then the probability of both variations occurring together is 1 in 100. This rule assumes that each variation is independent. See id; Thompson and Ford, 75 Va L Rev at 80–87 (cited in note 27); People v Castro, 545 NYS2d 985, 992–93 (Bronx Cty Sup 1989).

1992 NRC Report at 75 (cited in note 12) ("In one Manhattan murder investigation,
juries. A controversy soon erupted over whether the "product rule" relied upon accurate assumptions about the independence of VNTRs and the possible impact of population subgroups on the analysis. The National Research Council has issued two reports on this controversy in the past six years. In its first report, published in 1992, the NRC recommended that courts and experts employ an interim method while it reviewed the matter further. This interim method, known as the "ceiling principle," only heightened the controversy because many felt its assumptions were too conservative.

Some courts allowed the government to use this interim method while stressing the need to hear expert testimony from both sides. More importantly, a few courts allowed prosecution experts to present both the ceiling principle estimate and the expert's "best" estimate, which often used some of the product rule's techniques and produced a larger estimate. Four years later, the reported frequency estimates ranged from 1 in 500 to 1 in 739,000,000,000); Dubose v State, 662 So2d 1189, 1199 (Ala 1995) (odds of random match estimated at 1 in 500,000,000); McKinney v State, 403 SE2d 136, 138 (Ga App 1995) (1 in 200,000,000).

For examples of these criticisms, see Thompson and Ford, 75 Va L Rev 45 (cited in note 27); Note, 34 Ariz L Rev 829 (cited in note 27).

The "ceiling principle" involves the creation of an upper limit of allele frequency higher than that for any ethnic subgroup, eliminating the possibility of an abnormally low probability estimate. See 1992 NRC Report at 74–96 (cited in note 12).

See Eric S. Lander and Bruce Budowle, DNA Fingerprinting Dispute Laid to Rest, Nature 735, 736–37 (Oct 27, 1994).

See State v Bloom, 516 NW2d 159, 170 (Minn 1994) (Gardebring concurring) ("The trial court must be sensitive to the need for expert assistance in these matters and must assure public funding for this expert assistance where the defendant is indigent."); State v Morel, 676 A2d 1342, 1356 (RI 1996) ("Provided a defendant is afforded the opportunity to cross-examine the experts, to question the validity of their conclusions, and to disclose the potential weaknesses of the proffered DNA analyses, the results of such analyses may be presented to the jury."); State v Marcus, 683 A2d 221, 231 (NJ Super App Div 1996) ("The defendant remains free to present conflicting expert opinion testimony regarding population frequency calculations.").

Lander and Budowle, Nature at 736; Armstead v State, 673 A2d 221, 245 (Md 1996) ("Because the jury was presented with both the product rule and ceiling principle calculations, with full explanations of both, it had the opportunity to weigh the contested evidence."); Commonwealth vBiasiolli, 685 A2d 151, 166 (Pa Super 1996) ("It was within the discretion of the trial court to admit both types of evidence, and allow the jury to hear the different probabilities and weigh the credibility of those numbers." footnote omitted)); Marcus, 683 A2d at 232 (admitting product rule estimate into evidence only on defendant's cross examination).

As expected, the ceiling principle and product rule provided juries with vastly different estimates. See Armstead, 673 A2d at 225 (odds of random match estimated at 1 in 490,000,000 using product rule and 1 in 500,000 using ceiling rule); Biasiolli, 685 A2d at 165 (applying product rule yielded estimate of 1 in 10,000,000 while ceiling rule produced a figure of 1 in 30,000,000); Marcus, 683 A2d at 232 (1 in 4,700,000,000 from product rule as opposed to 1 in 3,500,000 from ceiling rule).
the NRC issued a second report stating that many of the problems with the statistical assumptions underlying DNA analysis had been resolved and endorsing the old "product rule." Nevertheless, this controversy demonstrated the relative infancy of DNA evidence and the danger of its uncontested use in the courtroom.

As the dispute over the "product rule" has died down, some people have expressed a new concern — that juries misunderstand the statistical evidence in a way that harms the defendant. First, juries simply might have trouble understanding the meaning of DNA statistical evidence, either because it is complicated or because the prosecution's DNA expert explains it in a misleading way. Second, while DNA evidence indicates that a defendant was the source of DNA found at a crime scene, it does not prove that he actually had contact with the crime scene or that he committed the crime:

From a policy perspective, DNA experts should avoid using such broad hypotheses as "contact with crime scene" and "guilt" because they require speculation about probabilities that have little to do with DNA genetics. Nothing in a DNA expert's background or knowledge of the evidence qualifies him to assess the likelihood of a frame-up or the chance of an innocent deposit of genetic material at an earlier time. Yet these possibilities must be assessed and quantified when likelihood ratios are constructed against the broader hypotheses.

---

52 1996 NRC Report at 156-59 (cited in note 8). Despite its conclusion that the controversy over DNA statistical analysis has been resolved, the NRC made no formal recommendation in its 1996 report on the issue of providing indigent defendants with DNA experts. The 1996 NRC Report did, however, suggest that neutral experts would benefit courts. See id at 182. In its 1992 report, the NRC endorsed the provision of DNA experts for indigents. See 1992 NRC Report at 147 (cited in note 12).


54 Koehler, 67 U Colo L Rev at 877.

55 Id at 876 demonstrating how a prosecution expert failed to explain statistical evidence adequately; Thompson, 67 U Colo L Rev at 846-56 (discussing problems in the presentation of DNA evidence to the jury in the O.J. Simpson case).

56 Koehler, 67 U Colo L Rev at 868. "It should be apparent that DNA frequencies do not identify the probabilities of guilt or innocence because otherwise all other evidence (e.g., eyewitness testimony, motive, opportunity, etc.) would be irrelevant." Id at 862.
Given the chance for laboratory error, the different possible statistical assumptions, the varying explanations that can be given for DNA statistics, and the limits of a DNA expert's training, estimation of DNA random match probabilities represents exactly the type of scientific evidence on which two reasonable experts can disagree.\(^6\) Moreover, given the powerful impact of DNA evidence on a jury\(^5\) and the serious consequences involved,\(^7\) a defendant cannot enjoy a fair trial without his own DNA expert.

2. The PCR Method.

In recent years, a new method of DNA testing known as the PCR method has gained popularity.\(^6\) The PCR method allows for amplification of a very small DNA sample into a more useful quantity of DNA,\(^6\) permitting analysts to identify each allele and eliminating the need for statistical analysis.\(^6\) Although widespread use of this technique could eliminate the problems associated with statistical DNA analysis, the PCR method does not measure as precisely as the VNTR method for two reasons. First, the segments used in PCR testing have fewer alleles to compare.\(^6\) Second, some of the segments include functional genes that are "more likely to be subject to natural selection and therefore might not conform strictly to some of the population-genetics assumptions used in evaluating the significance of a match.\(^6\) In addition, the PCR method contains increased possibilities for mutations or other errors.\(^6\)

---

\(^6\) Marcus, 683 A2d at 231 ("[I]t is commonplace in our courtrooms for juries to hear conflicting expert opinions regarding the precise significance of scientific tests."); Morel, 676 A2d at 1356 ("DNA evidence is not unlike other conflicting scientific evidence or medical evidence regularly presented to juries by experts.").

\(^5\) See note 6.

\(^7\) See note 7.

\(^6\) "PCR-based typing is widely and increasingly used in forensic DNA laboratories in this country and abroad." 1996 NRC Report at 70 (cited in note 8).

\(^6\) The ability to amplify DNA using the PCR method causes some confusion because a sample can be amplified using PCR and then run through the older VNTR testing method. "Once the amount of DNA is amplified by PCR methods, the analysis proceeds in essentially the same way as with VNTRs." Id. This Comment uses the phrase "PCR method" to refer to the non-VNTR testing process.

\(^6\) Id.

\(^6\) Id at 71.

\(^8\) 1996 NRC Report at 71 (cited in note 8).

\(^6\) "[A]mbiguity can sometimes arise if there are mutations that alter individual repeats." Id at 70. If mutations occur, an analyst might have to use the VNTR method.
B. How a DNA Expert Can Help the Defense Team

1. Rooting out laboratory error.

The process of comparing DNA evidence left at a crime scene with a suspect’s DNA profile involves many complicated steps, each providing significant potential for laboratory error. At a crime scene, technicians collect hair follicles, semen samples, blood spatters, and skin shavings, all of which contain DNA molecules. This evidence must be transferred along a rigidly maintained chain of custody and properly stored to ensure its usefulness. An analyst must extract the DNA from the samples and process it for comparison with the suspect’s DNA profile, obtained either through blood tests or in a police database.

Courts in several early cases ruled that DNA evidence analyzed with the VNTR method was inadmissible because of questionable laboratory procedures. Despite its relative infancy, some courts have raised similar concerns about the PCR method. A number of commentators have also raised questions about shoddy practices in DNA laboratories and the resulting potential for errors. One expert stated that:

Like all evidence, there is a risk of error associated with DNA evidence. When an eyewitness to a robbery testifies,

---

66 “DNA results are subject to false positives and have questionable validity when the samples are heavily contaminated.” Edward C. Monahan and James J. Clark, Funds for Defense Expertise: What National Benchmarks Require, The Champion 12, 52 (May 1997).

67 “DNA degrades rapidly when blood samples are left in a moist, warm environment . . . [and] degradation can render the DNA originally in a sample untypeable . . . .” Thompson, 67 U Colo L Rev at 832 (cited in note 53).


69 In United States v Hicks, 103 F3d 837, 846 (9th Cir 1996), cert denied, 117 S Ct 1483 (1997), the Ninth Circuit held that assertions of laboratory error affected only the evidentiary weight that DNA evidence should be given, not its admissibility. Nevertheless, the court took comfort in the fact that the defendant “not only engaged in extensive cross-examination on the issue of contamination, but he also called his own experts to testify to the dangers of contamination in PCR testing.” Id (emphasis added). See also United States v Love, 954 F Supp 401, 420 (D Mass 1996) (issues of laboratory error go to weight of DNA evidence, not to admissibility).

in essence, that a suspect “matches” the individual he saw holding a gun to the bank teller’s head, we do not and should not treat this testimony as certain proof that the suspect is the culprit. Instead, we treat this evidence as an eyewitness “report,” the reliability of which depends on a host of considerations (e.g., visibility, duration, incentive to lie, etc.). Reports of DNA matches should be treated similarly. The evidence in question, therefore, is not a DNA match but a report of a DNA match.\footnote{Id.}

By recommending procedures to reduce laboratory error, the National Research Council has demonstrated a serious concern with the quality of DNA laboratories.\footnote{Koehler, 67 U Colo L Rev at 868–69 (cited in note 53).} The introductory paragraph to the chapter called “Ensuring High Standards of Laboratory Performance” in the 1996 NRC Report frames the issue:

If DNA from an evidence sample and DNA from a suspect or victim share a profile that has a low frequency in the population, this suggests that the two DNA samples came from the same person; the lower the frequency, the stronger the evidence. But the possibility remains that the match is only apparent — that an error has occurred and the true profile of one of the sources differs from that reported by the laboratory.\footnote{Id.}

The NRC goes on to note that “some risk of error is inevitable, as in any human endeavor.”\footnote{One commentator stated that a defense expert is “perhaps the most crucial component to forestall the introduction of unreliable scientific evidence as complex and as technical as DNA analysis.” Comment, DNA Fingerprinting: A Guide to Admissibility and Use, 37 Mo L Rev 501, 547 (1992). See also Hicks, 103 F3d at 846 (noting that defendant called experts to testify about the dangers of contamination in DNA testing).}

An expert witness can help a criminal defendant by reviewing the practices of the prosecution’s DNA laboratory for error.\footnote{Castro, 545 NYS2d at 986 (defendant offered five experts at pre-trial admissibility hearing); People v Keene, 591 NYS2d 733, 735 (Queens Cty Sup 1992) (two defense experts); Hicks, 103 F3d at 846 (court noted importance of expert in checking laboratory procedure); Lowe, 954 F Supp at 420 (same).} In the early admissibility cases, review of laboratory practices by defense experts played a central role in showing why the DNA evidence was inadmissible.\footnote{1996 NRC Report at 75 (cited in note 8).} Defense experts can continue to
play this crucial monitoring role as new technologies become available.


A defense expert can conduct independent testing of unused DNA samples. In its 1996 report, the National Research Council recommended that forensic laboratories keep additional samples available for repeat testing, in order to ensure quality control and check results in the labs:

Whenever feasible, forensic samples should be divided into two or more parts at the earliest practicable stage and the unused parts retained to permit additional tests. The used and saved portions should be stored and handled separately. Any additional tests should be performed independently of the first by personnel not involved in the first test and preferably in a different laboratory.

In the O.J. Simpson trial, for example, the prosecution ordered multiple tests. Given the importance of verification of DNA test results, a defense expert can ensure independent verification by conducting the backup tests himself.

3. Challenging the VNTR Method.

If the prosecution's testing lab uses the VNTR method, a defense expert can challenge the statistical assumptions in a number of ways. First, an expert can perform an independent statistical analysis and present the jury with a lower probability estimate. Second, an expert can assist the defense attorney as he prepares to cross-examine the government's expert. Third, an
expert can explain the statistical evidence to the jury in a different way, demonstrating the uncertainty involved in likelihood ratios as well as the limits of DNA technology. 83

4. Challenging the PCR Method.

If the prosecution's testing lab uses the PCR method, a defense expert can explain to the jury the lack of precision and potential for error in this newer method. 84 In policing use of the PCR method in court, defense experts can play the same role they played in the early VNTR admissibility cases, where they exposed problems with the testing method and statistical estimates. 85 Unless the government provides indigent defendants with experts, however, the use of PCR technology by prosecutors may go unchallenged.

II. THE LEGAL CASE FOR PROVIDING DNA EXPERTS TO INDIGENT DEFENDANTS

While no federal court has heard a case involving an indigent defendant's request for a DNA expert, both the Supreme Court and lower federal courts have laid down principles in other expert cases that apply to the DNA context. These cases suggest that, to receive expert assistance, an indigent defendant must show that the area of expertise will be a significant factor at his trial. Because of the controversial and powerful nature of DNA evidence, an indigent defendant accused of rape or murder should be able to make the requisite showing of need. However, the few state courts which squarely address the DNA expert issue have reached mixed results. By failing to provide DNA experts where indigent defendants actually showed need, these courts have deviated from the Supreme Court's principles for providing expert assistance. 86

A. The Supreme Court's Indigency Jurisprudence

The Supreme Court has laid down the general principle that an indigent defendant is entitled to the "basic tools of an adequate defense or appeal." 87 These basic tools include a copy of the

defense team, including direct testimony and preparation for cross-examination).

83 See notes 53–56 and accompanying text.
84 See notes 60–65 and accompanying text.
85 These early challenges to the VNTR method led to improvements in the use of the technology. See notes 43–52 and accompanying text.
trial record,87 trial counsel,88 and counsel on appeal as of right.89 In Draper v Washington,90 the Court offered an explanation of its approach to indigency cases: “[T]he State must provide the indigent defendant with means of presenting his contentions . . . which are as good as those available to a nonindigent defendant with similar contentions.”91

Nevertheless, the Court did prescribe some limits on the rights of indigent defendants to government-funded assistance. In Britt v North Carolina,92 the Court held that an indigent defendant seeking a free trial transcript must demonstrate that the transcript is necessary to his appeal and that the state could not provide the same benefit through alternate means.93 Three years later, in Ross v Moffitt,94 the Court stated that “[t]he duty of the State under our cases is not to duplicate the legal arsenal that may be privately retained by a criminal defendant in a continuing effort to reverse his conviction, but only to assure the indigent defendant an adequate opportunity to present his claims fairly . . .

With these cases as background, the Court held in Ake v Oklahoma96 that an indigent defendant has the right to a state-funded psychiatric expert.97 Oklahoma charged Ake, an indigent, with first-degree murder.98 His lawyer asked for a psychiatrist to conduct an evaluation that would form the basis of an insanity defense.99 The trial court refused this request but the Supreme Court reversed, stating:

[m]ere access to the courthouse doors does not by itself assure a proper functioning of the adversary process, and . . .

---

91 Id at 496 (applying Griffin).
93 Id at 227.
95 Id at 616. While limiting what the government must provide, Ross reinforces the fundamental principle that courts should provide an indigent defendant with everything he needs to present his case fairly and adequately.
97 The Ake Court overruled United States ex rel Smith v Baldi, 344 US 561 (1953), which held that an indigent defendant did not have the right to a court-appointed psychiatrist. Ake, 470 US at 85.
98 Id at 72.
99 Id.
a criminal trial is fundamentally unfair if the State proceeds against an indigent defendant without making certain that he has access to the raw materials integral to the building of an effective defense.\textsuperscript{100}

The Court employed a three-factor test in analyzing Ake's request for expert assistance. First, the Court looked at "the private interest that will be affected by the action of the State."\textsuperscript{101} In Ake, the defendant's interest in life and liberty was very high—he faced the death penalty if convicted.\textsuperscript{102} Second, the Court turned to "the governmental interest that will be affected if the safeguard is to be provided."\textsuperscript{103} This factor considers the cost to the State, which the Court found to be minimal.\textsuperscript{104} Finally, the Court examined "the probable value of the additional or substitute procedural safeguards that are sought, and the risk of an erroneous deprivation of the affected interest if those safeguards are not provided."\textsuperscript{105} The Court considered the complex nature of the evidence, the wide disagreement among psychiatric experts, the pivotal role of the psychiatric evaluation in the trial, and the high risk of an inaccurate verdict.\textsuperscript{106} The Court summarized its analysis:

When the defendant is able to make an \textit{ex parte} threshold showing to the trial court that his sanity is likely to be a significant factor in his defense, the need for the assistance of a psychiatrist is readily apparent . . . . [W]here the potential accuracy of the jury's determination is so dramatically enhanced, and where the interests of the individual and the State in an accurate proceeding are substantial, the State's interest in its fisc must yield.\textsuperscript{107}

While Ake clearly stated that indigent defendants in capital cases who could demonstrate need had the right to an independent psychiatric evaluation, the Court gave no indication as to how far the Ake rationale would stretch. In fact, Chief Justice Burger argued in a concurring opinion that the Ake holding should not

\textsuperscript{100} Id at 77.
\textsuperscript{101} 470 US at 77.
\textsuperscript{102} Id at 73.
\textsuperscript{103} Id at 77.
\textsuperscript{104} Id at 78-79.
\textsuperscript{105} 470 US at 77.
\textsuperscript{106} Id at 79-82.
\textsuperscript{107} Id at 82-83 (footnote omitted).
extend beyond capital cases.\textsuperscript{108}

Ake’s three-factor test supports the argument that an indigent defendant faced with government use of DNA testing should receive expert assistance. As in Ake, the defendant’s private interest in almost any DNA case will be very high — a severe deprivation of liberty or perhaps even death.\textsuperscript{109} Prosecutors overwhelmingly use DNA testing in rape and murder cases, which carry long sentences or the death penalty.\textsuperscript{110} The use of DNA evidence in these cases easily satisfies the first prong of the Ake test.

The second factor — the cost to the state — presents a substantial concern in DNA cases.\textsuperscript{111} Although providing DNA experts for all indigent defendants who face long prison terms or death sentences would cost a significant amount of money, the relatively short history of DNA technology,\textsuperscript{112} especially new techniques like PCR,\textsuperscript{113} when combined with the scientific dis-

\textsuperscript{108} Id at 87 (Burger concurring). The Court briefly revisited the issue less than four months later in Caldwell v Mississippi, 472 US 320 (1985). Justice Marshall noted that the Court did not have to consider Caldwell’s contention that he had been improperly denied access to a criminal investigator, fingerprint expert, and ballistics expert:

Given that petitioner offered little more than undeveloped assertions that the requested assistance would be beneficial, we find no deprivation of due process in the trial judge’s decision . . . . We therefore have no need to determine as a matter of federal constitutional law what if any showing would have entitled a defendant to assistance of the type here sought.

472 US at 332 n 1. Two years later, the Court addressed the scope of expert assistance for indigents for the last time. In a dissent to a denial of certiorari in Johnson v Oklahoma, 484 US 878 (1987), Justice Marshall, joined by Justice Brennan, argued that the Court should have reviewed the trial court’s denial of an indigent’s request for a police chemist. Marshall pointed to both Ake and Caldwell as signs that the Court was moving closer to resolving this issue. With the denial of certiorari in Johnson, however, the Court halted its developing jurisprudence and forced the lower courts to determine the scope of indigent access to expert assistance.

\textsuperscript{109} The Ake Court stated that “[t]he private interest in the accuracy of a criminal proceeding that places an individual’s life or liberty at risk is almost uniquely compelling.” 470 US at 78.

\textsuperscript{110} See note 7 and accompanying text.

\textsuperscript{111} Estimates regarding the cost of DNA experts vary, but most range between $1,000 and $10,000. People v Vann, 627 NYS2d 473, 476 (Sup App Div 1995) (defendant was given $1,550 for consultation with DNA expert); Cade v State, 658 S2d 550, 554 (Fla Dist App 1995) (defendant’s request for DNA expert did not exceed $3,000); Taylor v State, 939 SW2d 148, 150 (Tex Crim App 1996) (defendant requested $5,000 for DNA expert); Dubose v State, 662 S2d 1156, 1172 (Ala Crim App 1993) (“Dubose I”), affd, 662 S2d 1189 (Ala 1995) (“Dubose II”) (affidavit from defense attorney familiar with DNA testing estimated that expert witness fees would be between $10,000 and $30,000).

\textsuperscript{112} See note 2 and accompanying text.

\textsuperscript{113} See note 69 and accompanying text.
putes," laborator errors," and concerns about jury confusion," compels the conclusion that the government must shoulder this responsibility under Ake. "The State's interest in prevailing at trial — unlike that of a private litigant — is necessarily tempered by its interest in the fair and accurate adjudication of criminal cases."117

The final Ake factor asks courts to weigh the value of the requested safeguard against the likelihood of an erroneous deprivation if the request is not granted.118 DNA evidence is both complex and powerful,119 making its use at trial similar to the "pivotal role that psychiatry has come to play in criminal proceedings."120 In addition, statistical DNA evidence provokes discord within the scientific community,121 a significant factor for the Court in Ake.122 Thus, the rationale of the Ake Court for providing psychiatric assistance should apply to DNA cases as well.123

B. Federal Cases Regarding the Scope of Expert Assistance

While no federal court has examined the issue of whether an indigent defendant has the right to a DNA expert,124 several circuit courts have decided cases involving other requests for scientific expert assistance. In these cases, each court employed the same basic test — reasonable probability that an expert would aid in the defense and that denial of expert assistance would re-

---

114 See notes 43–52 and accompanying text.
115 See notes 65–76 and accompanying text.
116 See notes 53–56 and accompanying text.
117 470 US at 79.
118 Id at 77.
119 For a discussion of the power of DNA evidence on jury deliberations, see note 6.
120 470 US at 79.
121 See notes 43–52 and accompanying text.
122 470 US at 81.
123 "Little v Streater," 452 US 1 (1981), provides an example of how courts could apply Ake's three-factor test to DNA experts. In Streater, the Court held that an indigent had the right to a state-funded blood test that could determine paternity. Although a civil proceeding, the process had prosecutorial overtones and the indigent sought exculpatory testing. Id at 9. Although prior in time to Ake, the Court applied the same three-factor test, a test originally developed in Mathews v Eldridge, 424 US 319, 334–35 (1976) (evidentiary hearing not required prior to termination of disability benefits). Streater, 452 US at 13.
124 The Fourth Circuit came closest to addressing this issue in Spencer v Murray, 5 F3d 758 (4th Cir 1993). Spencer claimed that the trial court erred in denying him funds for a DNA expert. Id at 760. In a footnote, the court called this claim "little better" than frivolous because the defense did not have an expert in mind when it made the motion and the trial judge had encouraged Spencer to come forward with a specific request, which he never did. In the court's view, "the trial judge not only assured the defense that it could have an expert witness, but also encouraged the defense to get one that would be truly helpful to its case." Id at 760 n 2.
sult in an unfair trial. Each decision turned on whether the defendant had made an adequate showing of scientific need. These cases demonstrate that when a defendant has made a sufficient showing, courts have granted expert assistance in fields far less complex than DNA testing.

In *Little v Armontrout*, the Eighth Circuit granted an indigent defendant's request for a hypnosis expert to counter hypnotically-induced testimony offered by two prosecution witnesses. After noting that the request was specific and timely, the court held that Little met the burden of showing that hypnotism was controversial. "Given the perils of hypnotically enhanced testimony, it is clear that an expert would have aided Little in his defense."

When courts have denied an indigent's request for assistance, they have rested their decisions on the defendant's failure to make an adequate showing of need. In *Moore v Kemp*, the Eleventh Circuit noted that the defendant had failed to "advise the court about the kind of expert he desired or the role the expert would play."

Similarly, the Fifth Circuit in *Scott v Louisiana*

---

125 See *Little v Armontrout*, 835 F2d 1240, 1244 (8th Cir 1987); *Moore v Kemp*, 809 F2d 702, 712 (11th Cir 1987). In a pair of opinions, the Fifth Circuit used a different test — whether the evidence was critical to the case and subject to varying expert opinion. See *Scott v Louisiana*, 934 F2d 631, 633 (5th Cir 1991); *Yohey v Collins*, 985 F2d 222, 227 (5th Cir 1993). There is no material difference between this test and the test used in *Armontrout* and *Moore*. In fact, the *Yohey* court used both tests interchangeably. *Yohey*, 985 F2d at 227. Fundamentally, all of these tests attempt to determine whether the requested expert satisfies the third prong of the Ake test and is “necessary” under 18 USC § 3006A(e) (1994 & Supp 1998), a federal statute providing for expert assistance under certain conditions.

126 See *Armontrout*, 835 F2d at 1244–45 (defendant entitled to hypnosis expert); *Moore*, 809 F2d at 713–18 (defendant not entitled to criminologist); *Scott*, 934 F2d at 633 (defendant had no right to a ballistics expert); *Yohey*, 985 F2d at 227 (defendant entitled to psychiatric expert but neither ballistics nor forensics expert).

127 835 F2d 1240 (8th Cir 1987).

128 Id at 1241–42.

129 Id at 1244.

130 809 F2d 702 (11th Cir 1987).

131 Id at 718. The opinion also stated that the trial judge knew only that “petitioner's lawyer wanted an expert of some kind to review any tests the state crime lab may have performed and to conduct an unspecified number of tests that counsel declined to describe.” Id at 717. A sharp dissent in *Moore* faulted the majority for requiring the defendant “to possess already the knowledge of the expert he seeks.” Id at 742–43 (Johnson dissenting in part). The dissent argued that “[w]hen a defendant asks for assistance and the need for assistance is obvious, it is fundamentally unfair for the court to deny assistance merely because the defendant lacks scientific knowledge.” Id at 743. See also Fred Warren Bennett, *Toward Eliminating Bargain Basement Justice: Providing Indigent Defendants with Expert Services and an Adequate Defense*, 58 L & Contemp Probs 95, 125 (1995).
ana found that the defendant had failed to make an adequate showing of need to support his request for a ballistics expert.

The problems encountered in Moore and Scott should not plague an indigent defendant's specific and timely request for a DNA expert. While not as controversial as hypnosis, DNA evidence certainly remains contestable. By looking for laboratory error, helping with cross-examination, testifying about lower statistical probabilities, and offering the jury an alternative explanation of DNA statistics, a defense DNA expert would reasonably assist an indigent defendant's effort to prove his innocence.

C. State Cases Regarding the Scope of DNA Expert Assistance

Several state courts have examined whether the government should provide an indigent defendant with a DNA expert. Struggling to apply Ake, these courts have employed a variety of tests

("Courts often require an explanation of considerable depth as to how the requested expert will help before the request is granted. However, the very purpose for which the expert may be needed by defense counsel is to 'inform' counsel so that they can explain to the court why the expert is necessary to the particular defense contemplated.")

(footnote omitted).

132 934 F2d 631 (5th Cir 1991).
133 Id at 633.
134 See notes 43–56 and accompanying text.
135 See notes 65–76 and accompanying text.
136 See note 82 and accompanying text.
137 See notes 50 and accompanying text.
138 See notes 55–56 and accompanying text.
139 In determining whether the requested DNA expert was a "basic tool of an adequate defense," courts have asked whether the defendant has demonstrated: (1) "a reasonable probability that [the] expert would be of assistance [and] that . . . denial of expert assistance would result in a fundamentally unfair trial," Norton v State, 930 SW2d 101, 106–07 (Tex App 1996); see also State v Mills, 420 SE2d 114, 117 (NC 1992); (2) "a particularized need for such services and that he will be prejudiced by the lack of expert assistance," Husse v Commonwealth, 476 SE2d 920, 926 (Va 1996), cert denied, 117 S Ct 1092 (1997); (3) "the necessity of expert assistance upon an issue likely to be significant at trial," State v Edwards, 868 SW2d 682, 697 (Tenn Crim App 1993); and (4) that DNA evidence was critical and subject to varying expert opinion, Dubose v State, 662 S2d 1189, 1194–95 (Ala 1995) ("Dubose II"). Some courts refused to formulate any test at all, instead listing factors for lower courts to consider in making their decisions. See Cade v State, 658 S2d 550, 554–55 (Fla Dist App 1995) (factors include centrality of DNA evidence to state's case, technical nature of evidence, timeliness and specificity of request, and the limited financial resources of the state); Mosier v State, 462 SE2d 643, 646 (Ga App 1995) (factors include centrality of evidence, specificity of request, and expected cost). As with the federal expert cases, this Comment contends that these tests are not materially different. See note 125 and accompanying text.
and reached inconsistent results.\(^\text{140}\)

Unlike the federal expert cases, the specificity of the showings made by defendants in the state DNA cases fails to account for the mixed results. In *Dubose v State*,\(^\text{141}\) the court granted the defendant's relatively simple request for an expert.\(^\text{142}\) In *State v Edwards*\(^\text{143}\) and *Husske v Commonwealth*,\(^\text{144}\) the defendants made very specific and detailed requests for expert help, but the courts rejected their pleas. Edwards, for example, made the following request:

The assistance of a DNA expert is crucial to the defendant in this case. DNA printing is a highly complex process which only a trained expert fully understands. Without this understanding, defense counsel cannot properly prepare for trial, or understand appropriate avenues to question results or cross-examine experts testifying for the prosecution. Without special training, the defense counsel would be at the mercy of the prosecutor’s expert, unable to discern weaknesses in the procedures used or in the interpretation of results.\(^\text{145}\)

Despite Edwards's specific discussion of the complex nature of DNA evidence, the court found Edwards's showing insufficient to “meet the minimum threshold of particular need” because his assertions were “too general in nature.”\(^\text{146}\) Husske made several

\(^{140}\) The mixed holdings of these courts — some have found a right to a DNA expert, others have not — cannot be attributed to their use of different tests. For example, both *Dubose* and *Mills* used a similar standard — reasonable probability of assistance and fear of an unfair trial if denied — but Dubose received a DNA expert while Mills did not. See *Dubose II*, 662 S2d at 1198; *Mills*, 420 SE2d at 118–19. Similarly, courts that have enumerated lists of important factors have also reached different results. Compare *Cade*, 658 S2d at 555 (indigent defendant entitled to DNA expert), with *Mosier*, 462 SE2d at 646–47 (indigent defendant not entitled to DNA expert).

\(^{141}\) 662 S2d 1189 (Ala 1995).

\(^{142}\) Id at 1199. In fact, the court did not mention the details, if any, of Dubose's request. The court simply held that Dubose “offered more than ‘undeveloped assertions that the requested assistance would be beneficial.”’ Id, quoting *Caldwell v Mississippi*, 472 US 320, 323 n 1 (1985).

\(^{143}\) 868 SW2d 682 (Tenn Crim App 1993).

\(^{144}\) 476 SE2d 920 (Va 1996), cert denied, 117 S Ct 1092 (1997). In a subsequent case applying *Husske*, the Court of Appeals of Virginia held that a lower court did not err in denying an indigent defendant's request for a third DNA expert. *Hodges v Commonwealth*, 492 SE2d 846, 852–53 (Va App 1997). In *Hodges*, however, the lower court did provide the defendant with two other DNA experts. Id at 852.

\(^{145}\) 868 SW2d at 697–98 (emphasis added).

\(^{146}\) Id at 698. Offering examples of what would have satisfied Edwards's burden, the court stated that such a showing “may have required a disclosure of the defense, proof,
requests at the trial level for a DNA expert, arguing that the evidence was "highly technical" and that "he thought it was difficult for a lawyer to challenge DNA evidence without expert assistance."

Nevertheless, the court characterized his pleas as "generalized statements" that "simply failed to show a particularized need."

These state DNA decisions may simply reflect the attitudes of particular courts toward either indigent defendants or DNA evidence. For example, in the two cases that have held that an indigent defendant had the right to a DNA expert — Dubose and Cade — the courts expressed sympathy for the plight of the indigent defendant. In Dubose, the court stated that the defendant "had no expert to independently test the samples, to question whether the DNA results, in fact, showed a 'match,' or to explain that scientific opinion may be divided on the reliability of DNA testing." In Cade, the court noted that "the DNA evidence was and some indication of the potential misidentification as to specific charges." Id. Such a strong requirement raises the concern that an indigent defendant cannot secure expert assistance without demonstrating to the court a level of knowledge for which an expert is required. See notes 130–133.

147 Husske, 476 SE2d at 926.

148 Id. A dissenting opinion noted that Husske had "proffered some 400 pages of court opinions and testimony [from other cases] that dramatized the nature and dimensions of the DNA dispute prevalent at that time in the scientific community." Id at 930 (Poff dissenting in part) (footnote omitted).

149 Indeed, courts in the same state have engaged in strong disagreements over this issue. In People v Leonard, 569 NW2d 663 (Mich App 1987), the Michigan Court of Appeals reversed the decision of the trial court to grant Leonard a new trial following his conviction because he had been denied a DNA expert. Instead of remanding, the court reinstated Leonard's convictions after finding that he did not make a showing of need. 569 NW2d at 668–73. In Taylor v State, 939 SW2d 148 (Tex Crim App 1996), the Texas Court of Criminal Appeals remanded because the trial court had erroneously denied an indigent defendant's request for a DNA expert after characterizing a court-appointed expert who testified for the prosecution as the defendant's expert. The Court of Criminal Appeals stated that Taylor "was entitled — at least in principle — to a DNA expert if he satisfied the threshold requirements...." 939 SW2d at 153. On remand, however, the trial court held that Taylor had not made a sufficient showing to merit expert help. Taylor v State, 1997 WL 539569, *3 (Tex App Sept 4, 1997). Finally, in Husske v Commonwealth, the Supreme Court of Virginia initially granted Husske a new trial because he was denied a DNA expert, but then reversed itself en banc. Husske, 476 SE2d 920 (Va 1996), cert denied, 117 S Ct 1092 (1997).

150 Dubose, 662 S2d at 1189; Cade, 658 S2d at 554–55. A few other cases provide inferential support for this proposition, although they did not directly grant an indigent defendant's request for a DNA expert. See Hodges, 492 SE2d at 852 (upholding lower court's decision to deny indigent defendant's request for third DNA expert while noting that two other DNA experts performed valuable functions); Polk v State, 612 S2d 381, 393 (Miss 1992) ("It is... imperative... that no defendant have [DNA] evidence admitted against him without the benefit of an independent expert witness to evaluate his data on his behalf") (Appendix A) (case involved only admissibility of DNA); Taylor, 939 SW2d at 153 (giving indigent defendant access to prosecution's DNA expert was insufficient).

151 662 S2d at 1199. The prosecution expert testified that the odds of a random DNA
central to the state's case and the remaining evidence against the defendant was not overwhelming. The court also highlighted the highly persuasive nature of DNA evidence and the timeliness and specificity of the defendant's request.

On the other hand, courts that have denied requests for a DNA expert expressed little sympathy for an indigent defendant's lack of resources. Some relied on the fact that the defendant did not make a specific enough request, without indicating how specific the request needed to be. For example, the North Carolina Supreme Court disposed of an appeal in *State v Mills* with the following dismissive language: "[D]efendant's showing demonstrates no more than a general desire to have an expert assist him in some vague manner in the event that DNA evidence might be introduced at trial." As noted above, the *Edwards* court also rejected a fairly specific showing of need because the defendant's explanation of the complex nature of DNA evidence was "too general in nature."

Other courts have cited the strength of the state's additional evidence against the defendant in holding that the denial of a DNA expert did not prejudice his case. In *Mosier v State*, the court held that the DNA evidence was not critical to Mosier's case because it was not the only evidence against him — the victim could identify Mosier. In *Husske v Commonwealth*, the court based its decision on the fact that Husske had confessed to the crimes in question.

Finally, some courts simply disagreed on basic issues of fact. The *Dubose* court thought that an indigent defendant needed a match were 1 in 500,000,000. Id. at 554.

---

658 S2d at 554.

Id.

420 SE2d 114 (NC 1992).

Id at 119 (emphasis added). The language of this quote echoes the majority opinion in *Moore* — an opinion that produced a vigorous dissent. See note 134. See also *State v Jacobs*, 1997 WL 576493, *3 (Tenn Crim App Sept 18, 1997) ("Appellant maintained that, because the State intended to introduce DNA evidence against him, he required his own DNA expert to verify the results. We do not believe that the foregoing adequately demonstrates particularized need . . . .")

See notes 145–46 and accompanying text.

868 SW2d at 698.

463 SE2d 649 (Ga App 1995).

Id at 648.


Id at 926. The court's logic presents some problems, however. First, given the fact that there was a trial, Husske must have pleaded not guilty and renounced his confession. In addition, the state clearly thought that the case was close enough to use DNA evidence to supplement the confession.
DNA expert to cross-examine state experts and otherwise present his case. In Missouri v Huchting, the Missouri Court of Appeals disputed this view:

[W]e disagree with [the] contention that the average attorney is ill-equipped to defend against [DNA] evidence. To the contrary, law libraries — i.e., law journals, practitioners' guides, annotated law reports, CLE materials, etc. — are teeming with information and advice for lawyers preparing to deal with DNA evidence in trial. Even a cursory perusal of the literature in this area reveals copious lists of questions for defense attorneys to use in cross-examinations and other strategies for undermining the weight of DNA evidence.

While state courts have disagreed about whether the government should provide indigent defendants with DNA experts, those ruling in favor of expert assistance reached the better legal and practical conclusion. DNA evidence, while powerful, does not eliminate the need for other evidence. Rather, it is a relatively new forensic technique with both great promise and significant problems. A criminal defendant charged with rape or murder faces a death sentence or lengthy prison term and needs an expert in DNA technology to assist his counsel on both direct and cross-examination, to probe for laboratory errors, to highlight contentious statistical assumptions, and to explain DNA match evidence to the jury. Without such an expert, however, neither an indigent defendant nor his lawyer can adequately explain this need to the court. Given the potential for this vicious circle, courts should not reject requests for DNA experts merely because an indigent defendant, who faces conviction by DNA, has failed to articulate the proper showing of need.
III. ALL CRIMINAL DEFENDANTS CHARGED WITH RAPE OR MURDER WHO FACE USE OF DNA EVIDENCE BY THE PROSECUTION SHOULD RECEIVE A DNA EXPERT

Given the significant cost of providing DNA experts for indigent defendants, courts will likely search for ways to limit this right. Currently, DNA testing usually enters the courtroom in one of two ways — a criminal prosecution for rape or murder, or a civil suit for paternity. The government should provide DNA experts for all criminal defendants facing conviction by DNA for rape or murder — crimes that carry either a death sentence or a long prison term. Civil paternity cases, on the other hand, do not raise the same concerns of loss of life or liberty, and provision of an expert in every case would place too great a burden on the government's resources.

Should the use of DNA evidence expand significantly to include lesser crimes like burglary or drug crimes, courts will have to reassess the line this Comment proposes. Such use is theoretically possible because so many types of physical evidence contain DNA — hair, skin, semen, blood. While rape or murder scenes usually contain more of these items, a mugger or a drug dealer could also leave a hair or some skin cells at the scene of a crime. Moreover, PCR testing, with its ability to amplify minute doses of DNA into useful evidence, might open the door to expanded use of DNA evidence in these lesser crimes.

Advocating this strong rule implies rejection of two other possibilities that courts might employ — the use of neutral experts and the limitation of expert assistance to capital cases.

A. Neutral Expert

In order to avoid the costs of providing an indigent defendant with his own expert, a court could appoint a neutral expert to test the DNA samples and offer his best probability estimate. As a witness of the court, this expert would bring an unbiased eye to the task and produce a result that neither side could contest. In
fact, the NRC recommended this approach in its 1996 report.  

A neutral expert would not provide an indigent defendant with adequate protection, however. Most of the reasons why an indigent defendant needs an expert relate to his attempt to present the strongest possible defense — an inherently adversarial task. A DNA expert working for the defense team can check for laboratory error, point out the underlying assumptions of the prosecution's statistical estimate, offer a lower estimate of his own, and explain the statistical evidence to the jury in the least harmful way. A neutral expert could, at the request of the court, prepare several statistical analyses, but probably not as many as either side would like. Moreover, because many of the issues raised by DNA evidence are inherently debatable, a neutral expert could not provide a single answer. Although many commentators fear the expense and confusion of a "battle of experts," allowing the jury to hear two adversarial opinions probably comes closest to producing truth in the DNA context. Thus, while use of a neutral expert would spare the government some expense, this procedure would not provide an indigent defendant with the "basic tools of an adequate defense," as the Supreme Court requires.

---

177 One court found that making a state expert accessible to the defense was inadequate. Taylor v Texas, 939 SW2d 148, 152-53 (Tex Crim App 1996) (en banc).
179 Although not specifically referring to DNA cases, several commentators have criticized proposals to use neutral experts for scientific issues. See Note, 84 Mich L Rev at 1345-57 (arguing that a neutral expert is not an adequate safeguard of an indigent defendant's constitutional rights); Comment, 37 Emory L J at 1018-21 (cited in note 82) (arguing that the language of Ake and the practical impact of neutral experts both support provision of a partisan expert); Bennett, 58 L & Contemp Probs at 95, 114-25 (cited in note 82) (discussing the many ways in which a partisan expert benefits the defense team). But see Note, 110 Harv L Rev at 952-58 (1997) (identifying concerns about neutral scientific advisors but nevertheless advocating a role for them in admissibility disputes).
180 Note, 84 Mich L Rev at 1353 ("The adversary system and the much-maligned 'battle of the experts' recognize that the expert, like any other witness, is fallible, and that the truth is most likely to emerge through each side presenting its own case.") (footnote omitted).
B. Limitation of Expert Help to Capital Cases

Another cost-saving idea would limit provision of DNA experts to capital cases. Supporters of this view argue that only capital cases tip Ake's balancing test far enough to mandate provision of an expert. Unless his life is on the line, the defendant does not have a sufficient interest under Ake to outweigh the government's interest in conserving its resources.\(^{162}\)

This proposal has some serious flaws. First, the language of Ake does not mandate limitation of its holding to capital cases. While Chief Justice Burger argued in a concurrence that the Ake decision should be limited to capital cases,\(^{183}\) the rest of the Court did not adopt this view. The Court stated the principles of the Ake decision in broader terms: "The private interest in the accuracy of a criminal proceeding that places an individual's life or liberty at risk is almost uniquely compelling."\(^{184}\) Several lower courts have extended Ake to non-capital cases\(^{185}\) and commentators have argued for an extension.\(^{186}\)

Second, the interests at stake when a defendant faces a rape or murder charge carrying a long prison term overwhelm any potential savings that the limitation would achieve.\(^{187}\) The use of DNA evidence in the courtroom, unchecked by an opposition

\(^{162}\) One commentator argues that proper application of the Ake test would ensure that indigent defendants receive DNA experts when appropriate. Note, The Indigent Criminal Defendant, DNA Evidence, and the Right to an Expert Witness: A Comparison of the Requirements of Due Process in State v. Dubose and Harris v. State, 6 BU Pub Int L J 267, 290 (1996) ("Given the inherent complexities of DNA evidence, the Ake balancing test appears to be a sensible, if not necessary solution."). This proposal does not go far enough, however, because state courts have been applying Ake to requests for DNA experts with mixed results. Given the problems described in Part II C, state courts should not be given a chance to engage in balancing when a defendant faces a death sentence or long prison term because of DNA evidence.


\(^{184}\) Id at 78 (emphasis added).

\(^{185}\) See Little v Armontrout, 835 F2d 1240, 1243–44 (8th Cir 1987) (stating that while "the defendant's interest in staying alive is greater and different in kind from his interest in avoiding a prison term,... the latter interest, in our opinion, still outweighs the state's interest...."); State v Barnett, 909 SW2d 423, 427–28 (Tenn 1995) (holding that Ake extends to non-capital cases and collecting other decisions to support this principle); State v Edwards, 868 SW2d 682, 697 (Tenn Crim App 1993) (extending Ake to non-capital case).


\(^{187}\) See notes 111–125 and accompanying text.
expert, leaves room for erroneous convictions due to laboratory error or jury confusion.\textsuperscript{186}

CONCLUSION

Despite the popular myth that DNA testing produces a "genetic fingerprint," the use of DNA technology in the courtroom raises a number of complex and controversial issues. The process of preparing and testing DNA samples is prone to laboratory error. The need to test partial samples requires an estimation of the odds of a random match, an estimation that has been the source of legal and scientific controversy. While a consensus might emerge surrounding one method of statistical analysis, courts are likely to allow the use of different methods that produce starkly different results. Regardless of the statistical method used, jury confusion remains a serious concern.

Nevertheless, the reputation of DNA testing, combined with its impressive statistical estimates, has a powerful effect on juries. A DNA expert working for the defense team can check for laboratory error, help defense counsel prepare for cross-examination, provide alternative probability estimates to the jury, and explain the statistical evidence in the best possible way. Without such expert help, the prosecution leaves the jury with a one-sided and biased picture of the DNA evidence.

Caselaw on the provision of expert services to indigents is sparse, but the principles of these cases support the notion that an indigent defendant facing rape or murder charges should receive DNA expert assistance upon request. The Supreme Court has stated that indigent defendants should have the basic tools of an adequate defense, including a psychiatric expert if relevant. The logic that led the Court to grant a psychiatric expert translates well to DNA cases because of the centrality of DNA testing to any case in which it is used. State cases specifically addressing this issue have produced a confusing jurisprudence, with some courts failing to grant requests when defendants have made solid showings of need. These cases failed to adhere to the principles laid out by the Supreme Court and a number of other federal and state courts that have examined the scope of expert assistance in non-DNA contexts.

The cost involved in providing DNA experts to indigents presents a valid concern. While some possible alternatives — use of

\textsuperscript{186} See notes 65–85 and accompanying text.
a neutral expert or restriction to capital cases — provide some help while limiting costs, they fail to meet the Supreme Court's requirement that the government give an indigent defendant all the tools needed to present his claims fairly. When the government intends to use the powerful and controversial evidence of DNA testing to secure a long prison term or death sentence against an indigent defendant, only a DNA expert dedicated to the defense can ensure that the finder of fact has heard all of the evidence needed to make this important decision.