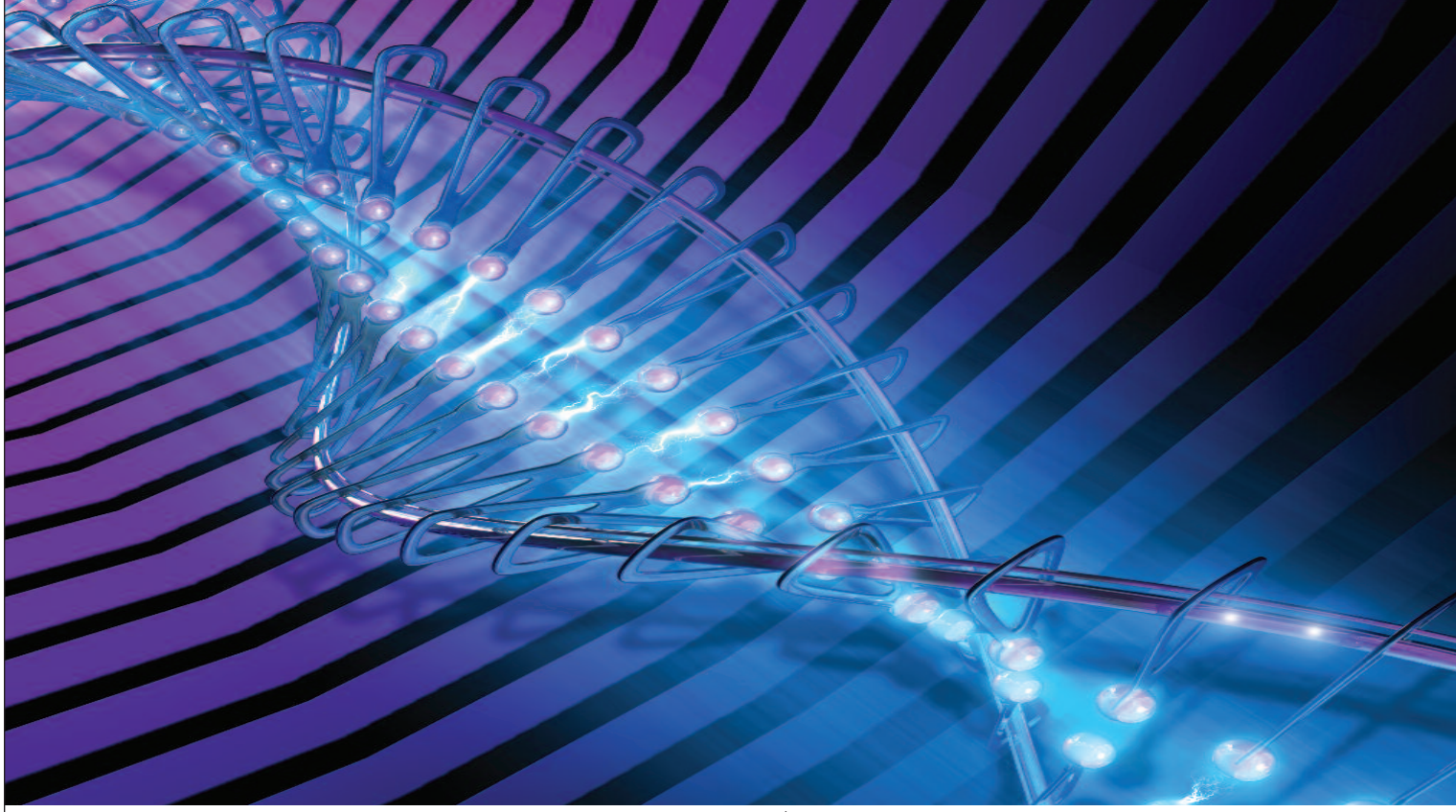

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'If DNA, Then Guilty': Strategies for Overcoming Juror Assumptions About DNA Evidence In Criminal Trials

Introduction

Through media and popular culture sources, prospective trial jurors gain *some* information about forensic evidence.[1] To use an adage, they are obtaining just enough information to be dangerous. As is constantly bemoaned in legal articles and war stories from the trenches, these pop-culture sources are actually making the job of attorneys all the more difficult.[2] Clients hire defense attorneys and have expectations about next-day trials, courtroom theatrics, and the use of high-tech gadgets to uncover that single "gotcha" piece of evidence that proves their innocence beyond a reasonable doubt.

Jurors, on the other hand, are a whole other can of worms. Jurors enter the courtroom with the same skewed expectations, but they are not necessarily willing to listen to a defense attorney's pleas to take forensic evidence with a grain of salt and resist the urge to jump to a conclusion of guilt the moment they hear those three letters: D-N-A. It is reasonable to opine that a majority of jurors enter a courtroom familiar with DNA evidence and possessing preconceived notions of the role this evidence plays in the criminal justice system.[3]

It is also reasonable to say that jurors are likely to truncate the logical progression between the presence of DNA evidence and a finding of guilt. In other words, jurors may be tempted to follow "if DNA, then guilty" reasoning — if there is DNA evidence, then the defendant must be guilty of the crime. The prosecution typically presents forensic evidence in broad strokes with the use of clear, concise, and conclusory statements: "The defendant's DNA was found at the scene of the crime. Therefore, the defendant must have committed that crime." When the evidence is presented in this manner, it is tempting to trust and accept that storyline; it makes sense and it is congruous with the way DNA evidence is presented in television shows and movies. Still, many jurors possess the analytic skills necessary to critically evaluate the evidence.

It is the job of defense attorneys to understand the "if DNA, then guilty" paradigm. The analytic journey from DNA evidence to a guilty verdict is grounded in several assumptions:

(1) The DNA evidence itself is *reliable and accurate*;

BY CHRISTINA T. KLINE, DEMOSTHENES LORANDOS, AND MICHAEL SPENCE

(2) The DNA evidence *identifies* the defendant, complainant, or other party necessary to prove guilt;

(3) This identification means that the individual was *present* at the scene where the DNA evidence was recovered;

(4) The identified individual had the *opportunity* to commit the alleged action;

(5) The DNA evidence proves that the identified individual *engaged in the specific acts alleged*; and

(6) The proof that the identified individual was present, had an opportunity, and did actually commit the act *demonstrates guilt.*

By revealing the analytic steps and their assumptions, the defense provides jurors an opportunity to consider, evaluate, and question the probative value of the proffered DNA evidence. Instead of focusing solely on battling the "DNA" step (i.e., challenge the scientific validity of the DNA evidence itself), the defense team should challenge the logical, inferential connections between the DNA evidence and a finding of guilt. Following this path, the defense is not faced with the daunting task of challenging the science and breaking it down in a way that a lay juror can understand.

This is not to suggest that a defense attorney should forgo attacking DNA evidence on the basis of the underlying science, raw data, or process. On the contrary, a defense attorney has a duty to ensure that the prosecution's DNA evidence is accurate and reliable. An attorney's decision not to attack the underlying science behind the DNA evidence can *only* be made after a diligent and thorough scientific review of the evidence. Unless the facts of the case support an alternate strategy — e.g., there is no basis whatsoever for the client to challenge the fact that his or her DNA was found at the scene — a lawyer cannot forgo making a scientific challenge without first completing a competent investigation and evaluation of the proffered DNA evidence.

Rather, this article suggests an additional/alternate method for rebutting DNA evidence that is separate and distinct from a strategy that focuses exclusively on challenging the science behind the evidence. The defense should challenge the science in tandem with other logic-driven strategies that are more approachable for the trier of fact. In doing so, a defense team can effectively identify and present a plausible alternative explanation for the DNA evidence and then use that evidence to support the alternate hypothesis while simultaneously challenging the jury's assumptions about guilt. This article illustrates this strategy with an example from a multi-count Texas criminal sexual conduct trial that took place in 2013.

Case Facts and Background

The complainant, an eight-year-old female and the defendant's former stepdaughter, alleged that the defendant had brought her into her bedroom and forced her to perform oral sex on him. The complainant also alleged that, after the defendant ejaculated into her mouth, she spat the ejaculate onto the floor near her bed. The Texas attorney general was in the midst of a hotly contested campaign for governor of Texas and he wanted to demonstrate that he was "smart on crime." He took the case away from the local county prosecutor, assigned an assistant attorney general (who literally wrote the book on prosecuting sex crimes in Texas), and assembled a large team of investigators, litigators, forensic laboratory personnel, and *Children's Advocacy Center* interviewers, trainers and therapists. The state's team obtained warrants, used sophisticated lighting technology to locate stains on the carpet in the child's room, and discovered the defendant's extensive rental history of movies featuring a young-girl-oral-sex theme.

The defendant was charged with two counts of Aggravated Sexual Assault of a Child (First Degree Felony, Tex. Pen. Code § 22.021) and one count of Indecency with a Child by Sexual Contact (Second Degree Felony, Tex. Pen. Code § 21.11). He was facing many decades in prison and the Texas crime lab gave the prosecution a tremendous amount of DNA evidence to help put the defendant away.

The Prosecution's Use of DNA Evidence

During the investigation, the police used an alternative light source in the child's room, found multiple fluorescing stains, and recovered a large piece of carpet from the bedroom floor. The crime lab then tested and retested numerous stains from the carpet. The crime lab's forensic biologists used a method called "differential DNA extraction" on the carpet stain samples. This technique attempts to purify a sperm cell DNA fraction — separating it from a second DNA fraction derived from non-sperm types (which can originate from various sources such as saliva, skin, or sweat). Although the DNA derived from the sperm fraction should be almost entirely comprised of male DNA, analysts are often unable to achieve a pristine purification of the sperm cell DNA.[4] In other words, it is possible that DNA derived from a number of non-sperm cell types could potentially end up in the sperm fraction. Keeping that in mind, if any differential extraction is performed on a mixture containing semen and saliva (presuming the accuracy of the complainant's allegations), the non-sperm cell fraction should logically include a substantial DNA component originating from salivary epithelial cells.[5]

To determine the origins of the DNA recovered from each of the two fractions from each carpet stain, the forensic lab initially gathered DNA samples from the defendant and the complainant for comparison purposes. The lab then compared the DNA profiles of the defendant and complainant to the DNA recovered from the carpet stains. In their first report, the forensic lab established that two of these stains, labeled "Stain A" and "Stain G," did indeed contain a mixture of sperm and non-sperm cell DNA. They also reported that the majority of the sperm cell fraction from "Stain A" matched the defendant's DNA profile. As for the non-sperm cell fraction in "Stain A," the lab reported a DNA mixture that was consistent with DNA profiles from the defendant, the complainant, and one unknown individual. In addition, the lab concluded that the sperm cell fraction from "Stain G" contained a mixture of DNA that matched the defendant, the complainant, and an unknown male. The non-sperm cell fraction in "Stain G" contained a mixture of DNA matching the complainant, an unknown male, and another individual.

Six months after the initial report, the state decided to collect and test a sample from the complainant's mother in order to compare her DNA profile with the mixtures reported from "Stain A" and "Stain G." Remember, individuals obtain half of their unique DNA from their mothers and half from their fathers. In the end, the crime lab had to acknowledge that the complainant's mother could have been a contributor to the non-sperm cell DNA component observed within the "Stain A" and "Stain G" DNA mixtures.

Also, a kinship analysis was done to determine the identity of the "unknown male." The lab concluded that the DNA most likely came from an individual who was either the biological father or a male child of the defendant. The prosecution, however, did not pursue either the defendant's father or son as potential suspects.

Because the many tests and analyses could easily overwhelm the jury, the prosecution's presentation was simple and straightforward. The police found two stains in the complainant's bedroom containing a mixture of sperm cell and non-sperm cell (that could have been salivary epithelial cells) DNA. In other words, it was entirely possible that the complainant's story about spitting ejaculate onto the carpet in her bedroom was true given that there were stains containing the defendant's sperm cell DNA mixed with non-sperm cell DNA that may have come from the complainant's saliva. It would be difficult for a jury to *not* be swayed by this straightforward and obvious reasoning. Instead of plowing through the complexities of science, DNA testing, and probabilities, the prosecution was able to present this evidence in a way that was clear-cut and trustworthy.

The Defense's Counter To the Prosecution's DNA Evidence

The defense recognized from the outset that the state's forensic biology methods were overwhelmingly complex, to say the least. Effectively reviewing and understanding articles about the science associated with extracting DNA evidence and the statistical analysis of match probability was challenging as well. For that reason, the defense team determined early in its preparation that it would be too taxing and time-consuming to educate jurors on how to decipher various results from the state's many tests, stains, and assays. The defense resolved to treat the DNA like any other evidence — pull it from the realm of science and demystify it as much as possible. As opposed to approaching the DNA results as a set of numbers, graphs and probabilities, the defense treated the DNA results as a set of facts that could be rationally described in an alternate context.

The defense had an alternate hypothesis of the DNA evidence: the defendant had broken his ankle and needed to sleep in a room with a bed that was low to the ground. The complainant spent much of her time at her biological father's house (i.e., not the defendant's home) and, therefore, her bedroom was often unoccupied. As a result, the defendant slept in the complainant's room when she was staying with her father, given his injury and inability to safely get in and out of the bed in his room. Additionally, when the complainant was visiting her father, the defendant engaged in normal marital relations with his wife (the complainant's mother). According to the defense's theory of the case, it was reasonable that any semen from the defendant — as well as the corresponding sperm cell DNA fraction — was present as a logical consequence of his sexual encounters with his wife, not the complainant.

In order to make this alternate hypothesis plausible and bend the prosecution's DNA evidence to support the theory, the defense team worked closely with another DNA expert witness who could explain the evidence in a way that a lay person could understand. This was essential. From there, the defense went through the assumptions listed earlier, figuring out what conclusions were necessary for a jury to get from the DNA to a finding of guilt. And finally, where possible, the defense launched an attack on the most susceptible assumptions.

Who Was Actually Present According to the DNA Evidence?

The defense team first attacked the assumption that the DNA evidence, having identified the defendant and placed him in the complainant's bedroom at some point in time, also proved that the defendant committed the alleged acts. In order to rebut this assumption, the defense team set out to show that the DNA evidence equally supported the defendant's alternate hypothesis (i.e., that his semen was present as a result of sexual encounters with the complainant's mother). The DNA evidence could be put in this context by showing that the non-sperm cells mixed with the defendant's sperm cells most likely came from the complainant's *mother*, rather than the complainant.

Table 1 is a portion of data taken from an "STR Worksheet" (called *short tandem repeats* in lab vernacular[6]) produced by the state's forensic lab in the case.[7]

Without context or explanation, these numbers are nonsensical and somewhat intimidating. This is the reason the data should not be presented to jurors in this unapproachable format without clear and detailed explanations. To that end, the defense team developed a way of using the numbers in Table 1 to support the conclusion that the DNA mixture only contained sperm cells from the defendant and non-sperm cells from the complainant's mother. How was this done?

The column on the far left of the STR Worksheet (Table 1) lists the identification/source of the DNA (a sample from the defendant, a sample from the complainant, a sample from the complainant's mother, the sperm fraction of Stain A, the non-sperm fraction of Stain A, the sperm fraction of Stain G, and the non-sperm fraction of Stain G). The top row contains a list of loci. Loci are areas along a strand of DNA that contain specific genes (i.e., alleles). To establish consistency between a known set of alleles (i.e., from a defendant) to an unknown set of alleles (i.e., in a stain or sample), the lab looks at the corresponding loci of the two DNA strands and determines whether or not there is such a consistency among the alleles.[8] The numbers list-

Table 1: Unaltered STR Worksheet

	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	AMEL	D5S818	FGA
Defendant	14, 14	29, 29	9, 10	12, 12	14, 15	6, 7	8, 12	12, 13	17, 17	11, 13	14, 19	8, 11	13, 13	X, Y	11, 13	20, 24
Complainant	11, 11	28, 31.2	8, 9	8, 10	14, 17	9.3, 9.3	8, 10	12, 12	17, 19	14, 15	17, 17	8, 11	14, 15	X, X	9, 11	19, 21
Mother	11, 15	28, 31.2	8, 11	8, 10	15, 17	7, 9.3	8, 8	12, 12	17, 24	14, 14	17, 18	11, 11	13, 14	X, X	9, 11	21, 26.2
Stain A (sperm)	(13), 14	29	9, 10	12, 12	14, 15	6, 7	8, 12	12, 13	17	11, 13	14, 19	8, 11	13, 13	X, Y	11, 13	20, 24
Stain A (non- sperm)	(11), (13), 14, (15)	(28), 29, 31.2	9, 10	(8), 12	14, 15	6, 7, (9.3)	8, 12	12, 13	17	11, 13, (14)	14, (17), (18), 19	8, 11	13, (14)	X, Y	(9), 11, 13	20, (21), 24
Stain G (sperm)	13, 14	28, 29	9, 10	10, 11, 12	14, 15,16, 17	6, 7	8, 12	12, 13	17, 23	11,13, 14, 15.2	14, 19	8, 11	12, 13	X, Y	11, 12, 13	20, 21
Stain G (non-sperm)	(11), 13, 14, (15)	28, 29, (31.2)	9	(8), (10), 11, 12	15, 16, (17)	6, 7, (9.3)	8, 12	12, 13	17, 23	13, (14), 15.2	14, (16), (17), (18)	INC	12, 13	X, Y	(11), 12, 13	20, 21

ed within the chart represents the identified STR alleles (i.e., the number of short tandem repeats of a particular DNA sequence) at the specific locus. For example, one of the loci tested was "D8S1179." At that locus, the defendant's alleles are 14, 14 while the complainant's alleles are 11, 11 and the mother's are 11, 15.[9] To use the STR Worksheet table, a lab technician need only play a matching game — observe a person's specific STR alleles from the various loci and note the inventory of matching alleles at the same set of loci with regard to the DNA results from each carpet stain. In analyzing a degraded or mixture sample[10] (i.e., one containing DNA from multiple contributors as in the defendant's case), if numerous matching alleles are observed from an individual, then this person most likely contributed DNA to the evidence sample.[11] The struggle for the defense was to present this information in a way that made sense, especially when the defense depended on explaining the allelic results in its favor.

Defense counsel explained the significance of the results in laymen's terms. It was the burden of the state's forensic biologist to demonstrate consistency between the defendant's alleles from each locus column to the alleles found in the evidentiary samples. With each consistent allele, the analyst could testify to an increased likelihood of a genuine profile match between the individual's DNA and the DNA reported from the carpet stain. However, to be truly certain that the defendant, the complainant, or another individual contributed DNA to each mystery stain, it was important to determine each individual's *unique* alleles (i.e., those numeric designations that only *one* individual from the group of potential contributors carries at a specific locus). The three-person universe in this case was defined as follows: the defendant, the complainant, and the complainant's mother. To compile an inventory of unique alleles, the defense compared the allele pairs of the defendant, the complainant, and the complainant's mother. After this was accomplished, the defense team blacked out any numbers that overlapped or matched. The remaining numbers were that individual's unique alleles (see Table 2).

Looking at the resultant chart, the defense indicated to the jury the following assertions:

The defendant had the following unique alleles at each locus: (a) 14 and 14 at D8S1179; (b) 29 and 29 at D21S11; (c) 10 at D7S820; (d) 12 and 12 at CSF1PO; (e) 6 at TH01; (e) 12 at D13S317; (f) 13 at D16S539; (g) 11 and 13 at D19S433; (h) 14 and 19 at vWA; (i) Y at AMEL; (j) 13 at D5S818; and (k) 20 and 24 at FGA.

The complainant had the following unique alleles at each locus: (a) 10 at D13S317; (b) 19 at D2S1338; (c) 15 at D19S433; (d) 15 at D18S51; and (e) 19 at FGA.

The complainant's mother had the following unique alleles at each locus: (a) 15 at D8S1179; (b) 11 at D7S820; (c) 24 at D2S1338; (d) 18 at vWA; and (e) 26.2 at FGA.

Based on these data, the defense agreed that the DNA evidence meant that the defendant was, in fact, present in the complainant's bedroom. His unique alleles could be found in the sperm and non-sperm fractions of each stain.

The same could not be said for the complainant. While the prosecution categorically stated that the complainant's non-sperm cells (most likely salivary epithelial cells) were those mixed with the defendant's sperm cells, her unique alleles were not present in any of the evidentiary samples. This was the opening the defense sought to exploit. The only way the state's assertion could be proven true was if the STR Worksheet showed that the stains contained the complainant's unique alleles in the stain mixtures. The state had to admit on cross-examination that the complainant and the complainant's mother shared many alleles at each locus. As a result, they had far fewer unique alleles than the defendant. It would be impossible to conclude whether the complainant or her mother had contributed an allele to the stain mixture because it could plausibly have come from *either* individual.

Moreover, in comparing the unique, non-blacked-out alleles in the chart to the alleles in each stain, Table 3 shows that there were unique alleles from the defendant (bolded) and the complainant's mother (underlined), but *none* from the complainant herself (italicized).

The task was to present this evidence in a clear and concise manner. Essentially, the defense team's DNA expert testified that he could not agree with the lab's conclusion that the complainant's DNA was in the stain mixtures. His opinion was based on the fact that the alleles unique to the complainant, which would have demonstrated with a greater certainty that the complainant's DNA was present, were nowhere to be found in the carpet stain mixtures. Instead, the defendant's story that he had engaged in sexual intercourse with the complainant's mother was far more likely given that some of the mother's unique alleles were clearly

Table 2: STR Worksheet With Blacked-Out Shared Alleles

	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	AMEL	D5S818	FGA
Defendant	14, 14	29, 29	[redacted] 10	12, 12	[redacted]	6 [redacted]	[redacted] 12	[redacted] 13	[redacted]	11, 13	14, 19	[redacted]	[redacted]	[redacted] Y	[redacted] 13	20, 24
Complainant	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted] 10	[redacted]	[redacted] 19	[redacted] 15	[redacted]	[redacted]	[redacted] 15	[redacted]	[redacted]	19 [redacted]
Mother	[redacted] 15	[redacted]	[redacted] 11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted] 24	[redacted]	[redacted] 18	[redacted]	[redacted]	[redacted]	[redacted]	[redacted] 26.2

Table 3: STR Worksheet With Unique Alleles Marked

	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	AMEL	D5S818	FGA
Defendant	**14, 14**	**29, 29**	[redacted] **10**	**12, 12**	[redacted]	**6** [redacted]	[redacted] **12**	[redacted] **13**	[redacted]	**11, 13**	**14, 19**	[redacted]	[redacted]	[redacted] **Y**	[redacted] **13**	**20, 24**
Complainant	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted] *10*	[redacted]	[redacted] *19*	[redacted] *15*	[redacted]	[redacted]	[redacted] *15*	[redacted]	[redacted]	*19* [redacted]
Mother	[redacted] 15	[redacted]	[redacted] 11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted] 24	[redacted]	[redacted] 18	[redacted]	[redacted]	[redacted]	[redacted]	[redacted] 26.2
Stain A (sperm)	(13), **14**	**29**	9, **10**	**12, 12**	14, 15	**6**, 7	8, **12**	12, **13**	17	**11, 13**	**14, 19**	8, 11	13, 13	X, **Y**	11, **13**	**20, 24**
Stain A (non-sperm)	(11), (13), **14**, (15)	(28), **29**, 31.2	9, **10**	(8), **12**	14, 15	**6**, 7, (9.3)	8, **12**	12, **13**	17	**11, 13**, (14)	**14**, (17), (18), **19**	8, 11	13, (14)	X, **Y**	(9), 11, **13**	**20**, (21), 24
Stain G (sperm)	13, **14**	28, **29**	9, **10**	10, 11, **12**	14, 15,16, 17	**6**, 7	8, **12**	12, **13**	17, 23	**11,13**, 14, 15.2	**14, 19**	8, 11	12, 13	X, **Y**	11, 12, **13**	**20**, 21
Stain G (non-sperm)	(11), 13, **14**, (15)	28, **29**, (31.2)	9	(8), (10), 11, **12**	15, 16, (17)	**6**, 7, (9.3)	8, **12**	12, **13**	17, 23	**13**, (14), 15.2	**14**, (16), (17), (18)	INC	12, 13	X, **Y**	(11), 12, **13**	**20**, 21

present in the stain mixtures. This testimony undercut the jury's assumption that the mixture of DNA meant that the defendant had engaged in forced oral sex with the complainant.

Did the DNA Evidence Prove That the Complainant's Story Was True?

The defense also challenged the jury's assumptions by demonstrating that there was not enough DNA from any of the individuals listed to prove that the complainant's story was true. This was a two-pronged attack.

First, the defense used the electropherograms (e-grams) to compare the amount of DNA from each individual found in each of the stain mixtures. Table 4 is an example of a portion of one of the e-grams (from the non-sperm fraction of Stain A on the carpet).

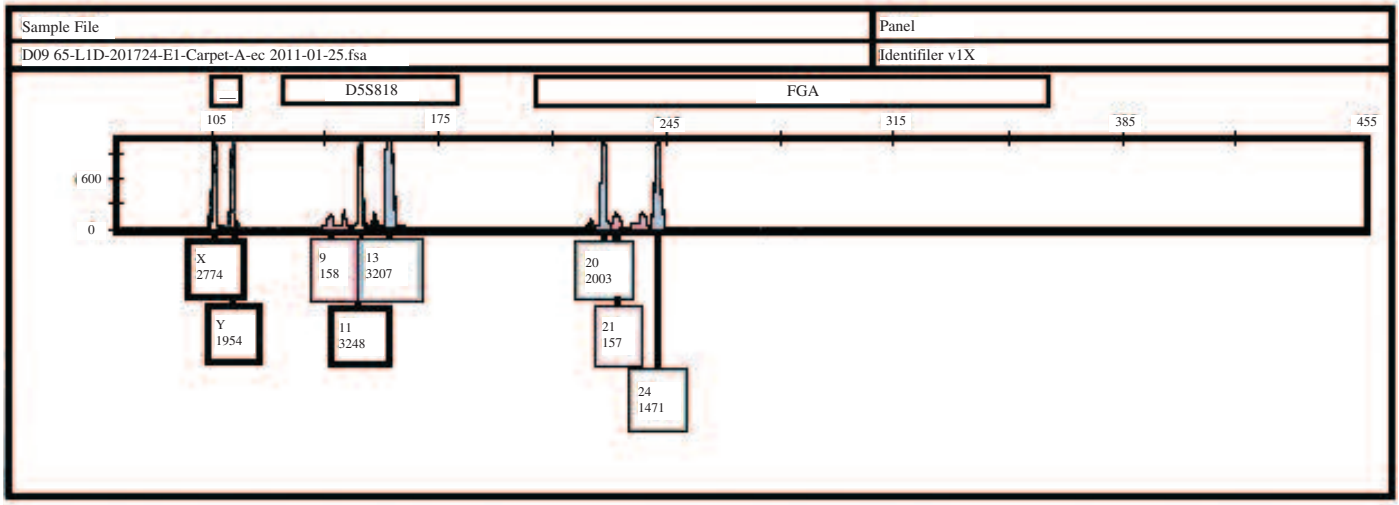
Obviously, these charts can be more harmful than helpful without context. The defense team used its DNA expert to explain that this chart represents three specific loci that the lab examined to compare the alleles between the unknown stain DNA and each individual's DNA. The peaks (depicted in a way that is similar to the heartbeat-like signals on an EKG chart) represent the amount of each allele found at each locus. The higher the peak, the greater the quantity of DNA representing that allele.[12] The defense used the e-grams to show that the alleles unique to the defendant comprised the vast majority of genetic material in the stains. The much larger peaks on this e-gram (all corresponding to the defendant's alleles) were highlighted in blue. This was then compared with the much smaller peaks (alleles that certainly could not have been contributed by the defendant) — which were highlighted in pink to signify a presumed female contribution (given that these alleles could have come from either the complainant or the complainant's mother). Again, this color-coded depiction illustrated the presence of profoundly more DNA from the male defendant in comparison to DNA from any presumed female contributors detected in each of the stains.

Slowly, and in step-by-step fashion, the defense demonstrated that the complainant's story was highly implausible. Saliva is a very rich source of DNA material. In the event that the complainant had actually deposited a saliva/semen mixture onto the carpet, positive saliva tests could have been readily obtained. The lab, however, had never analyzed the carpet stains for the presence of saliva, even though tests for saliva detection are widely available and in common usage in labs across the country.[13] Furthermore, the e-grams would have revealed much more than the diminutive pink signals by comparison to the observed larger blue peaks. Essentially, the e-grams showed that there was very little DNA from any female contributor — certainly not enough to prove the presence of DNA-rich saliva — which undermined the complainant's story about spitting onto the floor. The data simply did not support the state's conclusion given the comparative amounts of DNA from the three individuals tested.

Second, the defense also focused on the lab's finding with regard to the overall amount of sperm cell DNA recovered from the carpet stain mixtures. After the complainant's direct examination at trial, which included grisly stories of repeated abuse, and after the state's experts described test after test and stain after stain, the prosecution's version of the story made it sound as if the stains contained massive amounts of ejaculate from the defendant. The defense surmised that this overreach impacted the jurors' imaginations as to how much semen was present on the bedroom carpet. In order to combat this assumption and the assumption that the presence of the defendant's semen supported the veracity of the complainant's story, the defense had to make clear exactly how much semen was present.

The state's experts testified that their DNA extractions from the carpet stains produced approximately 325 nanograms of sperm cell fraction DNA on the carpet that was mostly attributable to the defendant. That number, without any additional explanation, suggested to the jury that a substantial amount of the defendant's semen was found all over the complainant's bedroom. The defense attacked this assumption as well. The defense's DNA expert testified that there are well over 15,000 nanograms of DNA in a *single* drop of semen. To offer a more conservative estimate to the jury, the defense presumed that the crime lab forensic biologist could have extracted as much as 3,000 nanograms of sperm cell DNA from the stains tested (rather than the modest 325 nanograms actually recovered). The defense then sought to offer a means to visualize the collective total volume of semen (based on the conservative estimate of 3,000 nanograms) present in the carpet stains. From stain after stain, cutting after cutting, test after test, there was less than *one-fifth of one drop* of semen confirmed within the stains. At trial, the defense attorney made sure the impact of this statement was not lost on the jury. He placed a sin-

Table 4: E-gram



gle drop of water on an overhead projector and proceeded to wipe away all but *an estimated one-fifth* of that drop. The jury could not possibly conclude that the defendant had ejaculated into the complainant's mouth given the insignificant amount of semen-derived DNA that was reported.

Both of these arguments (concerning the lack of DNA from the complainant and the insignificant amount of semen) were necessary to show the jury that the state's conclusions were faulty. The jury was not allowed to assume that the presence of DNA meant that the defendant was guilty. On the contrary, once the DNA evidence was put into context, there was no way the jury could reach a finding of guilty solely based on that evidence.

Could the Results Actually Be Trusted?

Finally, the defense challenged the overall reliability of the DNA results themselves; however, it was not necessary to attack the actual science behind the results. The state's data were put together and interpreted by people. People are fallible. Maybe their numbers were correct, but all the circumstances had to be examined. Thus, the defense chose to look at the *human* side of the process and, with the help of its DNA expert, examined the paperwork and the story that surrounded the lab's final results.

In this case, the defense found several notes from the lab indicating that the prosecution was heavily involved in the DNA extraction and testing processes. Notes indicated that assistant attorneys general had visited the lab, urged the lab to retest additional stains, and even made suggestions concerning the presence of bleach. Cross-examination with these notes cast doubt on whether the lab was independent and had reported the results accurately and fairly. By suggesting to the jury that the prosecution had exercised undue influence on the lab, the defense was able to cast additional doubt on the efficacy of the DNA evidence without having to attack the actual scientific process. The jury could readily understand, and even may have taken greater interest in, the kind of human scandal being presented. Again, this was an alternate way to challenge the DNA evidence without the risk of confusing or overwhelming the jury with potential scientific errors or procedural anomalies.

As indicated by the jury's verdict, the defense's strategy was ultimately suc-

cessful. The jury was not permitted to engage in "if DNA, then guilty" reasoning unchecked. Instead, the defense challenged the DNA evidence in a way that was clearer and more trustworthy than the prosecution's presentation. Rather than becoming overwhelmed or intimidated by forensic biology, charts, and numbers, the defense presented the DNA evidence just as it would any other piece of evidence

.

Conclusions and Caveats

There are always caveats to such success stories. First and foremost, DNA evidence was only a piece of the puzzle — the defense team also needed to effectively cross-examine the complaining witness and rebut many behavioral sciences experts who did their best to implicate the defendant. Second, this approach will not work in every case. This case was unique — rather than trying to refute the identification aspect of the DNA evidence, the defense instead attacked the significance of that identification. While the defendant's semen was present at the scene, it did not get there because the prosecution's story was true. That distinction was available due to the facts of the case. Conversely, when a defendant's innocence depends on demonstrating that he or she was never present at the scene, other strategies will likely be necessary. The defense team was lucky to have the expert support and factual basis to effectively rebut the prosecution's DNA evidence, but that doesn't mean the defense didn't need to be creative and vigilant in turning the evidence back in the defendant's favor and challenging the jurors' preconceived notions. This will always be a battle, regardless of a case's unique facts.

Notes

1. Kimberly Cogdell Boies, *Misuse of DNA Evidence Is Not Always a "Harmless Error": DNA Evidence, Prosecutorial Misconduct, and Wrongful Conviction*, 17 Tex. Wesleyan L. Rev. 403, 416-17 (2011) (describing the "CSI Effect" whereby popular television shows such as *CSI* indoctrinate jurors with preconceived expectations about DNA evidence but fail to provide any additional understanding of how such evidence is used at trial).

2. *Id.*

3. Joel D. Lieberman et al., *Gold versus Platinum: Do Jurors Recognize the Superiority and Limitations of DNA Evidence Compared to Other Types of Forensic Evidence?* 14 Psychol. Pub. Pol'y & L. 27, 52-53 (2008) (concluding that jurors give greater weight to DNA evidence presented at trial than other types of evidence — jurors found DNA evidence to be 95 percent accurate and 94 percent persuasive).

4. The Forensic Laboratory Handbook: Procedures and Practice 15 (Ashraf Mozayani & Carla Noziglia eds., 2006).

5. The State could have argued that the samples did not contain saliva because many other factors could have accounted for the lack of orally derived epithelial cells, such as how the evidence was sampled, how long it had been on the carpet, and whether the sample was properly collected and stored. Nevertheless, this counterargument was not presented by the State at trial and, therefore, is not directly addressed in this article. However, a defense team should consider these alternate explanations and caveats in preparing its case in order to better rebut the prosecution's DNA evidence and supporting expert testimony.

6. A helpful glossary of commonly used terms that will help readers understand many of the scientific terms used in this article can be found at http://www.cstl.nist.gov/strbase/glossary.htm (last visited Dec. 31, 2014).

7. The numerical data and locus labels included within the table were copied faithfully and directly from the STR Worksheet produced by the prosecution during the discovery stage of the defendant's case. In order to protect the identities of the defendant, the complainant, and the complainant's mother, the names have been altered. No other changes have been made to the substantive information set forth in the table.

8. Nat'l Inst. of Just., *DNA Evidence: Basics of Analyzing*, http://nij.gov/topics/forensics/evidence/dna/basics/pages/analyzing.aspx (Aug. 9, 2012).

9. The defendant appears to have inherited the same allele, 14, from both of his parents, thus rendering his profile as 14, 14 (homozygous). The same is true of the complainant, whose homozygous allele profile is 11, 11. The complainant's mother, on the other hand, appears to have inherited different alleles from each of her parents, rendering her profile as 11, 15 (heterozygous).

10. It should be noted that analyzing degraded or mixture samples may be further complicated by other factors that are beyond the scope of this article.

11. *Id.*

12. Patricia Nolan Bertino, *DNA STR Profiles: How to Read Electropherograms*; http://www.bertinoforensics.com/teacher_resources.html (last visited Nov. 23, 2014).

13. *See, e.g.*, IFI DNA Testing and Technologies, *RSID — Saliva*, http://www.ifi-test.com/rsidtm-saliva/ (last visited Dec. 3, 2014). ■

About the Authors

Christina T. Kline is an associate attorney at the litigation firm *Lorandos Joshi* in Ann Arbor, Mich. She earned a bachelor's degree with high honors from the University of California, Berkeley. She graduated from the University of Illinois, College of Law *magna cum laude*. She was instrumental in building the DNA defense in this case.

Christina T. Kline
Lorandos Joshi
2400 S. Huron Parkway
Ann Arbor, MI 48104
734-327-5030
E-MAIL c.kline@lorandoslaw.com

Demosthenes Lorandos, Ph.D., is a licensed forensic psychologist and trial attorney. He is the senior litigator at the litigation firm *Lorandos Joshi* in Ann Arbor, Mich. He was the leader of the defense team in this case.

Demosthenes Lorandos, Ph.D.
Lorandos Joshi
2400 S. Huron Parkway
Ann Arbor, MI 48104
734-327-5030
E-MAIL d.lorandos@lorandoslaw.com

Michael Spence, Ph.D., is a molecular biologist and specialist in forensic biology, DNA analysis, consultation, and trial planning. He is the founder of Spence Forensic Resources in Las Cruces, N.M. Dr. Spence was the trial consultant and expert witness for the defense in this case.

Michael Spence, Ph.D.
Spence Forensic Resources
2455 E. Missouri Avenue
Suite A
Las Cruces, NM 88001
575-556-8513
E-MAIL info@spenceforensics.com