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Winning Despite DNA: The Truth You Must Reveal

The report from the crime lab arrives. After visual and alternate light source testing, the 14-year-old victim's underwear "reveals stains characteristic of semen." Chemical and serological examination of the victim's bedsheet "confirms the presence of seminal fluid." And the lab found male DNA on her vaginal/cervical swab from the rape kit.

There is a presumption of infallibility when it comes to biological evidence and DNA. When battling against sex assault allegations, nothing is more frightening for defense attorneys than prosecutors saying they "have DNA evidence" against a client, i.e., that the crime lab forensic biologists have concluded that the client's body fluids, DNA, or other corroborative evidence has been found on or inside the alleged victim or at the crime scene. In most cases, prosecutors blindly accept the language found in the crime lab's reports.

It is easy for defense attorneys to become overwhelmed by DNA evidence and to believe they have no way to fight back against the allegations. This is not true. The questions remain: What does the evidence really show? What evidence is missing that a forensic biologist might "expect to find" under the circumstances?

This article is the result of two successful trials in which the government charged multiple aggravated counts of sexual assault, carrying mandatory prison sentences of 25 years to life, based on the purported strength of the DNA evidence. While this article is not a comprehensive explanation all DNA defenses, the reader will come to understand how the issues of location and transfer of DNA were critical to defending against the DNA evidence as well as that crime lab reports do not always reveal the full truth about the biological evidence and DNA.

With little resources, defense counsel can battle back against the misguided prosecutor's purported DNA evidence and demonstrate to the jury that there are other plausible explanations, many of which may come from the mouths of the government's forensic biologists themselves. In the end, the jury can understand that what may look like damaging evidence against the client has been neutralized by the defense team's better understanding of DNA evidence and defense counsel's revelation of the truth to the jury.

First, Some Basics

Transfer of DNA

To be relevant to a criminal allegation, biological evidence and DNA must be transferred to an object or person that is spatially proximate to the crime. Skin cells, white blood cells, hair follicles and sperm cells all contain DNA and, as such, are considered "sources" of DNA. A small amount of any of these sources can create a full DNA profile, which can identify the client to the exclusion of any other person on the planet save his or her identical twin.

BY JASON B. SHEFFIELD

People can transfer their sources of DNA in many ways. They include transfer via saliva, urine, blood, vaginal discharge, pre-ejaculate, ejaculate, and through touch.[1]

Saliva contains a heavy concentration of skin cells. This is the reason police use "buccal swabs" to create profiles. Urine contains skin cells that release from the walls of the urethra. White bloods cells are a rich source. Vaginal drainage traps skin cells and/or another person's DNA left via digital penetration or intercourse. Men can leave behind pre-ejaculate (a nutrient-rich fluid for sperm), which also contains skin cells and some sperm cells that leak out of the penis prior to ejaculation. Ejaculate contains densely collected sperm cells. Finally, DNA can be left behind through a person's skin coming into contact with another person or object, also known as "touch DNA."

'Touch' DNA

Humans constantly shed skin cells and the DNA within at varying rates. The oils on the skin, along with sweat, can make skin cells sticky and facilitate a greater chance of transfer onto an object. All detectives will admit they wear gloves at a crime scene for this reason. Bed sheets, shirt collars, and hats are a rich depository of touch DNA.

One's skin cells can be transferred to the alleged victim in sexual assault cases not only when a man touches the alleged victim (direct), but also when the alleged victim touches the man and then touches herself (indirect). This subsequent transfer can continue on and on. Thus, innocuous, innocent contact with the alleged victim can result in the defendant's DNA being transferred anywhere. It is important to note that touch DNA, whether deposited directly or indirectly, can result in a full DNA profile.[2]

Evidence Collection and Testing

The goal of any prosecutor is to get the expert's opinion to a "reasonable degree of scientific certainty" about the source of the DNA, the transfer mechanism, and to whom it belongs. Investigators should collect any item they believe may have come into contact with or was used by the perpetrator. The investigators will place those items in paper bags, not plastic, and bring them back to the crime lab to determine the source of the DNA and how it was transferred.

Scientists will first conduct a (1) visual examination of any items collected to look for various biological fluids and stains. They do this by using natural light and fluorescent light. Based on the way the stain looks under these circumstances, a scientist may conclude the stain is "consistent with" blood, saliva, or seminal fluid.

Next, the scientists will take a cutting[3] from the stain observed and submit the cutting to additional, more rigorous tests. These tests include the following: (2) chemical testing to look for seminal fluid; (3) microscopically viewing smears of the stain(s) to look for spermatozoa; (4) serological testing to confirm the presence of seminal fluid; (5) male DNA testing, which concludes the presence of male DNA; and (6) DNA typing to identify the perpetrator to a certain statistical relevance.

DNA on or in the Alleged Victim

If contact or penetration is alleged, the alleged victim will be taken for a SANE examination where a doctor or Sex Assault Nurse Examiner will conduct a forensic[4] examination for possible injuries and collect swabs from *inside* her oral, vaginal, and anal cavity.[5] It is common practice also to take "peri" swabs or swabs around the vagina and anus, as it is common for discharge or drainage to flow into those areas.[6] These swabs are preserved as part of the evidence in the case and are later tested.

A Working Example: Case Allegations and Crime Lab Results

In two similar cases, the teenage victims accused the defendants of vaginal and anal rape and digital penetration. The government presented a wide spectrum of biological and DNA evidence. This article combines elements of each case to create a new hypothetic case.

The 15-year-old alleged victim claimed her mother's boyfriend came into her room at 2:00 a.m., climbed into her bed, removed his clothing and her running shorts, and then penetrated her vagina and rectum without using a condom. She feigned sleep until she could no longer do so. Then, she complied due to her fear of what he would do if she resisted. She claimed he ejaculated on himself and used a towel from her bathroom to clean himself. She urinated afterwards, put her running shorts back on, and went back to bed. She did not shower or douche.

She was taken for a SANE later that same day, which was performed within 18 hours of the alleged assault. The doctor preserved the evidence in a rape kit. Police took her bedsheet, towel, and running shorts for examination.

The crime lab did extensive testing on the bed sheet and the girl's shorts, both of which revealed results that were helpful to the prosecution, including the presence of seminal fluid and sperm. The towel revealed the defendant's DNA. This led to the government charging the defendant with rape, aggravated child molestation, aggravated sodomy, and aggravated sexual battery.

The defendant denied all allegations, including ever being in her room.

Visual/ALS Testing: Bed Sheet, Running Shorts, and Towel

What It Is[7]

When there is any object suspected to contain biological fluid, the first stage of testing is visual/alternative light source ("ALS") testing. Biological stains have common colors that range from chalky white (ejaculate) to yellow (urine or ejaculate) to red (blood). The lab scientists will create a numbering system about the stains they observe, may circle the stains on the object, and then move the object into a darkroom for fluorescent light/ALS testing.

Certain biological fluids will glow under ALS. Some glow more brightly than others. Seminal fluid and/or semen (the combination of seminal fluid and sperm) glows very brightly.

Government's Case

The government's expert unveiled the items seized to the jury and showed the jury photographs of the stains under ALS. She then testified that the bedsheet, the crotch of the victim's running shorts, and the towel all revealed stains "characteristic of semen." The government argued that the expert's testimony corroborated the victim's account. These test results would not exist but for the defendant's assault of the victim.

Defense Strategy

On cross-examination of the government's expert and through a defense expert, the jury learned that ALS would cause other stains to glow that have absolutely nothing to do with seminal fluid. These stains include detergents and paint, but more importantly saliva, sweat, urine, and vaginal secretions![8] ALS testing is only a preliminary test for seminal fluid or semen; it is not "conclusive." The state's expert had to admit that the stain was "equally consistent with vaginal secretions or urine."

Chemical Examination: Acid Phosphatase (AP Test):

What It Is[9]

The lab conducts a chemical examination following the ALS testing. The scientists take a cutting from the stain they previously visualized under ALS and place it into a testing kit that resembles a contact lens holder. They add a few drops of a clear chemical and note if the color changes (usually violet/purple). If so, the crime lab will report that the chemical test "*indicates* the presence of seminal fluid." Any color change, no matter how slight, indicates the presence of seminal fluid.

Government's Case

The government's expert testified that she took a cutting from the bed sheet, the crotch of the running shorts, and the towel. She performed her testing according to protocol, and she noted how each chemical test on each object "indicated the presence of seminal fluid."

Defense Strategy

In cross-examining the expert, the jury learned that just as ALS has alternative explanations for glowing stains, this test also reacts and changes color for substances other than seminal fluid. In fact, the test can also show color change with certain levels of saliva and vaginal secretions — also known as "false positives." The secret to this fact lies with knowing the "sensitivity" of the test, i.e., knowing what minimum concentrations of saliva or vaginal secretions need to be present to cause the test to change color. Because each kit manufacturer has its own sensitivity level, defense counsel may need to consult with the defense expert. Here, however, the government's expert admitted the test did not conclusively prove seminal fluid for these reasons. In the absence of cross-examination, the jury would have been left with the wrong impression.

Microscopic Examination: Smears

What It Is[10]

If the chemical test indicates seminal fluid, the crime lab scientist will take a second cutting from the object adjacent to the first and soak it in a chemical reagent. The scientist then "smears" or rubs the fluid on a glass slide. Under a high-powered lens, the scientist can visualize sperm and *confirm* its presence on the object. If sperm is confirmed, there is no need to do further serological testing via the P30 test (explained below). The microscope test is the only "true confirmatory test" for sperm.

Government's Case

The crime lab scientist testified she saw "few partially intact spermatozoa" on the bed sheet and "many intact sperm" on the towel. There were no sperm seen on the victim's running shorts. Based on the victim's testimony that the defendant removed his penis before ejaculating and that she urinated after intercourse and wiped, the crime lab scientist testified that she would "expect to find" sperm in the crotch of the shorts.

In closing, the government argued the evidence on the bed sheet and towel corroborated the victim's account that the defendant ejaculated in the victim's bed and used her towel to clean himself off. Regarding the running shorts, the government argued that because the defendant removed his penis before ejaculation, there was no sperm on the victim and thus no reason for sperm to be left behind in the running shorts.

Defense Strategy

Unfortunately, the towel had conclusive evidence that it not only contained sperm cells, but also the defendant's DNA to the exclusion of all others. The question remained, however, about the towel: Did it really come from the victim's bathroom or did she remove it from the defendant's bathroom or laundry and plant it in her bathroom?[11]

The defense's expert disagreed with the government expert's report that the sheet had "few partial sperm" on it. In fact, the photo taken of the microscope's visual field showed only *one* round object. But it did not have a "collar" or a "tail." Without these identifying characteristics, the defense expert testified it was not a sperm cell but was "most likely" a fungal cell.

While the government had its argument about the shorts, the testimony about urination clearing sperm was wrong. It failed to acknowledge the phenomenon of "vaginal discharge/drainage" and what might possibly be found in the crotch under normal circumstances.

Two defense experts, a SANE nurse and a forensic biologist, testified that urinating does not clear ejaculate from inside the vagina because the urethra is outside the vagina. Only douching would do this. Additionally, both experts testified that men leak pre-ejaculate throughout intercourse and well before ejaculation. This fluid oftentimes contains sperm cells, which can be found inside the vagina when no condom was used, as in the allegations in this case. Through the process of excreting discharge, females can leak this fluid into the crotch of their underwear (or lining of their running shorts). Thus, it was *possible* that sperm would be found in the shorts despite no ejaculation at all.

Defense counsel was able to amplify the argument because vaginal secretions were actually found in the crotch (confirmed by the ALS test and the AP test). Thus, the absence of sperm in the crotch was inconsistent with the allegations: specifically, that when unprotected intercourse was alleged and pre-ejaculate is known to occur prior to ejaculation, the jury should expect evidence of sperm cells in the crotch. No sperm cells equated to no intercourse.

Serological Examination: The PSA Test

What It Is[12]

Absence a finding under the microscope, the crime lab scientist will perform a second chemical test, which is designed to be a second attempt to *confirm* the presence of seminal fluid absent a visual confirmation under the microscope. Called the P30 test, it looks for a specific protein only found in men: the Prostate Specific Antigen ("PSA").

The kit resembles a pregnancy test strip where one exposes a testing stick to the fluid created when one mixes a third cutting and a new chemical. It is considered positive or "confirmatory" for seminal fluid if two lines appear in the viewing field of the testing stick. One line is negative.

Government's Case

The crime lab did not perform the additional confirmatory serological test due to the ample sperm cells found on the towel under microscope.

Due to the minimal nature of the sperm evidence on the sheet, the crime lab opted to perform the serological test in an attempt to resolve the question of seminal fluid. In doing so, however, serological testing of the bed sheet "*failed to confirm* the presence of seminal fluid." The government's case suddenly had a conflict in the evidence, and the biologist had to admit it.

As for the crotch of the shorts, the biologist testified that the P30 test "*con-*

The PSA test is considered confirmatory for seminal fluid if two lines appear in the viewing field.

firmed the presence of seminal fluid." It was a big blow to the defense because it essentially confirmed the defense's theory of drainage and that the victim's drainage contained a protein that can only come from a male's penis.

Defense Strategy

After this third test, the bedsheet became less significant to the government's case and more supportive of the defense. The towel was beyond contradiction. The running shorts, however, were still in play for the government unless neutralized.

The learned truth is the PSA is not specific to just the male prostate! In fact, the crime lab's training included the fact that it could be found in lesser concentrations in saliva, amniotic fluid, female serum, breast milk, and most importantly *female urine*.[13] The defense team offered this testimony through its own forensic biologist because the lab scientist vacillated a bit on cross.[14]

In summary, (1) defense evidence showed that the glow in the crotch of the running shorts could be vaginal secretions; (2) the AP test (a test for semen) had a false positive for vaginal secretions; (3) there were no sperm cells on microscope; and (4) the P30 test (a test for prostate proteins) had a false positive for female urine.

After acquittal, the jury revealed they were appalled that the government left it to the defense to point out the false positive nature of these tests.

Male DNA: Y-STR Typing

What It Is

Of particular significance is the determination of whether the victim has the presence of male DNA in or on her body.[15] Depending on her age and/or claim, any male DNA found on her intimate parts — breasts, buttocks, inner thighs, vaginal, rectum — will create suspicion and fortify the government's case because it raises this question: What is male DNA doing there?

The test detects the presence of *male* DNA[16] by looking solely for evidence of the male's "Y" chromosome.[17] Thus, if the test finds the presence of "Y" chromosomes, they cannot be related to the alleged victim; they must be from a male. How does the test work? Imagine searching through a bowl of thousands of plastic marbles in search of two magnetic ones. The Y-STR test is the equivalent of using a magnet to home in on and extract those two magnetic marbles. It does not become blinded or confused by the unrelated plastic marbles.

Once male DNA is discovered, the government will seek to answer these questions: To whom does the DNA belong? (See DNA Typing below.); What is the source of the male DNA — skin, blood, or sperm? How did it get there — touch, saliva, drainage, or ejaculate?

Government's Case

The biologist for the government testified that she received vaginal, cervical and anal swabs, which were collected within 18 hours of the alleged assault by the SANE exam nurse. The results on all, however, were negative: no male DNA found.

Interestingly, the government's expert testified that she would "not expect to find" male DNA from the vaginal or rectal swab because the victim's DNA would "overpower" any male DNA. No amount of cross-examination could undo her testimony. The government later argued that it was possible male DNA was present, just overpowered.

Defense Strategy

Defense experts testified that the government's testimony was in error. After all, if the victim's DNA could overpower the male's DNA, what would be the point of a "male DNA" test?

Next, defense experts educated the jury on the transfer of DNA through touch inside the vagina and rectum, and they responded to a series of hypothetical questions to solidify the point. Yes, there were certain circumstances in which male DNA was "more likely" to be found:[18] digital penetration (fingers); intercourse when no condom was used; forceful penetration without lubrication; using saliva as a lubricant; no douching afterwards (and urinating or showering does not remove the male DNA from inside the vagina); and swabbing those areas within 18 to 24 hours. These circumstances were all facts in the defendant's case.

Ultimately, defense experts testified that a "higher probability" existed that male DNA would be found on the swabs under those specific facts and circumstances. In closing, defense counsel argued the absence of male DNA on the swabs was conclusive proof that the alleged victim lied. There was no intercourse or sodomy.

DNA Typing

What It Is

At its best, "DNA typing" evidence can only corroborate a claim; it cannot prove counsel's client committed the crime. However, the presence of the client's DNA at a certain location can absolutely sink the client's case unless defense counsel can explain how it got on the victim in a way that is consistent with his innocence.

When weighing the strength of DNA evidence, counsel must consider several different factors before being able to determine just how bad (or how neutral) the evidence is. For example, the location of the DNA, the absence of the DNA from where it might be expected, the various tests used along the way by the crime lab, and the statistical analysis of the results can create many levels of attack by counsel in defense of the client.

If present, DNA typing can produce a statistical certainty that the DNA at a particular location is the client's DNA to the exclusion of all others on the planet, save his identical twin. The defense attorney needs to explain that. It may be, however, that the client "cannot be excluded" or, in other words, is "includ-

ed" in the population of *possible* people with no greater certainty than "one of any of the males in the defendant's paternal line" or better yet, "one out of every four" persons on the planet. During trial, this would be the equivalent of telling the jurors that *3 out of the 12 of them* similarly are included in the DNA results. (Where was Juror Number Four that night?)

Government's Case

Due to the "few sperm" found on the sheet, the lab performed DNA typing. The biologists homed in on the same 2mm x 2mm cutting where they saw the "sperm," and discovered surprising results: there was evidence of "at least three profiles." Of the three, the victim was the only conclusive ID at 1 and 9 quintillion. Of the other two profiles, one purportedly "matched" the defendant. The government, however, chose *not to inform* the jury about the DNA results on the sheet. They were afraid it would "open the door" to the unknown third profile and permit the defense to offer evidence of the girl being caught having a sexual relationship with her boyfriend, which would traditionally be barred by the Rape Shield Statute.[19]

Figure 1: Known DNA of Victim

Loci	Victim's Mother's / Father's Alleles
1	12 / 15
2	7 /11
3	10 / 9
4	15
5	13 / 14
6	27 / 22
7	13
8	17 / 15
9	14 / 18
10	13 / 19
11	25 / 22
12	11 / 9
13	23/ 15
14	14 / 12
15	5 / 10
16	14

The government's scientist testified that the defendant's DNA on the towel was present to the statistical certainty of 1 and 9 quintillion. There are only 6 billion people on the planet. The DNA found on the towel definitely belonged to the defendant (or his identical twin), save contamination issues. In closing, the government reminded the jury that microscope testing revealed many sperm cells, which led to its conclusion that there was no plausible explanation for the defendant's towel with semen on it being in the alleged victim's private bathroom other than her report.

The biologist also gave inflammatory testimony that there was a second profile on the towel found in the same 2mm x 2mm cutting, which "matched" the victim. Based on the victim's testimony that the defendant penetrated her vagina without a condom and then wiped himself with the towel, the biologist explained that the victim's DNA could be on the towel simply due to his penetration of her vagina as she testified.

Defense Strategy

Defense experts disagreed not only with the biologist's use of the word "match" at trial but also in her report. They disagreed because the word "match" created the appearance that the crime lab had conclusively determined the second profile in fact belonged to the victim. Nothing was further from the truth.

Defense experts explained that the second profile only created a statistical certainty of *one out of every four* people. The alleged victim was only *included* in the possible population of people, just as one out of every four of the jurors was *included*. It gets better, however. Based on the DNA profile, the alleged victim's mother was also included in the population — the mother who shared a bathroom with the defendant.

This allowed defense counsel to argue that the DNA evidence on the towel proved only that the defendant had ejaculated on it and that it was equally probable the mother's DNA was on it. To solidify this point, defense counsel offered additional testimony that (1) the towel matched a set of towels only used by the defendant and the girl's mother and (2) the alleged victim had her own set of towels.

To help the jury understand that the mother was included in the possible ID, defense counsel and defense experts had to simplify DNA typing.

First, the jury learned that to reach the point where a DNA expert can create a statistic in the trillions, DNA typing homes in on 16 to 23 locations on a strand of DNA. While a strand of DNA has millions of locations, it is this limited number that is used to distinguish one human being from another. These locations are called loci. The graph in Figure 1 represents this in the left column. At each locus, an individual will have two alleles, one from the mother and one from the father. This will be represented by two numbers.[20] Sometimes, the mother and father give the same number at the same loci. In that case, only one number will be seen at that loci. Loci 4, 7, and 16 show this in the right column.

To get to the point of analysis, one must compare a "known sample of DNA" to an "unknown sample" or "suspected sample" and see where (or if) they match at these 16 loci. In the case, defense counsel needed to prove the second profile on the towel similarly "matched" the mother. Using the known DNA of the victim (Figure 1) and the unknown second profile (Figure 2) on the towel, defense experts explained the unknown profile was not as complete as the known profile. It only showed one allele at each of three locations — 5, 10, and 13.

Of course, the scientists at the crime lab were only asked to compare the victim's known with the unknown second profile. When they did, they wrote that the results "matched the victim at three loci." Figure 3 shows how they lined it up to compare.

The government did not seek to obtain the mother's DNA or DNA from the victim's father, which meant the government did not know which alleles the mother or father contributed at the victim's loci. In other words, was it the 14 or the 13 from the mother at loci 5? Not knowing the answer allowed the defense experts to testify that the 13 at loci 5 could be from the mother. The testimony was the same regarding the 13 at loci 10 and the 23 at loci 13. Thus, the jury learned the DNA on the towel not only "matched" one out of four people in the population, but also the victim's mother.

The same was true on cross-examination of the government's biologist: She had to concede the point and admit she could not tell the jury that

Figure 2: Uknown Profile	
Loci	**Unknown 2nd Profile**
1	
2	
3	
4	
5	13
6	
7	
8	
9	
10	13
11	
12	
13	23
14	
15	
16	

the second profile, in fact, belonged to the victim.

Male DNA: E1 and E2 Fractions During Separation

What It Is[21]

The government has another avenue to argue that its DNA evidence supports the claim that sperm is present on an object or swab. This information is not directly set out in any report. Thus, defense counsel can be blindsided by this testimony.

During the process of DNA typing, the biologist will soak the cutting or swab and drain the fluid into a small tube. The biologist places the tube into a centrifuge machine and spins it at a high rate. This spinning is *designed* to separate lighter weight skin cells from heavier sperm cells. The lighter weight skin cells accumulate at the top of the tube and are referred to as the "E1 Fraction." The heavier weight sperm cells move to the bottom portion of the tube and form a harder pellet referred to as the "E2 Fraction." The biologist draws off the E1 Fraction by using a pipette and tests for DNA. Any results are presumed to be from skin cells.

The biologist adds a more stringent chemical back to the tube where the harder pellet remains. These chemicals break open the sperm cells in the E2 Fraction for DNA typing. The results of the DNA from both the E1 and E2 Fraction are reported on internal lab documents, which can be retrieved by both parties. If there is any DNA found in the E2 Fraction, the lab *presumes* that it is from sperm, based on the inherent nature of the centrifuge separation process. The absence of any DNA in the E2 layer is yet another way to demonstrate to the jury that no sperm is present where one would expect to find it.

Government's Case

The DNA from the towel came from the E2 Fraction, as expected. The second profile came from the E1 Fraction. Because there was "no male DNA" found on any of the swabs, there was no further attempt to do DNA typing. Again, the government did not address the three profiles found on the sheet.

Defense Strategy

Due to the court's ruling on the sheet, defense experts informed the jury more thoroughly about the E2 Fraction. The experts highlighted that there was no DNA found in the E2 Fraction, which meant no sperm on the sheet. This corroborated the defense expert's former testimony that the alleged "few sperm" on the sheet was more likely to be a fungal cell.

Figure 3: Comparison of Profiles		
Loci	**Unknown Second Profile**	**Victim's Known Alleles**
5	13	14/13
10	13	13/19
13	23	15/23

Counsel Must Become Informed

In most jurisdictions, records about the crime lab's investigation into the evidence remain confidential until released by the government through the exchange of discovery. Rarely, however, will the crime lab provide anything other than the final reports, which may be a few pages for each test done. But there is much more. Due to the procedural nature of biological evidence and DNA testing, crime labs must document every step — from mistakes, to licensing issues, to internal communications, to results. These additional documents and photographs can be a treasure trove of exculpatory information.

Defense lawyers will most likely have to subpoena the records. Do not share them with the government. Defense lawyers should not be penalized simply because they must make the court aware of their needs. Proceed *ex parte* and provide the judge with a theory of the case document to help the court understand the critical nature of these records. Depending on a jurisdiction's rules of evidence, counsel may not have to provide the records to the government at all.[22]

Conclusion

DNA does not always sink the ship. Defense counsel has a real opportunity to demonstrate to the jury that the government's case is not open and shut simply because it has crime lab reports that seemingly corroborate the victim's allegations. Whether the defense team is seeking to impeach the government's experts or call one of its own, defense counsel can win despite the DNA evidence. In the defense of the two cases (condensed into one hypothetical trial), both juries reported to defense counsel that it was due to the evidence revealed through cross-examination of the government's experts and the presentation by the defense experts about the DNA that they acquitted both men.

Special thanks to forensic biologist Amy Mason.

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testify, be careful not to shift the burden in discussing the testimony the client gave. Remind the jury that, even though the client testified, the question the jurors have sworn to answer is whether the government has met its burden beyond a reasonable doubt. If the government did not do so on the basis of the evidence it put forth in its case, the jury's job is to return a "not guilty" verdict, irrespective of anything the client said. If the client did not testify, look for ways to highlight the client's story of innocence through the other evidence developed over the course of the trial.

Time's up, counsel. Will the client take the stand?

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Winning Despite DNA

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Notes

1. https://nij.ojp.gov/topics/articles/dna-evidence-basics-identifying-gathering-and-transporting.

2. http://www.theforensicinstitute.com/news-articles/views-and-opinions/DNA-transfer.

3. A cutting is roughly the size of a one-fourth inch square.

4. These professionals must balance their support of the emotional needs of the alleged victim with the integrity of the forensic evidence collected during the medial-forensic examination. *See* National Best Practices for Sexual Assault Kits: A Multidisciplinary Approach, U.S. Department of Justice, Office of Justice Programs, National Institute of Justice.

5. A "rape kit" as it is typically called, contains a comb and several q-tips (swabs) to collect any evidence left behind by the perpetrator on the victim's body, including hairs, saliva, seminal fluid, and spermatozoa.

6. See endnote 5.

7. Maher Noureddine, Ph.D., *Forensic Tests for Semen: What You Should Know*, Oct. 19, 2011, https://ncforensics.wordpress.com/2011/10/19/forensic-tests-for-semen-what-you-should-know.

8. Vaginal secretions occur at all ages of development.

9. Maher Noureddine, *supra* note 7.

10. *Id.*

11. The evidence that supported this question will be revealed later in the article.

12. Maher Noureddine, *supra* note 7.

13. *PSA in Body Fluids*, SERATEC User's Manual: An Overview for Users of the SERATEC© PSA Semiquant Tests.

14. The crime lab scientist testified that she did not believe the test would alert to the presence of female urine due to the sensitivity of the test excluding it.

15. The presence of male DNA, however, is not the same thing as creating a profile that identifies a unique individual through DNA typing.

16. https://www.tasanet.com/Knowledge-Center/Articles/ArtMID/477/ArticleID/169/Detecting-the-Presence-of-Male-DNA-in-Cases-of-Sexual-Assault-without-Ejaculation (*citing* Betz, et al., *DYS STR Analysis with Epithelial Cells in a Rape Case*, 118 For. Sci. Intl. 126-130 (2001); I. Sibille et al., *Y-STR DNA Amplification as Biological Evidence in Sexually Assaulted Female Victims with No Cytological Detection of Spermatozoa*, 125 For. Sci. Intl. 212-216 (2002); M. Franco & S. Trabuio, *Impact of Y-Filer Testing on the Recovery of Evidence in Sexual Assault Investigations*, accessed July 26, 2013, http://events.cdesign.com.au/ei/viewpdf.esp?id=314&file=//srv3/events/eventwin/docs/pdf/anzfss2012abstract00613.pdf).

17. Females have two "X" chromosomes (XX); males have an "X" and "Y" (XY).

18. "More likely" is not the same thing as "expected." Counsel may be hard pressed to get an expert to say she or he would *expect to find* male DNA under certain circumstances.

19. Over defense objection, the court ruled that the defense could not inform the jury of the third profile. However, the court did allow defense counsel to attack the "sperm" found on the sheet. The court also allowed defense counsel to cross-examine the girl about the timeline between being in trouble with the defendant and her outcry of rape, and to argue it motivated her to falsely accuse him.

20. The number represents the "number of times" a particular sequence repeats itself at that loci. Fifteen means it repeats itself 15 times.

21. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3119174/ (*citing* P. Gill, A.J. Jeffreys & D.J. Werrett, *Forensic Application of DNA Fingerprints*, 318 Nature 577–579 (1985), doi: 10.1038/318577a0.).

22. Some rules of discovery allow counsel to use the records on cross-examination without having to provide them prior to trial. Additionally, experts can review documents and the hearsay within and render an opinion without revealing the source of the hearsay (save cross-examination). If the defense chooses to use the records in its case-in-chief, the defense may be required to provide them prior to trial.

About the Author

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