"Dealing with DNA"
A Primer for Lawyers
By Christine Funk

I. Introduction

A few months ago I got a call from an attorney in another state who was going to be arguing a DNA case in front of her Court of Appeals *the next day*. She was wondering if I could point her in the right direction. This is my second most frustrating phone call. The absolute most frustrating phone call, which I've gotten more than once, is the one that sounds like this: "The lab scientist is testifying this afternoon. Can you fax me the questions?"

Dear defense bar, while some lab scientists are willing to write up questions for prosecutors to ask on direct, there is no corollary for the defense. It's like calling and saying, "I have a constitutional issue. Can you fax me the questions?"

That said, DNA isn't hard, it's just a very big topic. One that even after 13 years of handling DNA cases, is still presenting interesting and new issues in my practice. So where does one start? This article seeks to offer attorneys – both prosecution and defense – with a manageable starting point. It's not the end point, of course, but should provide you with a road map to assist you in beginning.

II. Before the Beginning

Speaking of starting, start early. I cannot stress this enough. You will not get up to speed the day before trial. It is unlikely that you will be able to locate a competent expert even a month before trial. Your expert will need time to review the evidence – and will likely, upon review, tell you of other documents they'd like to review that you haven't yet received. Further, if you decide to call the expert at trial, there are more likely to be scheduling conflicts the closer you are to trial. Finally on this topic, it doesn't matter how smart you are or how much you think you have an open and shut case, it's going to take a while to get up to speed on this topic. Give yourself the gift of time. Now let's begin!

III. Read the Report

I'll say that again. Read the report. Seriously. Earl Washington, Jr. spent 17 ½ years in prison on a rape and murder he didn't commit. Back in those days, they were still relying on serology testing. The sperm on the blanket tested ABO – A and PGM 1. Now before you decide you don't know what that means and stop reading, let me tell you that Earl Washington's ABO type was O and his PGM type was 2-1. Notice those two types don't match. In other words, they didn't come from the same source. Neither the prosecutor nor the defense attorney mentioned this to the jury at trial. Ouch.

IV. Consider the Significance of the Report

Take some time to really think about the significance of the report. I once had a prosecutor tell me my client's DNA profile from sperm cells observed on the knee area of an alleged victim's blue jeans was proof that he raped her. Wrong. At best, it's proof that my client's semen landed on a pair of her jeans (whether they were on or off, I couldn't tell you. . .) at some point during the 3 days they stayed together with several other teenage runaways at a flophouse where booze, sex, and marijuana were all in ready supply.

Speaking of the significance of the report, it should go without saying that if the defense to a rape charge is consent, the presence of the defendant's DNA in the rape kit is really of no consequence. A cigarette butt at the bus stop may put the defendant at the scene, but is hardly a smoking gun. Likewise, the defendant's DNA in the defendant's home – even if it's apparent blood, really isn't of any consequence. We all have bled in our homes at one time or another.

Did you see how I just said 'apparent blood?' Most (but not all) preliminary tests are presumptive. While saliva, vaginal fluid, and blood have presumptive tests, there is no definitive test for any of these. You can get a DNA profile from saliva, blood, skin cells, mucous, semen, sweat, tears, even urine. Because presumptive tests aren't definitive, you cannot say for certain where the DNA came from. Further, you can't put date or time stamp on this DNA.

Another thing, when dealing with 'wearer DNA' understand the 'major donor' may or may not be the 'major wearer' of the item of clothing in question. People shed their DNA at different rates, so the amount of DNA present on clothing is not a fair indication of the amount of time the clothing was worn by the person with the matching DNA profile. Nor is it an indication of how recently it was worn by that person.

V. Get the Rest of the File

I can't tell you how many times I've asked the prosecutor for 'the rest of the file' only to be told I have everything. The truth is, I have everything the prosecutor has, but that's not everything. The lab has an extensive file which, in my experience, is not disclosed unless specifically asked for. Ask for it. If this request is denied, ask for it more loudly. This is the information upon which the conclusions are based. You are entitled to review it. I would submit you are committing malpractice if you don't review it. Not obtaining and reviewing the file is tantamount to reading a police officer's summary of a defendant's taped confession, but not bothering to watch the tape.

If you are uncertain what to ask for, or if you practice in a jurisdiction where getting discovery is a battle unto itself, hop on the web. Most experts have discovery demands honed after years of experience battling for all the documents. In addition to a detailed list of items requested, there is typically a line demanding 'everything else pertaining to

the file, that has not been specifically requested.' Several DNA experts have been kind enough to post their discovery demands on the web for you to use without charge. Just make sure to take a moment to assure yourself you are using the appropriate request. The 3 most common types of DNA testing are STR, Y-STR, and mitochondrial DNA testing. Make sure your discovery demand is for the type of DNA testing you actually have in your case.

Once you receive the file, do yourself a really big favor. I have to tell you, if you take nothing more from this article, do this one thing. It's brilliant. Really. I wish I would have thought of this myself. Instead, I practiced DNA defense for years before I learned this trick. I'm going to make this its own paragraph – it's that important.

Make a copy of the file and put the original on a shelf.

You'll thank me later, I promise. Bates stamp the copy of the file, but leave the original clean. This will assist you at trial, as you will have a clean copy of the file, should you wish to introduce any part of the file into evidence or to use as an exhibit. On another note, the Bates stamp will assist you when talking to your expert. If your expert wants to talk to you about the extraction set up, you can simply ask for the Bates stamp page number, rather than engage in insipid conversations that go like this:

Expert: I'd like to talk to you about the extraction set up. Can you go to that page?

You: Ummmmm. . .

Expert: It's about a third of the way up from the bottom of the stack.

You: Okaaayyyyyyyyy.

Long pause with the sound of you rifling through the file.

You: Is it by the page with a bunch of columns on it?

Expert: No.

You: Where is it in relation to those pages that look like an EKG?

Expert: *soft sigh* Much closer to the back than those pages.

You: Is it near the page that looks like a bingo card, kind of?

Expert: *heavy sigh*

With a Bates stamp, your expert can just ask you to turn to page 0036 and you can go from there.

Of course you want to read the rest of the police reports in conjunction with the lab reports. How was the DNA collected? What items were collected? Take a look at police photos of the scene. Do you see any beer bottles? Cigarette butts? A half eaten ham sandwich? All of these are potential sources of DNA profiles. Another concern is contamination. Could contamination of evidence have occurred during collection? You may find this information in the police reports or you may find it in the underlying file from the lab.

VI. Read the File

Oh, yes, I did say that! Read the file. You really can do this. You won't likely understand all of it your first time through, but you'll understand more than you might think. For example, imagine if you read the following:

> Item 1 is a brown paper bag containing a sweatshirt said to be from the victim, a pair of underwear said to be from the victim, a pair of blue jeans said to be from the defendant, and a pair of underwear, said to be from the defendant.

"*A DNA test result which indicates the presence of 2 or more individuals, wherein the victim and the defendant cannot be excluded,*" is actually the result you would expect just by virtue of the items being in the same bag. (Now be careful, defense attorneys! Read the WHOLE file! If there are sperm cells microscopically observed in the crotch of the victim's panties, a 'wearer DNA' transfer argument is going to be less persuasive. . .)

In addition to checking the packaging, check 'time and space issues.' The lab has forms for every step of the process. Look at when they extracted blood and salvia samples. (This is documented on a form with a catchy title such as "Extraction of Blood/Saliva Samples.") You can see the case number, the item number, the amount of the sample used, and any additional information. Questioned samples should all be processed before known samples.

Communications matter. You may see notes, either hand written or entered into a system within the laboratory, or an email documenting communications between the scientist and the prosecutor, law enforcement, or amongst scientists. This may give you an idea as to what information the scientist had going into the testing. Could this information bias the examiner? Does it set the scene to limit what the scientist was looking for? Did it dictate what evidence was or was not examined?

Finally, check the work. Locate the defendant's DNA profile, and compare it to the evidence sample they say matches the defendant. Recall Earl Washington, Jr.? No one looked at his serology test results. (At least, I'd like to believe that the prosecution didn't proceed to ask for the death penalty when they knew the serology didn't match. I'd further prefer to believe the defense attorney also was unaware of the non-match, rather than simply fail to point out that inconsistency.)

VII. Moving Beyond the Case File

Consider the bigger picture. It's not just the evidence that may be called into question, think about the lab itself. Instruments need to be calibrated. Now before you stop reading, recall your first speeding trial? Or your first DWI case? Remember when someone gave you 'the questions' regarding calibration of the radar gun or the Breathalyzer machine? Just as those items need to be calibrated in accordance with the manufacturer's instructions, so, too must the pipettes, the thermocycler, the machine that does the capillary electropheresis. Each of these calibrations must be documented.

Additionally, if the lab is accredited, there have been inspections. The ASCLAD/LAB inspection, for example, is done once every five years. It includes a preliminary report and a final report. Also documented is any 'corrective action' that should be or was taken, as well as areas which could be the subject of improvements. There are also internal inspections done in compliance with certification requirements every six months.

Another set of documents to examine are contained in the 'unexpected results' file. This file, kept in compliance with SWGDAM Quality Assurance Guidelines for Forensic DNA Testing Laboratories, keeps track of just what it says – unexpected results. Standard 14: Corrective Action reads as follows :

> The laboratory shall establish and follow procedures for corrective action whenever proficiency testing discrepancies and/or casework errors are detected. The laboratory shall maintain documentation for the corrective action. Such documentation shall be retained in accordance with applicable Federal or state law.

This file can also be referred to as the 'contamination log' or the 'corrective action' file or some other name. For reasons unclear to me, many labs are resistant to the idea of disclosing this file. Thus, if you don't ask for it by the correct name, you don't get it. As such, I suggest the following language, "Please disclose the corrective action/contamination log/unexpected results file kept in compliance with SWGDAM Standard 14.1.1. If the laboratory does not comply with this Standard, a letter on letterhead stationery acknowledging this will suffice."

Now lets talk about why you want this file. If the negative control yields a positive result, that would be 'unexpected.' This is documented and attempts are made to 1. identify the profile; 2. determine when or how the profile got into the sample. Was there a contamination in the lab? Was the test tube contaminated when it arrived in the lab? Were the test tubes inadvertently put in the wrong rack? Were the test tubes mislabeled?

This file is largely a collection of random events, but occasionally a pattern may emerge. Perhaps a certain scientist commits more contamination events that the others. Perhaps a scientist consistently ignores precautions. For example, if a scientist experiences a contamination event in May, wherein their DNA appears in a sample, the scientist may conclude in their report that they need to be more careful about wearing a face mask and gloves. If the same scientist has another contamination in June, and another in August,

and each time the scientist documents that as a corrective action, they will be more careful about wearing a face mask and gloves, this may tell you something about the scientist's habits regarding both face masks and gloves. A logical inference of this is that the scientist may disregard other protocols in the lab.

The unexpected results file is also a lovely illustration of how easily DNA can transfer. Recall, these people are specially trained in handling DNA samples. They only open one piece of evidence at a time. They spray down their work stations with a bleach solution. They put on a fresh pair of gloves for each sample they handle. They wear lab coats and masks. Still, their DNA will sometimes appear in samples. There will also be documented cases of one sample contaminating another sample in the lab. You will also see documentations of switched samples. In a crime scene sample, of course, whether or not there's a mixture isn't known. But when a sample is from a known individual, say a defendant, unless he's recently had a blood transfusion, his DNA profile should contain no more than two alleles at each locus. The presence of three or more alleles (or markers) at two or more loci would generally indicate the presence of a mixture. You can expect to see documentation of known samples being contaminated with other samples. There have been documented instances of DNA profiles matching other employees in the lab appearing in casework – even some employees who haven't had any known contact with the sample or the biology section.

Cautionary note: This does not mean you are dealing with a bad lab. It means you are dealing with a lab that does DNA testing, using very sensitive testing methods. Contamination happens. Labs that claim it doesn't happen in their lab should be approached with caution and a healthy dose of skepticism.

Get a copy of the scientist's resume and check it out. It is not unheard of for a scientist to either puff up their credentials, or even manufacture them out of whole cloth. Call the University and confirm the scientist 1. attended the school listed; 2. graduated from the school listed; and 3. graduated with the degree listed on the resume. Google is also a wonderful tool. Google the scientist to see what you can learn about them. Get copies of any publications the scientist may have written. The order in which authors are listed on publications is important to scientists. Make sure your scientist accurately represented the order on his resume. Read what the scientist has written. If you don't understand what is written, ask someone. It is also a good idea to read transcripts of other times the scientist has testified. If you are a prosecutor, your lab may have a library of defense experts' previous testimony. For the defense bar, your local public defender's office likely has experience with scientists from the crime lab.

Scientists working at accredited labs are required to take proficiency tests every 6 months. Ask for the past 3 years of proficiency test results. Good news, prosecutors! Your scientist probably passed them all. That might impress the jury. Defense attorneys, if you think it is important, you should know that the truth is the tests aren't hard. The scientists know they are being tested. The idea is to treat the test as though it was a real item of evidence. Most labs employ a second reader in case work. Thus, a second reader will review the proficiency test results before they are sent in for scoring. There have

been some documented cases where the second reader catches an error before the test is sent in for scoring, and the original examiner corrects their work. That said, as easy as these tests are, sometimes the scientists fail these tests anyway, so it doesn't hurt to ask.

VIII. Get an Expert

If you are a prosecutor, you already have an expert – the lab analyst that performed the testing in your case. Why not call the analyst and set up a meeting? Together, the two of you can go over each page of the file. The lab analyst will likely weep with joy to learn that you are interested. Many, if not most, prosecutors fail to do this. All too often, I see prosecutors presuming that because they have DNA evidence, the case is over. I just finished a trial where the prosecutor tried time and again to get the scientist to agree that the DNA on my client's shirt came from the dead guy's blood. She wouldn't. See the presumptive testing discussion above.

Ask the scientist, "What do you think I should know?" If you have a theory about how DNA transferred to a certain item, run that theory by the scientist. Do not wait to attempt this during the trial.

Defense attorneys should get their own expert. What you do with your expert will depend on the case. You may wish for an expert to review the work done by the lab. This by far will be your most common purpose in hiring an expert. Much of the time, in my experience, the expert will review the file and tell me the state did every thing right. Some of the time, the expert will review the file and tell me that it probably wouldn't help if they testified, but they'd be happy to assist me in formulating questions I can use in cross examination. Occasionally, after review, an expert will call me and explain problems with the case that are significant enough that I will call my own expert witness at trial.

Some states will allow a testifying witness to be present in court for consultation when the other side's expert testifies. This is a really, really good idea in my experience. This will no doubt be easier for the prosecution, who can have someone from the lab sit in while the defense expert is testifying. The defense may have a more difficult time, as funding is always an issue. That said, everyone, including scientists, tend to be more careful about their words and how they present things when they are being observed by their peers. It is amazing how much more easily you will be able to get the opposing expert to agree with basic, fundamental concepts when another scientist is in the courtroom. Additionally, a scientist in the courtroom can assist you by taking notes and advising you on appropriate follow up questions that you may not have thought of on your own.

IX. The Mary Kay Standard

Finally, employ the Mary Kay Standard. Before proceeding with a DNA theory, make sure you run it by at least one other person. Regardless of whether you have handled a DNA case before, you simply must speak to another human being and relay your theory

to them to determine first if you can convey the information and second if you can convey the information in a way that is understood by the lay person. This is what I refer to as the Mary Kay standard. Why the 'Mary Kay' standard? Mary Kay is my mom. If my mom can't understand what I am saying, then as a general rule, neither can my jury. My mom isn't stupid, mind you. She was a music teacher before she started having kids and stayed home to raise them, as all good mothers did in the late '60's and early '70's. Beyond assisting her 5 kids with their science homework while growing up, my mom's not scientifically trained. Typically, neither are my jurors.

Remember when you first started law school, and there were all those latin words? Recall how overwhelming it felt that first semester? That's how your jurors will feel if you start throwing around words like loci and alleles. Unlike you and law school, however, the jurors did not choose to be there, and don't have a goal of succeeding to the extent you did that first semester of law school. Find other language that is already familiar to lay people when you can – but run them by your scientist before the scientist is on the stand. I have found that not all lab analysts appreciate 'a chunk of the DNA molecule' as a lay person's definition of a locus. I have further found that it is the rare scientist will agree with me that the purpose of the amplification process is to make 'a scrimillion copies of the target DNA.' Most, however, will agree that an allele can also be properly termed a 'marker.' Your expert can assist you in coming up with proper comparisons. That said, I have yet to come up with a lay person's term for 'electropherogram,' but I'm working on it.