THE COURT: And raise your right hand and face the jury so they can see you.

(Witness Duly Sworn)

THE COURT: Thank you. Please have a seat.

MR. LEONARD: May I proceed?

THE COURT: You may.

MR. LEONARD: Thank you.

JENNIFER CLAY,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

Q. ***(BY MR. LEONARD)*** Good afternoon, Ms. Clay.

A. Hello.

Q. Please introduce yourself to the jury.

A. My name is Jennifer Clay. I'm a DNA analyst at the Houston Police Department crime laboratory.

Q. And how long have you been with the Houston Police Department?

A. I have been there for seven years.

Q. Tell the jury a little bit about your educational training.

A. I attended the University of Houston in Clear Lake where I received a Bachelor's degree in biology.

Q. Okay. What sorts of on-the-job training or continuing education have you had?

A. Quite a bit. When I first started with HPD, I was trained as what we call screener or an analyst. Basically they would triage the cases. So, when items come in, they would test items specifically for blood and semen, retain items for a possible contact DNA, like saliva, and then prepare them and preserve them for DNA analysis.

In 2007, I started training to become a DNA analyst. That took approximately six months; but I had to undergo practice samples, dozens of practice samples, training modules that we had to do and fulfill. And I also had to do written exams, laboratory practicals. And even still today, we undergo a proficiency test twice a year.

We are required to read at least one scientific article a month, but the FBI also requires that we receive at least eight hours of training. Usually the lab does a really good job of providing far more than just the minimum eight hours, but we're required to at least get the eight hours. They sometimes send us out for training or send in individuals to train a large group of us at once.

Q. Okay. Have you ever failed a proficiency

test?

A. No, I have not.

Q. Okay. What is it exactly that you do for the Houston Police Department crime lab?

A. Kind of done a little bit of everything, but currently I receive data that comes out of the instruments from our technicians and I analyze data, issue a laboratory report, and testify in courts.

Q. Okay. How many times have you testified in court?

A. Well, this week I happened to have testified three times; but total I have testified a little over 30 times.

Q. Okay. Now, I want to turn your attention to this particular case that you're here for today. Did you issue a report with regards to this case?

A. Yes, I did.

Q. Okay. And does that report have like an incident number?

A. Yes, it does. It also has a HPD incident number that's usually assigned when an officer makes the incident in the OLO system.

Q. And just for the record, what incident number is that?

A. It's Incident No. 083298010.

Q. Okay. And does this report identify a particular suspect or a complaining witness or victim in this case?

A. I have a suspect and a complainant listed in the case, yes.

Q. Okay. And who are they?

A. Rodney Milum was the suspect -- listed suspect's name, and then Imani Hilton -- I don't know if I'm saying her name correctly.

Q. Okay. Now, just to be clear, did you actually do any of the hands-on testing of the evidence in this case?

A. I believe I did do some. I can tell you specifically.

Yes, I set up a quantifier, steps for processing the sample for DNA.

Q. When you say "quantities," you mean quantification?

A. Yes, quantification. I set up a couple of them, actually; and then I also set up an amp -- which is when we make copies of the DNA -- set up an amplification, and I also set up and loaded and run for one of -- a few of the samples.

Q. Okay. Explain to the jury why is it necessary to have so many people involved in the

different steps? Like is it possible to have one person do all the steps? Why does HPD have so many people involved in all of the different steps?

A. We receive a large number of cases; and in order to remain productive and get cases through our system quickly, it's more efficient for us to have simply a line-type system to where, you know, you have analysts that will extract the DNA, analysts that quantify the DNA, analysts to amplify and load.

We used to work cases from beginning to end where we would get assigned a case and I would work it all the way through, but it's just not as efficient to do it that way. So, this is just a more efficient way of processing a case.

Q. Okay. Let's talk specifically about your report in this case. What is it exactly that you are comparing?

A. Well, we received evidence items in this case and reference samples, and the DNA is a comparative analysis. So, we're taking samples from the crime scene that are submitted by the officer as well as reference samples or samples that are taken from individuals involved with the case and then doing a comparison of the profiles on both the evidence and the references.

Q. Okay. Now, when you say "evidence," what would be the evidence in this particular case that you were comparing?

A. In this particular case, we had a portion of the stain from some panties and then also a portion of the stain from carpet.

Q. Okay. And what were the reference samples that you were comparing?

A. From Rodney Milum and Imani Hilton.

Q. Okay. So, just so I'm clear on this, what you're doing is you're taking the known reference samples -- in other words, you know where those reference samples came from -- and you're developing a DNA profile for those known reference samples; is that correct?

A. Correct. The reference sample comes from an individual, usually just a swab of the inside of the cheek; but you can get a blood sample. It's just usually easier just to collect a swab. So, yes, and it was taken from an individual. So, that would be considered a known sample because it was known who that was coming from.

An unknown sample would be like from the panties. We don't know who would be on that stain; or a stain from the carpet would be another

question or unknown stain.

Q. Okay. And then you develop a DNA profile for the evidence that you're testing. In this case it would be the panties and from the carpet?

A. Correct. We develop a profile from the panties and the carpet and then also the reference, and I do a comparison of all of them.

Q. Okay. What types of profiles -- or what types of profiles do you see?

A. There is several different types of profiles. Some profiles that we get, just generally speaking, are single-source profiles, meaning it appears that only one person is contributing to that particular stain or that item that the swab was taken from.

Other times there is not a lot of DNA that's left behind. So, you get a profile, it doesn't look like it is more than one individual, but it's not complete. We're missing data. There has been dropout. So, there just wasn't enough DNA left behind to get a full profile.

Some other types of profiles that we see will be mixtures. Mixtures are profiles that have more than one person. So, it could have two people, three people. It just depends on what type

of mixture you have. Those are a little bit harder to interpret. They can be done -- mixtures are always a little bit more complicated because now you have several people contributing to one stain.

And to break down mixtures even further, a mixture can be undistinguishable, meaning that the people contributing are pretty much contributing evenly. So, there is not one person that is contributing more; but then other mixtures are what we call major/minor mixtures, meaning that one person is contributing significantly more DNA than any of the other contributors.

MR. LEONARD: Judge, may I approach?

THE COURT: Granted.

Q. (BY MR. LEONARD) I want to talk a little bit about your results in this case.

Okay. Let's talk about the results in this case. What were your results in this case?

A. Okay. Well, for the panties -- I will just start with those because those are the first item on my report. This was Item 1.1.1.1. I developed -- there is the sperm fraction. So, when you have a stain that was positive for possible semen or sperm, we do what's called a differential extraction. So, you have the same swab; but you're trying to separate

out the sperm from the epithelial cells or skin cells. So, in the sperm fraction of the stain from the panties, we obtained a partial male DNA profile.

Q. Okay. And exactly what does that mean?

A. Well, as I had stated earlier, this was a profile that was not complete. We have missing data. So, it was partial. So, I don't have a full profile that I'm working with; but it appears to just be a profile, not a mixture. So, it just appears to be one individual contributing.

Q. Okay. And is there a number or a stat that you use or are assigned to this particular DNA profile?

A. We will calculate statistics when we draw conclusions. So, I did draw a conclusion in this case, and in this case Rodney Milum could not be excluded as a possible contributor. And once -- since I'm stating that he cannot be excluded, I provide stats for that. And would you like me to give those to you now?

Q. Okay. Let me -- so, okay. And what were the stats that you calculated?

A. The stats that I calculated were 1 in 1.5 million for Caucasians; 1 in 1.1 million for African Americans; 1 in 3.3 million for Southeast Hispanics;

and one in 1.7 million for Southwest Hispanics.

Q. Okay. Let me just go through those numbers again. So, 1 in 1.1 million for Caucasians?

A. Caucasians were 1 in 1.5.

Q. One in?

A. In 1.5.

Q. Okay. One in 1.5 --

A. Sorry?

Q. So, is that 1 in --

A. One in 1.5 million.

Q. Okay. And what was the next?

A. For African Americans, it was 1 in 1.1 million.

Q. And what was the next?

A. One in 3.3 million.

Q. And that is for Hispanics?

A. That was Southeast Hispanics.

Q. Okay.

A. And then 1 in 1.7 million for Southwest Hispanics.

Q. I will do M for southwest Hispanics.

A. Yes.

Q. Okay. All right. So, for those of us who were not mathematicians or statisticians -- statisticians, what do these numbers mean?

A. Basically what it means is that if we would have to sample 1 in -- so, for Caucasians, we would have to sample 1.5 Caucasians before we would expect to see other individuals who would be included at the locations I calculated statistics at. We tested 15 locations, and I was only able to calculate statistics at six of the 15 locations.

Q. Okay.

A. So, if we sampled 1.5 million, you would expect one of the individuals to also not be excluded at those locations.

Q. Okay. So, does that mean that the male DNA profile that was found on these panties, does that make it more likely or less likely that it belonged to the defendant?

MR. SMITH: Objection, calls for speculation by the witness, Your Honor.

THE COURT: Overruled.

A. So, can I answer?

Q. (BY MR. LEONARD) Sure.

A. I mean, I can't exclude him as being a possible contributor to the mixture. I don't know what the likelihood would be of that. Again, this is just saying this is a frequency that these items appear in the population. That's how we calculate

the statistics, frequency that they appear at each -- each population. So, I don't know if it would be more likely. I can't exclude him, and these are the statistics to back it up.

Q. Okay. Okay. Did you develop any other conclusions for the panties?

A. Yes, I did.

Q. Okay.

A. We also had the epithelial fraction from the stain from the panties. This developed a mixture of at least two individuals, and Imani Hilton cannot be excluded as a possible contributor to the mixture.

Q. Okay. And by "epithelial," you are referring to skin?

A. Right. Usually skin cells that were, like, coming off of her body that may have been deposited on there or something.

Q. Okay. And you said Imani Hilton cannot be excluded?

A. Correct.

Q. Okay. What else?

A. And then no conclusions were made regarding the minor contributor. There just wasn't enough information to draw any conclusions to the minor contributor to the mixture.

Q. Okay. What else? What other conclusions did you reach?

A. I also tested the stain from the carpet. So, the sperm fraction from the stain on the carpet developed a full-male DNA profile.

Q. Okay. Okay. And what does that mean? What does it mean to develop a full-male DNA profile?

A. Well, unlike the first stain from the panties, the sperm fraction, that was just a partial; and I didn't have all of the information. Now, I have a full-male DNA profile. So, I was able to calculate statistics at more of the locations that we test.

Q. Okay. And what were the statistics for the full-male DNA profile that you developed?

A. He -- Rodney Milum could not be excluded as a contributor, and the statistics are 1 in 54 quintillion for Caucasians.

Q. Okay. So, 1 in 54 --

A. Quintillion.

Q. -- quintillion. So, you're going to have to help me with that number.

How many?

A. That's a 1 followed by, I think, 18 zeros. You want to just write quintillion, or do you want to

write all the zeros?

Q. Let's write out the zeros first, and then we will just abbreviate "Q" after that.

A. Okay.

Q. So it's followed by how many zeros?

A. I believe it's 18 zeroes. Let me just doublecheck and count since I'm going off the top of my head.

Yes, 18 zeros.

Q. All right. That's 1 in 54 quintillion for --

A. Caucasians.

Q. Okay. All right. Let's go to the next sheet. What was the next statistics?

A. One in 23 quintillion for African-Americans.

Q. So, 1 in 23 just say Q --

A. Okay.

Q. -- for African-Americans.

A. One in 490 quadrillion for Southeast Hispanics. Quadrillion has 15 zeros.

Q. And that's for?

A. Southeast Hispanics.

Q. Okay.

A. And then 1 in 220 quintillion for Southwest

Hispanics.

Q. So, 1 in 220?

A. Yes. Quintillion.

Q. Quintillion. For Southwest Hispanics?

A. Yes. That's correct.

Q. Okay. Okay. Now, those are -- those numbers are much huger -- or much larger than the numbers -- than the statistics numbers for the profile that you developed on the panties. Why is that?

A. Again, it's because the panties only provided a partial profile. I didn't have a full profile to compare the reference sample to. So, I couldn't calculate statistics everywhere. However, with the carpet, I have a more complete profile. So, I could calculate statistics at all of the 15 locations.

Q. Okay. So, I'm trying to -- help me understand this here. Are you saying that the DNA profile that you developed for the carpet -- if you tested every person in the world, does this stat represent how often you would expect to see that profile?

A. Well, the estimated world population is approximately 7 billion individuals.

Q. Okay.

A. So, this is significantly higher than the number of people on earth. So, you would need many times more than what the earth population currently is in order to sample that many individuals before you would expect to see someone to be consist at every location.

Q. Okay.

A. On profile.

Q. So, there are only 7 billion people in the world?

A. Approximately.

Q. Approximately 7 billion. Obviously, this number is extremely higher than -- approximately how many world populations would fit into one of these items?

A. I don't have that calculation here, but it's many hundreds of thousands times the world population.

Q. Okay. So, in other words, you would -- that DNA profile that was developed from the carpet is seen once in 200 -- what is the number?

A. Twenty-three quintillion.

Q. In 23 quintillion. That's how large of a sample size you would have to sample before you would

see that DNA profile again?

A. Before you would expect to see it again, yes.

Q. Okay. Can you say with any degree of certainty whether or not the DNA profile that you developed belongs to the defendant?

A. Yes. In our SOP, if the statistics for every racial group is above 100 billion, which is significantly more than the earth's population, which is approximately 7 billion, we do have a source statement where he -- to a reasonable degree of scientific certainty, Rodney cannot be excluded as the contributor to this DNA profile.

Q. Okay. Did you verify any other DNA profiles with regards to your analysis?

A. No. The only samples that we tested were the 1.1.1.1, which was the portion of the stain from the panties; and then Item 2.1.1, which was a portion of the stain from the carpet; and then the two reference samples, which were items 3.1 and 4.1.

Q. Okay. And just so I'm clear on this, if you -- let's say, for instance, hypothetically, if we took a sample of my DNA, you know, right here in court and we were to test that DNA profile and you were to develop a DNA profile, would you expect the

number to be higher or lower?

A. Than -- as comparing it to what?

Q. If you compared it to another sample of my DNA.

A. It would depend on the frequency of the alleles that are in your profile. They have determined the frequency that a particular number, which is part of what the profile looks like when it comes out of the instrument, will show up at that particular location for that racial group.

And so, depending on how rare your alleles happen to be, then your number could be larger; or it could be smaller. Just depends on your profile. I mean, usually, when you have a single source sample, the stats are these very large numbers, which is quintillion, quadrillion. That's not uncommon, but I wouldn't know until I actually looked at your profile and then found the frequency of each of your numbers or your alleles that are in your profile.

Q. Okay. Now, you used the language "Rodney Milum cannot be excluded." Why don't you use the language that he is included or that it is his DNA?

A. We tend to keep the same -- we want to -- we don't want to interchangeably use the word

"included" and "excluded" to avoid confusion. So, we usually say "cannot be excluded" or "the individual is excluded." So, we just stick with one form.

Q. Okay.

MR. LEONARD: I pass the witness.

THE COURT: Thank you.

Cross-examination?

MR. SMITH: Yes, Your Honor.

CROSS-EXAMINATION

Q. ***(BY MR. SMITH)*** First I want to ask you some questions about the reagent blanks.

A. Okay.

Q. Okay. In this particular run, one of the reagent blanks came back with a sample; is that correct?

A. There was a very low value in one of the reagent blanks, yes.

Q. Okay. And the purpose of the reagent blank is to determine if there has been cross-contamination; is that right?

A. Well, the primary purpose of the reference, or the reagent blank, is to make sure that all the reagents -- the chemicals that you are using on samples are being put into the reagent blank, additional tubes, so if there is anything in the

reagent, it would come up -- it would also come up in that reagent blank so if anybody or anything comes up in the sample, you would be able to detect.

Q. The reagent blank is supposed to be zero, right?

A. Well, this value was very, very low, less than one DNA worth, one cell would have of DNA. I, mean this is significantly lower. It should be undetermined, which is how it should read out on the instrument. This came back to -- and I can tell you -- just one second -- this value. Let's see. Came back to .00125 nanograms.

Q. Okay. And in your lab, is there a policy that when the reagent blank comes back with a value, that you retest?

A. Well, not necessarily. We take the reagent blank; and we treat it at the most strenuous level. So, the next step after you quantify is to amplify; and you can amplify nothing or you can amplify up to 10 microliters. So, the reagent blank is going to be treated the most sensitive. So, we're going to take 10 microliters, which is the most we can take from the reagent blank, and amplify that so if there is anything present, we can see what it is and address the issue.

Is that -- does that answer your question? So, we tested it; and we carried it through with this value.

Q. Okay. And that didn't cause you concern?

A. No. I mean, sometimes you get quality values that are off. We quantified a sample before and amplify it and think it's one value and for one reason or another, maybe possible an air bubble when the instrument was reading it, the reading was off.

So, we go off of the value that test given -- that is given to us at that time. We trust the instrument to be working; but if there is an error, bubble or something that caused it to have this value, we still are going to apply the maximum. So, if we did have anything, we would detect it.

Q. Okay. You have a copy of your report in front of you, correct?

A. Yes, I do.

Q. In that report you have a graph -- a chart; is that correct?

A. The allele table?

Q. Yes, ma'am.

A. Yes.

Q. You're looking at that right now; is that correct?

A. Yes, I am.

Q. Okay. I would call your attention, first of all, to -- in the epithelial fraction portion of the panties, okay, I would ask that you look at D5S818. There was a minor allele there; is that correct?

A. Yes.

Q. Of a 12 --

A. Correct.

Q. -- is that right?

A. Correct.

Q. Now, both Rodney Milum and Imani Hilton both tested at an 11 and a 13; is that correct?

A. Correct.

Q. And you see an 11 and a 13 in that particular allele; is that right?

A. You mean at D5? Is that what you are talking about?

Q. Yes, ma'am.

A. Yes, I see. Yes.

Q. So, there you see -- at that particular marker, I think is what the proper term is, you see 11, 13 -- and 13, and 12; is that right?

A. Correct.

Q. That would be an indication of somebody

else's DNA being in that sample; is that right?

A. Well, I wouldn't go so far to say that. In my report I do state that no conclusions will be made regarding the minor contributor because there is not enough information for me to draw conclusions. There was one additional minor allele at D5 and there was also an additional minor allele at D8 and TPOX, but these were not -- there was not enough information for me to draw any conclusions.

Q. To the minor person?

A. Major person I had enough information; but the minor person, the 12, the 8 and the D -- and the 14, I couldn't draw conclusions to, and I state that in my report.

Q. Okay. The major portion turned out to be Imani Hilton; is that correct?

A. Yes, sir, that's correct.

Q. Okay. And -- and there is a -- you will agree that there is a possibility of a -- another person's DNA being in that sample, correct?

A. Well, I state that it's a mixture. So, of course, it's the major contributor and I state that in my report, but -- and it's a mixture of somebody else.

Q. And it could be possibly somebody other

than Rodney Milum, correct?

A. That could be possible.

Q. And there is no way to determine with scientific certainty of that at this point in time; is that right?

A. Well, again, there is not enough information from the person contributing to the minor to say who that individual is. I don't know who that person is.

Q. Now, another question that I want to ask you about -- I want to talk to you about predominant DNA profiles and minority DNA profiles.

A. Do you mean major/minor?

Q. Major/minor, yes, ma'am.

A. Okay.

Q. It is possible, isn't it, for a major profile to completely block out a minor? Is that correct?

A. Sure. That can happen.

Q. So, in other words, you will run your testing and you would just get the major profile, but you wouldn't get the minor profile; is that right?

A. That could -- what you're talking about is -- so, maybe I wouldn't visualize a major/minor. I could just see -- like, for example, in this case,

I mean, I have a major being the complainant; and the minor, I can't really -- I don't have enough information from the minor. So, she could be masking, if that's -- that is one possibility, yes.

Q. Okay. And you -- when you have a -- let's talk about the sperm cell fraction from the carpet. Okay?

A. Okay.

Q. That was an extremely strong DNA sample; is that correct?

A. Correct.

Q. And it is possible that that particular DNA sample could be masking over other minor profiles; is that right?

A. That could be a possibility.

Q. And another thing that I want to ask -- that I'd like to ask you about is you cannot tell us when DNA was deposited on a -- on an item in terms of time; is that correct?

A. Yes, that's correct. I just know that this was the DNA that was present at the time that the item was collected.

Q. So, in other words, it could have been -- it could have been there years before; is that right?

A. I don't know if years before, but it could

be anytime. There is no way for me to determine time based on the DNA analysis that we do.

Q. And as a result, you cannot tell if one DNA profile was deposited on an item at the same time the other DNA profile was deposited, can you?

A. No. If I touch that handle today and then somebody touched it earlier this morning, both of our DNA could be there; but I wouldn't be able to tell who touched it first. Just the DNA would be present.

Q. You cannot -- and if there were days or weeks in between the deposits of those two particular DNA samples, there is no way you can tell that; is that correct?

A. No, I wouldn't be able to tell that.

Q. Okay. So, you would just -- so, there is no way that -- just there is no way you can tell us that those DNA samples were placed there at the same time?

A. Which are you talking about? For the stain on the carpet epithelial fraction?

Q. Yes, ma'am.

A. There was a mixture.

Q. Yes, ma'am.

A. I can't say that they were deposited at the exact same time for sure.

Q. Okay. Now -- and one could be put there after the other by way of a transfer, correct? From one item to another?

A. A transfer? Yes, DNA can be transferred. It's -- it's possible.

Q. It could be transferred by one item touching another item; is that correct?

A. Sure. I mean, if I bled all over my shirt and I put my shirt on the counter, my blood could then -- now my DNA would also be on the counter. So, yes, that could happen.

Q. I want to ask you some questions about sperm cells. Sperm cells die fairly rapidly, don't they?

A. No. Actually, they're pretty robust, assuming that they are preserved and you don't have it outside in the heat. But we have gotten DNA profiles off of relatively older cases.

Q. Okay. And you have gotten sperm cell complete profiles off of very small samples, right?

A. We have gotten them off very small samples, yes.

Q. In this particular circumstance, you basically -- when you're talking about the sperm fraction of the panties, you got basically half of

the loci that you're looking for; is that right?

A. Oh, yes. The locations -- loci, I was only able to calculate six of the locations. This could be from the -- there just wasn't that much deposited on the items so I didn't get a full profile.

Q. Okay. And you will agree with me that in time, given time, semen dries; is that correct?

A. Yes.

Q. And once it dries, then transfer is more difficult, right?

A. Well, yes, I would say so. It would be easier to transfer DNA if it's in a fluid form.

Q. Okay.

A. Not impossible, though.

Q. Which could result in you getting a partial profile; is that right?

A. That could be one reason. But there just either wasn't enough DNA left behind; or if it had been sitting out for a while or quite some time, maybe it started to degrade. Were people handling the item in between the time? I mean, a number of factors could go into play why there wasn't a full profile.

Q. Now -- but in order for DNA to degrade, it takes an appreciable amount of time; is that right?

A. Yes.

Q. You're talking about months, right?

A. Over a long time. There is not a specific date that it would happen. Again, depends on the environment, conditions of the item.

Q. If it were collected within a week of deposit, it probably would not degrade; is that right?

A. Assuming it -- the item wasn't like washed or laundered or cleaned or treated with bleach or some -- something to help remove it, I mean, it may be there. Those types of things we don't know until we test the item.

Q. Okay. And you were not given a third reference sample in this particular case to test; is that correct?

A. Yes, that's correct. I only had the two reference samples.

Q. Okay. If you had been given a third reference sample, it's possible that you could have made -- have identified the minority sample that was contained within the epithelial portion of the panties; is that right?

A. No, that's not correct. I said that I couldn't draw conclusions to the minor to anybody.

So, whether I got a sample from any individual, there is not enough data. It doesn't change the profile that's on the evidence item. There still is not enough DNA on the evidence profile to do a comparison. So, even if I received five more reference samples, I -- again, I still wouldn't be able to do it.

Q. Okay. But you can exclude somebody based on a single allele when that person does not have a number that is included within that particular sample; is that correct?

A. I maybe could make an exclusion, but I certainly wouldn't be able to identify who the second contributor is.

Q. Right. So, in this particular sample, that is 12 at D5; is that right?

A. Yes. That's correct.

Q. And neither Imani Hilton nor Rodney Milum have a -- both of them have an 11, 13; is that correct?

A. Correct.

Q. Neither one has a 12; is that right?

A. That's correct.

Q. You have an 11, 13, with a minor of 12. So, you have to exclude Rodney Milum from that

particular sample; is that right?

A. I did not exclude him. I just didn't draw any conclusions to him or to him as part of any of the mixture of this item.

Q. Okay. So, if a DNA sample was transferred from one item to another, that is a situation where it's highly probable where you would get a partial profile; is that right?

A. Sorry, I don't think -- I'm sorry, can you ask the question again? If I transferred the item?

Q. If a DNA -- if a person's DNA was transferred from one item to the other by touching, okay, that is a situation where it's probable that you would end up getting a partial profile; is that correct?

A. I mean, it's a possibility; but there is also the possibility -- like you could get a full, you could get a mixture. It is a possibility.

Q. You can get a full, for example, if it was still damp, correct?

A. It would be more likely; but, again, I mean, I could take a dried shirt with blood on it and place it on the counter; and maybe some flakes fell off. I wouldn't know until I swabbed that secondary item to see what the profile is. I'm not saying it's

not impossible. It's certainly a possibility, but we wouldn't know until we tested it.

Q. But we didn't have blood in this particular circumstance, right?

A. No. This would be -- okay. So, for semen, I mean, I don't know -- I'm not saying it's more likely that it's possible because it was transferred that way. I don't know what happened -- what happened to the items prior to me receiving them in the laboratory. These are the DNA that -- this is the DNA that is present on the item as we received them.

Q. Okay. You cannot tell us what happened with these particular items. All you can tell us is what DNA you found at the point when you examined the items; is that correct?

A. That's correct.

Q. You were given no samples to test in this case that came from the body of Imani Hilton; is that correct?

A. Correct. We just received the panties and the carpet.

Q. Okay.

MR. SMITH: I pass the witness, Your Honor.

THE COURT: Thank you.

MR. LEONARD: Briefly, Judge.

REDIRECT EXAMINATION

Q. ***(BY MR. LEONARD)*** Your lab did receive saliva swabs from Imani Hilton to test in this case?

A. Yes.

Q. You did -- okay. And you developed a DNA profile for Imani Hilton?

A. Yes, I did.

Q. Okay. And I want to go back to something else that we talked about earlier. We talked about the carpet, the portion of the stain from the carpet. Now, originally when we talked about the full-male DNA profile that was developed, this was with regards to the sperm fraction; is that correct?

A. Correct.

Q. Okay. I failed to include that. Okay. And, again, you developed a full-male DNA profile?

A. Correct.

Q. Okay. And was Imani Hilton excluded from the DNA profile that you developed from the carpet?

A. Yes, she was.

Q. Okay. So, she is excluded. She was not a contributor to this DNA profile?

A. Correct.

Q. Okay. You also developed a DNA profile from the epithelial fraction that was found on the carpet?

A. Correct.

Q. Okay. So, let's talk about that.

Okay. All right. And when were your find -- were your findings for this particular profile that you analyzed?

A. This item resulted in a mixture of at least two individuals, at least one of whom is male; and both could not be excluded as possible contributors to the mixture.

Q. Okay. And what were the stats that you developed for this profile?

A. One.

Q. This mixture?

A. One in 830 million for Caucasians.

Q. What else?

A. One in 490 million for African-Americans. One in 95 million for Southeast Hispanics. And 1 in 1.4 billion for Southwest Hispanics.

Q. Okay. And, again, what do these items mean for this particular profile?

A. It just means that you would have to test -- so, for example, for Caucasians, 1 in 830

million, you would have to test 830 million individuals before you would expect to see another individual who also could be contributing to that mixture.

Q. Okay. So, for African-Americans, that means you would have to test 1 in 490 million African-Americans before you would expect to see that same DNA profile?

A. Well, before you would expect to see somebody who would also be included in that DNA profile at every location.

Q. Okay.

MR. LEONARD: I pass the witness.

THE COURT: Thank you.

RECROSS-EXAMINATION

Q. ***(BY MR. SMITH)*** Back to D5 on sperm fraction of the carpet.

A. Okay.

Q. That particular allele has an 11, 13, and an asterisk; is that correct?

A. Eleven, 13 -- I'm sorry. On which sperm fraction of the carpet?

Q. Sperm fraction of the carpet on D5.

A. Yes.

Q. Okay. There is an unknown allele there; is

that correct?

A. Correct.

Q. Which means that that one was not developed, correct?

A. Correct. It was below our threshold.

Q. Which means that there could be another DNA sample within that profile that is masked; is that correct?

A. There could be. There was activity below our threshold that we analyze data, and we're not sure if it was a true peak or if it was some sort of artifact.

So, we want to at least state that it was there. So, we indicate that on my chart with an asterisk. Again, I can't draw conclusions to it; but it's possible that there could be somebody at a lower level that is being masked.

Q. Okay. That was going to be my next question.

A. Okay.

Q. And you cannot exclude the possibility that there was another person within that sample, right?

A. So -- I'm sorry. So --

Q. Within that sperm cell fraction, you cannot exclude the possibility of another person; is that

right?

A. We -- it wouldn't be out of the realm of possibility, and it actually is consistent with what the epithelial fraction is. This stain came from the same stain. So, it was put into the same solution and basically spun down in a centrifuge to expel the sperm pellets to go to the bottom, and then essentially the epithelial cells are the skin cells on the top. We take a pipette to transfer the top portion once you have a sperm pellet to a new tube.

So, the epithelial fraction resulted in a mixture, a clear mixture, of the two individuals in this case. The epithelial -- the sperm fraction resulted in a major with asterisks at a few of the locations. So, it's possible the pipetting may not have gotten every single skin cell that was deposited. So, you may have a little bit of a mixture just like you do in epithelial fraction.

So, you're correct. It's not out of the realm of possibility. A lot of those stains essentially came from the exact same stain, these two profiles. So, having another profile masked totally makes sense, especially when the epithelial fraction is a mixture of two individuals being two individuals in this case.

Q. Okay. And -- but you can agree with me that the two contributors that you have known values for both have 11, 13 and do not have a 12 and do not have any other alleles in any other items in that allele?

A. Sorry. Just a couple of things. So, you're referring to the stain from the -- epithelial stain from the panties at D5, correct?

Q. I'm referring to that as well as the sperm fraction from the carpet that has an asterisk by it.

A. Okay. There is an asterisk there, but it doesn't necessarily mean the asterisk is a 12. It just means there was something there below interpretation. So, I can't say that that's 12.

The 12, you're correct, at D5 is not consistent with either of the two individuals I have. Again, I can't draw and I don't draw conclusions to the minor contributor to that mixture or to that -- yes, to that mixture, and the asterisk -- I don't know what that belongs to. It was a below level. Possibly the major person is masking the minor person.

Q. Okay. But we can say definitely when it comes to the epithelial fraction portion of the panties, you're not able to include Rodney Milum in

that particular sample?

A. I don't draw conclusions either way regarding Rodney Milum because I don't feel comfortable doing so because there are such a minor -- there is so little information to the minor contributor to that profile.

Q. Okay.

MR. SMITH: Pass the witness, Your Honor.

THE COURT: Thank you.

Redirect?

MR. LEONARD: One final question, Judge.

FURTHER REDIRECT EXAMINATION

Q. ***(BY MR. LEONARD)*** Based upon your analysis of the sperm fraction that was recovered from the carpet and tested from the carpet, can you say with any degree of scientific certainty that Rodney Milum is the source of the DNA profile?

A. On the sperm fraction of the carpet?

Q. Yes.

A. Yes. To a reasonable degree of scientific certainty, Rodney Milum is a source of the DNA profile, excluding identical twins.

Q. And what does that mean, "excluding

identical twins"?

A. If he had an identical twin, they would have the same profile, in which case we wouldn't be able to differentiate which twin deposited. So, barring that, if he didn't have a twin, to a reasonable degree of scientific certainty I would say he would be the source of that DNA profile.

Q. And that is based upon the astronomical statistics that you were able to come up with?

A. Well, based upon the profile and doing my visual comparison to the data that came out of the instrument and backing that up with my statistics, I feel confident with my conclusions.

MR. LEONARD: I pass the witness.

THE COURT: Thank you.

Anything else?

MR. SMITH: Yes, Judge.

FURTHER RECROSS-EXAMINATION

Q. ***(BY MR. SMITH)*** You cannot say with any scientific certainty that any of Rodney Milum's DNA came from the body of Imani Hilton; is that correct?

A. Well, I don't have any swabs from the body of Imani Hilton. I just have a stain from the carpet and a stain from the panties. I don't have anything off of her body. So, obviously, if I don't have

anything, I can't draw conclusions on what I don't have.

Q. And you will agree with me that one profile can be deposited on the carpet at one time and another profile can be deposited on the carpet at another time, correct?

A. That is possible.

Q. And you will agree with me that you cannot tell us when that happened, right?

A. No. Again, I can't tell time with the DNA analysis. It's just the DNA that's present at the time that the item is collected.

Q. And you cannot exclude with any certainty that there might be a minor profile that's masked in that particular stain on the carpet?

A. There is a possibility of that on the stain on the carpet?

Q. Uh-huh (affirmative.)

A. Well, there is a real possibility that somebody's being masked, considering that the epithelial fraction generated a mixture. So, I have a profile in one and a mixture in the other. So, it makes sense that that is a real possibility for the sample. Obviously, there is a mixture on the same stain.

Q. So, there may be somebody else out there?

A. Well, it's consistent with Rodney Milum and Imani Hilton.

Q. And there is an indication that there is somebody else's DNA contained within the sample?

A. On which sample? Carpet sperm fraction?

Q. Carpet sperm fraction, let's start with that.

A. Yes, there could be somebody else; but I didn't say it had to be. It could be anybody. I don't know what I don't have. All I know is that Rodney couldn't be excluded as the profile. The asterisk, I don't draw conclusions on.

THE COURT: I think this is starting to get repetitious.

MR. SMITH: All right.

Q. ***(BY MR. SMITH)*** And --

MR. SMITH: I think I will pass the witness, Your Honor.

THE COURT: Thank you.

Anything else from the State?

MR. LEONARD: One -- two questions, Judge.

THE COURT: As long as they are not repetitious.

MR. LEONARD: Absolutely.

FURTHER REDIRECT EXAMINATION

Q. (BY MR. LEONARD) Is the DNA profile that you developed from the sperm fraction of the panties consistent with the DNA profile of Rodney Milum?

A. Yes, it is.

Q. Okay. And is the DNA profile that you developed from the epithelial fraction from the stain of the carpet consistent with the DNA profile of Rodney Milum?

A. It's consistent with not only Rodney Milum but also Imani Hilton.

Q. Okay.

MR. LEONARD: I pass the witness, Judge.

THE COURT: Anything else?

FURTHER RECROSS-EXAMINATION

Q. (BY MR. SMITH) And you would agree that that 12 in the epithelial fraction portion of the panties is inconsistent with Rodney Milum, correct?

A. Rodney Milum is an 11, 13. Imani Hilton is an 11, 13, also. At D5, which is just a location on the DNA, there is a 12 coming up. So, there is an allele that is not consistent with either one of them. However, I don't know who it belongs to; and I

draw no conclusions regarding it.

Q. Okay.

MR. SMITH: Pass the witness, Your Honor.

MR. LEONARD: Nothing further, Judge.

THE COURT: Thank you.

Is this witness excused for all purposes?

MR. LEONARD: Yes, Judge.

MR. SMITH: Yes, Judge.

THE COURT: Thank you so much.

(Witness released)

THE COURT: Any other witnesses for the State?

MR. LEONARD: Yes, Judge. State would call Courtney Head.

THE COURT: May I see counsel at the bench, please?

(At the Bench)

THE COURT: Is this the last witness?

MR. LEONARD: It is.

THE COURT: Are you already finished with the witnesses you have the scheduling problems?

MR. LEONARD: Yes, we have.

THE COURT: Thank you so much.

MR. LEONARD: Yes.

(End of Bench Discussion)

THE BAILIFF: Judge, this witness has not been sworn.

THE COURT: Good afternoon.

THE WITNESS: Hello.

THE COURT: And you can either stand or be seated; but if you would face the jury and raise your right hand, I will give you the oath.

(Witness Duly Sworn)

THE COURT: Thank you.

MR. SMITH: I'm okay.

MR. LEONARD: May I proceed?

THE COURT: You may.

COURTNEY HEAD,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

Q. ***(BY MR. LEONARD)*** Good afternoon.

A. Hello.

Q. Please introduce yourself to the jury.

A. My name is Courtney Head.

Q. And how are you currently employed?

A. I'm employed as a criminalist specialist with the Houston Police Department crime laboratory.

Q. And how long have you been with the Houston

Police Department crime lab?

A. Couple of months short of four years.

Q. And where are you currently assigned? What is your responsibilities there?

A. I am a case writing analyst. So, I can do testing, serological testing and DNA testing. I'm also a supervisor in the laboratory. I supervise 10 other analysts, help out with training. And I'm also the backup technical leader for the DNA section.

Q. And what sort of training and educational experience do you have?

A. I have a Bachelor's degree in biology with a minor in chemistry. I also have a Master's degree in forensic molecular biology with a concentration in molecular biology.

And I have been working in the field for almost 12 years. Initially, 12 years ago when I first started, I did a lot of training, a lot of hands-on, a lot of testing, a lot of written tests, oral tests. I have testified probably 50 times. So, I have got a lot of training and experience.

Q. Okay. And what sort of continuing education have you had?

A. Each year we're required to have eight hours of continuing education. So, actually, I have