

# Transcripts of the Attorney General's Initiative on DNA Laboratory Backlogs (AGID-LAB) Working Group

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Monday, October 21, 2002  
Courtyard by Marriott  
Crystal City, Virginia

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**DNA**  
**INITIATIVE**



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## **WELCOMING, INTRODUCTIONS, AND OPENING REMARKS**

MS. HART: Good afternoon. I think I've met just about everybody here, but we have some new faces. For those of you who don't know me, I'm Sarah Hart, the director of NIJ, and I would like to welcome you all here to the second meeting of AGID-LAB, the Attorney General's initiative on DNA laboratory backlogs.

I'm really delighted that you've all taken time out of your very, very busy schedules to come here. Every time I look at the group of people that we have here I'm really amazed by the wealth of knowledge and experience and wide variety of viewpoints that are represented in this room, and I do recognize given the kind of work that you do, what a tremendous inconvenience it can be to take some time, even a couple of days, out of your schedule to come to a meeting like this, and so I really very much appreciate the fact that you have all done that and devoted the time for what I think is a very important project, and I know that people in the room share that view.

By the way, last week I reread the transcript of our first meeting, which I have to tell you is kind of a phone book, and I think my staff was a little surprised when I said I wanted to take it home on the train and read it. I was again impressed going through there by how thoughtful the discussions were, how constructive I thought the discussions were, and what good ideas came out of them.

I will, though, just for the record want to make clear that when I said - the transcript reads that I believed in the decapitation of offenders. I think it was the incapacitation of the offenders is what I said. So just for the record I want to make it clear to everybody that's what I meant. I always find it difficult to read a transcript because you never like the way you sound in it, but I know for sure I did not say that.

I will tell you that even though we are on the second meeting and we still have work to do here, that doesn't mean that what you've done hasn't had a tremendous impact so far. The discussions that we had last time were very, very helpful to us in having further discussions within the Department on various DNA issues. I testified in May for the Senate Judiciary Committee chaired by Senator Biden, and I have to tell you it was extremely helpful to be able to talk about a number of the issues that you all had brought to my attention. It certainly was in forming discussion, and it is already in forming the Department's policies.

One of the things, for example, that we had talked about was the need to address local crime labs and make sure that their backlogs were addressed even though traditionally the Department usually does not support direct grants to local jurisdictions because it so waters down the amount of money that can be granted. In this particular situation because we're talking about such a limited pool of crime labs that are out there, we were able to take a position from the Department that federal dollars should be made available both to state labs and to local crime labs because in many ways that was the place where there was the greatest need.

So even though we are not in any way finished, the work that you have done so far is having an ongoing impact and it has been extremely helpful. As I'm sure you realize, there continues to be tremendous interest on the Hill on these issues. There are a number of pieces of legislation that

are going on about this. I just had a meeting with Congressman Smith, who is the chair of the subcommittee on crime through the House Committee on the Judiciary. He's extremely interested in these questions. So I look forward to many good things to come in the future.

As you may recall, the last time when we talked, I asked you specifically to focus on two issues, which you all did, which was looking at if we could down the road say what we wanted this capacity of our country to be on DNA evidence, what would be kind of the vision of the future and how do you get there. Then at the same time the second question was pretty much, well, until you get there how do you get the best public safety benefit and public interest benefit out of what we have and how to go forward. So I thought there were some very, very helpful suggestions there.

We did reach consensus on a number of issues. People generally seemed to feel that we needed to improve the capacity of the labs. Automation of the labs was the way to go. We needed more analysts. We needed to have more training for analysts for law enforcement, for defense attorneys, for judges, for prosecutors. For having so many people in a room, I don't think oftentimes you find agreement on such a wide range of issues by so many people, but this was something it seemed last time everybody seemed to have a very strong interest in, and especially addressing the backlog problem.

There are some other issues that I think still need further discussion, talking about some future improvements with CODIS, making sure that we have the maximum benefit for everybody on the state and local level with that. I'm delighted that Joe DiZinno is here again today, and, Joe, thanks for taking the time.

I have to tell you, by the way, in the last year I have been especially pleased to be developing such a good working relationship with the FBI. Dwight Adams, who is now in a leadership position over there, has really reached out to NIJ and our staff, and I'm greatly appreciative of that and the kind of cooperative work that we're doing going forward. I think it's a very good sign, and I think ultimately it will help all of us in the long run combining all of our thoughts and best efforts here.

Shortly I'm going to be turning this over to Glenn to talk about some of the issues that we need to discuss, but I also wanted to mention today that we have two professionals from the Forensic Science Laboratory of the South African Police Service. Are you the gentlemen who are sitting up there?

MR. MORRIS: Both of us.

MS. HART: I didn't recognize you before, and I'm sorry I haven't had a chance to meet you. Lisa Forman, who I'm sure you have met, came in and suggested that we hear from you, that you've done some amazing work there, and perhaps it will help some of us think outside the box about how we approach the issues here in this country. So I'm really looking forward to this presentation today.

MR. MORRIS: Thank you.

MS. HART: We have members from the Forensic Resource Network here who are going to talk about some of the issues that they've got going and some suggestions that we should think about.

A couple of things I wanted to talk about. The Attorney General's directive to me was to convene this working group, which you all obviously are doing, so that I could make recommendations to him about how to go forward in the future. One of the things that I would like to try and keep in mind for this is that I would like to identify the areas that we think especially need work. For example, let's suppose you say we need more analysts. What I would like to do is identify the particular issues that we need to address and identify options for addressing them without wedding ourselves to one particular option. I think to me it's always better to maintain some flexibility, to identify a range of options because something that we think may work may not work with the Hill, for example, and we would need their support.

So I'm going to ask you if you can at this point to try and especially identify what are the particular issues that we need to address, and then how do we identify options for various ways to do it so that we maintain some flexibility. So this is a tall working order that I've got for you, and I do appreciate that you all are coming here and doing this.

What I would like to do before I turn this over is just ask that everybody go around the room and introduce yourselves again and where you're from so that we all know who is here. That certainly will be very helpful to me to have you introduce yourselves again. I'll start with the gentlemen from South Africa.

MR. MORRIS: Thank you. My name is Keith Morris. I'm the director of the police forensic laboratory system in South Africa.

MR. VAN NIEKERK: Good afternoon. My name is Johann van Niekerk, and I'm a forensic scientist attached to the biology unit of the forensic science lab of South Africa.

MS. HART: Thank you for coming all this way.

MR. VAN NIEKERK: Thank you very much for having us.

MS. WEST: Good afternoon. I'm Mary West. I'm the commander of the forensic services division of the Chicago Police Department.

MR. DILLINGHAM: I'm Steve Dillingham with the American Prosecutors Research Institute.

MR. FERRARA: Paul Ferrara, director of the Virginia Division of Forensic Science.

MR. SIGEL: Steve Sigel, chairman of ASCLD-LAB and director of the Western Laboratory of Virginia's Division of Forensic Science.

MR. COFFMAN: David Coffman, supervisor of Florida's statewide DNA database.

MR. BUTLER: John Butler from the National Institutes of Standards and Technology.

MR. KRESBACH: John Kresbach, City of Albuquerque Police Department, and I also supervise the statewide database program for New Mexico.

MS. CROUSE: I'm Cecilia Crouse. I'm from the Palm Beach County sheriff's office crime laboratory. I'm the supervisor of the serology DNA section.

MR. VIGGIANNI: My name is Nick Viggiani. I'm with the NIJ staff. I work in the investigative and forensic sciences division for Lisa Forman.

MS. JONES: Robin Jones. I'm with ISD also, NIJ.

MS. FORMAN: Lisa Forman, investigative and forensic sciences division, National Institute of Justice.

MR. SCHMITT: I'm Glenn Schmitt. I'm the deputy director of the National Institute of Justice.

MR. MORGAN: John Morgan, science advisor to the director.

MS. HERD: I'm Kim Herd. I'm with the U.S. Attorney's Office in Washington, D.C.

MR. CLINE: I'm Phil Cline. I'm the chief of the detectives for the Chicago Police Department.

MR. DiZINNO: Joe DiZinno, deputy assistant director of the FBI laboratory.

MR. TILSTONE: Bill Tilstone, executive director of the NFSTC.

MR. SELAVKA: Carl Selavka. I'm the director of the State Police crime laboratory in Massachusetts.

MS. NARVESON: Susan Narveson. I'm the president of the American Society of Crime Laboratory Directors and director of the Phoenix Police Department crime laboratory.

MS. GUIDO: Syndi Guido. I'm the criminal justice advisor to Pennsylvania's governor.

MR. CLARKE: I'm Woody Clarke. I'm a deputy district attorney in San Diego County.

MR. GIALAMAS: Dean Gialamas. I'm the assistant director of the Los Angeles County Sheriff's Department crime lab.

MS. SAMPLES: Marie Samples, assistant director of the department of forensic biology in New York City.

MS. HART: We've got a number of people in the crowd. If people don't mind just letting us know who you are.

MS. KREEGER: Good afternoon. I'm Lisa Kreeger. I'm the DNA forensic evidence program manager at the American Prosecutor Research Institute.

MR. HOUCK: Max Houck. I'm the projects director for the forensic science initiative at West Virginia University.

MS. HOLUP: I'm Linda Holup. I'm with the Marshall University Forensic Science Center.

MS. BERNHARDT: Gena Bernhardt. I'm with the Department of Justice.

MR. HESS: David Hess, Congressional public affairs, OJP.

MS. MUZZATTI: Claire Muzzatti, intern at NFSTC.

MR. BALLANTYNE: Jack Ballantyne, associate director for research, National Center of Forensic Science.

MR. LOTHRIDGE: Kevin Lothridge, deputy executive director for the NFSTC.

MR. FENGER: Terry Fenger, director of the Marshall University forensic science program.

MR. STOLOROW: Mark Stolorow, director of Orchid Cellmark Laboratories.

MR. JONES: John Paul Jones, former NIJ employee, now business school student.

MS. TULLY: Lois Tully, program manager of NIJ.

MS. KASHTAN: I'm Pat Kashtan, NIJ ISD.

MR. NELSON: I'm Mark Nelson, special agent in charge of North Carolina State Bureau of Investigation.

MR. SCHELLBERG: Tim Schellberg, Smith Alling Lane.

MS. HURST: Lisa Hurst, Smith Alling Lane.

MR. TURNER: Chris Turner, NIJ investigative forensic sciences division.

MS. HART: Thank you all, and I especially wanted to thank Lisa Forman and her folks for setting this up. They always do a terrific job advising us on things on DNA, and I'm very, very lucky to have inherited such a fine staff at NIJ on this. It's certainly a delight, and I'm glad she has organized all of this.

In the meantime I'm going to turn it over to Glenn to move on to the next agenda item.

## **SOUTH AFRICAN POLICE SERVICE FORENSIC SCIENCE LABORATORY**

MR. SCHMITT: Thank you, Sarah, and let me add my thanks to all of you for your participation here today. I look forward to visiting with all of you at the break and at our meals.

We have a very interesting agenda for you that I'll get to in just a minute. A couple of housekeeping matters. We're in a much more cozy environment that we were before, so I hope you will all feel free to get refills on your iced tea. If you didn't get a chance to get the dessert that's out there, you should do that.

Because the court reporter will kill me if I don't do this, I'm going to ask Gena to send a sign-in sheet around the back table because the microphones could not pick up the names of everyone who was at the back couple tables, and that way we can make sure we have a record of everyone who is here today.

I invite you now to take a look at the agenda that we have prepared for this. You will see that we have alternating sessions of serious discussion followed by events that we hope are informative and interesting to you to kind of make it also more worthwhile for your participation here today.

We wanted to give you some perspectives of the way DNA and DNA analysis are being used in other countries or in other organizations so that you will get a chance to see how other folks are thinking about these issues, and we have tried to intersperse some of these presentations around the actual working sessions that we have scheduled for the next day and a half.

The order of march more or less is to look at this issue in about four broad areas. In that regard let me first call your attention to something that you will see is entitled executive summary towards the top. What we've done is to ask our people to go over all of our discussion from the last meeting, the first meeting of AGID-LAB, and kind of synthesize what we all think you all came to a consensus on and to summarize it here in this executive summary.

I ask you to look this over during the presentations if they're not as exciting as you would like them to be, during the breaks, in your rooms this evening, and then call to our attention in some fashion, either one on one or in a large group setting the items that you think perhaps we got wrong or we didn't get as complete as we should have so that we do in fact have a record of the consensus that we think you all reached because at this meeting we hope to talk about areas in which we didn't get consensus either because we talked about it and there really wasn't one yet or we just didn't talk about it yet.

That brings us to the second piece of paper that you have that says AGID-LAB discussion topics and draft recommendations for October 21 through 22. We have lumped these into four categories, IT integration and information sharing, transforming practice through competency building, DNA databases, and legislative and policy matters, and we're going to discuss them more or less in that order as you see on the agenda.



When we get to each of these sections, we'll talk about some of the introductory paragraphs that we've put together. We've numbered those for your ease in following. It pretty much introduces the subject to those of you who maybe don't have as much familiarity as others here. We understand that each of you has a different focus, a different use, a different entry into this subject, and so different parts will resonate with you, and some you will know and some you won't know.

Underneath each of the numbered paragraphs we have something that is listed in italics as a recommendation, and this truly is just a stepping off point for our discussion today based on our staff work here at NIJ. It may be that at the end of the discussion time we will be completely 180 degrees away from what the recommendation said. I hope we aren't that wrong in predicting where you all will come out, but my point is to say that none of this is cast in stone. We truly want to know what you all think is the right way to go.

We will go over the list in order, and then at the end after the numbered paragraphs we have something called other discussion items. We don't have a lead-in there. We don't have recommendations. They're just items that we think ought to be discussed, and we'll get to those as well.

You will also see on the agenda that we've interspersed one or two additional areas, quote, unquote, of things to discuss that didn't fit in one of the big categories. There were just so many things that we came up with that we didn't want to lump them all together, and so we just put them in, and that's our 4:00 to 5:00 p.m. area of discussion this evening.

After we've gone through this it will be time for public comment for those folks who are not on the AGID-LAB group, but who are here today, and I hope that they will also feel welcome to pigeon hole the participants during the breaks and suggest to them things that they should say or should enlarge upon. We will hear from them directly at the end of the afternoon, and we'll repeat this again tomorrow, and you see the agenda that's down there.

I am going to try to play time broker and ringmaster as we go forward. Just as the transcript got Sarah's quote wrong, I think I had said the last time that time was an evil taskmaster as opposed to time was an evil taskmaster. Whether by needle or whips and chairs or whatever happens to accomplish it, time marches on, and I will try to keep us within the parameters so that you don't all walk out at the end of the day tomorrow and we're only halfway through the agenda.

We had hoped that we might have Maureen Casey with us here today. We asked Maureen to take on that role, but Mayor Giuliani has dispatched Maureen and one of the other members of Giuliani Partners down to Mexico City. I think they had landed a big deal with the Mexican government to try to clean up the crime problem in Mexico City. It's a big job, as you might imagine, so Maureen and her colleague have been dispatched down there. We'll still, of course, invite Maureen's comments on what we discuss today as well as the comments of other folks on the panel who perhaps could not be in attendance with us so that we get their views and recommendations.

So Sarah and I both will try to be facilitators. I think I'll do more of that so that Sarah can listen and chime in and take notes, and then I'll also be taking notes as well as the rest of the staff, and we will at the end of the day try to summarize where you all have made recommendations and what the next steps will be after we conclude tomorrow.

Let me just pause for a moment and ask if there are any questions from anyone at this point as to how we're going to go forward.

Well, that being the case, we're going to move to not the substantive discussion, but to a portion of information receiving by you. We are pleased, as Sarah mentioned, to have two members of the South African Police Service with us here today to discuss the ways in which they have been developing their program in their country. We're pleased to have the commissioner of the forensic science laboratory, Dr. Keith Morris, and also Mr. Johann van Niekerk – I apologize if I just massacred your name - who is the gentleman who has been developing the DNA program in the forensic science lab. I'll turn it over to them.

Gentlemen, thank you very much for coming all this way to be with us and to share with us the work that you're doing on DNA.

MR. MORRIS: Thank you. Today we would just like to present a few of our ideas regarding the automation of DNA casework as we perceive it in South Africa, and before I go into too much detail I would just like to give you a little bit of the perspective on South Africa to perhaps place this discussion into context.

Today we would just like to thank first NIJ and specifically the director, Sarah Hart, and Dr. Lisa Forman for their invitation to come out to Washington and give us this wonderful opportunity to meet people that maybe we've only read about or found information on the Internet and speak to them face to face.

Forensic DNA in South Africa, I'll give you a little bit of background, and then we'll go into what we define as laboratory automation and then look at the automation of samples both for offender samples and for crime scene samples, what is our methodology there, maybe in terms of the reference samples what we have already put in place, and the development which we've got in place for the crime scene samples and how we're going to approach this problem, and then shortly just a summary of what we have said, and if there are any questions, we might be in a position to answer those.

First of all, the ladies and gentlemen who are doing all of the work for us, Johann van Niekerk is here with me today. The others who weren't able to make it today are Arnold Greyling, Christo Weitz, and Carene Snyman, and we would like to say in their absence thank you for all the work that they've put into this program.

## **THE CRIME PROBLEM IN SOUTH AFRICA**

MR. MORRIS: South Africa, just for your information, is about twice the size of Texas. It has a population of about 42 million people, and, unfortunately, we've got a very high crime incidence. The laboratory is composed of four laboratories at which we do DNA in two of those laboratories. We initiated our DNA work in 1991. We discontinued the serological typing work in 1996 and recently looked at the information on our DNA database, which is in its infancy at the moment.

Crime investigation, to give you some idea of these figures, these figures are quoted for last year incidents through 100,000 of the population. So sexual assault, 119; murder, 44; assault with intention to do grievous bodily harm, 557; burglary, 659; and theft of all types, 1,259 incidents per 100,000 of the population.

Case load in terms of DNA, this is what our case load has looked like over the cases which we have received, peaking at over 40,000 last year, the problem being being able to do DNA on all of those cases, how to get all of these cases through, and, as is the tendency in the world, an increasing load which needs to be dealt with to assist in the investigation of these crimes.

These are the distribution of cases which we are receiving at the laboratory. As you can see, rape, sexual assault forms the greater proportion of these cases. What our concern is if one moves over then to doing a database, this would then decrease to a figure of about 3% of the total cases that we receive, and by looking at that representing a total figure of 40,000 cases would obviously have a very negative impact on the backlogs which we will experience.

One of the biggest problems that we have in South Africa is rapes of minors. It is a serious problem. One of our main objectives that we're trying to address in South Africa are crimes against women and children, how to reduce those, to give them the necessary investigation and scientific support in those investigations, and how to try and solve this problem.

There was an instance. I know that it was published internationally. It was the rape of a baby with the name of Tshepang. She was nine months old and was apparently from the initial investigation raped by six individuals. These people were arrested. We received their DNA profiles as well as samples from the survivor, and all six of those people were excluded.

The problem that this creates in South Africa is there is an enormous ignorance regarding scientific evidence and regarding DNA evidence in particular, and, to be quite honest, the large proportion of people will never have heard the word DNA in their lives before. The community that this took place in were fully convinced that all six of these people had in fact raped this baby, and they were waiting for justice to be done the way they would like to have seen it be done. They were then all excluded by those DNA profiles that were obtained and indicated a different profile of a person unidentified. We went through an additional 42 potential suspects until the perpetrator was apprehended, and the fact of the matter is there was an eyewitness physically to this rape that took place.

This is the kind of media coverage that we did get of this: They're a savage species. I hear they rape their young. This provides us with an enormous challenge in South Africa to try and address these kind of problems.

## FORENSIC AUTOMATION THROUGH ROBOTICS

MR. MORRIS: This is what we're doing at automation. What is automation the way we perceive it and what are the benefits that we would like to obtain from automating our DNA evidence? The first thing that we've accepted is this principle that the automated process will not be the same as the manual process. If one wants to look at automation and you want to simply automate according to the manual process that you are implementing at that point in time, that might not necessarily provide you with the optimal solution. We firmly believe in the use of robotics. This is derived from the word robata, which was defined by Karl Capek in 1921. This is the way he looked at it was forced labor or drudgery.

I think the point of this is that in a process which lends itself toward automation the removal of people doing repetitive processes out from the final result up front enables one to move that human capital into the post-analysis part of the process, into the interpretation, evaluation, and providing of those results in court. So we try to remove human intervention as far as possible into this process.

What is robotics? Two definitions that we have worked on are reprogrammable, multifunctional manipulator designed to move materials, parts, tools, or specialized devices through various programmed motions for the performance of a variety of tasks and then an automatic device that performs functions normally ascribed to humans or a machine in the form of a human.

The way we see it for robotics is the application of instruments operating autonomously in a Cartesian axis system in a voluminous 3-D space under control of preprogrammed inputs. Automation, the process of coordinating robotic action with no or minimal human intervention towards a predefined goal for a given process; that is, the important thing is the removing human intervention as far as is possible to get the reproducibility of results which are really not obtainable in a manual process.

The taking of samples lends itself to accuracy problems, reproducibility problems, which has an impact in the results that are obtained and also the cost of rerunning those samples. In South Africa we don't have large amounts of money available to push at the problem. We want to get the job done right the first time.

This is important. The robotic system allows the scientist to load more samples, assay more plates, and walk away from that process for a longer period of time. What is important here is the provision of auto tracking and the recording of every single step. Every sample, every subsample, at any point in time in that process this can be provided in court if so needed. One of the most significant benefits of liquid handling, which is fundamental to the process, is not so much as the speed and throughput, but the precision and the reproducibility of the assays which are being performed.

What I would like to do now is I'm going to hand it over to Johann, who is going to take us through a number of parts of this. First of all, the important thing about automation and the challenge maybe for crime scene samples even more so than with control samples is the vehicle in which the sample is collected. If the vehicle for sample collection isn't standardized, it

provides a real problem in automating. We will go through what we have done and what we have put down for our reference samples and give you some idea of the integration of the various components of the system. Very often we get information from suppliers of instrumentation who will say this piece of equipment is fully automated and that doesn't fit into our definition of automation. So it provides a lot more challenges to us to get this process finalized and then some insight into what we are proposing and will be implementing in terms of the crime scene samples, which are an even greater problem both in South Africa and in countries throughout the world. Thank you.

MR. VAN NIEKERK: Thank you, ladies and gentlemen. I think when Karl Capek wrote the book on universal robots, he actually had a forensic science lab in mind because one of the premises of working in a forensic science lab is the fact that you do things over and over and over again and then you start and do it again.

So for that purpose we decided about two years ago that we needed to look at our processes and automate as much as possible for the event of running into backlogs, which everybody internationally does, and this is what we would like to talk you about this afternoon and just quickly show you what it is that we've done so far and bounce these ideas off of you in informal discussions afterwards, which we are obviously looking forward towards. So this is a purposeful meeting for us, and we really do appreciate the fact that we can be here.

As Commissioner Morris has said, the input vehicle for any automated system or any process we want to improve the efficiency of needs to be standardized according to our perception of things. We are in the fortunate position of being able to describe and design our own evidence collection kits in South Africa, and basically, given the small country and the remoteness of where we sit on the southern point of Africa, we are capable of having one specific data collection kit for the purpose of evidence collection. This kit really provides at this stage for us all the necessary equipment that is required for the collection of evidence.

Form follows function. That is one of the mottos for us, if you will. Whether we look at the design of an evidence collection kit, whether we look at the design of an automated system, at the end of the day both of those two entities must integrate and form a whole. For that purpose we decided methodology follows requirement. Our requirement is quite simply the following: We need to analyze more samples in less time. We need to be able to analyze more samples with less money available. We need to be able to analyze more samples so that we can establish an effective database so that we can really become effective in the investigation as well as the prevention of crime.

The contents of our evidence collection kits of which I've got a couple of examples here which I would like to show you later if time permits, we basically have divided our forensic DNA database into two parts. As with the CODIS system is the offenders index and the forensic index, we have a crime index, which equates to the forensic index, and then a reference index, which equates to the offenders index.

What we have done is we have standardized some Decon swabs in the kits, a couple of catch papers and combs for the collection of evidence and hair and some auxiliary equipment which

just facilitates the whole process of evidence collection. Then the reference index component of our kits basically consists of the Marshal cassette.

On this point you will see the word Marshal coming up again and again. Obviously given the one L, it has no bearing on the Marshall University. Lewis Marshal was the starting point to name this process that we have designed. It basically comes from U.S. marshals. What does a U.S. marshal do? Take a person into custody, transports him or her to a place of safekeeping, looking after him the whole way.

This is basically what the Marshal cassette is doing for us. I'll show you a picture of what it is now. Then this cassette contains FTA paper, and we have designed our entire reference processing system around FTA paper. I don't think I need to tell you what FTA is all about. It's such a well-known commodity.

Our kits are bar coded. As Commissioner Morris has said, sample tracking is quite important to us. It's not quite important; it's essential. So all of our kits are prebar coded by the manufacturer, which just facilitates the tracking of samples still in the lab. Just to give you an indication of the contents of the kits, we have produced a little device very similar to something which is available from Switzerland. It's a little cardboard box for the collection and safe transportation of swabs. We have medical practitioners collect samples from survivors of sexual assault, and these are then placed into these cardboard containers which are prebar coded, as I've said. These are folded and closed down and sealed each with their own individual and unique identifier, individual bar code.

## THE MARSHAL CASSETTE

MR. VAN NIEKERK: The Marshal cassette, as I mentioned earlier, is a device that we have designed to facilitate the automation of blood samples in a forensic environment. We basically came up with this design to save on costs, to be very blunt about this. FTA is not a cheap way of collecting blood, transporting, and presenting blood, so we needed to basically cut down on the consumption of FTA paper, and I think much to the dismay of Wattman Belsi in the United Kingdom, we are using much less FTA paper per sample collection than they would like to sell to us.

Why do we use FTA? Just as a quick reminder, it is a simple and safe handling medium for genetic material as far as the collection, transport, processing, and storage is concerned. The benefits of this Marshal cassette that I've shown you - and I'll explain later on exactly how we go about using this - it provides us with a single solution for the collection, safe transportation, preservation, and automated processing of genetic material. As far as the automated processing is concerned, the DNA purification and sample isolation procedure just takes place in an automated fashion in the lab because of FTA and what it is.

The cassette that I've just shown you - and maybe I should go back to that slide just so that you have it in the background - you will see there a couple of holes, and I'm just going to point to those sitting down like this. Those holes over there are basically fitted with single disks of FTA paper.

What we do is we have a surgeon or medical practitioner draw blood from the person - and I'll explain the issue of blood later on - we have a medical practitioner draw blood from a person, and then the blood is spotted at the time of collection on the FTA paper. In other words, this means that it doesn't matter when we receive the sample in for analysis. The quality and quantity of DNA is within acceptable variances for us to be able to put it into an automated system.

I told that you we needed to save on cost, and the cost of this device, this Marshal cassette, works out to be the equivalent of about 50 American cents with the added cost of about \$1 for the purification reagent that is required given the fact that we handle this cassette in an automated liquid handler, so this works out to be the equivalent of about six local telephone calls for the processing of a sample.

The beauty of this is that we don't need any lab technician intervention. Given the fact that we receive the sample already spotted - or the blood sample already spotted on FTA paper, we don't need a lab technician to sit down, take a sample, spot it onto FTA paper, allow it to become dry, and the whole process that goes with that. Another bonus is the fact that we don't need to quantify the DNA. Given the fact that a specific size of disk is punched out from the cassette into a PCR tube rack, we just don't need to quantify the DNA, and that adds to time saving, to cost saving.

This just gives you a basic indication of the components of the kit that is required for the collection of blood for spotting onto the Marshal cassette. This device that you see over there is



something that is being used quite extensively or that used to be used quite extensively in hematology labs for making blood smears. It's called a Diffsafe. That's the trade name.

Basically what you will do is, as you will see later on, what you want to do is spot blood from the chip directly onto the FTA paper without removing the cap. So what is required is for a Diffsafe to be inserted through the closed stopper of the tube and then the tube is physically inverted and you press down on the tube, and a single droplet of blood is spotted onto the FTA paper where it becomes dry within a couple of minutes.

I think from our understanding this is basically what this whole meeting is all about and why we're so fortunate to be invited to be here. The improving of lab efficiencies is I think high on the agenda, if not at the top of the agenda, internationally at this stage given the fact that DNA is becoming the mainstay of forensic human identification through DNA typing.

## **THE SOUTH AFRICA FORENSICS LAB AND PROCESSING**

MR. VAN NIEKERK: What I would like to show you now is just a couple of pictures - well, quite a few pictures of the lab system that we have installed or that we are building and installing in South Africa, and I would like to use these pictures as a kickoff board to give you an indication of where we plan to go forward with the automation of crime samples.

The lab that we are currently working on, which is close to completion - the developmental validations of it has been done, the formal integration of the system must be done then, and our internal validations will take place before it's commissioned by the first of March of next year. This lab has been designed for the automated processing of offenders' samples.

There are three parts of this lab. The first part is the sample preparation lab where Marshal cassettes are being loaded into trays. If you will just excuse me, I'm going to dig in a box and I'll show you if you don't mind that. Just to add something to the voice, the first part of this lab is where these cassettes - I'll show them to you later on - are being added to a tray system like this, which is bar coded, which is then fit into the automated system, and after the handling by the lab technician of this cassette by putting it into the tray, after that until the time when we receive a result back from the system there is no human intervention anymore.

The preamplification lab basically takes care of the DNA purification, the punching of FTA paper, the PCR setup, and the amplification and detection lab takes care of DNA amplification and capillary electrophoresis for subsequent fragment analysis.

This is just an overview of what the lab looks like. We're completely aware of the fact that the robots - if I say "robots," I'm talking about articulated robot arms - is becoming a very well-known sight in labs all over the world. What does make this lab unique to a certain extent is that we've got the sample pit or the PCR setup lab and the DNA analysis lab next to one another only with an air lock in between. The physical spaces are further reinforced by means of differential pressures in the lab, so that if there is some kind of breaking in integrity of the lab in a wall, if a window is smashed out or whatever, then it will only flow in one direction and not allow contamination to take place towards the side where you still have the unidentified samples.

This just gives you another view of the lab. This view is taken from the preamplification lab, and if you look through the window, you look straight into the amplification detection lab. Next to it, just to orient you, this machine standing over here is an ABI 3100 genetic analyzer and then the track loading towards the air lock through which samples are received into the amplification and detection lab.

So just to show you these couple of pictures that I promised you, if we go through the process flow - I'm just going to mention this now. As we get to each stage I'll just pause and tell you more about that. The process flow in this lab is we have to log our samples into the system via LIMS. Then we need to have DNA purified - the FTA paper must be dried after it has been washed. We then punch the samples into PCR plates. We do PCR normalization and setup in a robotic liquid handler. The sample is then sent through an air lock to the next lab where DNA

amplification takes case, the capillary electrophoresis setup takes place, and fragment analysis in a 16 capillary electrophoresis machine takes place.

Then afterwards just as a conclusion to this I would like to just to give you an idea of how we go about doing hitpicking, as we call it. If, for instance, we have a failed PCR or something like that, we can always go back and retrieve the sample and resend it through the system either coming straight from the blood sample or from samples stored in an automated storage and retrieval cold storage facility.

The first slide that I would like to show you is where we have our Marshal cassettes washed. This is a deviation from the normal way in which FTA paper is being processed. Normally what you do just in 30 seconds - normally what you want to do when you deal with FTA paper is you want to punch out a piece of blood stained paper, dispense that into a reaction tube, and then add the purification reagent to that, vortex the sample to wash out all the cell debris and PCR inhibitors and whatnot, and then you would carry on adding your PCR mix and so on to that after the sample has been washed.

What we do is we just switch over two steps. We first wash our sample and then punch, and the cassette has been designed to facilitate exactly that. So what we do is we have the robot arm place the tray containing the cassettes onto a custom designed and built washing station which facilitates the vacuum filtration of purification reagent through the paper and under vacuum it's just flushed away. From the top it looks roughly speaking like this.

What you see over there, those white dots next to the brown dot, the brown dot is where blood is spotted onto the FTA paper and the white dots are where blood is in the process of being washed away or the hemoglobin and debris is being washed away in this vacuum filtration system.

The drying is obviously essential because you sit with a soaked piece of paper after you've washed it, and you really don't want to exert the kind of force that we do in the system on a piece of paper. What you basically will end up with is shattered DNA through hydrostatic shock or something like that. So this machine, again it's a home brewed kind of thing, home designed. It's a drying oven incubator, if you will, which upgrades at 60 degrees centigrade, and it has got a rotating disk on which the trays are being placed, and 44 minutes later we take the tray out, and the sample is dry and ready to be punched.

This is just a view from one of the access doors into the drying oven showing you the disk with all the trays containing Marshal cassettes stacked on the work surface.

What I also should mention to you is that when these trays are loaded into the system, they're loaded into a magazine 24 trays at a time each containing four cassettes, which equates to 96 samples. So every time we add or we load a batch of samples it fills up a 96 PCR at a time.

I don't know if you can see this, but I tried to take these pictures just so you can see this. On the end of the robot arm there is a bar code scanner, and every single step along the way, whatever lab way we are using, the lab way is bar coded by means of that sample. Traceability is

maintained by scanning every single step along the way. There the robot arm just goes ahead and picks up one of the trays. It either puts it in or takes it out, whichever way you will.

The next step is the punching of the samples, and if I say "punching," it basically boils down to the following. As I said to you, you want to remove a small but known size of FTA paper and put that into a 96 PCR plate for downstream processing. For that purpose or for this purpose we have had this machine designed.

The basic premise of this machine is as follows: The robot arm would place down the tray containing the Marshal cassettes on the work surface of this punching work station, and those pneumatic cylinders over there - each of those have a collar which swings around and picks up a disposal plastic pin which is being fed from a bowl feeder in the back, which I'll show you in a subsequent picture. A bowl feeder feeds these disposable pins into a tube, which makes it possible for the pneumatic punch to pick up this pin, go around, swing around, position itself over the specific roll that needs to be punched, and goes down and punches out a piece of paper, which then falls into a PCR plate which is moving on a Cartesian Axis underneath the tray. By doing that we are capable of punching 96 samples into a PCR plate without any contamination or fears, without any issues as far as that is concerned.

Then the robot arm comes along and puts down the tray containing the Marshal cassettes. It then swings around and scans the tray to make sure that exactly the same device is being placed down. I hope I've got a picture of that because that's quite something to see. I don't think I've got this picture. What it then further does is it moves forward and it also scans the individual bar codes of the cassettes which it expects to receive through the LIMS as confirmation of which cassettes are in which position.

For the benefit of taking these photographs we had some of those glass panels of this device removed. From this point on forward it is physically impossible to effect even through malicious intent - to effect sample switching because after the robot arm has placed the tray on the work surface you cannot get manual access to the samples which are being punched down into the PCR plate, which is located over there and moves underneath the tray. This device is secured through doors which will physically bring the system to a standstill if you open them while the system is in operation. So it's impossible to effect sample switching even, as I said, if you really wanted to.

There you can see the bowl feeders responsible for feeding those disposable pins into the system. From this view you can physically see - given that's the robot track running over there, you can see how the robot has access to the punching work station from this side.

What I also wanted to show you in this slide here is this carousel, which is here. All of our magazines containing these 24 trays are loaded into carousels with turntables, which then positions the specific required magazine towards the robot track at any given time. We've got four of these carousels in the system looking after the loading of samples and the off-loading of samples.

As I said to you earlier on, when I speak about hitpicking, the important thing there is that we want the samples - if I say "samples," I'm talking about the reference DNA samples on the cassettes - we want those samples to remain in the system in the automated lab until such time that we are sure that we have received an acceptable DNA profile.

What happens then after the four samples have been punched from these four trays the tray is moved from the punching work station into one of these holding carousels over here, and eventually after we know that all the samples have given us DNA profiles that are acceptable, only then will the system release the tray to go out to be removed.

PCR setup again just takes place in one single liquid handler, and this device over here is just a cooling block which makes it possible for us to take our PCR master mixes and put it into the block let's say at 10 o'clock in the morning and leave it there until 10 o'clock the next day until we remove the empty tubes and replace it with full ones because the liquid handler takes care of mixing or doing the great mixing of master mix and then also dispensing the master mix into the PCR plate, which is situated next door.

As you can see over there, the previous one, the liquid handler is physically picking up some master mix from the cold store and dispensing it into the respective wells. Before we can get this plate sent through to the next lab we have to have this 96 PCR plate sealed with a metal foil, and that takes place on an automated laboratory plate sealer, which really seals those plates so well you physically have to destroy the plate to get the seal off.

So it makes it possible for us to transfer the samples without any fear of contamination, and also those of you who have crime lab experience and know what it takes to close down individual PCR tubes, this machine closes 96 or seals 96 wells in less than ten seconds, no sore thumbs, nothing.

This is just a view from the other side where the robot arm physically goes along and accepts the plate that has been sent through the transfer chamber. First of all, before it really accepts a plate it will go and check and see is this the plate that I expect to find or is this something that has been put in by someone else? So it goes along and it scans the bar code, which is situated on the PCR plate. It will then go and remove the plate from the air lock.

This air lock is a double door system where the one door will open, the door leading to the lab from where the sample is inserted. If I say "sample," the samples are inserted, the PCR plate is inserted. The PCR plate is then positioned on a turntable in the middle of this air lock, the door behind it closes, and it is physically replaced. In other words, we create a negative pressure in this air lock.

Then the air is normalized again, the door on the following side is opened, and the robot arm responsible for sample transfer in this lab, it goes along, recognizes the plate, accepts it, and picks it up and takes it into the lab for further dusting and processing.

DNA amplification takes place in the thermocycler. I'm sure you all familiar with those. In fact, when we designed the system, we were quite surprised to find that this was the only robotic

amenable thermocycler available at the time that we knew of. We didn't know of anything else. So as I'll get to later on, all of these instruments are remotely controlled from a centralized control system, and I'll come to that just now.

What I wanted to tell you was we are looking at the thermocycler. The only two instruments that we could purchase commercially off the shelf that we could put down and integrate in a plug and play fashion were the automated lab plate sealer and thermocycler. Every single other machine had to be extensively modified to make it do what we wanted it to do.

I'm seeing Dr. Butler over here. This is quite an experience putting a face to a name.

Anyway, what we need to do is we need to have these 96 PCR plates pierced. We need to have those foil seals pierced before we send them to the liquid handler for transfer of amplified DNA samples and for the addition of internal standards and so forth.

So we have designed this monstrosity over here. It's pneumatically operated. What it does is the cylinder which you see running in the center over there, that cylinder goes along and it picks up a piercing plate. I don't have a picture showing you what this piercing plate looks like, but if you want to draw a picture in your own mind of what it looks like, imagine you've got a piece of aluminum with 96 small little pyramids on it. That's the piercing plate.

So what we do is we have this piercing plate picked up by the cylinder through an electromagnet. It then moves it along to where the robot places down the PCR plate containing amplified DNA, and it goes and pierces 96 holes into the foil. The plate is then sent out to be cleaned. The piercing plate is then sent out to be cleaned, and we've got 96 wells pierced or 96 holes pierced into a piece of foil.

This is the kind of thing that you really want to look at if you want to do this kind of thing. This machine, which is available commercially off the shelf, pierces those plates in an automated fashion, and you don't have to build this agricultural looking implement; you can really have a lab instrument. It works for us.

The central transfer for capillary electrophoresis setup takes place on another liquid handler. The robot arm goes along, puts down the pierced PCR plate containing amplified DNA. We've got another piece here called cold store built onto the work surface of this liquid handler, and the liquid handler then goes along and merely transfers samples from the PCR plate containing amplified DNA to the job plate, which is the one that needs to go into the 3100 genetic analyzer.

This was a challenge, getting the robot or the robotic system to effect this procedure which now follows. As you can see over there, what we did was we had this little clamp built onto the liquid handler which would hold down the plate that goes into the 3100 genetic analyzer, and what we do is we preinsert the rubber system, which is required for capillary electrophoresis downstream onto this plate so that the robotic device doesn't need to do that when we need it because, as Commissioner Morris said earlier on, our point of departure, our goal was to have no or minimal human intervention.

This system is designed to run 24 hours per day with a half an hour window period where you can go about changing your reagents, replenish consumables, and so forth. So we really couldn't have a person go in after everything is automated to go and build this little sandwich structure and put that into the genetic analyzer. That just defies the object of the exercise. I'll show you how we went about that.

Then again you can see this preinstalled on the plate for the capillary electrophoresis, and you see a picture of the robotic liquid handler effecting the transfer from the cold store of allelic ladders being put into the plate. What we do is we put allelic ladders in groups of six, one allelic ladder per two rows of samples just for practical purposes.

That is the automated storage cold store. Again, it's something that we had locally designed and built. It cost us about a sixth of what a commercial unit would cost us, and it has about double the capacity of one of the larger commercially available units.

The robot arm when it places a PCR plate from which amplified DNA has been transferred into the cold storage unit, the robot arm scans it just to make sure that it is placing exactly the right plate into cold storage. What I also just need to say at this point is we have another automated lab plate sealer in this lab, being the DNA amplification and detection lab, so that we can reseal the plate which has just been pierced, as I explained to you earlier on.

This same agricultural looking device, farm implement makes it possible for us to build the sandwich structure which is required by the AVI 3100 to effect capillary electrophoresis. This base plate thing - I don't know what it's actually called, but just to give you an indication of what this is, the black plate which you see over there at the bottom, that is a base plate, if you will. A 96 PCR plate then needs to be put into this base plate, fitting onto it, and then you have to go about putting a top cover plate over this whole assembly and clip it into the base plate so that you have a sandwich, for lack of a better description. So this machine builds that thing for us, no problem whatsoever. The base plate is being put on and it builds the sandwich for us.

Fragment analysis takes place in, as I said, the 3100 genetic analyzer, and for this purpose we also needed to modify an instrument which is sold as a fully automated genetic analyzer. Isn't that so? Now, the first thing we did was we took off one of the plastic covers from the doors to allow the robot arm to have access to the door. If I talk about the door, this structure here, this part is a door which you have to manually open. Then you have to manually put this sandwich device onto the work surface, you close the door, and you press the start button. We didn't want to do that, so the robot arm does that for us. We just took away that plastic part which was in the way, and the robot arm actually fits there and does what it needs to do.

It may sound like a very simple thing to get an instrument of this nature to be remotely activated to commence the start of a run. This was not so because this instrument is not designed, nor does it allow that by nature, and we had to work in conjunction with engineers from applied Biosystems to get this machine initialized by an external control system.

This is just another picture of the robot arm interacting with the genetic analyzer.

I'm just going to mention a couple of things about hitpicking in the last couple of minutes. Given the fact that we have these Marshal cassettes stored in a holding bay, if you will, and given the fact that we have amplified DNA stored in an automated storage and retrieval cold store, it makes it possible for the robot system upon input from an analyst who is now instead of using muscle power, using brain power, this analyst can say, listen, I want this sample to be rerun and I would like the rerun to commence from the start. In other words, let's go for the next well and punch the next well that comes through the system again or they can say we don't want to waste all of this money that we spent on amplifying the DNA. Maybe it's just one of the capillaries that gave up the ghost, and we would just like to read that specific sample from the amplified product. So those actions can both be taken care of in an automated fashion.

The control system is quite unlike most other labs, most unlike anything that you may encounter in most other labs. This whole system is controlled by a programmable logic controller. We've got this one - we just call it mother. We've got this one mother PLC who takes care of all the motions that need to be fitted in the system. The human-machine interface to this PLC, which is a dumb animal sitting there in a cabinet which I'll show you a picture of - the human-machine interface is effective through a SCADA system, which is an acronym for systems control and data acquisition.

This is exactly what we want. We want to be able to sit in front of a PC screen and remotely adjust set points for temperature or the differential pressures in the lab. We want to get twins from that. So data acquisition on the one hand and systems control on the other hand makes it possible for a human to interface with the automated system, if you will, from a remote facility.

We run a tracking database on SQL server, which also links to LIMS and our equivalent of - I'm sure you're all familiar with True Allele. We've got an equivalent which was developed by one of my colleagues, Stewart Allen, in the STR lab.

This here is a picture of the PLC system and the devices underneath, which are all the server controllers looking after motion in the automated system. That gives you an idea of all the wiring that goes through the system. The engineers told me you can't take a picture of this because it's not neat. I said then fix it. They said to me we can't. So here is the picture nevertheless.

All of these wires come from the PLC. Just to give you an indication, you would have a PLC standing on the next floor, the automated lab also on the next floor, and then through the floor we had holes core drilled, and all the cabling would come through the floor and would then emerge through the core drilled holes underneath the instruments we required. So there is no breaking the integrity of the walls in the system. Everything comes through the floor, all the services that are required.

You may have noticed that there were some round disks in the lab. Those disks make it possible for the instruments to be swung around so that you can face the instrument when you want to service it or replenish chemicals, and then you press a button and the server moves the machine back to its logical position so that it can interface with the robot arm. This just shows the vacuum filtration unit to wash the FTA paper and the PCR setup machine over there facing away from the robot towards the human operator.



The throughput of the system is something that we were quite happy with. As I told you, we wanted the system to be run 24 hours per day with a half an hour window period during which operators would go in, one operator per lab, to replenish chemicals and consumables and so on.

This system given one genetic analyzer, which is very important - given one genetic analyzer, this system is capable of typing 440 samples per 24 hours. This is wrong. This one hour over here should have been up there next to the operators because it's one hour operator time per day. So if you would just excuse that.

So this automated system is capable of typing 440 samples per day, and given the fact that we don't expect any operator errors or anything like that, we then run the samples through the system once, which then gives us 440 DNA profiles. With the manual system currently in place we need six analysts to effect the processing of 840 samples, which works out to be 420 DNA profiles given the fact that we have to duplicate all the samples to check for errors and stuff like that.

So the automated system, per week we have two and a half hours of operator intervention, whereas in the manual we have 1,630 hours of operator intervention. Given the fact of the turn-around time of the 420 DNA profiles of five days, the manual system is capable of giving us 420 DNA profiles, whereas the automated system gives us 2,220 DNA profiles per five days.

What Commissioner Morris just reminded me of is we have left a space open on the work surface in the amplification detection area for an additional genetic analyzer, which is just going to double the throughput.

I'm not going to spend much time on this because I've got one minute left. These are just a couple of plans of the new facility that we're going to move into. It's an old abandoned hospital building. As you all know, when a DNA lab needs to be set up, they look for an old, run-down building, and say here you go and be thankful.

I'm not going to spend too much time on this. What I want to show you is just an overview. This gives an indication - if you will indulge me with more minute, this area over here will be our evidence recovery lab, and if you just look downstairs, that's the area over there. So what we're going to do is all of the crime sample processing for inclusion in the automated system will take place over here, and through pneumatic tubes we will then send those samples over to this wing over here, which will then be the automated lab setup.

Over here samples will be added to 48 well and 96 well lab plates, and through those devices over there, which are air locks, the samples will be introduced into the automated labs for processing. That over there, those are the tables on which instruments will rest, and that's just the robot arm that will effect all the motion in there.

So you see we've got one, two, three lab facilities lying adjacent to one another. What you see over there are antechambers because what we plan on doing is we plan on running these labs as if they were cleaning rooms. We don't have a clean environment, but just for cleanliness and good housekeeping we're going to do that.

Ladies and gentlemen, my time has run up one minute and ten seconds ago, so thank you very much for this opportunity. Commissioner Morris has told you how much we appreciate this, but just from a personal point of view this is really a fantastic and very generous opportunity that you have afforded us.

Thank you very much. I hope in this short span of time we've given you an indication of what we're doing, what we're busy doing, and we would love to speak with you over the next day and also tomorrow about what we're doing, and we would also be very interested to find out how you go about automating your labs, if you do that, and how you see things happening in the future.

Thank you very much for your time. Thank you.

## **COST SAVINGS**

MS. HART: That was really terrific. I don't know if you could feel it from here, but the immense envy in the room and the frantic note taking while you were talking is a real sign of the interest that you've generated around the room here. We were passing notes back and forth here on this.

If you could, it would be very helpful - we are going to take a break, but if you wouldn't mind staying at the tables as we move into our automation IT discussion, we could ask some questions. One of the things just to start I have to take the director's prerogative and ask a question here, which is the burning one I have. I presume you know how much this cost you, but have you figured out what this saves you in money? In other words, how much of a labor savings are you realizing here and what would it cost you to generate the same amount of work if you had done it in the traditional way?

MR. VAN NIEKERK: Yes, ma'am. This system - I can tell you exactly how much it cost us to establish it to this point because we went out and tendered for this given the fact that we are a government organization, and the total value of all 18 tenders that form part of this one process amounted to 11.8 million South African rand. I don't have a calculator with me. I couldn't tell you how many dollars that would be, but it's roughly speaking the equivalent of I would say about \$1 million. So this is about \$1 million.

Given the fact that, for instance, the genetic analyzer - if you just take one instrument, the genetic analyzer cost us 1.6 million South African rand. That's a chunk already taken away from the 11.8. So we are very satisfied at this stage with what we got for the money that we paid.

How much is it going to save us? I'll tell you now we would not be able to afford to run this system to capacity given the fact that your PCR mixing and your consumable costs are so high. We basically worked out that the consumable costs per day could amount to something like 124,000 rand, again in our currency, between 124 and 250 thousand rand per day, which is about \$24,000, if you will.

The saving, that is a question that I would not be able to answer you because I don't know what the cost per man-hour works out currently at the lab, but basically we're looking at - if I can answer your question like this: Just as far as DNA isolation is concerned, the saving there is half an hour human operator intervention versus 96 hours lab technician intervention in a manual system, so the ratio is 1 to 192 in man-hours. So that is basically the kind of savings we're looking at from a man-hour point of view.

Would you like to add to that?

MR. MORRIS: I think that the main issue is it's very difficult to compare given our costing of manpower, but the point that I tried to make earlier was our moving people out, which is really a committed cost that I've got in the people that are employed, moving them out of this physical operation into the evaluation and evidence giving side of the work. So I've already got this, if you will, sunk cost which has been moved out to something which is going to enable us to

produce results on the results which are being obtained from that system. So in that sense we're going to have a financial saving.

In terms of if one looks at sort of a payback on what the investment is, if one takes how many samples we would be able to process in a year given that there are no public holidays, no weekends, no nothing like that, how long is it going to take me to do that same number of samples with a given work force that is available, and that would give me some kind of measure of the effectiveness of the system.

MS. HART: This was terrific. It was a wonderful presentation and well worth bringing you guys here for. We're scheduled for a break now. If somebody else has a burning question or we could reserve it for after the break. How about a break, and we'll come back in 15 minutes, back at 3:00.

## **DISCUSSION OF AUTOMATED FORENSIC DNA ANALYSIS**

### **IT AND INFORMATION SHARING**

MR. SCHMITT: We will begin with the state of the art in automatic forensic DNA analysis. We're now going to make you earn your keep this afternoon by providing recommendations to us as to what to do in this area. As you see from your schedule, the first item of discussion for us this afternoon is IT information and information sharing, and appropriately enough we're actually going to start off with automated systems as our first area of discussion.

I would like to start our discussion if we could by calling your attention to the last sentence in Paragraph No. 1 on your discussion topics and draft recommendations where we say the average turn-around time for nonpriority cases at the state and local level is approximately one year and that this could be reduced to less than two months if laboratories were empowered with high technology automated systems.

I'm curious as to the direction of everyone here on that statement. Is it accurate? Is it not ambitious enough? What do people think?

## **TIME LAG, SPACE, AND STAFF ISSUES**

MR. GIALAMAS: I guess I can tell you from Lo Angeles' end at a local level the time it takes for testing for us is about that time. It's anywhere from nine to 12 months turn-around once the case is brought in. I would think that with emerging technology we might be able to turn cases around faster than two months, but it's just what technology we're going to use and how we're going to apply it.

MS. HART: If you were looking at long-term goals; in other words, you were saying five years from now or ten years from now where would we want to be, what would you think is a realistic target to shoot for?

MR. GIALAMAS: From my perspective it would be essentially having either two programs or one program that works in complete. The biggest problem that we have with investigations is being able to get reliable information to investigators in a reasonable amount of time. When we have a case that's taking six to 12 months to turn around and meanwhile investigators are investigating the case, it does them no good six or nine months later to find out we exonerated the suspect that they've work so hard in pursuing. That needs to be made aware of immediately both for law enforcement's benefit and the subject's benefit.

If we were to take that perspective, it would be nice to turn samples around within a few days, perhaps five to seven days for investigative lead information, so that immediately we have some results that can be used, but maybe the case isn't complete and total by that point in time. If we were to extend it to a complete case, I would love to be able to say we would get it done in three weeks and within a month we would have the case done, complete, and ready for filing. That would be my dream, and I think that's doable within five years. We just need to apply the resources to be able to do that.

MR. SCHMITT: Other comments? If I haven't recognized you by name, if you would mention your name when you begin to speak so that the court reporter can make sure she has attributed your remarks to the right person. If you don't want your remarks attributed to you, you could perhaps say I'm Paul Ferrara and this is what he said.

MR. FERRARA: To expand a little bit on the question and Dean's comment, implicit in this discussion, at least in my mind, is that we're talking about the application of this technology to each and every possible case and instance. Keep in mind that the figures that you're looking at or that we reflect right now more often than not are reflecting laboratories which are being very selective in the types of cases that they are performing.

In Virginia with the exception of misdemeanor drug possession cases we're accepting DNA in almost every case with a turn-around time of probably six to nine months. I think our goal would be to, one, be able to work all of those types of cases, particularly those that form valuable investigative information, and to be able to turn that information around in priority cases in a matter of hours; on a routine basis certainly less than 30 days.

MS. CROUSE: I remember when the DNA Identification Act came out and we started getting our grant monies in the mid to late '90s. The most exciting thing about that grant was the realization that infrastructure had to change, and that included within the laboratory that special rooms needed to be made and special accommodations needed to be made for reagents and et cetera, et cetera, everything from refrigerators to the actual room itself.

Going to this type of automation I think we're going to have to revisit that point, that laboratories are just not set up for this even though many laboratories did a tremendous job in getting up to speed with having appropriate laboratory facilities for conducting PCR analysis. With the robotic system you're talking about going back to square one and revamping laboratories, at least the great majority that I have been in, including my own. We just bought a robot for our laboratory, and we had to take a hood out so we could put it down somewhere.

MR. SELAVKA: I think one of the things that everybody is kind of saying that needs to be enunciated clearly is there are really two paths. There is an investigative testing path with a short time frame where information must be provided to investigators in order to include or exclude suspects, but then there is the adjudication path. It will have a longer frame available to us as laboratorians, but we still have to do that. There are more items to test, more stains per item, and ultimately we're trying to demonstrate the absence of a third or fourth party at a crime scene. Basically the information that we might elicit through additional testing is going to include or rule out other actors that may be important for the defense's theory or for mitigation.

So we have the dual responsibility of quick results as well as complete results, and they don't need to be done at the same time. We're front loading certain testing for analysis turn-around time, but then in the end we still have to do more in those cases, more boxes, more items, more stains per item.

MR. SCHMITT: Let me ask you a question base on what Cecilia said and ask Carl and Dean in particular and everyone else, of course, do you have physical limitations in your current locations that are impediments to automation? It's not going to fit, you don't have the space, you need a new building, a new structure, you just can't add a wing on or knock down a wall.

MR. SELAVKA: In our laboratory we've taken to hiring anybody that's shorter than 4 feet tall. We're in a 22,000 square foot building with eight functional units of which DNA is one. So we're looking at 80 to 100 thousand square feet of additional space and another 50 staff. We only have eight DNA examiners in the mix for 6.5 million people.

MR. SCHMITT: Dean, do you have some more thoughts?

MR. GIALAMAS: Just on that comical note, you were fortunate enough to get a hospital. We're actually in a vacated sanitation district facility.

We have the same space issues certainly. In fact, our agency was the stepchild for what a DNA lab should not look like or a laboratory design. Fortunately for us, we're in the throes of building a new facility, and CC's comments are very well taken because here we are here struggling with building a new facility, and our laboratory is looking at building out about 27,000 square feet

specifically for DNA, a DNA lab that will be 27,000 square feet to hold up to 72 analysts, and this technology change is such that obviously that's going in the wrong direction if this technology is going to be it.

The space could easily be modified, but if that's a reality in the next few years, then, sure, that's going to be a focus. But our current problem is space. If given people or equipment, I have nowhere to put them.

MR. SCHMITT: Is there a comment over here?

MR. KRESBACH: 72 analysts. CC and I, that's the wow. I've got three. So it's a completely different situation, I guess. I mean I'm in a brand new facility. I've got space for nine to 12 analysts. I have three. I've got plenty of room for these robotics. Throw me the number. I'll put them into place.

I think what some systems may have difficulty in, depending upon what eventually is decided, is say funding is eventually made available for some of these types of things. How is it ever going to filter down to people like myself or Cecilia or Susan that are at local and county laboratories with the way the current granting structure and the lawmakers' mindsets are? It's going to look real nice in our state laboratory, but it will most likely do me little to no good if I'm not given access to those types of things and such. I mean I hope that things can change or flexibility can be put into place, but in the interim at least from my perspective it's something of a pipe dream.

MS. HART: This is something that they're certainly very aware of in Congress and the Department, too. So the Department's position is that we need to support the local labs in the same way that the state labs are being supported. So I think that, although it's certainly not a done deal, there seems to be a very strong push in that direction.

MR. SCHMITT: We're talking about allowing units of local government to apply for the funding directly, which I think would ameliorate much of that, I hope.

We're going to get to personnel issues a little later, but one of the things that is kind of in the mix here from John's comment is - and I know you're going to say the answer to this question is both, but which do you all need more, automated systems or analysts? I'll leave that out there.

MR. TILSTONE: Just go back to your opening remark, in the last 18 months we've reviewed a number of things including workload in all the crime labs in four of the major states, and just as a piece of information, the average turn-around time for DNA cases was 176 days. The range was classes of 30, and the longest was 500. There is no consistent pattern in the turn-around time and the size of the lab and the number of analysts that they have. The two labs with the speediest turn-around time were one of the smallest and one of the largest. So I don't know where that leaves you in regard to your last question about do you need people or machines.

MR. SCHMITT: It may mean that some people need people and some people need machines.



MS. NARVESON: One comment I would make in regard to John's comment in regard to large city laboratories that exist within states of smaller population, I applaud NIJ's recognition of the special needs of those laboratories. I would also indicate that based on comments I'm receiving from some of the [ASCLD](#) members is that all of these efforts remain part of a comprehensive state plan. I think that was one of the very best things that came out of NIJ was that requirement to get laboratories within a state talking to each other such that we all know in which direction we're going.

Our needs are going to be different, and John's need is going to be different than the state labs. It's the same situation for many labs across the country. City, county labs are different from the state labs, but I do think that it's a very positive action in the right direction to have comprehensive state plans for each of these organizations.

MR. GIALAMAS: I was just going to add that needs may be different because personnel may be required to do different things. For instance, in our laboratory our criminalists are also responsible for responding to and attending to all the major crime scenes in the county, and that adds a tremendous burden in interruption in the daily work that we do, and because of that - and that's just an operational issue - that there may be factors that play into my agency because of operational demands and personnel demands that exceed what some other laboratories have having full-time people devoted to just doing DNA testing or perhaps ideally operating the machines that are doing the DNA testing.

MR. FERRARA: To answer your original question, Glenn, as to what do you need, robotics or analysts, and the answer clearly is both, while we pursue obviously automation, robotics to address the analytical end, I think all of the lab people here will attest that one thing that the robotics or automation cannot and will not replace are the need for the people at the crime scene, for the examiners to find DNA evidence to test in the first place from multiple hundreds of objects from single crime scenes, and then no robotics or automation is going to provide the testimony, respond to the discovery orders, and testify at trial.

So while robotics is very valuable obviously, we're watching in Virginia - we've got about 38 examiners, and we're trying to see what impact automation is going to have on their productivity, but one of the major limiting factors we're finding is the amount of time that the examiners are not in the laboratory, not involved directly in the DNA analysis itself, but evaluating physical evidence and/or testifying, appearing in court, responding to court orders, et cetera, et cetera, helping prosecutors, and so on. This is what on an average monthly basis limits our forensic scientists in Virginia to about six to eight cases per month per examiner.

MS. HART: The best way to say this I guess is much like they said earlier, which is you look at everything your analysts are doing and figure out what can be automated. What is routine stuff we're doing over and over again? So should the general approach here be to look at everything you're doing; that which you can automate, you should try to, you strive for that; and reserve your very valuable staff for the things that cannot be automated? Is that a fair statement?

MR. FERRARA: I'll say.

## TIME ISSUES

MR. COFFMAN: I just wanted to make a comment on the turn-around time. I think you need to be careful just looking at other lab systems and saying their turn-around time is this or that. There are a couple more questions you need to ask: Are they limiting the kind of cases they accept? Are they only taking rapes and homicides, sexual assaults and homicides?

If they're only taking that, they may have a wonderful turn-around time. If they're taking everything from doing DNA on baggies that drug dealers leave or burglaries, their turn-around time may look unusually high, but they're accepting more.

The other issue is there are laboratories out there - we're all trying to find innovative ways of dealing with our backlog, but there are laboratory systems out there who also limit what they do on a case. They may only work one unknown from a case, whereas another lab sets the limit we'll only work 15 unknowns from a case.

So I just think looking at turn-around times, you have to ask three or four other questions to make sure you're dealing with apples and apples.

MR. CLARKE: Just building on that same thought also, much of the work on, for example, unsolved cases is dictated by what work is necessary in charge cases dictated largely by trial dates. So they all interplay very much with one another. I know, for instance, in laboratories that I'm familiar with all work may stop on assault cases because there are two or three cases that have to be finished for purposes of trial that might be three weeks from now.

So they very much are in a - I don't know if the term is symbiotic or symbolic or some word like that.

## HOW SHOULD FEDERAL FUNDS BE ALLOCATED?

MR. SCHMITT: Let me ask you to look at the recommendation that we have listed here, and I know that if I asked you if a program should in fact be developed to address this, you would all say yes, so let me ask it in a slightly different way, and that is if there were a fixed pot of money for DNA analysis, would it be better to allow you all to apply for grants and then decide to what use it should be put or should part of that money be carved off into a separate IT sort of integration pot?

MR. GIALAMAS: My preference would be that you allow agencies to decide how best it is that technology or staff or whatever resource needs are needed be applied. I think it's fair to require and demand that a particular goal be met, and the goal between all of us could be universal. It could be higher productivity or higher throughput, whatever it is that our definition is, but if you set that as a goal and demand it, then allowing the agencies to decide the mechanism in which that's going to take place, whether it's automation, people, space, gives them the flexibility of achieving that goal, not losing sight of the mission, the charge, and that is to get more done at this point in time.

MR. SELAVKA: It may be heresy I know, but maybe a highly automated database for the nation centrally funded. Regardless of your state's laws, those samples that you collect under your state law could be forwarded. We already have a voucher system now for federally funded convicted offender backlog reductions. Maybe we should centralized the entire infrastructure, do something like they've done in South Africa and redeploy those forensic resources in laboratories into states and localities for casework samples. So we have one pot of money that we all do what we need to increase the capacity for casework and centralize the databases for the country.

It may be anathema. You will probably tell me that those are state systems that have been testing. David may lose his job or have to be redeployed or something. My state doesn't test its samples. We don't have a laboratory that could it. We're always going to need to pay for it to outsource or ask the Federal Government to help us. It's a very different idea.

MR. SCHMITT: If the Federal Government were to pay for a program that would allow automation to occur similar to what we're doing with high throughput on the offender sample; in other words, you wouldn't get the money to buy your own South African robot; we would buy ten of them for you through somebody and they would be someplace and you would send your samples there, who would have a lot of heartburn doing your samples in that way? I would assume it would be mostly convicted offender samples, but I suppose maybe there is some easier casework stuff that you could do, if you have blood stains from casework, for example.

MS. CROUSE: Last week the Palm Beach Post came to our laboratory. They had been there previously when they found out that we had applied for the no suspect grant and that it looked like the State of Florida was going to be awarded and that we were going to get some monies, and they wanted to know what it was all about.

I guess two weeks ago - I didn't see the article - there was something in People magazine or something about backlogs. So she asked if she could come out, and she ended up bringing

photographers and half their division, and I thought this was a very positive thing, but when she asked why do we need a no suspect grant, I opened two file drawers, and those are 2001 and 2000 cases, and I said because there are victims sitting in this drawer.

What a negative article came out of that. It hasn't hit the press yet, but she was very - my bottom line to her was that if we were a private business, we would be out of business because we are not servicing our clients. Our clients are the victims and the citizens. If that's what it took to get these cases done, I would do it in a heartbeat if there was a centralized location.

I don't know if our detectives would ever let their stuff go. I don't know if the 34 agencies we serve would ever let their individual cases go out the door. They're not keen about the no suspect at this point. They want guarantees that any private outsourcing company is going to be up to snuff, but I just honestly feel - I don't think that is heresy. I think it's an interesting idea.

MR. SCHMITT: Has anyone experienced a chain of custody challenge that was successful based on the fact that it left the government lab's control and went to a private lab's facility?

MS. CROUSE: We actually had a case thrown out because the people in the private lab didn't take a picture of the evidence. All they had was a drawing. It was terrible. It ended up that piece of the evidence didn't matter because there was another piece that we didn't send, and this time they took a picture. It was a real hassle. We've sent out a lot of cases, and that's a rare one.

MR. CLARKE: I think particularly as the public's perception and expectation of DNA has become so much stronger, other than occasional bumps in the road, the chain of custody issues I don't think exist like they used to exist. These were methods used to attack not only the technology, but testing perhaps ten years ago or perhaps more recent, but I think now we've reached a different step in that process and now jurors want to hear this evidence, and unless they can be shown something is wrong with the testing in this case, which is obviously extremely rare, they're going to embrace it. I think we see that in the reactions of criminal defendants as to how they defend these charges. They've changed.

MS. SAMPLES: I don't run a data bank laboratory, so I don't know what the feeling would be of a data bank laboratory to Carl's suggestion, but I certainly have heard that data bank laboratories are used as training grounds for analysts. They can learn the ropes before they move on to the meat of what we do, which is real casework. I would think anything that would free up analysts, properly qualified analysts, to handle evidence and do that part which they would do the best would be a good thing.

MR. SCHMITT: I mentioned to you earlier that I had asked folks who were listening in today to speak to you and give you comments, and at the end they will have time to make comments as well, but I wanted just to share with you that one of the folks in the audience who is from one of the private labs has given me a note to say that his lab had processed 7,000 cases last year with a 60-day turn-around time, which is required by their contract, just to give you an idea of - another data point for this discussion.

More on the thought of how the money ought to be split up if there is a fixed pot of money out there?

MS. NARVESON: I would like to see a dual approach. I would like to have money available to the various agencies to implement these new procedures within their own scope of responsibility and their own state and local limitations, but I might suggest that we do have a number of partners that could be utilized to maybe more fully define and package information that would facilitate the identification of options for laboratories to consider. For instance, the Forensic Research Network might be employed to look into this and come up with recommendations or guidelines as to what needs to be considered, what kinds of things are available, what is going to be the impact, and perhaps even assist laboratory directors in putting together the sales package that they need to take forward to other agencies such that when we make these applications for the large grants, it has all been thought out and there is good information to rely on.

MS. HART: That's one of the reasons when I asked the question earlier about whether the people in South Africa had figured out what the cost was and what money was saved, I just remember coming from the corrections arena when you would have to go to your legislature and say we want \$100 million to build a new prison. Everybody just goes to the creek until you say and we will recoup that cost in four years in labor savings by having a new design that's much more efficient.

So to me always on these sorts of questions any time you have information about what you are going to save in labor costs or costs of - you know, I like the fact that you had up there the cost of your collection kits, your X kits. I like that term, by the way. That I think is extremely helpful whenever we can package things in that kind of way where we can talk about the types of saving and why it's worth the investment, and ultimately that's why part of the question on whether you should go with staff or with automation.

What concerns me when you just sit there and do staff and do business the same old way is are you permanently signing on to that kind of investment as opposed to developing capacity building that will save money down the road and ultimately allow state labs to be more self-sufficient?

MR. SCHMITT: Let me ask our South African visitors was the impetus for your automation initiative to free up analysts to do other things or was it so that you could process more samples in the same amount of workdays?

MR. VAN NIEKERK: It was most definitely both.

MR. SCHMITT: Everybody says both. I'm going to ask my questions in a different way.

MR. VAN NIEKERK: It was mostly definitely both. If I say anything else, one of the selling points that I and our automation team, development team had to bring to our management was the fact that one of the benefits of automation is the fact that you can free up people for more intelligent work. If you just take, as an example, a person sitting in a DNA isolation lab running through 60, 70 samples per day, centrifuging all the time, just doing nothing but repetitive work -

most definitely one of the biggest strong points for us was the fact that we could free up people for intelligent work. In other words, this made it possible for us to say we don't need as many people as we envisioned because we can take a trained analyst and redeploy him and let him do something else.

One of the first questions people started asking us was am I going to lose my job, and most definitely it was not the case. In fact, we can now start looking towards career development for people instead of having them doing repetitive work.

MR. MORRIS: I think maybe from my side where you see a certain number of cases, our objective is to get those cases completed at a certain time period. As was mentioned, I want to get this information to court. I don't want detectives working on a case where that suspect has already been excluded. The other objective was to increase DNA that was done in all of those cases. As I also said, if I put selective procedures in place in order to do DNA or not, that is the other side. So if I automate, I get the throughput up, and it allows me to increase the number or the percentage of cases on which DNA is performed. So that's why it's both. You actually get both of those benefits from the same decision.

## INTEGRATING SYSTEMS

MR. SCHMITT: I want to move us now to the second numbered paragraph under this topic heading, that being integration systems. As we discussed this on the staff level, it seemed like there was a great deal of support for promoting integrated IT at different levels in the criminal justice system, and I want to test that hypothesis again here today.

Take a look, if you would, at the last sentence of the numbered paragraph, the notion linking DNA databases with other criminal justice databases such as IAFIS and NCIC. I know that the Bureau is in fact linking CODIS with both of those databases or they're in that process, and I'm sure Joe will comment on that as we go forward, and states perhaps might want to link their local DNA database with their own state center on NCIC.

How crucial is this to do at this juncture in the process? I guess also think broader than just connecting databases. Should this be connected with other agencies and allow you to share electronically information that you might otherwise share in paper or over the phone?

MR. COFFMAN: We're in the process right now of our most labor intensive part of our process. We're getting about 5 to 6 thousand samples a month for our convicted offender program. It's not the DNA analysis. It's the up-front crime lab tech. Data entry portion because you have several thousand agencies involved in collection. They all fill out the form to a different level of completeness. We want the form completed totally because we want to have this integrated with our criminal history.

We're in the process of hiring a company to - it's called our integrated criminal history effort to where at the collection site - we want to move the collection site, first of all, away from all of these other agencies and have it in the courtroom because everybody has to be pronounced guilty in the courtroom at some point, and then we have a live scan unit in each courtroom.

What will happen is the individual will put his thumbprint down, it will hit our integrated criminal history, and it will let the collector know if someone is needing a sample collected. If they are, it prints out I think it's a 2-D bar code that represents their fingerprint. That gets put on the form. It comes to our lab. We'll bar code it, and it dumps his information from the criminal history right into offender data so we won't have any more data entry and looking for missing information.

We right now look for duplicate samples so we don't waste resources, and we saved about \$4-1/2 million in 12 years by not working samples that have been collected before. I mean we have people that are in and out of there two or three times a year, and if it's a different agency collecting it, you're going to get it again, and that just seems like a waste of resources to keep reanalyzing these guys.

Basically long story short, I think it's important that we do integrate some of our efforts. Right now I have six people to track down the juvenile justice criminal history, the Department of Corrections. This will get it down to where we think one to two people can handle our whole case load just by using a bar code scanner and processing it that way.

MR. FERRARA: I, too, think this is a critical avenue we do have to go down more so recently in Virginia. In January we started taking samples upon arrest for violent felonies and burglaries. Almost all of the crimes that we currently take samples from are people who are convicted. Now, implicit in that arrestee statute is that a person who is arrested for a felony and then subsequently the case is null pros'ed or dismissed, that sample has to be expunged in the records. That means obviously I have to have access to criminal record histories, which we've never needed before. Our laboratory is not part of a law enforcement agency. It just serves them all.

So I have found a critical need right from the magistrate when he or she issues an arrest warrant to have language indicating that this is an offense for which the law requires a sample to be taken, for the person taking that sample to check a system to determine if in fact a DNA sample has not already been drawn from that individual because keep in mind if we're taking samples on arrest, the idea is we're not going to take them on conviction.

Then once the sample has been taken we need to enter a field in a criminal history record somewhere whereby there is an indication that a sample has been taken from that individual. As Dave mentioned, our State Police, before they allow that data to go in state criminal record history is going to want to make sure there are fingerprints of that individual to verify that that DNA sample is from that individual.

Then when the case is adjudicated - and this is one of the most difficult problems that most of our laboratories have had - we would love to be able to give you lots of data on what is the disposition of the last 950 cold hits we have had, how many convictions, how many dismissals, et cetera, et cetera. We don't have access to that kind of information, and particularly in trying in Virginia to distinguish between juveniles who are adjudicated delinquent as opposed to juveniles who are convicted offenders because I think only those that are convicted as adults can I put into NDIS, even though my state law says that those adjudicated delinquent.

So all of these are examples of the need for communication between now the laboratory and all of these criminal information systems. This is making it all the more clear that this is the direction where laboratories are going to have to go.

MS. JONES: I wanted to know how your courts and your law enforcement agencies are receiving this information that it's going to be their responsibility now to integrate this process into an already overburdened system, either of you, both.

MR. COFFMAN: We've had a memorandum of understanding with the sheriffs and just said look, we've had enough hits. We're getting enough each month that they finally can't say what is this going to do for us. They know what it's going to do for them. So we have a memorandum of understanding with the sheriffs to agree that they take on the responsibility of collection in the courthouse.

One of the most difficult parts has been in the past we've collected blood. Well, in 2001 we switched to oral swabs, which made it easier for them. We increased our collections 1,000 samples a month for people we weren't getting it before by going to oral swabs onto FTA paper.



So it's fully automated. Well, not fully. I have a guy that makes a robotic noise when he puts it on the paper.

We talked to the sheriffs association this year, and they seem very positive on it. I don't know whether they will actually do it when it comes around, but the plan really is to have this live scan unit. It's supposed to get back results in less than a minute that says a sample needs to be taken. They're already fingerprinting them. Their case prints are already being taken, so all we're asking for is another couple of thumbprints. They don't have to fill out the form anymore other than the name because all of his information will be housed in a bar code that prints out, which represents his criminal history record.

Then once we get it and we say we haven't seen this sample before, then when it dumps information into our system, it will update the criminal history to say the sample is already collected. We were trying to stop duplicate collections. We reached 50% duplicates a year, you know, if we weren't careful.

So I think it is tough, but I think they're willing to do it, especially if we can limit where it's being done and we can make it as easy for them as possible.

MS. JONES: Do you think it largely has to do with getting law enforcement to embrace this technology as their own and not just a tool for the prosecution and defense anymore? For the courts basically.

MR. COFFMAN: Right. I think there are not many states that they can't embrace it as their own. There has been so many of them that have had amazing cases solved, and this is the only way they did it. As I said, in our state we're doing volunteers now. We get 5,000 volunteers a year, and that just amazes me, but they do just out of the goodness of their hearts.

MR. SCHMITT: I've got ask what motivates them to volunteer?

MR. COFFMAN: Well, I think it is - we were asked to do this by local law enforcement because they didn't want to wait until they were convicted or someone was convicted, so they brought them in.

MR. SCHMITT: I know I'm going to commit a crime, so get me now?

MR. COFFMAN: The only thing I can figure is they think the more cooperative they are with law enforcement, that it's going to go easier on them. They're just not thinking of the big picture, but they sign a consent form, and we have had 18 hits. Believe me, this is the one time I was not wanting hits because I didn't want this to expand statewide because it's hard to plan our budget. One county will send 2,000 a year; the other will send three, and it's hard to plan, but it's unfortunately working.

MR. CLARKE: I just wanted to address the linking of some of these systems like IAFIS and CODIS and NCIC. We have been working for a couple of years now, especially in regards to CODIS and NCIC, and our approach was not to have everyone who has CODIS access have

NCIC access or vice versa, but it's important for the investigator to know if he's searching a criminal history record in NCIC that a CODIS record is available because he may have evidence that he may not submit unless he knows a CODIS record is available.

So the idea is to put some sort of indicator into NCIC if a CODIS record is available, and an indicator also would include where that profile resides and who to contact about that profile.

So that's the approach we're taking, and we have been in the process of doing that now for a couple of years. It's long bureaucratic process to make changes in some of these databases, but we are integrating some of them.

MR. SCHMITT: Is that linkage made only with respect to the samples that are uploaded into the national database?

MR. CLARKE: We haven't gotten that far yet, but probably that's the way it will be.

MR. SCHMITT: Will there be at some point a modification to NCIC to allow the local inputters to note in the national database that there is a local DNA file in the local database?

MR. CLARKE: I'm sure with the CODIS redesign it will make it much easier for some of the state and locals to know or agencies with CODIS profiles available or that may be available in another agency or another laboratory. So I think the CODIS redesign will facilitate that.

MS. NARVESON: Arizona just went through a very interesting exercise, and I hope it remains only an exercise, but the Rules of Criminal Justice Procedure are being revised, and one interpretation is that the laboratories will be required to complete all requests for analysis within 30 days of arraignment.

Even though there are times when we don't think we're very technologically advanced, we have a LIMS system that can't get the data from the other computer systems that exist, and I would say that police agencies very often have very antiquated systems. Ours is one that's a 10, 12-year-old proprietary system. We have to talk to that, which has to also be able to at some point provide data to county attorneys, city attorneys, U.S. attorneys, et cetera.

These systems need revamping. We can't even get an arraignment date that we can rely on. There is no automated mechanism. In my mind it's such an easy thing technologically to do, and I end up talking to the hand. They don't want to hear about it because they're not ready and it's not their idea, but this truly needs to be an integrated effort across law enforcement and the courts and the laboratories because we are in a leadership role right now where our technology is more advanced than theirs as far as communication is concerned. We can't meet the demands of the courts and the investigations without having that easy and free, but secure flow of information back and forth.

MR. SCHMITT: What is the preference among people here in terms of how this sort of technology would be developed? That we would fund it specifically to allow states to develop their own or we would fund two or three sites and from that come up with one or two

applications that would then be made available to other states to allow their systems to be integrated?

In case you don't know, NIJ has been working in this area of criminal justice systems integration, not necessarily the DNA area, but other information systems in integrating them for some time, and we have had great successes in coming up with hardware and software that allows disparate systems that have no relation with one another to actually be able to share information and not just record identities, but actual pictures of their records back and forth among agencies and among data systems.

MR. COFFMAN: I would like to see maybe you form maybe very small working groups to maybe come up with different solutions. We've learned a lot in the LIMS system that we created. A year ago I thought it was the worst decision I ever made. Now I think it's the best thing I ever did. It's a real learning process, and if everybody goes out on their own and does it, you're going to get 50 different versions of some garbage.

I really think it would be better to get more minds in the mix, not too big of groups, but maybe fund two or three smaller working groups to work in their states to develop something and then use that as a model and maybe merge it later on.

Also I was going to mention about the automation. Another thing that comes to mind, we've tried to automate since 1996, and another personnel need pops up when you start doing it, and that's an IT professional to be in your lab. Most IT people in our agencies out there, first of all, will never talk to another IT person. If it's not their idea, they're not going to accept it, and also when you have someone on site - and I have been very fortunate to have that since 1996 - they learn what you're doing. Even though they're not scientists, I mean DNA scientists, they learn what you're doing and so when you ask for something, they give you what you need, not what you asked for, and that is very valuable.

So I think the more complicated our computer systems have gotten, our LIMS and robotics - I have been very fortunate to have a guy who is really good with that kind of stuff, but I know a lot of labs don't have that.

MR. SCHMITT: Any comments on this approach of two or three working groups, Dave's idea to come up with a system that would then be kind of a state-of-the-art system that people could use?

MS. CROUSE: We actually talked about this a couple of years ago, and the idea was to have a small group and use it as a template, but use it as a sophisticated enough template where we could find what some of the issues were really going to be, but it ranked everything from booking all the way through the court system. It was the entire system that was going to be interlinked, not just the DNA system to the ballistics system or to the NCIC. It was everything, and for some reason the idea never got off the ground, which means the template never formed.

I totally agree with Dave that a lot of Rue Goldbergs can happen. If everybody tries to do this themselves, it's really going to be very complicated, and if someone can just show that it works -

we have an IT person that likes us because we're behind four doors and he can get locked in our lab and nobody else can touch him, and that's where he comes to rest, but while he is there he does some stuff. We have had to hire somebody on the outside to take care of all the MacIntosh issues because we're Mac driven for our technology, and we don't have any intention of switching over. So it gets more and more complicated, but I think a template would be fabulous to be able to hand somebody.

MR. KRESBACH: I think in a sense we've already got hundreds of agencies around the country that are doing their own thing already, whether it's very low tech. To the very high tech. Unfortunately, my system can't talk to my state laboratory. The local agencies around our jurisdiction can't talk to us. I can't even send an e-mail to our state laboratory without it getting bounced back at me, much less these bigger picture type of things.

I would think whatever is decided, whether it's small groups or a single group that would get together and start to formulate ideas that would work, that it needs to be done such that it could be universally applicable on similar - not the same, but similar platforms, similar, if not identical, software systems in a sense very similar to the way CODIS is now.

I can buy whatever hardware I want as long as it meets minimum specifications. I can buy certain types of software applications that I might want to use ancillary to CODIS, but at the end the core CODIS software is the same regardless of whether I'm a city lab, a state lab, a county lab. You name it; it's all the same. You're talking apples to apples unlike things like IAFIS.

If I've got one system, my system won't talk to the state system, won't talk to the county system, won't talk to whoever even though we're doing the same type of thing. So whatever it is that would come out potentially from these small groups, it needs to be something that's universally accessible and universally communicable. Otherwise, we'll still have these agencies veering off in 100 different directions, my own included.

Again, I can't send an e-mail to our state lab, but I could do everything internal to my own building; I just can't get it out and they can't get their information in. We've spent huge sums of money already for a system that's not yet in place.

MR. SCHMITT: Other comments?

MR. SELAVKA: I'm reminded that there is an assurance that we all have to take care of when we get grants from NIJ that involves the information technology administrator for the state. When I was in New York and then went to Massachusetts - that requirement kind of started when I got to Massachusetts - I realized that although there is a person with that name, they don't do what that name implies that they do, and I'm not sure if they do that in any state. I know that it doesn't happen in Massachusetts.

There is no integration. The administrator has no - although I think he might have the authority, and I really have to ask him that, in his own mind he may have titular authority, but I'm not sure he has it functionally, but he can't get it accomplished. The infrastructure doesn't allow for it, and unless I think you leverage funds to do other things, with the requirement that state's IT

administrators make that integration happen as part of the requirements of these grants, that may be the only way it ends up happening. It's too big.

I think Cecilia stated it really well. From the beginning to the end it's so big and so complicated you would have to - this is almost one of those highway funds things. If you want highway funds, your blood alcohol will be .08. You may have to leverage something really big to get this to happen the right way. I don't think you can do it with pilot programs because they will just sit on a shelf. Everybody will say that's nice in Albuquerque, but it doesn't work in Boston.

MR. SCHMITT: Other comments? Moving on, if you will note Paragraph 3 under IT integration and information sharing, at the last meeting there was discussion about wanting to know what was going on in other places. That's part of the reason why we had the folks from South Africa here today. We also gave some thought to what is going on in the U.K. They have been in the news quite a bit, particularly about the tremendous successes that they have enjoyed. Of course, they don't have some of the similar procedural constraints as we do in the United States, which leads to why this is so helpful in that country for using this type of analysis. It is a little different than it is here or at least perceived to be here in the United States.

We thought it would be helpful to have a greater understanding of how DNA analysis is used in the U.K., and so Director Hart has engaged a research project funded by NIJ to look at this, and we expect a final report this coming summer; however, we're not going to make you wait that long for a preview, and tomorrow on the agenda at our working lunch Tim Schellberg and Lisa Hurst, who are here from the Smith Alling Lane firm, which is the entity that won the grant from us to do this work, will be here to give you an update on where their research stands. So that's mostly a commercial advertisement for what is coming tomorrow.

## LOCATION OF EVIDENCE

MR. SCHMITT: Let's move to the No. 4 topic on our list of discussion items. We have thrown out some issues here that come up in our discussions. We wanted to make sure that we have the benefit of your views on this. Let's start with the second one, if you don't mind, which is location of evidence.

Where we're going on this is are there problems with evidence storage, evidence retrieval, chain of custody issues, just merely space issues, and other than give us more money, which I realize is the answer to all of my questions, what can we do to help on this? Is it that our funding streams are not robust enough to allow you to do that? There is just not enough money to allow you to solve that problem and do the other things?

Let's start off with location of evidence. Who has problems? Paul, do you have any problems with location of evidence?

MR. FERRARA: As part and parcel I think probably most states as they've developed postconviction statutes, part and parcel of those are requirements for the retention of evidence even after a conviction for some period of time. Those kinds of statutes obviously cause a problem depending upon where the statute requires the evidence be retained.

In Virginia that dubious honor fell on the Division of Forensic Science to retain the evidence of all felony convictions for 15 years or the length of the sentence or until the sentence is executed. Obviously that's going to be problematic from a storage standpoint, but, on the other hand, it does assure that evidence will be available for postconviction testing in the future should it be necessary.

But clearly storage of evidence and the space associated with it are going to continue to grow as well as everything else about this technology.

MR. GIALAMAS: I guess being from Los Angeles, I can't help but comment about some evidence issues. I take it you're all familiar with our evidence issues. I guess once again we're the stepchild, and I guess I'm representing L.A. because it's both the sheriff's department and the PD that have gotten pretty beaten up in the media.

But we do have issues in California. Much like Paul does, we have a requirement that all evidence be retained as long as a person is incarcerated. There is a hook that allows you to dispose of the evidence as long as you can show the disposition of the person's incarceration status, which again we go back to the information sharing, communication issues.

One of the things that I would like to throw out maybe not to complicate things, but just as a point of discussion is having been on the State Attorney General's task force on this very issue about evidence, one of the biggest things are comments I get back from agencies complaining about direction is how evidence really needs to be stored. The idea of is it critical that the evidence absolutely be frozen, and that frozen condition makes a big difference for a lot of agencies.

That may be something that we as scientists have to really address and answer for our clients, our criminal justice community, because at the sheriff's department we have three 800 square foot walk-in freezers. They're stacked floor to ceiling. We are in the midst of building two more. If we continue at the rate we're growing, we're going to have to change our 30,000 square foot warehouse to a bilevel freezer of the entire space, and if we're going to be keeping this evidence forever, and that seems to be the indication, there has got to be a better way to keep it than at four degrees centigrade. There has got to be a way that we can maintain it perhaps in a refrigerated environment. A cool room with no humidity, for example, is just an idea that we talked about.

That may be something that we ought to pursue, giving guidance to agencies on how to keep their evidence because the burden may not be on the crime labs; that burden may be on the agencies themselves.

MS. HART: Would it helpful to have kind of almost some best practice information disseminated about kind of using your limited storage resources wisely to kind of get what is the most cost effective use? One of the other things that I recall from Los Angeles that was mentioned to me was this whole issue about how the paperwork trail went about and that in Los Angeles it became easier to get the evidence destroyed because you didn't have to have a signature of a higher up, but to hold the evidence you had to get a signature of a higher up.

MR. GIALAMAS: That's exactly the way it happens.

MS. HART: So part of this, too, would also be encouraging states to look at kind of the paperwork trail and how this works and make sure that it's serving the needs that they want met.

MR. GIALAMAS: Absolutely. I can tell you from our end one of the things we experienced in our agency was that as different investigative units take over, for example, we have a unit called the Family Crimes Bureau. They're the ones that take care of the sexual assault evidence. So at its local station level it gets collected, and that station detective is tagged as the detective. It then gets transferred to the Family Crimes Bureau. The disposition notice doesn't get changed in the information trail, so it goes back to the detective. He says I'm not handling this case; it's someone else and could easily sign off on it without realizing that the evidence is being dispositioned or discarded.

The same thing at the Los Angeles police department. I'm sure many of you heard of these 1,000 DNA cases that were discarded. That particular issue had to do with a miscommunication within the department as to the investigative status of those cases. So we need the information base there to absolutely prevent this from happening anywhere else. We've seen it happen in L.A. I wouldn't wish it on anyone else.

MS. GUIDO: I was just going to say that one of the things that I think is a real problem in terms of evidence storage is, depending on your state, for example, in Pennsylvania ours is pretty much county by county how that evidence is going to be stored, it can cause real problems for you not only in your criminal case, but later in your civil case should something go wrong.

We have a case right now that's becoming pretty famous. In fact, Johnny Cochran was out to see me about two weeks ago about our case, a guy that did 28 years in prison and then was released on a Postconviction Relief Act petition. The DA decided not to prosecute, but it all centers around the work that was done in our State Police crime lab. The technician and everybody else is now going to be sued over what she did.

It centers around a print that supposedly had blood on it, and there is some question now about whether or not the print did have blood on it. The print can't be found. You know, county by county they decide how to take care of their evidence. In Dauphin County where this happened they are keeping their evidence from their old cases out in the basement of a local nursing home, which isn't uncommon because I'm from another county, and back when I was a prosecutor, we kept our evidence out in the county nursing home in really deplorable conditions actually.

So I just point out that it can be not only a problem for the prosecutors, but may be a problem for your lab personnel later on down the road. We're looking at millions and millions of dollars here in that suit when it seems that maybe the lab director did nothing wrong. She may have been absolutely accurate, but we just can't find the prints anymore.



## **PROPER STORAGE - STANDARDS AND OTHER ISSUES**

MR. SCHMITT: Let me ask you a question before you comment. You can comment and answer the question at the same time. You mentioned the four degrees centigrade issue. Is there a lack or has there been a lack of research to identify what the acceptable conditions are for biological evidence storage that's long term; i.e., do we have enough research that four degrees centigrade isn't what is necessary, that 20 degrees and no humidity is sufficient for two years or four years, and if you want to go beyond, you can say something else, or is that an area that no one really has had time to get around to because you've all been actually doing cases?

MR. FERRARA: We have been storing, for example, blood samples of convicted felons, and we've got like 13 years of those samples, and they have been stored at room temperature, in a controlled environment, but basically room temperature and low humidity, and those samples have experienced - we've tested them periodically, and there has been absolutely no visible degradation of those samples for 13 years. I suspect there are more controlled studies rather than anecdotal that have been done, but we got to the point where when we moved to our new facility about five years ago, we disposed of minus 60 degree freezers for storage of those samples, and except for a great savings in our electrical bill haven't seen any difference at all whatsoever in the quality of the samples. That's properly preserved examples.

MR. SCHMITT: Lisa wants to chime in.

MS. FORMAN: There are actually a number of controlled surveys that have been done. They were done early on when those questions were first asked in court, and they're so old that I don't actually remember the published literature on them anymore, but there are a number of validation studies that were conducted, and since those studies started NIST has been collecting and testing samples now for Margaret says 20 years, but I must have been such a small child when I started there, it can't possibly be 20 years.

Many of those studies are brought into the scientific community via talks that she has given, and ultimately there will be a major peer review paper that's written on it. So there is decades worth of information, and all of us were very young when we started.

MR. SCHMITT: Dean, why do you then use four degrees centigrade still?

MR. GIALAMAS: Well, I guess the best answer I can give is that based on the studies we've done, that has been the best temperature to maintain it for this point in time. I truly believe that the four degrees centigrade is not really necessary to that degree. I think just keeping it much like Paul is doing, and that's a building consideration that we're going through right now, do we build giant walk-in freezers or are we going to build kind of a cool room that we can control humidity?

Because it's such an issue in California and related to this Attorney General's task force, the state Attorney General's task force issue, that that was a key area that we failed to really address on this task force. No one is willing to take that risk. No one wants to be the first in California to say I'm the one that took that gamble and now I'm losing out in the courtroom. Poor Woody here has

got to deal with our evidence, and now he has a problem with it because I didn't store it at the right temperature.

MS. NARVESON: We've looked at this issue quite extensively also, and it comes down I think primarily to limited samples where you are on the borderline. We all know that the freeze-thaw cycle can have a detrimental effect on whatever you've got there. I'm with Paul on substantial size samples I think room temperature storage under controlled conditions is just absolutely fine, but in the area of limited samples, and you really want to be able to get as much information from that sample as possible, that's the area that causes us concern at this point in time and the legal issues because sure as I'm sitting here today, if we go to all room temperature storage, that will become the issue.

MR. GIALAMAS: One of the other comments that came up in California was not knowing where technology was going to drive again, we didn't want to be in a situation where we're saving testing samples for today's technology not knowing what is going to be knocking at the door tomorrow.

MR. SCHMITT: Let me ask you on the general issue of best practices is it helpful or does it make you nervous when someone such as NIJ comes out with best practices publications on evidence collection, evidence storage? For example, if we were to convene a group of experts just on the issue of evidence storage and we came out with a best practices and it said one of the ends of the spectrum, whether it's Paul's or Dean's, to the extent that your state doesn't do that, are you worried that then creates issues for the defense that would allow them to unfairly spin the case, creating an issue that's not in fact a real issue in the case, or do you find that it might be helpful when you're trying to make the case to your supervisors and funders that I am not crazy; here is the National Institute of Justice's best practices collection, and they say that room temperature and low humidity is just fine? How does it cut?

MR. TILSTONE: Essentially I would like to ask Steve the question because the question as posed and as reworded by you has already been answered because the ASCLD manual has quite specific instructions in it as to what is acceptable for the storage of biological evidence. It already is captured in writing what is the best practice for storage.

MR. SIGEL: But that is really coming out of the technical guidance that was given through the DAB advisory board back a number of years ago and the accreditation process looking at the quality issues in laboratories, you know, as being driven or guided by what the practitioners within the technical fields would be doing. So I guess from that standpoint if there was guidance given, ASCLD-LAB would be responding to that rather than a driving force behind that.

MR. SCHMITT: Is it better that such guidance come from a professional voluntary association of professionals versus some arm of the Federal Government? Does that make it more or less acceptable, easier or harder to defend?

MR. SELAVKA: I think something that we have to remember is the ASCLD-LAB standards are one thing and the DAB standards are one thing, but really the evidence as a system has only a very small component that includes us, and when you take that into account, the lack of harmony

among agencies across our country and really worldwide is a failing because the standards should act as leverage for us to get the resources at every point of the evidence control process, not just in laboratories.

So the prosecutor knows where the holes are. You just mentioned, Syndi, about some holes in the system, and without appropriate harmonization or standards or guidelines from somebody that's authoritative, you don't have any leverage. Even though it's bad at the beginning, all quality systems start with this look in the mirror saying we're not where we should be, and it's going to take resources to get there.

MR. SCHMITT: Who is more authoritative, though, the government or a professional association?

MR. SELAVKA: There is no overriding professional association that you can rely on to do evidence as a system kind of review that I know of. I think it would have to be some August body put together by NIJ flown in from South Africa.

MR. CLARKE: I think as an end user, as an advocate of the courtroom, I don't like standards for obvious reasons because not only can it be the spin, as you used it, but also lack of compliance, which may be for a very good reason, but it might be very difficult to explain in court. At the same time if I have an analyst from an accredited laboratory, an ASCLD accredited laboratory, am I going to ask that question? Absolutely, and then we'll move on. It will be very quick.

But in terms of standards, it can range from the absurd, as in the Simpson trial, dealing with standards and lack of compliance with quality assurance protocols within the police agency, which can go on for days, or obviously in the majority of cases it's irrelevant.

So it's hard to give an answer to that question. Do they help? As an advocate for the use of science I like the existence of standards. As an advocate in the courtroom, I may despise it.

MS. HART: One of the things that we certainly struggle with at NIJ because you want to make sure you get the best information out there in the field, but at the same time you don't want to be creating problem for the people you're serving, which are the state and local governments, so sometimes it's that question of striking a balance between getting the information out there.

What does concern me is if it looks like you're doing the Cadillac standard let's say so that somebody can get more resources, what happens in that jurisdiction that can't get the Cadillac resources because the money has to go for schools or something else? Are you putting those people at a real disadvantage by issuing a publication that makes it look that they have to have the Cadillac standards or their evidence isn't any good?

MR. GIALAMAS: I really think it depends on what the standard is. If we use Paul's example of refrigeration and controlled humidity, if an agency or laboratory or let's even bring in the court system because that's the biggest part of location and storage of evidence that I have is the way courts treat their evidence once it's submitted to court, should be something that anyone can achieve. It's not something that's that unreasonable.

If we come out saying that it has to be minus four or minus 20 degrees C frozen conditions, that's a huge burden, but telling someone that they have to have an air conditioned room with a controlled humidity is a mild cost to society for the furtherance and maintenance of that evidence so that it can be preserved indefinitely.

MS. HART: So, in other words, you could put information that says this is the Cadillac standard and go down all the way.

MR. GIALAMAS: I would start the other way. Instead of starting from the top saying this is what you should do - and this is what we found in the State Attorney General's task force issue is they didn't provide a minimum recommendation; evidence should be stored here and anything is better is to the option of the agency, and the whole issue fell on accountability. The bottom line is the state didn't want to be held to coming up with this because then the next thing you know is that people would be applying for reimbursements and grants because this is a state mandated kind of issue, and I think organizations have done something similar.

I can tell you forensically the organizations I belong to, many of them don't come out with something because they know it involves more than just forensic science. It involves the court system, district attorneys, police departments, who they may or may not be a part of, so by them coming out with a standard, it affects people outside of their organization, whereas the NIJ as kind of like an overseeing body on a national level may be in an easier position to do it.

MS. HART: Is it also something that's worth looking at from what I would call like a day forward, day backward kind of question? It becomes very difficult to go back and say for all the evidence that has previously been collected we're going to go find out where it is. I can remember as a prosecutor opening up a homicide file and finding the bloody clothes of the defendant. There is no way it should be there, but that's where it was. Is it the kind of thing that is worth looking at as a two-part thing and saying even if you can't address what has happened in the past, we should go forward and establish kind of standards for how we are going to collect and preserve evidence in the future even if we can't address the back ones quite the way we want to? Is that a worthwhile strategy or not?

MS. NARVESON: I think if you were to focus on minimum standards, meaning this is what good science requires at a minimum, and then at the option of the agency or the resources of the agency they could choose to exceed those standards in all cases or in certain select cases, but I think the minimum standard which has always been what ASCLD has done is set the minimum standard.

Best practice is something else, and sometimes we get the two confused and it causes a lot of consternation, but minimum standards. I think what Paul is saying is very reasonable, and those organizations then could meet minimum standards. It just seems like it's good laboratory practice.

MR. SCHMITT: Sir, you had a comment, and then we will come over to Kim Herd.

MR. VAN NIEKERK: Thank you. We have basically designed our evidence collection kits for sexual assault evidence collection on the numerous standards of different states in the United States, for instance, New Jersey, Texas, California, Tennessee, Kentucky. We've done away with the use of glass slides, for instance, for microscopy based on recommendations emanating from New Hampshire and so forth.

In other words, those standards became a guideline for us on how to go about designing what we thought would constitute international best practices. We based our automated system on the guidelines that emanated from the National Commission on the Future of DNA Evidence working group on where DNA evidence was going in the future.

Has there been any problems, if I can ask this question? Are you aware of any major problems where people were set to a disadvantage because of standards in, for instance, something like sexual assault examinations? Has that been a problem, for instance, over the past couple of years?

MS. FORMAN: I think that it's fair to say that when you get no yield on a case, it can be a no yield for a variety of reasons. One of the reasons may be that the evidence just wasn't properly collected or stored. So that's part and parcel of what is being talked about, but I think you bring up an incredibly important point, and that is these are really questions of molecular biology, that the preservation of cellular material wouldn't necessarily just come from the forensic community, but could be part of a broader investigation.

Sue brought up a good point, and that is typically the NIJ guides deal with best minimum standards, never looking to a Cadillac, but looking to what is the least you have to do to make something work. So I think that investigating this, if NIJ chose to investigate this as a research process or as a technical working group process, it would necessarily have to go outside of just the forensic circles and include broader areas of molecular biology. I think a lot of them were addressed in that original working group publication.

MS. HERD: I would basically just echo what the last several people have said. As long as you shape it in terms of a best practice or guideline, that's a lot easier to deal with when you're in court and you have somebody that does challenge the fact that a certain laboratory doesn't abide by a certain standard, as it were.

There is a case in Minnesota now that is really just about that issue. The allegation is they're not following a certain standard, a standard that is really antiquated and has been supplanted by the DAB, but courts and defense attorneys in particular tend to just really take a grip on that, and then the rest of the community is hampered.

So it's really all in how you package it, and standards themselves are really dangerous, I think.

MR. SCHMITT: Before we move on to the next area I ask you to look at Paragraph 4 of the discussion items and see if any of those phrases are ones you want to comment on. I won't go through each one, but if anybody has a strong opinion or comment you want to make on any one of those, please speak them. I'm particularly interested in the disposition of cases issue, whether

the fact that you don't know what happened to the case after you did your analysis is a real problem, but it's an open floor on any one of these other points.

MR. FERRARA: As I indicated earlier, this ultimate disposition of cases is very problematic as our databases and the use of our databases increase. It's problematic from several standpoints. One is informational, statistical. Who should we be taking samples from? What was the impact of a particular sample in a particular case?

Ultimately, for example, if you have samples from an arrestee, that cannot be searched nationally, and so one has to know when was that person who was sampled upon arrest ultimately convicted so that then that sample can be lifted up to a national level and put on NDIS where it can be searched nationally.

So I think disposition of cases is critical. Plus I think it will also establish - if there is any question about the efficacy of DNA databases, I think a good study on the disposition of these cases will dispel any reservations anyone might have as to their efficacy.

MS. CROUSE: I kind of want to make a comment on several of these in one basket. It seems that before we can actually conduct some of the new technology on casework evidence regardless if it has to do with the evidence storage all the way through to the interpretation of a DNA profile there has to be some kind of - it seems anyway that there has to be a series of standards or validations that have to be done before that can be accomplished.

One of the things I'm specifically interested in is this expert software, and there don't seem to be any guidelines, and I know that's going to have to come from a higher source, but there don't seem to be any guidelines on how to validate this procedure regardless if you use the system that South Africa is using or cybergenetics or whatever.

I think the same is with any kind of technology transfer. I'm not sure where those guidelines are going to come from to even march forward into some of these areas.

MR. DIZINNO: I would offer that possibly some of those guidelines could come out of SWGs such as SWG Dam and some of the other SWGs, whether it be another forensic area to get a group together of scientists to come up with those guidelines and pass them through the SWG and make those available.

MR. SCHMITT: Does anyone have issues on disposition of cases in a state where they don't allow DNA to be taken from arrestees or is this a Virginia problem only other than general record keeping?

MR. COFFMAN: I think it's going to be a problem for many states because Louisiana has had an arrestee statute and they haven't started it, and I really think it's what is going to happen across the country.

MR. SCHMITT: Does this issue get solved if the federal statute allows for the uploading - if the federal statute were amended to allow all samples lawfully collected under a state's law to be loaded up?

MR. COFFMAN: I would definitely like to see that if it's lawful in your state. What we're doing is sharing information. The federal system does not have any name information. They still have to go through the gatekeeper in the state. I would like to see if it's lawful and proper to collect in your state, that it is able to be shared nationally.

MR. SCHMITT: That solves your biggest problem, Paul, which is we uploaded something we weren't lawfully allowed to do.

MR. FERRARA: Yes, clearly. Obviously from our standpoint we would love to see legislation that would also presumably allow Virginia, for example, and any state as they pass statutes requiring samples upon arrest to avail themselves of federal funding for processing those samples.

Ironically in Virginia because of the current federal law, I have to do the arrestees in house at cost, and I won't be taking samples on conviction theoretically and won't be able to avail myself of any of that money. I think one can argue that well, Virginia passed that law; that's Virginia's problem, but from a standpoint of where we want to be going in the future, I think it's something we all ought to address.

Now, having that said that, arrestee law or not, I think we still need to be able to follow disposition of these cases because in many cases, depending on what happened to a case even taken on conviction, I may or may not have a sample legally up at national. I mean it's entirely possible. We're subject to audits through the IG's office and such, and it's very difficult for me to make any assurances without knowing each and every case, let alone have the resources to follow those dispositions.

MS. NARVESON: I think the other thing, too, for laboratories that are dealing with limited resources is how critical it is to know which cases really are still in the pipeline that require us to dedicate our limited resources to them. Being able to have disposition information available on an ongoing basis allows us to prioritize our assignments and use what resources we have to get the cases through the pipeline other than staying with the he said/she said cases and wasting our time where somebody has already taken a plea agreement. We could be moving on to other cases.

MR. FERRARA: Susan raises an excellent point. As an example, just this past week we made a DNA data bank hit. Our examiner calls the investigator, and the investigator says that's great, but the guy has already been charged and convicted, and we had run the analysis that we didn't have to do simply because again we weren't in a position to follow where that particular investigation or case was going.

MR. GIALAMAS: I can tell you about success stories in L.A. about communication because we have a system that the sheriff has put together which puts all the crime information, crime reports

into one database so that all law enforcement agencies in Southern California can access. As part of our cold hit in doing the unsolved suspect list cases we identified about 1,300 sexual assault cases that needed to be analyzed in our agency. About 450 of those cases we didn't even need to analyze and we didn't have to go through the step of analyzing them because in looking up the system, we had realized that the case was either dismissed, it had already been adjudicated in court, and having that information now took off 450 cases of our backlog immediately just through data acquisition. So that point has already been proven at least on a local level how that can succeed.



## MITOCHONDRIAL DNA ANALYSIS

MR. SCHMITT: In the way of expectation setting, we will stay until 5:30.

I would like to move us now to the next section of the agenda, which would be additional areas, and I would like to start of with mitochondrial DNA analysis. In particular, I would like to have a discussion begin with some folks sharing what they use mitochondrial for, how often, what percentage of your actual workload is mito work, and talk about perhaps the pressures on the outside and people who want it. Is it rightly put or not, and where you see that fitting into the panoply here going forward. As you can see from this list, we'll also move in a little bit to a discussion of using mitochondrial DNA analysis for identifying human remains.

Let's start with Joe.

MR. DIZINNO: Maybe I can give you some baseline numbers to start working with. In the past three years we have had between five and six mitochondrial DNA examiners qualified, each working with at least one biologist, sometimes two, and they've put out between 200 and 240 cases per year, so it's an average of about 30 to 35 cases per year per examination team, which can consist of a minimum of two and possibly three people. Of those cases, about 75% of the cases involved hairs and about 25% of them involved unidentified remains.

As far as assessing what the needs are to be met for mitochondrial DNA, I think that's a very difficult thing to do. I know NIJ in the past has tried to identify how many rape kits are out there. This is almost like trying to identify how many rape kits are out there with hairs present or how many hairs that are in clothing that haven't been processed. It's almost an impossible task.

I can say that you really I don't think can perform mitochondrial DNA analysis without also an expertise in hair microscopy within your laboratory, and there are fewer and fewer numbers of laboratories performing hair microscopy that I doubt if anyone in this room who has a lab would want to start tackling mitochondrial DNA without a hair microscopist. So they're kind of joined at the hip, those two areas of expertise.

On the other hand, I would say that I think it has a tremendous potential if the hair evidence out there alone were exploited to its fullest extent, but again that would require hair microscopy expertise as well as mitochondrial DNA expertise.

MS. CROUSE: Last year we sent out eight cases because we don't do mitochondrial DNA analysis. We sent out eight cases. We had approximately 650 cases total come into the laboratory, but only eight of them went out. Two were bones and six were hair.

MR. FERRARA: Virginia's experience has been that the demand and the need for the mitochondrial DNA analysis, as Joe has previously stated and I echo his remarks, has got to grow. I get very concerned when I see any forensic laboratory reporting out a microscopic hair comparison one way or another without the benefit of a mitochondrial DNA, and I think that's a direction that we need to go, which is going to presumably further increase the demand for mitochondrial capabilities.

We're trying to establish it in Virginia. We've held off as long as we can, but I think it's inevitable. The resources available right now are very limited. The Bureau has got their hands full. Private laboratories, the analysis is extremely expensive, and I know a lot of prosecutors who I have had to - I have had to agree to pay for the DNA testing because the prosecutor was going to take a case to court without mitochondrial because they didn't want to pay \$4,500 for a single hair and a reference blood sample.

I don't think we should tolerate that kind of condition. So clearly there needs to be some enhancement in the area of mito work.

MR. SCHMITT: Do you ever see cases where there is pressure brought by the detectives or someone else to do mitochondrial analysis when you also have sufficient material to do regular nuclear analysis?

MR. FERRARA: No.

MR. SCHMITT: In other words, a wasting of efforts is what I'm getting at.

MR. FERRARA: No. That's the first thing we look for and try to screen that out. Obviously my remarks deal with the situations where all attempts to develop an STR profile fail and the only evidence available is a hair. Then subsequent to a screening by a hair microscopist not just for comparison purposes I might add, but also for ascertaining if you're dealing with body hair, racial origin, and such, but once that is complete mito is the only result.

MR. SIGEL: Was that also a case you had no other way to do DNA analysis by using mito?

MS. CROUSE: Even if it looks shabby, I'll still go for it, but our state attorneys will not pay for it.

MS. NARVESON: As part of a feasibility study we actually tried to get our hands around what would be the possible demand for services in the State of Arizona. We were surprised looking at cases that couldn't be solved with nuclear DNA looking at unidentified remains that are just laying, no one has any identification material. We came up with about 150 cases right off the top of the study, and my feeling is it's just like, you know, you build it and they will come. Right now it's a cost factor. In fact, we are meeting a great demand for service with nuclear DNA, but I think if it's there and it's reasonable, you will see the demand increase.

MR. SELAVKA: Just very quickly, we have a couple of cases, relatively high profile, where there were nuclear DNA results that have exonerated a suspect, and there was a hair in the gut of a victim, and that hair, we were forced to do mitochondrial on it. It didn't make any difference, but it was one of those cases. So it's not always just in the absence of nuclear DNA. Sometimes it's a force by the investigators or by the DA.

MR. SCHMITT: You mean it's forced even over the objection of the lab who says this is not necessary?

MR. SELAVKA: Yes.

MS. NARVESON: Usually we see that with nuclear DNA where it's the sleep over and the stepfather of the hosting young girl is accused of molesting someone, and, of course, everybody has brought the sleeping bags from somewhere else and they want all the hairs and they want nuclear DNA done on it. Those are potentially mito cases.

MR. SCHMITT: Susan, you made the comment if you build it, they will come. Is that also a caution that if you build it, you're going to get lots and lots of requests for it, and there needs to be some sort of either gatekeeper function or education function that happens on this?

Let me pose a question for the chief. You can answer now or as we go forward here. Are your detectives amenable to being educated, if you will, by the lab guys on this or on the detective's side does this seem as kind of a silver bullet: Hey, we can now analyze anything you can find, and so make these lab boys do their jobs and use mito on everything?

MR. CLINE: In Chicago we got rid of our lab about seven years ago. We're using the state lab now. The state lab has set up training for detectives where detective go to the state lab, sit down with the analysts, and talk, and that has been a tremendous boost for us because it's understanding on both sides.

The other thing is we try on our high profile cases to get our detectives over to the lab, sit down, and take a look at the evidence with the analyst and say what can we work on here. Let's say it's a high profile sexual assault case. Let's first do the swabs before we worry about clothing or bedding or anything like that. It has been a success, but it's definitely an education process.

MR. SCHMITT: Joe, at the Bureau who has final say on what kind of analysis is run? Is it the lab?

MR. DIZINNO: Usually the lab personnel work with the investigators and try to determine what is probative and what isn't, so it's really a joint effort.

MR. SCHMITT: So it sounds like you and the chief would agree that either working together or a communication function is crucial here to appropriately place the laboratory resources in the most efficient manner.

MR. DIZINNO: That's correct.

MR. CLARKE: I was just going to say as an end consumer, I feel like I'm at my first Alcoholics Anonymous meeting. I confess I'm a mitochondrial DNA addict now. Having just been involved in the trial of that rash of children kidnap, murders and so on, we turned to mitochondrial DNA testing, and we really had, for lack of a better term, a free shot at it because there were hairs totally associated with our defendant. The Bureau stepped in immediately because of the nature of the crime and obtained an important mitochondrial DNA match from one location, but ultimately we had - I hate to say it - another 25 hairs typed at a private laboratory, and a little multiplication will tell you the pain of that, but nonetheless it turned out to be excruciatingly

important, telling the tale of where our victim had been, in our defendant's home, in his bed, in his motor home, in a series of locations.

Can we do that in a routine case? Of course not. Some day we may be able to hopefully, but that turned out to be an extremely important technology used in a case where at our original laboratory they could only screen these hairs. That's the best they could do. Everyone was blonde practically that was involved or potentially involved in the case, and hair microscopists know that that gives them less opportunity to be distinguishing in terms of features and so forth. But here ultimately by spending a lot of money, which is okay in cases like this, we ended up being able to tell the jury the full story of what happened. In a capital case in particular that can be extremely important because the capital juries, death penalty qualified juries, expect more and want us to go down that route.

MR. SCHMITT: But there you had a theory of the case and a litigation strategy that you wanted to achieve using this type of analysis. It wasn't let's analyze everything and make sure that we've got the right guy. You had a theory that you wanted to lay out that you could only lay out through this type of analysis.

MR. CLARKE: Exactly, and the fact that an exclusion - out of the 25 hairs there were probably ten exclusions in that batch - exclusions did not defeat what we believe happened. The inclusions became extremely important.

So there are many varieties of that. There can be much testing of hair. As Joe knows perhaps more than any of us, the hair is just not probative regardless of the result. You go back to the original case in Tennessee. That's a number of years ago. Now I believe a pubic hair in a young girl's throat, that's probative. So it's measuring that along the spectrum.

MR. SCHMITT: What is the best way to meet the needs that you have? CC has eight cases in her county in a year. Does it make sense for her to have that kind of capability in her lab? Paul, how many cases would you have in the state?

MR. FERRARA: We've determined that we have enough demand even currently to have one team performing mitochondrial in house, but that's for an entire state of 7-1/2 million people, but at least two.

MR. SCHMITT: Is this the sort of thing where there needs to be national, regional laboratories that do this sort of thing on a reimbursable basis? Is it that states can simply through memorandums of agreement partner with other states that have these capabilities that other states would have it, and that would meet the need? Is there a need to have private labs to handle this? If the answer to that is yes, might we not fund - allow our money to be used for developing these capabilities in the state and local labs?

MR. CLARKE: I think right now the private laboratories are filling that need because Joe and his resources, they took extra steps to perform typing on I think it was two samples, extraordinary extra steps. The private laboratories I think are better equipped to do that, particularly when, as in this case, a defendant refused to waive time. He demanded a speedy trial within 60 days.

MR. SCHMITT: You didn't have any chain of custody issues having gone to the private lab?

MR. CLARKE: No, none.

MS. CROUSE: One of the things I'm still confused about with regard to mitochondrial, and maybe I didn't understand the impetus for the production of the mitochondrial strips, the nylon strips, it was my understanding that originally years ago those were going to be developed for labs like ours that were small labs that wanted maybe to pump out presumptive identity by mitochondrial analysis and then it can go on for a full sequencing. Is that part of the schematic anymore or do you have any idea what is -

MR. DIZINNO: That was being developed by a private company. They asked for our input into that. I still think it would be worthwhile as a screening tool, but you would have to perform the full sequence once you go to court. We haven't put any resources into developing sort of those screening mechanisms for mitochondrial.

MS. CROUSE: Because we would have considered that. We are also looking into mitochondrial snips as well. I'm just not sure where the technology is going for the small labs like ours. We're not going to be a full-fledged sequencing laboratory ever. We just won't have a need for it.

MR. SCHMITT: Other thoughts?

MS. SAMPLES: We had planned to have our mitochondrial DNA up a year ago, but we got derailed. We are planning to have it up soon, we hope, and our goal is to be a regional resource for the laboratories certainly within our state and hopefully for a fee, but all of those particular details still have to be worked out. I feel like Susan feels, and that is if we open it, we're going to be swamped with requests for analysis. We don't really have a good idea of what our case load is going to be. We just assume it's going to be too much.

MR. SCHMITT: And then you would do what?

MS. SAMPLES: Develop a backlog.

MS. HERD: It also seems to me that there is just a real unevenness across the country in terms of prosecutor awareness of mitochondrial DNA technology and what it can and cannot do and the willingness to pay for it. As CC noted in your situation versus Woody's situation where it was a very high profile case and the DA was pretty much willing to spend whatever needed to be spent to solve the case, and, you know, you were in a position where you could get the samples analyzed, but I think a lot of prosecutors aren't aware of the power and the need for mitochondrial DNA perhaps or that the FBI is a resource and maybe their backlog isn't as bad or that they have hired more analysts and have them on line. Am I correct in my perception of that, that there is an unevenness in the awareness of prosecutors?

MR. DILLINGHAM: Kim, you know better than I there is. One of the things that I think Sarah started out with earlier was the need for training in a variety of areas, but certainly there is no

greater need than in the prosecution community. So I just reiterate your identification of that need.

Also I don't want to jump back too far, but you and Woody hit it perfectly on a previous discussion about the issue, and I know you're going to be grappling with it, of standards and prosecutors. Standards is something that are used to beat up on prosecutors, and to the extent that we focus on guidelines, best practices, I think we're in a much better position. So in this area as well the training - I think that the best practices in the prosecution community will only become reality with some attention and resources devoted to it.

MS. HERD: Also in these types of situations establishing a regional lab or that whole debate really prosecutors can kind of drive whether that happens or Attorneys General. So even if at the lab level it's identified as a problem, it really needs to get out there to those policymakers and to the end users, who are then able to go to advocate for it, and a lot of times that gap is very, very wide obviously, as you well know.

MR. SCHMITT: Paul, do you think that the policymakers in Virginia would allow your lab to do mitochondrial work for other states on a reimbursable basis assuming Virginia didn't lose any money, maybe even made money in the deal? Has that been discussed if you're at liberty to say?

MR. FERRARA: Our Attorney General has been a real advocate and keeps telling me, Paul, I'm going to get you money to set up mitochondrial. He's a former prosecutor, and he realizes the necessity. Currently by statute we're allowed to provide forensic laboratory services to any law enforcement agency working a criminal investigation in Virginia or any federal agency requesting it.

I am quite sure that with respect to mitochondrial DNA, they would modify the statute to allow us to provide as capacity allows to do work on a fee basis for another jurisdiction, yes.

MS. GUIDO: I was just going to say on the issue of prosecutor awareness, I'm sure that is an issue, too, but it seems to me that the budgets of the various district attorneys are just as crucial to that, because, for example, in our state, Pennsylvania, we have a lot of - in our 67 counties we've got Philadelphia, which is larger, and then we have some places that have a part-time DA, one guy. We have one guy up in Monroe County, for example, who his county commissioners would not even authorize any funds whatsoever for the office, no paper, no pens. He was running the District Attorney's Office out of his own private law office.

If they had a high profile case, they're not going to be able to send it out. It doesn't matter how big the case is to that county. They can't send it out. I can't think of the state right offhand, but some of you may remember. It was in the news not long ago where the local judge determined that the prosecutor was not allowed to seek the death penalty because he felt it was going to bankrupt the county budget if they did that.

So how that funding is going to happen is a crucial issue, whether it's going to go to a central location or whatever, just so it's available to some of these smaller areas that they just wouldn't have the budget to even move money from one case to the other. They just couldn't do it.

MR. SCHMITT: As I told you earlier, I invited the manufacturer folks who are here today to pass me notes. This is in response to I think CC's comment or question. The note I received is that mitochondrial DNA snips are being developed with a kit which would permit small labs to screen for mitochondrial and also Y chromosomes on a ABI 310.

I want to ask Joe to tell us a little bit, if he can or to the extent he can, the FBI's plans to use its CODIS or a file of CODIS to help identify human remains and then ask those of you from other states whether your states are developing or planning to use DNA analysis in that similar way even within your own state's database or uploading into the FBI's database.

MR. DIZINNO: CODIS has in it another file for missing persons, and it actually is a file with two subfiles, a missing persons file and a missing persons reference file. Currently that will - or originally that will contain mitochondrial DNA profiles only; however, it will be set up so that it can contain the profiles of STRs for mitochondrial DNA. Our initiative initially is for mitochondrial DNA on human remains because generally we're not able to obtain nuclear DNA results from most of the human remains that we receive.

MR. SCHMITT: Is anyone else doing similar work in their state? John, do you want to start off and tell us what you're doing?

MR. KRESBACH: Currently we're doing nothing; however, I just testified before a legislative committee last Thursday to this very issue. When our original CODIS bill, if you will, was passed in 1997, for ease of getting it passed through our legislature it specifically had stripped out any references to unidentified human remains, missing persons, relatives of those people, and the like.

After September 11 and other similar types of things have gone on around the world where they have needed to identify large numbers of people or just even the individual person who has been badly decomposed it's now in the forefront, and we're actually pursuing legislation to specifically allow us to utilize CODIS and any of the other resources that may or may not be either through private vendors of the Federal Government or whoever to be able to have this as a resource that we can offer the citizens of New Mexico.

Currently our medical investigator, our Office of Medical Investigation, which is a statewide office - if you die in New Mexico under unusual or unknown circumstances, you're going to get shipped to Albuquerque. They perform the autopsies, collect specimens, and then you go back for burial if you're identified.

We have currently between six and ten people per year that are not identifiable by any means. They're not necessarily decomposed. We just have a very transient population in New Mexico. For all we know, they could be Mexican nationals, they could be people from other states who have been off the radar screen of their respective families for a significant period of time, and if they've not had dental work or if they have not had fingerprints taken because they're not a criminal, you have this perfectly suitable body for doing nuclear DNA, but regardless you still can't figure out who they are.

So we're in process of putting those pieces together in order to take advantage of whatever the Federal Government is going to have as far as CODIS. So once it's up and running and regardless of whether we have to pay for the mitochondrial DNA if it's necessary or the family members of the missing person might want to, you know, invest in that type of thing, which our proposed statute would allow for to minimize the burden on any small jurisdictions, we're ready to take advantage of whatever is out there or we will be in February.

MS. HART: Dean, I know that California passed a statute a couple of years ago requiring the testing of remains, and I was wondering how that has worked in California. Most states do not appear to have that type of a statute.

MR. GIALAMAS: Well, I can't speak too well because I don't work for the state, but at last count I think they had ten samples in the database.

MS. HART: Ten unidentified dead or basically that's not a priority of testing?

MR. GIALAMAS: Ten unidentified remains in the database that some day we could upload and compare to, but the program is just getting off the ground. The state, as I think Marie had mentioned earlier, is pretty much a training center, regionalized training center for most laboratories. They bring people in, train them to do DNA, and they're usually lost to another agency. So I think that has greatly affected their ability to keep up on their programs. We do have a mitochondrial program that is being started in the state for this very reason, but I don't think it's up and running at this point in time to any significant degree.

MR. COFFMAN: I was just going to say we have utilized CODIS to have a missing person index in Florida for about a year and a half, but we are using it for STR. CODIS doesn't allow you to do mitochondrial at this time, and so we are just inputting STR profiles on unidentified human remains, and we have had our first successful identification to a convicted offender that was collected eight years ago.

MR. SCHMITT: Is it just locally? You're not uploading anything yet to the national database?

MR. COFFMAN: No.

MR. SCHMITT: But the reason you're using STRs is because that allows you to use the CODIS software that you have in your local database.

MR. COFFMAN: I don't think our agency right now has any plans to move to mitochondrial.

MR. SCHMITT: The hit that you got was with a convicted offender?

MR. COFFMAN: Yes. It was an unidentified human remains found in a wooded area, and they were able to get STR for it, and we searched the offenders and matched an offender.

MR. SCHMITT: Joe, what the Bureau is going to do here is search the reference subfiles, but you will also search the convicted offender file?



MR. DIZINNO: That's correct.

MR. SCHMITT: The federal statute that deals with us today, the Federal Budget Commission's Act, requires that we make time for public comment on what we're doing here today, and, of course, we believe that it's important in and of itself. The reason I bring it up at this time in this somewhat awkward way is the statute requires me to do this at 5:00 p.m. regardless of where we are in the discussion. So a marker that we will come back to postconviction DNA testing as a subject in just a few minutes.

## **PUBLIC COMMENT**

MR. SCHMITT: I will now invite public comment. To those people who care to make a comment, I ask that you identify your name at the microphone, which is behind me and come to the microphone and identify yourself so the transcriber can take your name down. If you care to give us an affiliation, that would be helpful I think to everyone here. We ask that you ask a question. If you want to make a comment, we ask that it not be a speech, but a comment. I'll invite people at the AGID-LAB group to comment in response if they care to. Just to note for the folks in the public, we will be having some discussion on the postconviction testing, and perhaps we can allow for a second round, but brief public comment on that as time permits.

So we'll open it for public comment at this time.

MS. KREEGER: Lisa Kreeger, APRI DNA forensic unit. I was just going to say that in addition to prosecutor awareness or competence level in DNA usage in mito, it seems that in listening today one theme kept hitting me, and that was that ongoing communication between prosecutors, law enforcement, and laboratories is crucial to evidence screening, to time usage in light of policies, specifically postconviction, or court orders or court calendars, time usage in light of admissibility or discovery issues or pretrial preparation issues, time usage regarding cold cases and communication regarding case disposition.

It's crucial to the efficacy of the criminal justice system that that is an ongoing reality, and one of the things that I wanted to suggest or point out - and maybe this is a segue to tomorrow - but it would be useful if the recommendations either encouraged or monies required demonstration of multidisciplinary efforts that address those issues on an ongoing basis, and I just wanted to point out that I think that having teams and having communication and having demonstration of that on an ongoing basis would be extremely helpful.

MR. SCHMITT: Is there other public comment? Any response from the AGID-LAB members up to where we are or further comments on what we had been discussing?

MR. COFFMAN: I know there is a lot of rules, and we just saw that with the 5 o'clock thing where you had to stop. So this is probably oversimplifying and I know it probably can't be done, but why couldn't there be just sort of a - Mary said slush fund; that's not a good term to use here, but a pot of money that attorneys or people who really feel the need to have a mitochondrial in the case that there is an application process, and just say the case has to meet certain criteria, and we will hand over - you can check the community and find out what a fair price is and say if you can find it for 2,500 a sample, then go and do good things. Why couldn't there be that application process since there seems to be such an up and down feeling of what each state would - the case load they would have?

MR. SCHMITT: There is no reason why there can't be some appropriate fund created. It's just a question of what the legislative branch chooses to allow us to have to use. Some might suggest that if you create a fund, people will come flocking to it. You can perhaps say in response that you can deal with that with the criteria, kind of poor labs have to show why they're poor and why

they couldn't otherwise do it. The district attorney who has to work out of his home can make a case that he needs it more than a big city lab that also applies for it.

MR. COFFMAN: And it also would prevent the laborious process of setting up a contract in a state. Right now if we have specialized cases that come in, you don't have to go through the bid process to have a case worked. This way you wouldn't say that we're going to send 100 cases off for mitochondrial and then we have to do a state contract, which takes on the books 30 days, but it really takes 90 to 120 in most states, and then your year is almost up. You're running out of time and you can't get the money spent where if it's a case-by-case basis, you would just say here is a fair price. If you can find a vendor that will do for it for that, we will either pay for it or if you want to use a vendor that's more for whatever reason, you make up the difference.

MS. FORMAN: When we develop a program, one of the things that we try to do is stick very close to the goals of the legislation, and so there is no room, for example, in convicted offender analyses to develop a mitochondrial database because you can't solve a crime necessarily with just mitochondrial DNA, using that identification.

What we've had people looking into is is there a way to do no suspect casework using mitochondrial DNA, but the function of the programs that we have thus far, even though we tried to make the convicted offender program as user friendly as possible by having the states not have to fill out a lot and just working through the vendors is that the program as a whole has to kind of hold together.

So an individual pot for accessing mitochondrial DNA testing on a per case basis seems sort of beyond the scope of what NIJ has done in the past, but there might be other agencies that could be tapped into for that sort of thing or not even agencies, but groups that could be tapped into for that sort of on thing. So, for example, something like the Forensic Resource Network might be an appropriate place where something like that could exist as a program area.

MR. COFFMAN: Could the National Prosecutors Association - if I got it wrong, I'm sorry - could they apply for a grant and have prosecutors go through them to distribute it?

MS. FORMAN: So it would be prosecutor initiated?

MR. COFFMAN: That's usually who is demanding it, so...

MS. HART: I think what this highlights is the fact that you need some flexibility in funding because sometimes you may want to be doing trade-offs as opposed to having enough funds to let's say go do timely testing of a burglary no suspect case let's say. You would want to say no; I would rather pool and for those 10 no suspect burglary cases I could get a mitochondrial case, and I think that's more important.

So one of the things that we have certainly been pushing for is greater flexibility in the funding that is going out so that the state and local labs can make rational choices about where they get the biggest public safety benefit of the dollars. So I think that's something that certainly on the Hill there has been interest in making the funds more flexible.

MR. SELAVKA: I can only imagine what Barry would be saying if he was here, so I'll say it for him, and with all due respect, Woody, the balance of the prosecutor's resources against the defendant's resources through even indigency accounts in major crimes is - granted the government has the burden of proof, but it would seem resources of this type you would have to create some sort of balance for access, and I'm not sure that the Federal Government is going to be in a position to do that. There are strong arguments that leaves this up to the states. It's a state issue to begin with in the vast majority of cases. So it would seem like tapping into federal resources for forensic science infrastructure improvement or law enforcement infrastructure improvement is the wrong approach. It would seem that's more of a state issue and let them handle it the same way they handle the balance of access through funding for indigent clients on the defense case.

MR. COFFMAN: I was just kind of making the suggestion because we're already using this DNA money the help pay overtime for prosecutors and overtime for law enforcement officials to help us identify the no suspect cases that need to be worked, so I just thought this would be a natural progression in that direction.

MS. FORMAN: And we tried to build that kind of flexibility into that program, and it is possible that that flexibility can be maintained in that program, but remember that that program is funding to states. They have to ask for it in their proposal to NIJ. So that's a very big possibility, but, again, it speaks to what Carl said. If the state or the applicant identifies that that's important in their situation, then they need to put it in their application.

I think it also begs another question, and that is what Sarah said. The flexibility in that program is not really there beyond no suspect cases, and it's the identification of the case type that really limits the program in the way that the states can apply for funding.

## POSTCONVICTION DNA TESTING

MR. SCHMITT: Let's move now to the subject of postconviction DNA testing. By this - I think it's obvious, but I'll state it - we mean a situation where either through statute or through a state procedure mandated by the chief executive or someone else, perhaps the Attorney General, convicted offenders may petition to have evidence sampled for the presence of DNA material after a conviction as part of some process whereby they're trying to assert their actual innocence for the crime.

I would like to hear from those people who have a statute on the books in their state. If it has been recently enacted, which I assume actually most of them have been, what impact that has had on your analysis and especially in terms of timeliness, moving one thing in front of another, kind of where you see things going, and then just a general discussion about this subject.

MR. FERRARA: With respect to specific actions after enactment of a postconviction statute, which went into effect in July of 2001, nine cases have gone through the process in Virginia. Five of those cases have been completed. Four are pending. Of the five completed there were two inclusions, two inconclusives, and one exclusion that also resulted through a data bank hit of the real perpetrator.

MS. NARVESON: Arizona has a postconviction testing statute on the books. To date it has not resulted in a large number of cases coming forward, but we did have a case of an individual who had been convicted of first degree murder, sentenced to death. On retrial he was convicted once again, sentenced to life. On a court order to do the testing pursuant to a continued request for this type of testing he was eliminated as having any association with the victim. We ran the sample against the state database, and we were able to identify an individual who was going to be released from the state prison within 30 days of his being hit against. So that was I think the 100th person identified as being exonerated.

MS. HART: One of the questions that was asked of me and I didn't have this answer, but if you had to kind of do a range about what it cost to do postconviction DNA testing, what it would cost for let's say a rape case, an uncomplicated rape case compared to a much more difficult case with blood stains or whatever, does anybody have - if you could just give me a ballpark figure about what you would be talking about on an average per case from the uncomplicated to the more complicated.

MR. FERRARA: On a postconviction?

MS. HART: Yes.

MR. FERRARA: The analytical process on the postconviction cases, let's say on a rape case, weren't particularly more expensive analytically than a pre-prosecution case. What did take considerable more time in these postconvictions is conversations between the courts and the laboratory and collecting the evidence and figuring out exactly what pieces of evidence and what types of examinations are being asked. To put a dollar figure on it, therefore, I would

guesstimate something in the order of about \$5,000 for a single, relatively straightforward rape case.

MS. HART: Is that roughly about right?

MS. GUIDO: Would that include factoring in the cost of having the expert go testify in court about the results?

MR. FERRARA: Yes. I come up with those figures roughly based on looking at the number of examiners I have and the number of cases and dividing the total budget into that. So, yes, that would be incorporated into that estimate.

MS. GUIDO: The reason I wondered is because we have a brand new statute that I think the governor signed within the last month or two, so we don't know what the impact of that is going to be, but one of the things that came about during the negotiations with the legislature was they were arguing over who was going to pay for the postconviction testing, and, of course, the counties didn't want to pay for the testing. A lot of locals used the State Police, and so it was decided that the State Police were going to pay for it. This is what the legislature put on it.

Well, the State Police got upset about that because it might not even be our case; it might be a county case and it's going to be paid for by the State Police, and ultimately how that was worked out with the legislature was that the State Police have to pay for the test, but they can choose to do the test in their own labs or they can choose to contract it out.

The director of our lab was saying she thought that they might end up having to put a lot of them out there, contract them out because they just wouldn't have the time to go to court and do everything that's going to go along with that. So that was why I was wondering. That is something that's going to have to be factored in. In most postconviction proceedings I would think that there is a pretty good likelihood that you might have to have testimony about it.

MR. SCHMITT: I would like to ask Paul and Susan to tell us if the Virginia and Arizona statutes require that the offender assert his or her actual innocence for the crime in question, and then also to talk about whether in your case or in other states of which you're aware that have this if there is an evidence retention issue that has been a problem. They ask for the test. The evidence is just gone.

MR. FERRARA: In Virginia before that postconviction decision can be reached there has to be a finding that the evidence is in fact in existence somewhere. Otherwise it doesn't even reach that stage. There probably would have been a lot more postconviction cases in Virginia, for example, had the evidence not been destroyed many, many years ago.

What was the first part of that question? Actually in fact the statute is called a writ of actual innocence.

MR. SCHMITT: Susan, do you know from Arizona?

MS. NARVESON: I'm not intimately familiar with the legislation, but since Arizona is the home of Ron Reinstein, who sat on the commission that put together the booklet, I'm sure that Ron had a very important role to play in that. I would say, just like Paul said before, that most of the analytical work did not take any more than a regular case coming into the laboratory, but finding where the evidence was, was it in the clerk's office, was it in our property management bureau, and then finding out what had been done before, going back and pulling the case files, looking with some degree of horror as to what the state of the art was back in 1980 whatever it was, and to see how little we could do then, and in some cases we didn't even do that well.

So trying to put all the pieces together, trying to walk that fine line between recognizing we were there as an entity that could resolve this and dealing with defense counsel and prosecuting counsel, the investigators who invested so much in this, and especially the prosecutors who were still around who had prosecuted that case, that took more of our time and dealing with the political issues than the actual analytical time spent.

MS. GUIDO: I was just going to say with our new statute that just came in, they do have to make a show of actual innocence, but, for example, in capital cases the actual innocence could be the actual innocent of either the aggravating or the mitigating factors. So that if the aggravating factor was that they had a significant history of prior felony convictions and the person had three burglaries before and now thinks if you went back and did the DNA on the prints that were found at the scene, that it would show that he really wasn't the person, then that's something that potentially could have this kind of testing.

On the mitigating factors, only one juror has to find those, but the defense attorneys were just adamant about having that there. One of our mitigating factors in Pennsylvania has to do with whether or not you played a minor role in the commission of the crime. So if you had said, yes, I was involved in the murder of this woman; I murdered her, but I didn't rape her, then that might be your mitigating factor, and you could go have DNA testing.

So even though there is actual innocence, in capital cases it's quite a bit broader than that and it can go back in time to these prior convictions, which are not capital cases.

MS. HART: I have some familiarity with Pennsylvania, having come from there. What I thought was remarkable about the Pennsylvania statute, which is really quite complex, was the fact that this was a statute that was agreed to both by the prosecutions organization as well as the ACLU. They came to terms jointly and jointly supported this particular statute.

MS. GUIDO: There was some give and take of it and it was what can we live with. From the prosecution standpoint I know the attorneys in Philadelphia, their biggest concern was that we had no DNA statute. So although they wanted to have a statute that they could live with, right now in Pennsylvania the Third Circuit overturns all of our death penalty statutes every time they get up there. So far something like 30 cases have gone to the Third Circuit, and all of them have been overturned for different technical reasons, all of which have to do with the instructions that were given to the jury, but nothing to do with the DNA testing, but the prosecutors still felt that if they had a DNA statute in place, that this would give them some more credibility as a state with the Third Circuit that we do in fact care about innocent people.

MS. HART: I might have misheard it. Did you say the Third Circuit reversed all the DNA statutes or the death penalty cases?

MS. GUIDO: What I'm saying is it's interesting because the prosecutors wanted a DNA statute because of all the Third Circuit reversals of their capital convictions, but the capital convictions that were being reversed, the reversal had nothing to do with DNA. In fact, of the 250-some people we have on death row, I had one of my attorneys do an analysis of it, and we have very few of those cases where DNA would really play a major role in the crime, although now with DNA going to fingerprints and everything else, that might change, but your basic DNA evidence played little role in that.

Still because we had so many of these convictions, the prosecutors, especially from Philadelphia, were very concerned that the message it was sending to the public and us not having a DNA statute and we have the defense attorneys out there harping about it constantly was that we were just a state that didn't care about defendants. So that's the main reason that the prosecutors were urging - actually it was the prosecutors that were calling me regularly saying when is the governor going to sign that bill and not the defense attorneys. The prosecutors felt that the defense attorneys didn't really want the bill. They felt the defense attorneys were in a better position to be able to come in and say we have no bill. We have all of these people on death row that are innocent. If we just had a DNA bill that would get them tested - so the prosecutors wanted to be able to say we have a bill. All they have to do is go file the application with the court.

MR. CLARKE: The update from the left-hand coast, California, is we have had a statute in effect since January 1 of last year, and the latest number I heard is several months old, that we had had I believe approximately 40 formal motions filed in the entire state. I may be wrong on the number, but it's a tiny fraction obviously of the number of people in custody in California.

Our state I don't believe requires that they swear under penalty of perjury that they're innocent, but I'm not sure it's relevant anyway because they're going to do that even if they have committed the crime, frankly, but we did adopt a standard. It was by compromise between members of the ACLU and prosecutors groups who ended up deciding on the best language possible using the commission's recommendations.

Also I would be remiss, many of you know about the in-house project we have in the San Diego District Attorney's Office where we proactively examine every case of an inmate who is still in prison for a crime for which they were committed to prison in 1992 or before. There are 765 of those inmates. We are now done with 700. Out of that group of 700 two things are I think are important. One, 70% of the time inmates admit to being the person who committed the crime, but they allege some other defense such as lack of intent, self-defense, consensual sexual intercourse, and so forth. That was a shocking number to us. Most people were sentenced to a very lengthy prison term.

The second part is out of the 700 cases that we have now completed four cases were approved for DNA testing by our office. In the first it turned out there was no [biological evidence](#) - the evidence has not been destroyed, but there was no biological evidence on the physical evidence.



In the second case the inmate declined our invitation for testing. In the third instance there was DNA. It turned out to be nonprobative evidence consistent with the victim's husband. In the fourth case there is no exculpatory information possible, but we believe testing might be able to link the second unidentified murder in a particular case.

Our experience with evidence destruction has been, although we don't have hard statistics on this, roughly consistent with what the innocence projects around the county have discovered; that is, evidence in cases that otherwise we believe would be appropriate for testing has been destroyed about 75% of the time.

So we're not having good luck. We've found the courts have a better chance of still having the evidence than law enforcement does, and our statute in effect again since the first of last year does require maintenance of all biological evidence in any case until the person is no longer incarcerated. Obviously that doesn't help the people that predated January 1 of 2001. So that's our situation. I think Dean might have another comment.

MR. GIALAMAS: If we have time, I was going to throw in some information about the effects on the crime lab with postconviction in L.A. Like Woody has mentioned, most of the evidence that we have found that has been requested to be examined for postconviction, in greater than 90% of the cases we found out that evidence was destroyed or dispositioned. So this goes back to the topic we addressed earlier. So there is really no chance for doing any further work.

We had four official requests where we have been ordered by the court to conduct testing in our laboratory. It has affected our operation to a very small extent, but with the court order we were directed to do the tests and we were directed to do it within a time frame, so it kind of played in how do we do regular casework with other ongoing work. In one of those cases we got into a legal battle with the courts because we were directed in the court order to proceed with our testing in a specific manner, and, in fact, our client at the time was the public defender's office, and we were requested to do overamplification of a vaginal aspirate sample in hopes of finding this other DNA sample. We got into some ugly issues in the courtroom explaining that.

The bottom line was that our philosophy was whether we are ordered or not, we were not going to conduct the test. The judge ordered us to do it, and I just basically said you can't order me to do something that is unscientific. If I can't validate that procedure, you won't accept it. So don't ask me to do something that you won't accept. The compromise was we sent it to a private laboratory, who once it left our hands, our liability, we were no longer interested, but just to let you know we have had some funny things, of course, happen in L.A.

MR. SCHMITT: Any other comments on this?

MR. SELAVKA: Our state finds itself - we have had eight postconviction cases. Five of those we ended up having testing done by a laboratory that's not accredited, and it was a California based laboratory with which you're well familiar, but the interesting dichotomy is that you find that the sample - and in the three of these five were exhaustive tests - if you should find that you have an exoneration, you're looking at a profile that can't be used in CODIS. So it would seem that if nothing else, a recommendation from somebody some day. We have been taking it to

judges, but they couldn't get it that laboratories that do testing especially when it's publicly funded for postconviction relief should be done by laboratories that meet the standards of DAB, and therefore it's a really minor point, but it may be important in one or two cases sometimes, and it would be a shame if we couldn't solve the case because of that technical tree.

MS. CROUSE: Is Barry going to be here tomorrow? That's not my comment. The reason I'm asking is because the State of Florida, their statute was enacted in 2001, and there was a time limit on it, if I'm correct, of two years, and as of the last crime lab directors meeting my crime lab director said that no one had applied, and I find out that last week that one person had applied, a judge in Miami had ordered postconviction relief, and the defense called me and said county labs are to do the work or their designee, and in this particular case the defense attorney called and was extremely frustrated. He had just spoken with Barry Scheck and said that the reason that there is not more in Florida is because they just are hitting brick walls and they can't seem to get these pumped through to the court systems and a comment was made about the two-year limit, trying to get to that two-year limit. So I really wish Barry were here to address that because that is hearsay through the defense attorney.

MR. CLARKE: Is there any update that anyone has on the Innocence Protection Act?

MR. SCHMITT: I'll brief you after we're done.

In the interest of time any other comments on this? I promised to invite a very brief public comment on this point if there is anyone who wanted to comment on anything we discussed on the postconviction aspect. So I'll turn to the public now.

MR. STOLOROW: Mark Stolorow. I'm director of Orchid Cellmark in Germantown, Maryland, a private laboratory. One of the questions was the cost for postconviction testing, and generally the simplest - I believe the question that was posed is what is the simplest, least expensive, and generally speaking that would be an evidence swab and a reference standard from the defendant, and on average that's about \$2,000 regardless of which private laboratory you go to.

More complicated ones - the example that I gave on one of my little notes is one recently from Chicago. There was a woman who was raped and murdered in 1984 named Laura Rosetti, and four people were convicted and sentenced to long terms in Illinois. As it turns out, there were over 40 items of evidence that revealed 22 previously unidentified semen stains, and of those 22 stains, none of them came from these four convicted. Two mixed male profiles were recently identified with two suspects who will now be tried for this crime. The cost of those 40 items is about \$50,000. So that's what I say again is on the high side.

The other thing I wanted to comment on was the cost of testimony for outside expert testimony. The fees usually average from about \$1,200 a day to \$2,000 a day, but it is exceedingly rare that on a postconviction case there would ever be expert testimony. If the outcome is a match, there is no need to testify. If the outcome is an exoneration, there would be no testimony for those defendants, but there may be testimony later if there are new defendants who are brought to trial. Thanks.

MR. SCHMITT: Is there any other public comment? Any more comments on this topic from AGID-LAB members? We'll turn it over to Sarah for closing remarks here in a moment. I'll ask you to note we'll be here tomorrow. I ask that you review the discussion topics. We have three topic areas tomorrow to discuss, and I also ask that you review the executive summary document that I mentioned earlier today that we have not discussed and we will not be discussing formally on the agenda. Please review it and make sure that we have that summarized correctly from the March meeting. I'll turn it over now to Sarah Hart.

## **CLOSING REMARKS**

MS. HART: Like a good attorney, I know I'm out of time. It's 5:39. We were supposed to end at 5:30, and the one thing I should not do is hold you up. I just wanted to thank you all for your discussion today. This was very informative to me, and especially for our people from South Africa. You've really sparked some great discussion here, which is what we had hoped, so I'm very pleased. Have a wonderful evening, and we will see you back here tomorrow morning. Thank you all.

(Whereupon at 5:40 p.m. the meeting was recessed.)