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September 26, 2007

Mayeti Gametchu
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One Boston Place, 40th Floor
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COPY

RE: Charles vs. Commonwealth of Massachusetts
Cellmark Case #F991025
ReliaGene Technologies File #F0022656/FR-239



Dear Ms. Gametchu:

My name is Gina Pineda and I currently serve as Reliagene Technologies' Assistant Forensic Director and Technical Leader. ReliaGene is a leading private DNA laboratory and research facility specializing in human genetic identification. I have over ten years of experience in forensic DNA analysis and management. I possess a Master of Science degree in Pathology with a concentration in forensic DNA from the Louisiana State University Health Sciences Center. I am an Associate Member of the American Academy of Forensic Sciences.

ReliaGene was asked by your firm to perform two tasks:

1. A document review of DNA work performed in the above referenced case by Cellmark DNA Laboratory summarized in three reports from Cellmark dated May 7, 1999, May 28, 1999 (amended on October 12, 1999), and April 17, 2001. I was also asked to render a scientific opinion regarding the interpretation of these test results.
2. STR and Y-STR analysis on the sperm and non-sperm fraction DNA extracts generated and used by Cellmark on robe cuttings 04 and 05. I was asked to perform Y-STR testing in order to determine whether the DNA observed by Cellmark in these samples, namely from the sperm fractions, came from males. The Y-STR test is a test for genetic markers only on the Y chromosome and is, therefore, specific to male individuals only. Therefore, an interpretable male profile can be obtained even from samples containing large amounts of female DNA and small amounts of male DNA. Because the results of this test don't involve any female DNA, it can easily be used to determine the number of male donors present in a sample. In addition, I was asked to perform STR testing so that the results could be uploaded into the CODIS database to check for hits to individuals in the database. The STR test is the conventional, routinely used type of DNA test that involves testing 13 to 15 genetic markers on the non-gender chromosomes. The gender specific marker Amelogenin tested during the STR analysis performed by ReliaGene was also able to provide information regarding gender.

The documents received and reviewed include a 116-page Cellmark case file copy containing lab worksheets, photographic copies of the PM/DQA1 dot blots, photos of evidence, and various correspondence. Also reviewed were the CVs and job descriptions of the Cellmark report signers, Lisa Grossweiler, Jacki Higgins, and Charlotte Word.

I concur with the findings contained in Cellmark's case file.

Cellmark performed the DNA testing using the PM/DQA1 PCR method. As stated in the reports, Charles is excluded as a DNA donor in the samples tested. The items tested include the following:

- A semen stain on a sheet (item 01)
- A semen stain from a robe (item 02)
- Various semen stains from the same robe (item 04, Bottom Rear of Robe and item 05, Inside Back of Robe)
- Control sample of same robe (item 06)
- Blood sample of Rodriguez Charles (item 03)

A differential extraction was employed by Cellmark with respect to each of samples 01, 02, 04, 05, and 06 in this case. Differential extraction refers to a specialized extraction method performed on semen stains in which sperm cells are separated from non-sperm cells. This method results in two fractions – a sperm fraction (eventually compared to a suspect or other male individuals) and a non-sperm fraction. Epithelial cell DNA is typically found in the non-sperm fraction of a differential extraction and in articles of clothing or bed sheets, usually originates from shed skin cells from the wearer or from the person whose skin came into direct contact with the item. I understand from a court document signed by both parties in this case that one of the victims wore the robe during her sexual assault, and this victim, as well as another victim, were sexually assaulted on the bed sheet, which, based on the court document, also belonged to the first victim and was on her bed.

Cellmark microscopically observed sperm cells in each of the sperm fraction samples for samples 01, 02, 04, 05, and 06. The DNA from the sperm fraction of item 01 (sheet) revealed the presence of primarily one person. The DNA from the epithelial fraction of item 01 revealed the presence of two people. The DNA from the sperm fraction of 02 (robe) was primarily from one person, different than the person in the sperm fraction of 01. The DNA from the epithelial fraction of 02 was primarily from one person, with the second person as a minor contributor.

Mr. Charles (03) is excluded as a source of the DNA tested in all of the 01 and 02 samples, including the DNA in the sperm fractions.

Although the type of testing performed by Cellmark could not specifically test the gender of the DNA observed, the extraction process described above resulting in sperm fractions where sperm cells were observed in every single sperm fraction makes it highly probable, certainly to a reasonable degree of scientific certainty, that the gender of the DNA from the sperm fractions is male. It is also likely to be the case, to a reasonable degree of scientific certainty, that the male DNA from the sperm fractions came from sperm cells, which were observed microscopically post-differential extraction in each sperm fraction. Further supporting this conclusion is the fact that no epithelial cells were observed post-differential extraction in the sperm fractions and the fact that sperm cells, which come from male semen donors, in my experience are very robust.

As with samples 01 and 02, Mr. Charles (03) is also excluded as a source of the DNA from the 04 (Bottom Rear of Robe), the 05 (Inside Back of Robe), and the 06 (Control) samples, including the DNA from the sperm fractions.

It is my understanding that the gender of the DNA observed in the sperm fractions has been questioned in this case. Accordingly, ReliaGene conducted gender specific testing on items 04 and 05. (ReliaGene could not do further DNA testing on items 01 and 02 as the DNA extracts generated by Cellmark were depleted by Cellmark's testing).

The gender specific testing performed by ReliaGene -- Y-STR and STR -- revealed that the one DNA donor observed by Cellmark in the 04 sperm fraction is, in fact, a male donor.

The Y-STR and STR testing revealed that the two or more DNA donors observed by Cellmark in the 05 sperm fraction are, in fact, male donors.

With regard to the epithelial fractions, the STR testing revealed the primary donor observed by Cellmark in the 04 epithelial fraction is a female donor. In addition, the Y-STR test revealed that the male observed in the 04 sperm fraction is the same (minor) male observed in the 04 epithelial fraction.

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The STR testing revealed that the primary DNA donor observed by Cellmark in the 05 epithelial fraction is a female donor. The Y-STR testing revealed that the mixture of males observed in the 05 sperm fraction are the same male mixtures observed in the 05 epithelial fraction.

The Y-STR tests confirm the Cellmark PM/DQ and the ReliaGene STR test results as to the number of contributors in the 04 and 05 sperm fraction samples. One male donor is present in robe cutting 04 and at least two male donors are present in robe cutting 05. (It is possible that the sperm donor from robe cutting 04 is also included in 05 as a third contributor.) It is therefore impossible that the DNA detected by Cellmark in the sperm fractions is not coming from male individuals.

Based upon the results and conclusions drawn from ReliaGene's Y-STR and STR testing of robe cuttings 04 and 05 and Cellmark's PM/DQ testing of sheet cutting 01 and robe cutting 02, a total of at least three sperm donors are present in the sheet and robe extracts. Among the other reasons I've discussed, my opinion is based upon the following information:

1. A single sperm donor detected in the sperm fraction of the semen stain from sheet (01). Although ReliaGene could not test Cellmark's extracts from sheet cutting 01 because they were depleted by the testing, this donor is highly likely, and certainly to a reasonable degree of scientific certainty, to be male.

This opinion is based upon the differential extraction process, Cellmark's post-differential extraction microscopic observation of sperm cells in every sperm fraction, and the nature of sperm cells in general, all of which are discussed above, as well as the fact that ReliaGene's testing of the sperm fractions for robe cuttings 04 and 05 confirmed that every sperm fraction profile detected by Cellmark with respect to those samples was, in fact, male.

2. A single sperm donor detected in the sperm fraction of the semen stains from robe cutting 02 and 04. The donor from robe cutting 04 is conclusively male. The sperm fraction donor in 04 and 02 is the same individual.
3. At least two sperm donors in robe stain 05, one of which could be the single sperm donor from sheet cutting 01.

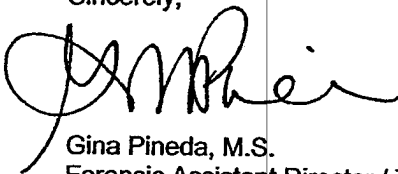
Because of the depletion of the extract from sheet cutting 01, ReliaGene did not independently test the sample. The Cellmark PM/DQ results of the sperm fraction of sheet cutting 01 would be sufficient to exclude an individual as a contributor to 05. However, comparison of the testing reveals that 01 cannot be excluded as one of the two sperm donors in 05 and may, in fact, be one of the two 05 sperm donors.

In addition, based upon the results from the epithelial fractions, the testing reveals the presence of one predominant female. The PM/DQ testing reveals the predominant presence of one donor in the epithelial fractions, consistent with each other. The Amelogenin gender identification marker in the STR testing reveals a female as the major donor in the epithelial fractions of robe stains 04 and 05. Furthermore, the major component of the STR profiles from the epithelial fractions of robe stains 04 and 05 are consistent with each other. This female is highly likely to be one of the victims.

Finally, an STR CODIS uploadable profile was obtained from the sperm fractions of both items tested from the robe, stains 04 and 05.

If you have any further questions, please call me at 504-378-9640.

Sincerely,



Gina Pineda, M.S.
Forensic Assistant Director / Technical Leader