B4SampleLADDER PP16 - Sample File Information

Run Information

User Name:	LEH	Run Date:	Wed, Sep 04, 2002
Instrument:	ABI PRISM™ 310	Start Time:	06:49:16 PM
Data Coll. Version:	ABI PRISM 310 Collection 1.2.2	Run Duration:	36 Mins 28 Secs
Lane:	B4	Total Points:	8096

Data Collection Settings

Module File:	GS STR POP4 (1 mL) A	Run Voltage:	15000	Volts
Matrix File:	PP16-7/8/02LEH	Inj. Voltage:	15000	Volts
Spectra:		Inj. Duration	3	Seconds
Size Standard:		Temperature:	60	°C
		Laser Power:	9	mWatts

Gel Information

Sample Information

Sample Name: LADDER PP16 (All Ladders 9/4/02 ak)

Dye	Sample Info	Comment
B:	LADDER PP16	
G:	LADDER PP16	
Y:	LADDER PP16	
R:	LADDER PP16	

Analysis Records

B: Analyzed 08:52:28 AM Thu, Sep 05, 2002

Parameters: 9/4/02B	Standard: PP16-1/31/02ma	**Peak Totals**	
Analysis Range: 3500 - 7600 pts	Dye Std: R	Found In:	
Baselined: Yes Multi-Component: Yes	Size Method: Local Southern Method	- Sample:	96
Data Smoothing: Light	Size Range: 60 - 600 bps	- Dye Std:	20
Peak Detection Threshold: 200	Std Peak Det. Threshold: 200	Std Defined:	21
Peak Detection Min. Half-Width: 3	Split Pk Corr.: None	Std Matched:	20

G: Analyzed 08:52:28 AM Thu, Sep 05, 2002

Y: Analyzed 08:52:28 AM Thu, Sep 05, 2002

R: Analyzed 08:52:28 AM Thu, Sep 05, 2002

TK Allele NLS

A1Sample1155 BAL-54 - Sample File Information

Run Information

User Name:	LEH	Run Date:	Wed, Sep 04, 2002
Instrument:	ABI PRISM™ 310	Start Time:	07:25:47 PM
Data Coll. Version:	ABI PRISM 310 Collection 1.2.2	Run Duration:	36 Mins 30 Secs
Type:	A1	Total Points:	8096

Data Collection Settings

Module File:	GS STR POP4 (1 mL) A	Run Voltage:	15000	Volts
Matrix File:	PP16-7/8/02LEH	Inj. Voltage:	15000	Volts
Parameters:		Inj. Duration	3	Seconds
Size Standard:		Temperature:	60	°C
		Laser Power:	9	mWatts

Gel Information

Sample Information

Sample Name: 1155 BAL-54 / All samples opened Validation 9/4/02 [illegible]

Dye	Sample Info	Comment
B:	1155 BAL-54	LOT#149877
G:	1155 BAL-54	
Y:	1155 BAL-54	
R:	1155 BAL-54	

Analysis Records

B: Analyzed 08:52:30 AM Thu, Sep 05, 2002

Parameters: 9/4/02A	Standard: PP16-1/31/02ma	**Peak Totals**
Analysis Range: 3200 - 7600 pts	Dye Std: R	Found In:
Baselined: Yes Multi-Componented: Yes	Size Method: Local Southern Method	- Sample: 13
Data Smoothing: Light	Size Range: 60 - 600 bps	- Dye Std: 25
Peak Detection Threshold: 200	Std Peak Det. Threshold: 200	Std Defined: 21
[illegible]	[illegible]	[illegible]

G: Analyzed 08:52:30 AM Thu, Sep 05, 2002

Y: Analyzed 08:52:30 AM Thu, Sep 05, 2002

R: Analyzed 08:52:30 AM Thu, Sep 05, 2002

WLF8225

TR 9/6/02 [illegible]

Exhibit D

Forensic Science Associates

3053 Research Drive, Richmond, CA 94806
FAX (510) 222-8887
(510) 222-8883

March 13, 2003

Lori E. Hutchinson
Montana Department of Justice
Forensic Science Division
2679 Palmer
Missoula, MT, 59808

Re: Montana v. Paul Kordonowy
Kristen Bergh, Victim
Sidney PD Case No. 87-0758
Our File No. 03-128

Report 1

Background

The following information was communicated to us by Lori Hutchinson, forensic scientist, with the Montana State Forensic Science Laboratory. The Kordonowy case involves a sexual assault in which the victim is Kristen Bergh; and the convicted defendant is Paul Kordonowy.

Our File No. 03-128

On or about the early morning hours of July 25, 1987, Kristen Bergh was asleep in the bedroom of her Sidney, Montana residence when an assailant entered her bedroom and raped her. She described her assailant as a Caucasian who was 5'9" to 5'11" tall weighing between 145 to 175 pounds with a medium build. This individual also had the smell of alcohol on his breath. The assailant attempted to have vaginal intercourse with her but had difficulty maintaining an erection. The assailant obtained lubricant from Bergh's bathroom and proceeded to have vaginal intercourse with her and digitally penetrated her rectum. During the assault the assailant covered her face with a pillow which caused her to receive a bloody nose. After the assault the assailant left Bergh's residence apparently on foot since Bergh did not hear any vehicle start up outside her home.

After the assailant departed Bergh's residence she notified police at about 5:00 a.m. whereupon she was taken to Community Memorial Hospital where sexual assault specimens were collected and she was treated for a bloody nose and released. Pursuant to the investigation of this case a "chewed on" tooth pick was recovered from near Bergh's bed. A pair of pink panties and bedding were also recovered from this bed. A pair of purple panties were recovered from the kitchen counter top. Bergh stated to investigators that the last time she had intercourse with her boyfriend, Lynn Lohse, was two days prior to the assault, July 23, 1987.

The Bergh rape kit specimens and underpants were submitted to the Montana State Forensic Science Laboratory in January, 1989, where the physical evidence was examined by Julie Long [see Long Report dated August 7, 1989]. Long determined that semen was present in the Bergh vaginal samples and on the pink #10 and blue #9 underpants; however, she was only able to identify spermatozoa on the blue underpants. ABO blood grouping tests for the water soluble ABO blood group substances revealed the "A" and "H" antigens. Long determined that both Bergh and Kordonowy were ABO type O secretors. Since ABO type O secretors produce only the "H" antigen and since ABO type A secretors produce both the "A" and the "H" antigen, neither Paul Kordonowy nor Kristen Bergh could be the source of the "A" antigen. Normally, a finding of this nature means that the semen source is

an ABO type A secretor which eliminates Kordonowy as that source; or, in the alternative, there are multiple semen sources, one of which must be an A secretor.

Although Long advised the readers of her report that at least some of the semen detected on the vaginal samples and both underpants samples could originate from an ABO type A secretor semen source, she also asserted that the water soluble ABO type "A" antigen activity in these samples could originate from bacteria. She also accounted for the apparent absence of spermatozoa in the vaginal samples as a consequence of bacterial destruction. Thus, alleged large quantities of bacteria destroyed spermatozoa without destoying other cells while at the same time creating ABO type "A" blood group substances. There is no scientific basis for these assertions.

Spermatozoa are among the most hardy cells produced by the human body. The spermatozoa head is cross-linked with disulfide bonds which make this membrane resistant to attack by even strong detergents. This type of chemical bonding is also present in hair. In fact it is the relative chemical toughness of the spermatozoa membrane that is exploited to separate sperm DNA from non sperm DNA. Knowledgeable and experienced forensic scientists routinely observe vaginal specimens overrun with bacteria where epithelial cells are invaded and partially digested and spermatozoa survive relatively unaffected. In fact the evidence in this case demonstrates no significant adverse bacterial damage to any normally expected cells and spermatozoa are present where Long claims they are absent [see below].

Similarly there is no evidence whatsoever that bacteria produce water soluble ABO antigens of any sort much less ABO antigens of type "A". If this assertion were true, the ABO typing of sexual assault evidence would be inherently unreliable because no scientist could ever know whether or not the ABO antigens detected in vaginal or oral samples were from ubiquitous bacteria or the human being from whom the sample was collected or some other human being contributing a body fluid to the sample. Like the claim that bacteria preferentially destroy spermatozoa, the claim that bacteria preferentially secrete ABO "A" antigens is without scientific basis; and, if true,

would undermine the entire scientific foundation for the ABO typing of body fluid evidence.

The finding of the ABO type "A" antigen activity in the Bergh sexual assault evidence, taken at face value, demonstrates that semen is present in this evidence from an individual who is not Paul Kordonowy. It was requested that PCR based DNA typing be conducted to determine whether or not Paul Kordonowy can be eliminated as the source of spermatozoa from the Bergh garments and vaginal specimens. It was also requested that this analysis be conducted "blindly", that is, without knowledge of reference samples from either Bergh or Kordonowy. This report describes our initial examination and genetic profiling of the evidence collected from Bergh.

Items of Physical Evidence

The following items of physical evidence were received from Lori Hutchinson of the Montana Department of Justice Forensic Science Division Crime Lab in Missoula on January 27, 2003 via Federal Express delivery service:

Item

1. Tape sealed paper bag marked "89-234, 005, State's Exhibit 8" containing pink panties.

2. Tape sealed paper bag marked "89-234, 008, Sheets" containing a paper bag marked "89-234, 008, State's Exhibit 11" containing:

2-1. A flat yellow floral print bed sheet.

2-2. A fitted yellow floral print bed sheet.

3. Tape sealed paper bag marked "89-234, 010, State's Exhibit 14 Dark blue panties" containing a similarly marked tape sealed paper bag containing blue panties.

4. Tape sealed paper bag marked "89-234, 011, State's Exhibit 15" containing a yellow floral print pillowcase.

5. Tape sealed paper bag marked "89-234, 013, Pillowcase found on bed, State's Exhibit 17" containing a similarly marked paper bag containing a yellow floral print pillowcase.

6. Tape sealed envelope marked "89-234, #9 panty + Bl" and "89-234, 020" containing:

6-1. A glassine paper envelope marked "89-234 panty A #9" containing blue cloth.

6-2. A glassine paper envelope marked "89-234 panty Bl #9" containing blue cloth.

7. Tape sealed envelope marked "89-234, #10 panty A + Bl" and "89-234, 021" containing:

7-1. A glassine paper envelope marked "89-234 panty A" containing stained pink cloth.

7-2. A glassine paper envelope marked "89-234 Bl panty" containing pink cloth.

8. Tape sealed envelope marked "89-234, nightgown A, B, C + Bl" and "89-234, 023" containing:

8-1. A glassine paper envelope marked "89-234 nightgown A" containing pink cloth.

8-2. A glassine paper envelope marked "89-234 n.gown B" containing pink cloth.

8-3. A glassine paper envelope marked "89-234 n.gown C" containing pink cloth.

8-4. A glassine paper envelope marked "89-234 n.gown Bl" containing pink cloth.

9. Tape sealed envelope marked "89-234 vag" and "89-234, 022" containing a glassine envelope containing a partial swab.

Examination of the Bergh Pink Underpants Exhibit #8 [Item 1]

A pair of pink underpants from Bergh Exhibit #8 [Item 1] was submitted for examination. The packaging for this garment is illustrated in figure 1. The underpants front outside surface is illustrated in figure 2; the back outside surface is illustrated in figure 3. The underpants front inside surface is illustrated in figure 4; the back inside surface is illustrated in figure 5. The underpants inside crotch surface is illustrated in figure 6. A large section of fabric has previously been removed from the inside surface of the crotch center. Two areas [A and B] adjacent to the previously removed fabric in the crotch center were selected for further examination. No blood was detected in these areas using a sensitive presumptive test [o-tolidine and hydrogen peroxide]. No significant acid phosphatase activity was detected in these areas using a spot test. [1] Fabric approximately 2 cm^2 was removed from areas A and B and extracted. Areas A and B are illustrated in detail in figure 7. A low level of spermatozoa and epithelial cells were detected from both areas [A and B].

The section of fabric previously removed from this underpants crotch [Item 7-1] was also provided for examination. The packaging for this underpants cutting is illustrated in figure 8. The underpants crotch cutting is illustrated in figure 9. Fabric has previously been removed from the center of the underpants crotch cutting. Additional fabric was removed from the crotch cutting in area A and extracted. Area A is illustrated in figures 10 and 11. Microscopic examination of the cellular debris revealed a low to moderate number of spermatozoa and epithelial cells. The cellular material from all the pink underpants crotch specimens were pooled for DNA extraction and analysis as described below.

[1] Acid phosphatase is an enzyme that is found at very high levels in human semen and at much lower levels in other body fluids such as vaginal secretions.

Our File No. 03-128

Examination of the Bergh Yellow Flat Sheet Exhibit #11 [Item 2-1]

The Bergh yellow flat sheet Exhibit #11 [Item 2-1] was submitted for examination. The packaging for this bedding is illustrated in figure 12. The folded sheet is illustrated in figure 13. Two stained areas [A and B] were detected on the sheet surface. These stained areas are generally illustrated in figure 13. The borders of these stains were marked and fabric approximately 2 cm^2 was removed and extracted. No blood or acid phosphatase activity was detected in either stained area. Microscopic examination of the cellular debris failed to reveal any spermatozoa. A low level of dermal cells are present in area A; and a low level of epithelial cells are present in area B. DNA was extracted from the epithelial cells in area B as described below. Areas A and B are illustrated in detail in figures 14, 15, 16, and 17.

Examination of the Bergh Blue Underpants Exhibit #14 [Item 3]

A pair of blue underpants from Bergh Exhibit #14 [Item 3] was submitted for examination. The packaging for this garment is illustrated in figure 18. The underpants front outside surface is illustrated in figure 19; the back outside surface is illustrated in figure 20. The underpants front inside surface is illustrated in figure 21; the inside back surface is illustrated in figure 22. The inside crotch surface is illustrated in figure 23. A large section of fabric has previously been removed from the middle of the inside crotch surface. Two stained areas [A and B] from the underpants crotch were selected for further examination. Acid phosphatase activity was detected in these areas using a spot test; no blood was detected in these areas using a sensitive presumptive test. Fabric approximately 1 cm^2 was removed from areas A and B and extracted. Microscopic examination of the cellular debris revealed a low to moderate number of spermatozoa and numerous epithelial cells. DNA was extracted from these samples as described below. Areas A and B are illustrated in detail in figures 24 and 25.

The cutting previously removed from the blue underpants crotch [Item 6-1] was also submitted for examination. The packaging for this fabric is illustrated in figure 26. The previously removed and sampled crotch fabric is illustrated in figure 27. Visible stain material remains on the fabric surface. A portion of the stained area [A] was selected for further examination. Acid phosphatase activity was detected in area A using a spot test; no blood was detected in this area using a sensitive presumptive test. Fabric approximately 1 cm^2 was removed from area A and extracted. Microscopic examination of the cellular debris revealed a low to moderate number of spermatozoa and numerous epithelial cells. DNA was extracted from this sample as described below. Area A is illustrated in detail in figures 28 and 29.

Examination of the Bergh First Yellow Pillowcase Exhibit #15 [Item 4]

A yellow pillowcase from the Bergh bedding Exhibit #15 [Item 4] was submitted for examination. The packaging for this pillowcase is illustrated in figure 30. The pillowcase is generally illustrated in figure 31. No significant stains were detected on this pillowcase. No further work was conducted on this item.

Examination of the Bergh Second Yellow Pillowcase Exhibit #17 [Item 5]

A second yellow pillowcase from the Bergh bedding Exhibit #17 [Item 5] was submitted for examination. The packaging for this pillowcase is illustrated in figure 32. The pillowcase is generally illustrated in figure 33. No significant stains were detected on this pillowcase. No further work was conducted on this item.

Examination of the Bergh Nightgown Cuttings [Item 8]

Four cuttings from the Bergh nightgown [Item 8] were submitted for examination. The packaging for these cuttings is illustrated in figure 34. The fabric from the first cutting #A [Item 8-1] is illustrated in figure 35. This fabric cutting is oval shaped and approximately 2 inches long and 1.5 inches wide. A 1 cm^2 section of cloth has previously been removed from this sample. A faint yellowed deposit is present on this fabric where most of this deposit has been removed in the previous sampling. No blood was detected on this sample using a sensitive presumptive test. A low level of acid phosphatase activity was detected in this sample using a spot test. Fabric approximately 2 cm^2 was removed from this cutting in area A and extracted. Area A is illustrated in figures 36 and 37.

The second nightgown cutting #B [Item 8-2] is illustrated in figure 38. This oval cutting is approximately 1.75 inches long and 1.5 inches wide. A piece of fabric approximately 1 cm^2 has previously been removed from the cutting center. No blood was detected on this sample using a sensitive presumptive test. A low level of acid phosphatase activity was detected in this sample using a spot test. No further work was conducted on this specimen.

The third nightgown cutting #C [Item 8-3] is illustrated in figure 39. This oval cutting is approximately 1.75 inches long and 1.25 inches wide. A 1 cm^2 section of cloth has previously been removed from this sample. A yellowed deposit is present on this fabric surrounding the previously removed material. No blood was detected on this sample using a sensitive presumptive test. A low level of acid phosphatase activity was detected in this sample using a spot test. Fabric approximately 2 cm^2 was removed from this cutting in area A and extracted. Area A is illustrated in figures 40 and 41.

The fourth nightgown cutting #BC [Item 8-4] is illustrated in figure 42. No apparent stain material is present on this fabric. No further work was conducted on this specimen.

Microscopic examination of the cellular debris from nightgown cutting #A [Item 8-1] and #C [Item 8-3] revealed a low to moderate number of spermatozoa and numerous epithelial cells from each sample. DNA was extracted from these specimens as described below and the spermatozoa fractions pooled for the DNA analysis.

Examination of the Bergh Partial Vaginal Swab [Item 9]

A partial vaginal swab from Bergh [Item 9] was submitted for examination. The packaging for this swab is illustrated in figure 43. The vaginal swab remnant is illustrated in figure 44. All of the external surfaces of this swab have been removed during previous examinations. All of the remaining material from this swab was removed and extracted. Microscopic examination of the cellular debris revealed a low level of spermatozoa and numerous epithelial cells. A low and normal level of bacteria are also present in this specimen. DNA was extracted from this sample as described below.

Genetic Analysis of DNA

Several genes were amplified using the polymerase chain reaction [PCR] and subsequently typed. These genes include the STR genes known as Profiler Plus [D3S1358, vWA, FGA, D8S1179, D21S11, D18S51, D5S818, D13S317, D7S820]; and amelogenin, a gene that allows sex determination.

D3S1358, vWA, FGA, D8S1179, D21S11, D18S51, D5S818, D13S317, and D7S820 are short tandem repeat [STR] genes. These genes are composed of tandemly repeated units of a core DNA segment where the difference between different alleles is determined by the number of core repeated units contained within the allele. The typical size of the core unit for an STR gene is on the order of four base pairs [bp]. The primers that recognize particular STR genes can be labeled with a fluorescent dye so that the alleles can be detected and quantitatively assessed after electrophoresis.

These STR genes can be grouped so that several gene systems can be typed simultaneously from one analysis. For example, nine STR genes [D3S1358, vWA, FGA, D8S1179, D21S11, D18S51, D5S818, D13S317, D7S820] and amelogenin] are grouped together in a typing system called Profiler Plus. For those genes which employ a D_S_ nomenclature, the number following the "D" designation indicates the human chromosomal location of the gene locus. Some of these genes employ a different nomenclature determined by their discoverers. For example, the following STR genes are in this category: The vWA gene is located on chromosome 12. The FGA gene is located on chromosome 4.

The amelogenin gene is located on the sex determining X and Y chromosomes. Amelogenin is a gene responsible for the synthesis of a protein associated with fetal tooth bud development. A portion of this gene on the X chromosome contains a 6 bp deleted DNA segment allowing this region of the X chromosome to be distinguished from the corresponding region of the Y chromosome by size. Since females possess two X chromosomes and males possess an X and a Y chromosome, the sex of a specimen source can be determined by examining this DNA region using electrophoresis.

Genetic analysis of the specimens in this case involved the following essential steps:

1. Epithelial cells were digested with SDS and proteinase K followed by digestion of spermatozoa with SDS, proteinase K, and DTT [dithiothreitol].

2. DNA was extracted from sample digests with chloroform/phenol and concentrated using Centricon molecular filters.

3. The various genes described above were amplified using the Polymerase Chain Reaction [PCR].

4. The STR genes and amelogenin were typed using capillary electrophoresis.

The results of this analysis are summarized in Table 1. These findings revealed the following observed facts:

Reference Samples

1. No reference samples from **Kristen Bergh** or **Paul Kordonowy** have been provided at this stage of our investigation of the biological evidence in this case.

2. **Kristen Bergh** was determined to be D3S1358 type 15,18; vWA type 14,17; FGA type 19,25; D8S1179 type 10,14; D21S11 type 31,32.2; D18S51 type 14,15; D5S818 type 12,13; D13S317 type 11,14; and D7S820 type 8,8. This DNA was also determined to originate from a female by analysis of the amelogenin gene. This array of genotypes occurs in significantly less than one out of 100,000 members of the population. The calculated genotype frequencies indicate that it is unlikely that more than one human being has ever possessed this particular genotype array. The frequencies associated with individual genotypes are summarized in Appendix 1 below.

3. The genetic profile for **Kristen Bergh** is based on the analysis of female epithelial cells recovered from [1] her pink panties #8 [Items 1 and 7-1], her flat sheet #11 [Item 2-1B] in area B, [3] her blue panties #14 [Item 3] in areas A and B, [4] her blue panties cutting #9 [Item 6-1] in area A, [5] her nightgown in stain #A [Item 8-1A] and stain #C [Item 8-3A], and [6] her partial vaginal swab [Item 9].

Our File No. 03-128

Spermatozoa from the Bergh Pink Panties Crotch #8 Items 1 and 7-1

4. The spermatozoa pooled from the Bergh pink panties crotch #8 [Item 1] and the pink panties crotch cutting [Item 7-1] were determined to be D3S1358 type 15,18; vWA type 17,19; FGA type 20,25; D8S1179 type 12,13; D21S11 type 30,31.2; D18S51 type 12,14; D5S818 type 10,13; D13S317 type 8,12; and D7S820 type 9,11. This DNA was also determined to originate from a male by analysis of the amelogenin gene. This array of genotypes occurs in significantly less than one out of 100,000 members of the population. The calculated genotype frequencies indicate that it is unlikely that more than one human being has ever possessed this particular genotype array. The frequencies associated with individual genotypes are summarized in Appendix 1 below.

5. For the purpose of our reports the source of the spermatozoa pooled from the Bergh pink panties crotch #8 [Item 1] and the pink panties crotch cutting [Item 7-1] is characterized as **Unknown Male #1.**

Spermatozoa from the Bergh Blue Panties Items 3 and 6-1

6. The spermatozoa recovered from the Bergh blue panties crotch #14 [Item 3] in areas A and B as well as the spermatozoa from the Bergh blue panties crotch cutting #9 [Item 6-1] in area A were determined to be D3S1358 type 15,18; vWA type 17,19; FGA type 20,25; D8S1179 type 12,13; D21S11 type 30,31.2; D18S51 type 12,14; D5S818 type 10,13; D13S317 type 8,12; and D7S820 type 9,11. This DNA was also determined to originate from a male by analysis of the amelogenin gene. This array of genotypes occurs in significantly less than one out of 100,000 members of the population. The calculated genotype frequencies indicate that it is unlikely that more than one human being has ever possessed this particular genotype array. The frequencies associated with individual genotypes are summarized in Appendix 1 below.

7. The spermatozoa recovered from the Bergh blue panties crotch #14 [Item 3] in areas A and B as well as the spermatozoa from the Bergh blue panties crotch cutting #9 [Item 6-1] in area A originate from **Unknown Male #1.**

Spermatozoa from the Bergh Nightgown Cuttings #A [Items 8-1A] and #C [Item 8-3A]

8. The spermatozoa pooled from the Bergh nightgown cuttings #A [Item 8-1A] and #C [Item 8-3A] were determined to be D3S1358 type **15,18**; vWA type **17,19**; FGA type **20,25**; D8S1179 type **12,13**; D21S11 type **30,31.2**; D18S51 type **12,14**; D5S818 type **10,13**; D13S317 type **8,12**; and D7S820 type **9,11**. This DNA was also determined to originate from a male by analysis of the amelogenin gene. This array of genotypes occurs in significantly less than one out of 100,000 members of the population. The calculated genotype frequencies indicate that it is unlikely that more than one human being has ever possessed this particular genotype array. The frequencies associated with individual genotypes are summarized in Appendix 1 below.

9. The spermatozoa pooled from the Bergh nightgown cuttings #A [Item 8-1A] and #C [Item 8-3A] were determined to originate from **Unknown Male #1.**

Our File No. 03-128

Spermatozoa from the Bergh Partial Vaginal Swab Item 9

10. The spermatozoa DNA fraction recovered from the Bergh partial vaginal swab [Item 9] was determined to contain a complex mixture of female and male DNA where the majority of the DNA originates from Kristen Bergh and the minority of the DNA originates from at least three males. One of the male DNA sources is genetically compatible with **Unknown Male #1** . The alleles detected in the spermatozoa DNA fraction from the Bergh partial vaginal swab [Item 9] were determined to be D3S1358 alleles **15,18>16,17**; vWA alleles **17>14,18,19**; FGA alleles **19,25>20,21,23,27**; D8S1179 alleles **14>10>12,13,15**; D21S11 alleles **31,32.2>30,31.2**; D18S51 alleles **15>11,12,13,14,17**; D5S818 alleles **12>11,13>10**; D13S317 alleles **11,14>8,9,10,12**; and D7S820 alleles **8>9,11**. The alleles detected in the spermatozoa DNA fraction from the Bergh partial vaginal swab [Item 9] which can not originate from either Kristen Bergh or **Unknown Male #1** are underlined in red above. Two males in addition to **Unknown Male #1** are required to account for these findings. The alleles underlined in red must be possessed by one or the other males in addition to **Unknown Male #1** . Complete genotypes from these two additional males can not be deduced from this analysis.

11. We have developed a highly discriminating genetic profile for **Unknown Male #1** and for Kristen Bergh. The genetic profile for Kristen Bergh was determined from multiple female epithelial cell specimens from the evidence described above. **Unknown Male #1** is the source of the spermatozoa from [1] the Bergh pink panties crotch #8 [Item 1] and the pink panties crotch cutting [Item 7-1], [2] the Bergh blue panties crotch #14 [Item 3] in areas A and B as well as the spermatozoa from the Bergh blue panties crotch cutting #9 [Item 6-1] in area A, and [3] the Bergh nightgown cuttings #A [Item 8-1A] and #C [Item 8-3A].

Our File No. 03-128

12. We have also determined that spermatozoa from at least three males are present in the sperm DNA fraction from the Kristen Bergh partial vaginal swab [Item 9]. **Unknown Male #1** is genetically compatible with being one of these three spermatozoa sources. The other two spermatozoa sources must share between them the alleles underlined in red in ¶ 10.

13. It is now appropriate to provide to us reference samples from Kristen Bergh, Kristen Bergh's boyfriend, and Paul Kordonowy to determine whether or not Kristen Bergh's boyfriend and/or Paul Kordonowy can be eliminated as the source of the spermatozoa from **Unknown Male #1** and/or the spermatozoa from the additional males present on the Bergh partial vaginal swab [Item 9].

Should you have any questions concerning this work, please contact us.

Sincerely,

Edward T. Blake, D.Crim.

Alan Keel, Criminalist

Appendix 1:

Cumulative Frequency Data for the D3S1358, vWA, FGA, D8S1179, D21S11, D18S51, D5S818, D13S317, and D7S820 Genotypes

Item 1/7-1. Pooled Spermatozoa from Pink Panties Crotch #8.
Item 3A. Spermatozoa from Blue Panties #14, A.
Item 3B. Spermatozoa from Blue Panties #14, B.
Item 6-1A. Spermatozoa from Blue Panties #9, A.
Item 8-1A/8-3A. Pooled Spermatozoa from Nightgown #A & #C.

[Unknown Male #1/Lynn Lohse]

Marker	Type	Frequency in Caucasians	Frequency in Blacks	Frequency in Mexican Americans
D3S1358	15,18	0.0695	0.0396	0.0766
vWA	17,19	0.0416	0.0222	0.0322
FGA	20,25	0.0280	0.0152	0.0182
D8S1179	12,13	0.0926	0.0534	0.0720
D21S11	30,31.2	0.0491	0.0220	0.0615
D18S51	12,14	0.0465	0.0103	0.0447
D5S818	10,13	0.0178	0.0324	<0.01
D13S317	8,12	0.0541	0.0249	0.0441
D7S820	9,11	0.0584	0.0474	0.0380
Cumulative Frequency		10^{-12}	$10^{-14.2}$	$10^{-12.8}$
Reciprocal Frequency		1/1 trillion	1/162 trillion	1/6.7 trillion