



## **DNA Interpretation Test No. 16-589**

### **Summary Report**

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This proficiency test was sent to 48 participants. Each participant received a sample pack consisting of a DVD containing electropherograms which they were requested to evaluate using their existing protocols. Participants were also offered this test data digitally through the CTS portal. Data were returned from 28 participants (58% response rate) and are compiled into the following tables:

	<u>Page</u>
<a href="#"><u>Manufacturer's Information</u></a>	<u>2</u>
<a href="#"><u>Summary Comments</u></a>	<u>4</u>
<a href="#"><u>Table 1: Interpretation Guidelines</u></a>	<u>5</u>
<a href="#"><u>Table 2: STR &amp; Amelogenin Results</u></a>	<u>6</u>
<a href="#"><u>Table 3: YSTR Results</u></a>	<u>22</u>
<a href="#"><u>Table 4: DNA Analysis</u></a>	<u>33</u>
<a href="#"><u>Table 5: Statistical Analysis of Item 3</u></a>	<u>35</u>
<a href="#"><u>Table 6: Statistical Analysis of Item 4</u></a>	<u>39</u>
<a href="#"><u>Table 7: Databases Used</u></a>	<u>43</u>
<a href="#"><u>Table 8: Amplification Kit Survey</u></a>	<u>47</u>
<a href="#"><u>Table 9: Additional Comments</u></a>	<u>48</u>
<a href="#"><u>Appendix: Data Sheet</u></a>	<u>50</u>

This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

## **Manufacturer's Information**

Each sample pack contained digital files consisting of electropherograms from DNA profiles of two known samples (Items 1 & 2) and two questioned samples (Items 3 & 4). Participants were requested to evaluate the electropherograms and interpret the data using their existing protocols.

SAMPLE PREPARATION: Item 1 was created using blood collected from a female donor and Item 2 was created using blood collected from a male donor. The Item 3 mixture was created by combining two parts of blood from the Item 1 female donor, one part of blood from the Item 2 male donor and two parts of blood collected from another male donor. The Item 4 mixture was created using four parts of blood from Item 2 male donor and one part of blood collected from a different female donor than was used for Item 1.

SAMPLE SET ASSEMBLY: Once sample preparation and verification was completed, each DVD was checked to ensure all images were accessible.

VERIFICATION: Laboratories that conducted predistribution testing of the electropherograms reported consistent results for all loci. All associations were consistent amongst the predistribution laboratories.

### Amelogenin and STR Results

Results compiled by predistribution laboratories and a consensus of participants.

Item	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	
1	17,3,17.3	22,22	10,11	16,18	12,13	10,11
	11,13	13,13	15,23	8,14	9,9	15,16
	14,15	30,33.2	10,15	X,X	10,12	21,26
	9,11	5,11	8,9.3	8,8	14,19	
2	16,3,17.3	22,23	11,12	15,15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	*	X,Y	7,11	23,25
	*	7,15	6,7	6,9	15,17	
3	*	*	*	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	*	8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	*	X,Y	7,10,11,12	19,20,21,23,25,26
	*	*	6,7,8,9,9.3	*	14,15,16,17,19	
4	14,16,3,17.3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	*	*	6,7,9.3	6,8,9,11	15,17	

NOTE- An "\*" represents a locus with less than 10 participants reporting or for which a consensus result of greater than 75% was not achieved.

### YSTR Results

Results compiled from predistribution laboratories and a consensus of participants.

Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4		
2	17	14,14	12	28	22	10	11	13
	16	8	10	20,21	15	16	27	12
	13	19	16	20	12	11		
3	*	14,15	12,13	*	21,22	10	11	13
	14,16	*	10,11	*	15	16	*	12,13
	11,13	17,19	16,17	20,21	*	*		
4	17	14,14	12	28	22	10	*	13
	16	8	10	*	15	16	27	*
	13	19	16	20	*	11		

NOTE- An "\*" represents a locus with less than 10 participants reporting or for which a consensus result of greater than 75% was not achieved.

## Summary Comments

This test was designed to allow participants to assess their proficiency in evaluating electropherograms (e-grams) and interpreting data. Each participant received electropherograms (in both FSA and PDF formats) of four items including the following kits: Identifiler® Plus, PowerPlex® Fusion 5C, YFiler®, PowerPlex® Y23.

It was noted that e-grams for specific amplification kits showed locus and/or allele drop-out resulting in incomplete DNA profiles for certain Items. Drop-out events caused participants to omit certain alleles that may have been present in another amplification kit's data set. When evaluating results, the differences amongst the different kits should be considered.

### STR Data

Twenty-seven participants evaluated the STR data. Of these, twelve evaluated data using the FSA files, ten used the PDF files, and five reported that they used both formats for their evaluation.

For Item 1, there were no reported results that differed from the consensus.

For Item 2, two participants reported results that differed from the consensus. One participant evaluating the PowerPlex® Fusion 5C data reported a single allele "9" at the TPOX locus where the consensus result was "6, 9". The omitted "6" allele does fall below this participant's analytical threshold of 75 RFU. The second participant reported an inconsistent allele at the FGA locus.

For Item 3, one participant reported results that differed from the consensus. This participant (one of the five PowerPlex® Fusion 5C users) was missing alleles at four loci where the RFU values associated with the alleles fell below their reported analytical threshold.

For Item 4, four participants reported results that differed from the consensus. One participant reported "21.2, 23, 25" at locus FGA in comparison to 14 other Identifiler® Plus users that reported "22, 23, 25". Another participant reported additional alleles at D21S11, FGA and TPOX. Two of the five PowerPlex® Fusion 5C users were missing alleles "8" and "11" at TPOX; for one of these participants these two peaks fell below their stochastic threshold and for the other participant these peaks fell under their analytical threshold.

### Y-STR Data

Twenty-four participants reported Y-STR results. Participants had the opportunity to report results for 22 different Y-STR loci, however the following six loci are not covered by the YFiler® amplification kit: DYS481, DYS533, DYS549, DYS570, DYS576 and DYS643.

For Item 3, nine participants evaluated results using the YFiler® kit data, eight used the PowerPlex® Y23 kit, six used both kits and one participant did not report which kit was evaluated. Of the PowerPlex® Y23 users, four participants were missing alleles. Two reported "14" at locus DYS437 where the consensus was "14, 16". The RFU value of the omitted "16" allele fell below the analytical thresholds reported by these participants. The two remaining participants reported "INC" at locus DYS635 due to their reagent blanks showing a "21" allele above their analytical threshold. Of the six participants using both Y-STR amplification kits, one participant reported inconsistent allelic responses for the majority of the loci.

For Item 4, nine participants reported using the YFiler® kit, seven used PowerPlex® Y23, seven reported the evaluation of both amplification kits and one participant did not report which kit was evaluated.

Of the 28 participants that reported results, 24 included the victim (Item 1) and the suspect (Item 2) as possible contributors to the Item 3 mixture. One participant excluded the victim (Item 1) as a possible contributor to the Item 3 mixture and two reported inconclusive/uninterpretable. Four participants reported inconclusive/uninterpretable as to whether the suspect (Item 2) was a contributor to the Item 3 mixture. For the Item 4 mixture, 27 participants excluded the victim (Item 1) as a possible contributor and 28 included the suspect (Item 2).

# Interpretation Guidelines

TABLE 1

WebCode	Analytical Threshold	Peak Height Ratio	Stochastic Threshold
47RM4Y	50	60%	100
6D44BY	74 rfu	60%	50 rfu
6JTJZ7	75 RFU	60%	50 RFU
6UTC9W	50 RFU	65%	150 RFU
7PC7A2	75 rfu for both STR and YSTR (See comments in Part II)	60% for STR, 50% for YSTR (See comments in Part II)	50 rfu for STR, 75 rfu for YSTR (See comments in Part II)
9W8PP3	75 RFU	60%	50 RFU
ABM68R	See additional comments (Part II)	See additional comments (Part II)	See additional comments (Part II)
AFECQZ			
ANN24Y	30 RFU	60%	50 RFU
C6A7NX			
EKDKXQ	ID+ 75rfus, PPY23 50rfus	ID+ 40% PPY23 none	ID+ 150rfus, PPY23 for DYS385 200rfus
F7AF9Q	50	60	50
H6PDEM	60 RFU	60%	233 RFU
HAMXGL	75 rfu	50%	300 rfu
HBTH6L	50	60%	150 RFU
JG27HM	STR_B:26 G:33 Y:45 R:34; Y-STR_B:36 G:53 Y:77 R:55	60%	150
KEQHNN	35 RFU	150 to 699 RFU: 30%, >699 RFU: 60%	150 RFU
LT7ZPH	30 rfu for PowerPlex Y23	N/A for PowerPlex Y23	N/A for PowerPlex Y23
MFB9HJ	75 rfu (100 rfu for PowerplexY23)	60%	150 rfu
NWDBVG	50	60	75
PCLLZF			
R6DY2B	50	60	100
R7N4CE	Identifiler Plus 75 RFUs, PPY23 50 RFUs	Identifiler Plus 40%, PPY23 None	Identifiler Plus 150 RFUs, PPY23 200 RFUs for DYS385 only
UKHAJE	50	40%*	150*
UVG7GA	60 rfu	60 %	606 rfu
VCMPR7	30	60	50
VF6PA8	50	60	100
Y2UFV9	50 RFU	65%	275 RFU (10s injection)

# STR & Amelogenin Results

TABLE 2

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	
Item 1						
47RM4Y	Identifiler® Plus (FSA Format)					
1	-	22	-	16,18	12,13	10,11
	11,13	-	-	8,14	9	15,16
	14,15	30,33.2	-	X,X	10,12	21,26
	-	-	8,9.3	8	14,19	
6D44BY	PowerPlex® Fusion 5C (PDF Format)					
1	17.3,17.3	22,22	10,11	16,18	12,13	10,11
	11,13	13,13	15,23	8,14	9,9	15,16
	14,15	30,33.2	10,15	X,X	10,12	21,26
	9,11	5,11	8,9.3	8,8	14,19	
6JTJZ7	Identifiler® Plus (FSA Format)					
1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	
6UTC9W	PowerPlex® Fusion 5C (FSA Format)					
1	17.3	22	10,11	16,18	12,13	10,11
	11,13	13	15,23	8,14	9	15,16
	14,15	30,33.2	10,15	X	10,12	21,26
	9,11	5,11	8,9.3	8	14,19	
7PC7A2	Identifiler® Plus (FSA Format)					
1		22		16,18	12,13	10,11
	11,13			8,14	9	15,16
	14,15	30,33.2		X	10,12	21,26
			8,9.3	8	14,19	
9W8PP3	Identifiler® Plus, PowerPlex® Fusion 5C (PDF Format)					
1	17.3	22	10,11	16,18	12,13	10,11
	11,13	13	15,23	8,14	9	15,16
	14,15	30,33.2	10,15	X	10,12	21,26
	9,11	5,11	8,9.3	8	14,19	
ABM68R	PowerPlex® Fusion 5C (FSA Format), (PDF Format)					
1	17.3	22	10,11	16,18	12,13	10,11
	11,13	13	15,23	8,14	9	15,16
	14,15	30,33.2	10,15	X	10,12	21,26
	9,11	5,11	8,9.3	8	14,19	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 1

AFECQZ (PDF Format)

1	17.3	22	10,11	16,18	12,13	10,11
	11,13	13	15,23	8,14	9	15,16
	14,15	30,33.2	10,15	X	10,12	21,26
	9,11	5,11	8,9.3	8	14,19	

ANN24Y Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)

1	17.3	22	10,11	16,18	12,13	10,11
	11,13	13	15,23	8,14	9	15,16
	14,15	30,33.2	10,15	X	10,12	21,26
	9,11	5,11	8,9.3	8	14,19	

C6A7NX Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)

1	17.3	22	10,11	16,18	12,13	10,11
	11,13	13	15,23	8,14	9	15,16
	14,15	30,33.2	10,15	X	10,12	21,26
	9,11	5,11	8,9.3	8	14,19	

EKDKXQ Identifiler® Plus (PDF Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

F7AF9Q Identifiler® Plus (PDF Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

H6PDEM Identifiler® Plus (FSA Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

HAMXGL PowerPlex® Fusion 5C (PDF Format)

1	17.3	22	10,11	16,18	12,13	10,11
	11,13	13	15,23	8,14	9	15,16
	14,15	30,33.2	10,15	X	10,12	21,26
	9,11	5,11	8,9.3	8	14,19	

HBTH6L PowerPlex® Fusion 5C (PDF Format)

1	17.3	22	10,11	16,18	12,13	10,11
	11,13	13	15,23	8,14	9	15,16
	14,15	30,33.2	10,15	X	10,12	21,26
	9,11	5,11	8,9.3	8	14,19	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 1

JG27HM PowerPlex® Fusion 5C (FSA Format)

1	17,3	22	10,11	16,18	12,13	10,11
	11,13	13	15,23	8,14	9	15,16
	14,15	30,33.2	10,15	X,X	10,12	21,26
	9,11	5,11	8,9.3	8	14,19	

KEQHHN Identifiler® Plus (FSA Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

MFB9HJ Identifiler® Plus (FSA Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

NWDBVG Identifiler® Plus (PDF Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

PCLLZF Identifiler® Plus (FSA Format), (PDF Format)

1		22		16,18	12,13	10,11
	11,13			8,14	9	15,16
	14,15	30,33.2		X	10,12	21,26
			8,9.3	8	14,19	

R6DY2B Identifiler® Plus (FSA Format)

1		22		16,18	12,13	10,11
	11,13			8,14	9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8	14,19	

R7N4CE Identifiler® Plus (PDF Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

UKHAJE Identifiler® Plus (FSA Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	



<b>WebCode</b>	<b>D1S1656</b>	<b>D2S1338</b>	<b>D2S441</b>	<b>D3S1358</b>	<b>D5S818</b>	<b>D7S820</b>
	<b>D8S1179</b>	<b>D10S1248</b>	<b>D12S391</b>	<b>D13S317</b>	<b>D16S539</b>	<b>D18S51</b>
	<b>D19S433</b>	<b>D21S11</b>	<b>D22S1045</b>	<b>Amelogenin</b>	<b>CSF1PO</b>	<b>FGA</b>
	<b>Penta D</b>	<b>Penta E</b>	<b>TH01</b>	<b>TPOX</b>	<b>vWA</b>	

## Item 1

UVG7GA Identifiler® Plus (PDF Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

VCMR7 Identifiler® Plus (FSA Format), (PDF Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

VF6PA8 Identifiler® Plus (FSA Format)

1	-	22	-	16,18	12,13	10,11
	11,13	-	-	8,14	9	15,16
	14,15	30,33.2	-	X,X	10,12	21,26
	-	-	8,9.3	8	14,19	

Y2UFV9 Identifiler® Plus (FSA Format)

1		22,22		16,18	12,13	10,11
	11,13			8,14	9,9	15,16
	14,15	30,33.2		X,X	10,12	21,26
			8,9.3	8,8	14,19	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 2

47RM4Y Identifiler® Plus (FSA Format)

2	-	22,23	-	15	11,12	11,12
	12,15	-	-	8,12	9,12	17,18
	12.2,13	29,30	-	X,Y	7,11	23,25
	-	-	6,7	6,9	15,17	

6D44BY PowerPlex® Fusion 5C (PDF Format)

2	16.3,17.3	22,23	11,12	15,15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15,17	X,Y	7,11	23,25
	5,13	7,15	6,7	6,9	15,17	

6JTJZ7 Identifiler® Plus (FSA Format)

2		22,23		15,15	11,12	11,12
	12,15			8,12	9,12	17,18
	12.2,13	29,30		X,Y	7,11	23,25
			6,7	6,9	15,17	

6UTC9W PowerPlex® Fusion 5C (FSA Format)

2	16.3,17.3	22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15,17	X,Y	7,11	23,25
	5,13	7,15	6,7	6,9	15,17	

7PC7A2 Identifiler® Plus (FSA Format)

2		22,23		15	11,12	11,12
	12,15			8,12	9,12	17,18
	12.2,13	29,30		X,Y	7,11	23,25
			6,7	6,9	15,17	

9W8PP3 Identifiler® Plus, PowerPlex® Fusion 5C (PDF Format)

2	16.3,17.3	22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15,17	X,Y	7,11	23,25
	5,13	7,15	6,7	6,9	15,17	

ABM68R PowerPlex® Fusion 5C (FSA Format), (PDF Format)

2	16.3,17.3	22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15,17	X,Y	7,11	23,25
	5,13	7,15	6,7	6,9	15,17	

AFECQZ (PDF Format)

2	16.3,17.3	22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15,17	X,Y	7,11	23,25
	5,13	7,15	6,7	6,9	15,17	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 2

ANN24Y Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)

2	16.3,17.3	22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15,17	X,Y	7,11	23,25
	5,13	7,15	6,7	6,9	15,17	

C6A7NX Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)

2	16.3,17.3	22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15,17	X,Y	7,11	23,25
	5,13	7,15	6,7	6,9	15,17	

EKDKXQ Identifiler® Plus (PDF Format)

2		22,23		15,15	11,12	11,12
	12,15			8,12	9,12	17,18
	12.2,13	29,30		X,Y	7,11	23,25
			6,7	6,9	15,17	

F7AF9Q Identifiler® Plus (PDF Format)

2		22,23		15,15	11,12	11,12
	12,15			8,12	9,12	17,18
	12.2,13	29,30		X,Y	7,11	23,25
			6,7	6,9	15,17	

H6PDEM Identifiler® Plus (FSA Format)

2		22,23		15,15	11,12	11,12
	12,15			8,12	9,12	17,18
	12.2,13	29,30		X,Y	7,11	23,25
			6,7	6,9	15,17	

HAMXGL PowerPlex® Fusion 5C (PDF Format)

2	16.3,17.3	22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15	X,Y	7,11	23,25
	5	7,15	6,7	9	15,17	

HBTH6L PowerPlex® Fusion 5C (PDF Format)

2	16.3,17.3	22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15,17	X,Y	7,11	23,25
	5,13	7,15	6,7	6,9	15,17	

JG27HM PowerPlex® Fusion 5C (FSA Format)

2	16.3,17.3	22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22	8,12	9,12	17,18
	12.2,13	29,30	15,17	X,Y	7,11	23,25
	5,13	7,15	6,7	6,9	15,17	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 2

KEQHHN Identifiler® Plus (FSA Format)

2	22,23		15,15	11,12	11,12
	12,15		8,12	9,12	17,18
	12.2,13	29,30	X,Y	7,11	23,25
			6,7	6,9	15,17

MFB9HJ Identifiler® Plus (FSA Format)

2	22,23		15,15	11,12	11,12
	12,15		8,12	9,12	17,18
	12.2,13	29,30	X,Y	7,11	23,25
			6,7	6,9	15,17

NWDBVG Identifiler® Plus (PDF Format)

2	22,23		15,15	11,12	11,12
	12,15		8,12	9,12	17,18
	12.2,13	29,30	X,Y	7,11	23,25
			6,7	6,9	15,17

PCLLZF Identifiler® Plus (FSA Format), (PDF Format)

2	22,23		15	11,12	11,12
	12,15		8,12	9,12	17,18
	12.2,13	29,30	X,Y	7,11	23,15
			6,7	6,9	15,17

R6DY2B Identifiler® Plus (FSA Format)

2	22,23		15	11,12	11,12
	12,15		8,12	9,12	17,18
	12.2,13	29,30	X,Y	7,11	23,25
			6,7	6,9	15,17

R7N4CE (PDF Format)

2	22,23		15,15	11,12	11,12
	12,15		8,12	9,12	17,18
	12.2,13	29,30	X,Y	7,11	23,25
			6,7	6,9	15,17

UKHAJE Identifiler® Plus (FSA Format)

2	22,23		15,15	11,12	11,12
	12,15		8,12	9,12	17,18
	12.2,13	29,30	X,Y	7,11	23,25
			6,7	6,9	15,17

UVG7GA Identifiler® Plus (PDF Format)

2	22,23		15,15	11,12	11,12
	12,15		8,12	9,12	17,18
	12.2,13	29,30	X,Y	7,11	23,25
			6,7	6,9	15,17

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

Item 2

VCMPR7	Identifiler® Plus (FSA Format), (PDF Format)					
2		22,23		15,15	11,12	11,12
	12,15			8,12	9,12	17,18
	12.2,13	29,30		X,Y	7,11	23,25
			6,7	6,9	15,17	

VF6PA8	Identifiler® Plus (FSA Format)					
2	-	22,23	-	15	11,12	11,12
	12,15	-	-	8,12	9,12	17,18
	12.2,13	29,30	-	X,Y	7,11	23,25
	-	-	6,7	6,9	15,17	

Y2UFV9	Identifiler® Plus (FSA Format)					
2		22,23		15,15	11,12	11,12
	12,15			8,12	9,12	17,18
	12.2,13	29,30		X,Y	7,11	23,25
			6,7	6,9	15,17	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 3

47RM4Y	Identifiler® Plus (FSA Format)					
3	-	18,19,22,23	-	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	-	-	8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	-	X,Y	7,10,11,12	19,20,21,23,25,26
	-	-	6,7,8,9,9.3	6,8,9	14,15,16,17,19	
6D44BY	Identifiler® Plus, PowerPlex® Fusion 5C (PDF Format)					
3	16,16.3,17.3	18,19,22	10,11,12	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,16,17,22,23	8,12,13,14	9,12,13	14,15,16,17,18
	13,14,15	28,29,30,31.2,33.2		X,Y	10,11,12	19,20,21,23,25,26
	5,9,11,13	5,7,11,15	6,7,8,9,9.3	8	14,15,16,19	
6JTJZ7	Identifiler® Plus (FSA Format)					
3		(18),(19),22,(23)		(15),(16),(17),18	(10),(11),12,13	10,11,12
	11,12,13,(15)			8,12,13,14	9,(12),(13)	(14),(15),(16),(17),(18)
	(12.2),(13),14,(15)	28,(29),30,(31.2),(33.2)		X,(Y)	(7),10,(11),(12)	19,20,21,(23),(25),26
			(6),(7),(8),9,(9.3)	(6),8,(9)	14,15,(16),(17),19	
6UTC9W	PowerPlex® Fusion 5C (FSA Format)					
3	16,16.3,17.3	18,19,22	10,11,12	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,16,17,22,23	8,12,13,14	9,12,13	14,15,16,17,18
	13,14,15	28,29,30,31.2,33.2		X,Y	10,11,12	19,20,21,23,25,26
	5,9,11,13	5,7,11,15	6,7,8,9,9.3	8	14,15,16,19	
7PC7A2	Identifiler® Plus (FSA Format)					
3		18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15			8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2		X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19	
9W8PP3	Identifiler® Plus, PowerPlex® Fusion 5C (PDF Format)					
3	16,16.3,17.3	18,19,22,23	10,11,12	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,16,17,22,23	8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2		X,Y	7,10,11,12	19,20,21,23,25,26
	5,9,11,13	5,7,11,15	6,7,8,9,9.3	6,8,9	14,15,16,17,19	
ABM68R	PowerPlex® Fusion 5C (FSA Format), (PDF Format)					
3	16,17.3	18,19,22	10,11,12	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,16,17,22,23	8,12,13,14	9,12,13	14,15,16,17,18
	13,14,15	28,29,30,31.2,33.2	10,11,15,17	X,Y	7,10,11,12	19,20,21,23,25,26
	5,9,11,13	5,7,11,15	6,7,8,9,9.3	8	14,15,16,17,19	
AFECQZ	(PDF Format)					
3	16,16.3,17.3	18,19,22,23	10,11,12	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,16,17,22,23	8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2		X,Y	7,10,11,12	19,20,21,23,25,26
	5,9,11,13	5,7,11,15	6,7,8,9,9.3	6,8,9,10	14,15,16,17,19	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 3

ANN24Y Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)

3	16,16.3,17.3		10,11,12	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,16,17,22,23	8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	10,11,15,17	X,Y	7,10,11,12	19,20,21,23,25,26
	5,9,11,13	5,7,11,15	6,7,8,9,9.3	6,8,9	14,15,16,17,19	

C6A7NX Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)

3	16,16.3,17.3	18,19,22,23	10,11,12	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,16,17,22,23	8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2		X,Y	7,10,11,12	19,20,21,23,25,26
	5,9,11,13	5,7,11,15	6,7,8,9,9.3	6,8,9	14,15,16,17,19	

EKDKXQ Identifiler® Plus (PDF Format)

3		18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15			8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2		X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19	

F7AF9Q Identifiler® Plus (PDF Format)

3		18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15			8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2		X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9,10	14,15,16,17,19	

H6PDEM Identifiler® Plus (FSA Format)

3		18,19,22		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15			8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2		X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8	14,15,16,17,19	

HAMXGL PowerPlex® Fusion 5C (PDF Format)

3	16,16.3,17.3	18,19,22	10,11	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,22,23	8,12,13,14	9,12,13	14,15,16
	13,14,15	28,29,30,31.2,33.2	NR	X,Y	10,12	19,20,21,25,26
	9,11,13	5,11,15	7,8,9,9.3	8	14,15,16,19	

HBTH6L PowerPlex® Fusion 5C (PDF Format)

3	16,16.3,17.3	18,19,22	10,11,12	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,16,17,22,23	8,12,13,14	9,12,13	14,15,16,17,18
	13,14,15	28,29,30,31.2,33.2	ND	X,Y	10,11,12	19,20,21,23,25,26
	5,9,11,13	5,7,11,15	6,7,8,9,9.3	8	14,15,16,19	

JG27HM PowerPlex® Fusion 5C (FSA Format)

3	16,16.3,17.3	18,19,22	10,11,12	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	13,14,15	15,16,17,22,23	8,12,13,14	9,12,13	14,15,16,17,18
	13,14,15	28,29,30,31.2,33.2	10,15,17	X,Y	10,11,12	19,20,21,23,25,26
	5,9,11,13	5,7,11,15	6,7,8,9,9.3	8	14,15,16,19	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 3

KEQHHN Identifiler® Plus (FSA Format)

3	18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15		8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19

MFB9HJ Identifiler® Plus (FSA Format)

3	18,19,22		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15		8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8	14,15,16,17,19

NWDBVG Identifiler® Plus (PDF Format)

3	18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15		8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9,10	14,15,16,17,19

PCLLZF Identifiler® Plus (FSA Format), (PDF Format)

3	18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15		8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19

R6DY2B Identifiler® Plus (FSA Format)

3	18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15		8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19

R7N4CE Identifiler® Plus (PDF Format)

3	18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15		8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19

UKHAJE Identifiler® Plus (FSA Format)

3	18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15		8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19

UVG7GA Identifiler® Plus (PDF Format)

3	18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15		8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19



WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

Item 3

VCMPR7	Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)					
3		18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15			8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2		X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19	

VF6PA8	Identifiler® Plus (FSA Format)					
3	-	18,19,22,23	-	15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15	-	-	8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2	-	X,Y	7,10,11,12	19,20,21,23,25,26
	-	-	6,7,8,9,9.3	6,8,9	14,15,16,17,19	

Y2UFV9	Identifiler® Plus (FSA Format)					
3		18,19,22,23		15,16,17,18	10,11,12,13	10,11,12
	11,12,13,15			8,12,13,14	9,12,13	14,15,16,17,18
	12.2,13,14,15	28,29,30,31.2,33.2		X,Y	7,10,11,12	19,20,21,23,25,26
			6,7,8,9,9.3	6,8,9	14,15,16,17,19	

3major		18,19,22		IND	IND	10,11,12
	11,12,13			8,12,13,14	9,13	14,15,16
	13,14,15	28,30,33.2		IND	10,11,12	19,20,21,26
			8,9,9.3	8	14,15,16,19	

3minor		23		IND	IND	
	15				12	17,18
	12.2	29,31.2		IND	7	23,25
			6,7	6,9	17	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 4

47RM4Y Identifiler® Plus (FSA Format)

4	-	19,20,22,23	-	15,18	11,12,13	8,11,12
	10,12,13,15	-	-	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	-	X,Y	7,10,11	22,23,25
	-	-	6,7,9.3	6,8,9,11	15,17	

6D44BY Identifiler® Plus, PowerPlex® Fusion 5C (PDF Format)

4	14,16.3,17.3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	5,10,11,13	7,10,13,15	6,7,9.3	6,8,9,11	15,17	

6JTJZ7 Identifiler® Plus (FSA Format)

4		(19),(20),22,23		15,(18)	11,12,(13)	(8),11,(12)
	(10),12,(13),15			8,12	9,11,12	12,14,17,18
	(12.2),13,(15)	(29),30		X,(Y)	7,10,11	(22),23,(25)
			(6),(7),9.3	6,8,9,(11)	15,17	

6UTC9W PowerPlex® Fusion 5C (FSA Format)

4	14,16.3,17.3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	5,10,13	7,10,13,15	6,7,9.3	6,8,9,11	15,17	

7PC7A2 Identifiler® Plus (FSA Format)

4		19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15			8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30		X,Y	7,10,11	22,23,25
			6,7,9.3	6,8,9,11	15,17	

9W8PP3 Identifiler® Plus, PowerPlex® Fusion 5C (PDF Format)

4	14,16.3,17.3			8,12		
		29,30		X,Y		
					15,17	
4major		22,23	11,12	15	11,12	11,12
	12,15	13,15	17,22		9,12	17,18
	12.2,13		15,17		7,11	23,25
	5,13	7,15	6,7	6,9		
4minor		19,20	15	18	13	8
	10,13	12	19		11	12,14
	15		16		10	22
	10	10,13	9.3	8,11		

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 4

ABM68R PowerPlex® Fusion 5C (FSA Format), (PDF Format)

4	14,16,3,17,3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	5,10,11,13	7,10,13,15	6,7,9,3	6,8,9,11	15,17	

AFECQZ (PDF Format)

4	14,16,3,17,3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	5,10,13	7,10,13,15	6,7,9,3	6,8,9,11	15,17	

ANN24Y Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)

4	14,16,3,17,3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	5,10,11,13	7,10,13,15	6,7,9,3	6,8,9,11	15,17	

C6A7NX Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)

4	14,16,3,17,3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	5,10,11,13	7,10,13,15	6,7,9,3	6,8,9,11	15,17	

EKDKXQ Identifiler® Plus (PDF Format)

4		19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15			8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30		X,Y	7,10,11	21.2,23,25
			6,7,9,3	6,8,9,11	15,17	

F7AF9Q Identifiler® Plus (PDF Format)

4		19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15			8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30		X,Y	7,10,11	22,23,25
			6,7,9,3	6,8,9,11	15,17	

H6PDEM Identifiler® Plus (FSA Format)

4		19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15			8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30		X,Y	7,10,11	22,23,25
			6,7,9,3	6,8,9,11	15,17	

HAMXGL PowerPlex® Fusion 5C (PDF Format)

4	14,16,3,17,3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	5,13	7,13,15	6,7,9,3	6,9	15,17	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 4

HBTH6L PowerPlex® Fusion 5C (PDF Format)

4	14,16,3,17.3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	5,10,13	7,10,13,15	6,7,9.3	6,8,9,11	15,17	

JG27HM PowerPlex® Fusion 5C (FSA Format)

4	14,16,3,17.3	19,20,22,23	11,12,15	15,18	11,12,13	8,11,12
	10,12,13,15	12,13,15	17,19,22	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	15,16,17	X,Y	7,10,11	22,23,25
	5,10,13	7,10,13,15	6,7,9.3	6,9	15,17	

KEQHHN Identifiler® Plus (FSA Format)

4		19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15			8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30		X,Y	7,10,11	22,23,25
			6,7,9.3	6,8,9,11	15,17	

MFB9HJ Identifiler® Plus (FSA Format)

4						
	12.2,13,15	29,30			7,10,11	
			6,7,9.3			
4major		22,23		15,15	11,12	11,12
	12,15			8,12	9,12	17,18
				X,Y		23,25
				6,9	15,17	
4minor		19,20		15,18	12,13	8,11
	10,13			8,12	11,11	12,14
				X,X		22,25
				8,11	15,17	

NWDBVG Identifiler® Plus (PDF Format)

4		19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15			8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30,36		X,Y	7,10,11	17.2,21.2,22,23,25,32.2
			6,7,9.3	6,8,9,10,11	15,17	

PCLLZF Identifiler® Plus (FSA Format), (PDF Format)

4		19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15			8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30		X,Y	7,10,11	22,23,25
			6,7,9.3	6,8,9,11	15,17	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	TH01	TPOX	vWA	

## Item 4

R6DY2B Identifiler® Plus (FSA Format)

4	19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15		8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	X,Y	7,10,11	22,23,25
			6,7,9.3	6,8,9,11	15,17

R7N4CE Identifiler® Plus (PDF Format)

4	19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15		8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	X,Y	7,10,11	22,23,25
			6,7,9.3	6,8,9,11	15,17

UKHAJE Identifiler® Plus (FSA Format)

4	19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15		8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	X,Y	7,10,11	22,23,25
			6,7,9.3	6,8,9,11	15,17

UVG7GA Identifiler® Plus (PDF Format)

4	19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15		8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	X,Y	7,10,11	22,23,25
			6,7,9.3	6,8,9,11	15,17

VCMR7 Identifiler® Plus, PowerPlex® Fusion 5C (FSA Format), (PDF Format)

4	19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15		8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	X,Y	7,10,11	22,23,25
			6,7,9.3	6,8,9,11	15,17

VF6PA8 Identifiler® Plus (FSA Format)

4	-	19,20,22,23	-	15,18	11,12,13	8,11,12
	10,12,13,15	-	-	8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	-	X,Y	7,10,11	22,23,25
	-	-	6,7,9.3	6,8,9,11	15,17	

Y2UFV9 Identifiler® Plus (FSA Format)

4	19,20,22,23		15,18	11,12,13	8,11,12
	10,12,13,15		8,12	9,11,12	12,14,17,18
	12.2,13,15	29,30	X,Y	7,10,11	22,23,25
			6,7,9.3	6,8,9,11	15,17

# YSTR Results

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4		

Item 1

6UTC9W	PowerPlex®Y23								
	1	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-
		-	-	-	-	-			

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393	
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533	
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4			
<b>Item 2</b>										
47RM4Y	Yfiler® (FSA Format)									
	2	17	14	12	28	22	10	11	13	
		16	8	10	20,21	15	16	-	-	
		-	-	-	20	-	11			
6D44BY	PowerPlex®Y23 (PDF Format)									
	2	17	14,14	12	28	22	10	11	13	
		16	8	10	20,21	15	16	27	12	
		13	19	16	20	12	11			
6UTC9W	PowerPlex®Y23 (FSA Format)									
	2	17	14	12	28	22	10	11	13	
		16	8	10	20,21	15	16	27	12	
		13	19	16	20	12	11			
7PC7A2	Yfiler® (FSA Format)									
	2	17	14	12	28	22	10	11	13	
		16	8	10	20,21	15	16			
				20			11			
9W8PP3	Yfiler®, PowerPlex®Y23 (PDF Format)									
	2	17	14	12	28	22	10	11	13	
		16	8	10	20,21	15	16	27	12	
		13	19	16	20	12	11			
ABM68R	PowerPlex®Y23 (FSA Format), (PDF Format)									
	2	17	14	12	28	22	10	11	13	
		16	8	10	20,21	15	16	27	12	
		13	19	16	20	12	11			
AFECQZ	(PDF Format)									
	2	17	14	12	28	22	10	11	13	
		16	8	10	20,21	15	16	27	12	
		13	19	16	20	12	11			
ANN24Y	Yfiler®, PowerPlex®Y23 (FSA Format), (PDF Format)									
	2	17	14	12	28	22	10	11	13	
		16	8	10	20,21	15	16	27	12	
		13	19	16	20	12	11			

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4		
<b>Item 2</b>									
C6A7NX	Yfiler®, PowerPlex®Y23 (FSA Format), (PDF Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	12
		13	19	16	20	12	11		
EKDKXQ	PowerPlex®Y23 (PDF Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	12
		13	19	16	20	12	11		
F7AF9Q	Yfiler®								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16		
				20			11		
H6PDEM	Yfiler® (FSA Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16		
				20			11		
HAMXGL	PowerPlex®Y23 (PDF Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	12
		13	19	16	20	12	11		
JG27HM	PowerPlex®Y23 (FSA Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	12
		13	19	16	20	12	11		
LT7ZPH	PowerPlex®Y23 (PDF Format)								
	2	17	14,14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	12
		13	19	16	20	12	11		
MFB9HJ	PowerPlex®Y23 (FSA Format)								
	2	17	14,14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	12
		13	19	16	20	12	11		



TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4		
<b>Item 2</b>									
NWDBVG	YFiler®, PowerPlex®Y23 (PDF Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	12
		13	19	16	20	12	11		
PCLLZF	YFiler® (FSA Format), (PDF Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16		
					20		11		
R6DY2B	YFiler® (FSA Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16		
					20		11		
R7N4CE	PowerPlex®Y23 (PDF Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	12
		13	19	16	20	12	11		
UVG7GA	YFiler® (PDF Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16		
					20		11		
VCMPR7	PowerPlex®Y23 (FSA Format), (PDF Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	12
		13	19	16	20	12	11		
VF6PA8	YFiler® (FSA Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	-	-
		-	-	-	20	-	11		
Y2UFV9	YFiler® (FSA Format)								
	2	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16		
					20		11		

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4		

Item 3

47RM4Y	YFiler® (FSA Format)								
	3	15,17	14,15	12,13	30	21,22	10	11	13
		14,16	8,11	10,11	20,21	15	16	-	-
		-	-	-	20,21	-	10,11		

6D44BY	YFiler®, PowerPlex®Y23 (PDF Format)								
	3	21,22	20,21	14,15	28,30	16	10	12,13	17,19
		10,11	8,11	25,27	12,13	14	16,17	11	14,16
		13	20,21	15,17	15	11,13	10,11		

6UTC9W	PowerPlex®Y23 (FSA Format)								
	3	15			28,30		10	11	13
			11		20,21	15	16		
						14	10		

	3major		15	13		21			
		14		11				25	13
		11	17	17	21				

	3minor		14	12		22			
		16		10				27	12
		13	19	16	20				

7PC7A2	YFiler® (FSA Format)								
	3	15,17	14,15	13	30	21,22	10	11	13
		14,16	8,11	10,11	20	15	16		
					20,21		10,11		

9W8PP3	YFiler®, PowerPlex®Y23 (PDF Format)								
	3	15,17	14,15	12,13	28,30	21,22	10	11	13
		14,16	8,11	10,11	20,21	15	16	25,27	12,13
		11,13	17,19	16,17	20,21	12,14	10,11		

ABM68R	YFiler®, PowerPlex®Y23 (FSA Format), (PDF Format)								
	3	15,17	14,15	12,13	28,30	21,22	10	11	13
		14,16	8,11	10,11	20,21	15	16	-	12,13
		11,13	17,19	16,17	20,21	-	10,11		

AFECQZ	(PDF Format)								
	3	15	14,15	12,13	28,30	21,22	10	11	13
		14,16	11	10,11	20,21	15	16	25,26,27	12,13
		11,13	17,19	16,17	20,21	14	10		

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4		

Item 3

ANN24Y	PowerPlex®Y23 (FSA Format), (PDF Format)								
	3		14,15	12,13	28,30	21,22	10	11	13
		14,16	8,11	10,11	20,21		16	25,27	12,13
		11,13	17,19	16,17	20,21		10,11		
C6A7NX	YFiler®, PowerPlex®Y23 (FSA Format), (PDF Format)								
	3	15,17	14,15	12,13	28,30	21,22	10	11	13
		14,16	8,11	10,11	20,21	15	16	25,27	12,13
		11,13	17,19	16,17	20,21		10,11		
EKDKXQ	PowerPlex®Y23 (PDF Format)								
	3	15	14,15	12,13	28,30	21,22	10	11	13
		14,16	11	10,11	20,21	15	16	25,27	12,13
		11,13	17,19	16,17	INC	14	10		
F7AF9Q	YFiler® (PDF Format)								
	3major	15	15	13	30	21	10	11	13
		14	11	11	20	15	16		
					21		10		
	3minor	17	14			22			
		16	8	10					
					20		11		
H6PDEM	YFiler® (FSA Format)								
	3				30		10	11	13
					20	15	16		
	3major	15	15	13		21			
		14	11	11					
					21		10		
	3minor	17	14	12		22			
		16	8	10					
					20		11		

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393	
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533	
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4			
<b>Item 3</b>										
HAMXGL	PowerPlex®Y23 (PDF Format)									
	3	15	14,15	12,13	30	21,22	10	11	13	
		14	11	10,11	20,21	15	16	25,27	12,13	
		11,13	17,19	16,17	20,21	14	10			
	3major		15	13		21				
				11				25	13	
		11	17	17	21					
	3minor		14	12		22				
				10				27	12	
		13	19	16	20					
JG27HM	PowerPlex®Y23 (FSA Format)									
	3	15	14,15	12,13	28,30	21,22	10	11	13	
		14,16	11	10,11	20,21	15	16	25,27	12,13	
		11,13	17,19	16,17	20,21	14	10			
LT7ZPH	PowerPlex®Y23 (PDF Format)									
	3	15	14,15	12,13	28,30	21,22	10,10	11	13	
		14,16	11	10,11	20,21	15	16	25,26,27	12,13	
		11,13	17,19	16,17	20,21	14	10			
MFB9HJ	PowerPlex®Y23 (FSA Format)									
	3		14	12		22				
				10,11	20,21			25,27	12	
		13	19	16,17	20					
	3major	15	15	13		21	10	11	13	
		14	11			15	16		13	
		11	17		21		10			
NWDBVG	YFiler®, PowerPlex®Y23 (PDF Format)									
	3	15,19	14,15	12,13	28,30	21,22	10	11	13	
		14,16	8,11	10,11	20,21	15	16	25,26,27	12,13	
		11,13	17,19	16,17	20,21	14	10,11			
PCLLZF	YFiler® (FSA Format), (PDF Format)									
	3	15,17	14,15	13	30	21,22	10	11	13	
		14,16	8,11	10,11	20	15	16			
					20,21		10,11			

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4		
<b>Item 3</b>									
R6DY2B	YFiler® (FSA Format)								
	3	15,17	14,15	12,13	30	21,22	10	11	13
		14,16	8,11	10,11	20,21	15	16		
					20,21		10,11		
R7N4CE	PowerPlex®Y23 (PDF Format)								
	3	15	14,15	12,13	28,30	21,22	10	11	13
		14,16	11	10,11	20,21	15	16	25,27	12,13
		11,13	17,19	16,17	INC	14	10		
UVG7GA	YFiler® (PDF Format)								
	3	15,17	14,15	13	30	21,22	10	11	13
		14,16	8,11	10,11	20	15	16		
					20,21		10,11		
VCMPR7	YFiler®, PowerPlex®Y23 (FSA Format), (PDF Format)								
	3	15,17	14,15	12,13	28,30	21,22	10	11	13
		14,16	8,11	10,11	20,21	15	16	25,27	12,13
		11,13	17,19	16,17	20,21	12,14	10,11		
VF6PA8	YFiler® (FSA Format)								
	3	15,17	14,15	12,13	30	21,22	10	11	13
		14,16	8,11	10,11	20,21	15	16		
					20,21		10,11		
Y2UFV9	YFiler® (FSA Format)								
	3major	15	15	13	30	21	10	11	13
		14	11	11	20	15	16		
					21		10		
	3minor	17	14			22			
		16	8	10					
					20		11		

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4		
<b>Item 4</b>									
47RM4Y	Yfiler® (FSA Format)								
	4	17	14	12	28	22	10	11	13
		16	8	10	20	15	16	-	-
		-	-	-	20	-	11		
6D44BY	Yfiler®, PowerPlex®Y23 (PDF Format)								
	4	17	14	12	28	22	10		13
		16	8	10	20,21	15	16	27	
		13	19	16	20		11		
6UTC9W	PowerPlex®Y23 (FSA Format)								
	4		14	12		22	10		13
					20,21		16	27	
		13	19	16	20				
7PC7A2	Yfiler® (FSA Format)								
	4	17	14	12	28	22	10		13
		16	8	10	20	15	16		
							11		
9W8PP3	Yfiler®, PowerPlex®Y23 (PDF Format)								
	4	17	14	12	28	22	10		13
		16	8	10	20,21	15	16	27	
		13	19	16	20	12	11		
ABM68R	Yfiler®, PowerPlex®Y23 (FSA Format), (PDF Format)								
	4	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	-
		13	19	16	20	-	11		
AFECQZ	(PDF Format)								
	4	17	14	12	28	22	10		13
		16	8	10	20,21	15	16	27	
		13	19	16	20		11		
ANN24Y	Yfiler®, PowerPlex®Y23 (FSA Format), (PDF Format)								
	4	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	
		13	19	16	20		11		

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4		

Item 4

C6A7NX	Yfiler®, PowerPlex®Y23 (FSA Format), (PDF Format)								
	4	17	14	12	28	22	10	11	13
		16	8	10	20,21	15	16	27	
		13	19	16	20		11		
EKDKXQ	PowerPlex®Y23 (PDF Format)								
	4		14	12		22	10		13
					20,21		16	27	
		13	19	16	20				
F7AF9Q	Yfiler® (PDF Format)								
	4	17	14	12	28	22	10		13
		16	8	10	20	15	16		
							11		
H6PDEM	Yfiler® (FSA Format)								
	4	17	14	12	28	22	10	11	13
		16	8	10	20	15	16		
							11		
HAMXGL	PowerPlex®Y23 (PDF Format)								
	4		14	12		22	10		13
					20,21		16	27	
		13	19	16	20				
JG27HM	PowerPlex®Y23 (FSA Format)								
	4	17	14	12		22	10		13
					20,21		16	27	
		13	19	16	20				
LT7ZPH	PowerPlex®Y23 (PDF Format)								
	4	F	14,F	12	F	22	10	F	13
		F	F	F	20,21	F	16	27	F
		13	19	16	20	F	F		
MFB9HJ	PowerPlex®Y23 (FSA Format)								
	4			12		22	10		13
					20,21		16	27	
		13	19	16	20				

TABLE 3

WebCode	Item	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393	
		DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533	
		DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4			
<b>Item 4</b>										
NWDBVG	YFiler®, PowerPlex®Y23 (PDF Format)									
	4	17	14	12	28	22	10		13	
		16	8	10	20,21	15	16	27		
		13	19	16	20		11			
PCLLZF	YFiler® (FSA Format), (PDF Format)									
	4	17	14	12	28	22	10		13	
		16	8	10	20	15	16			
							11			
R6DY2B	YFiler® (FSA Format)									
	4	17	14	12	28	22	10	11	13	
		16	8	10	20	15	16			
					20		11			
R7N4CE	PowerPlex®Y23 (PDF Format)									
	4		14	12		22	10		13	
					20,21		16	27		
		13	19	16	20					
UVG7GA	YFiler® (PDF Format)									
	4	17	14	12	28	22	10		13	
		16	8	10	20	15	16			
							11			
VCMPR7	YFiler®, PowerPlex®Y23 (FSA Format), (PDF Format)									
	4	17	14	12	28	22	10	11	13	
		16	8	10	20,21	15	16	27		
		13	19	16	20		11			
VF6PA8	YFiler® (FSA Format)									
	4	17	14	12	28	22	10	11	13	
		16	8	10	20	15	16			
					20		11			
Y2UFV9	YFiler® (FSA Format)									
	4	17	14	12	28	22	10		13	
		16	8	10	20	15	16			
							11			



## DNA Analysis

Based on the examination of the DNA profiles provided, could the Victim (Item 1) and/or the Suspect (Item 2) be included as a possible contributor to the questioned Item?

TABLE 4

WebCode	<u>Item 3 Conclusion</u>			<u>Item 4 Conclusion</u>		
	<u># of Contributors</u>	<u>Item 1</u>	<u>Item 2</u>	<u># of Contributors</u>	<u>Item 1</u>	<u>Item 2</u>
47RM4Y	3	Included	Included	2	Excluded	Included
6D44BY	3	Included	Included	2	Excluded	Included
6JTJZ7	at least 3	Included	Included	at least 2	Excluded	Included
6UTC9W	3	Included	Included	2	Excluded	Included
7PC7A2	At least 3	Included	Included	At least two	Excluded	Included
9W8PP3	Minimum 3	Included	Included	minimum 2	Excluded	Included
ABM68R	minimal 3 contributors	Included	Inconclusive / Uninterpretable	minimal 2 contributors	Excluded	Included
AFECQZ	3	Excluded	Included	2	Excluded	Included
ANN24Y	3	Included	Included	2	Excluded	Included
C6A7NX	3	Included	Included	2	Excluded	Included
EKDKXQ	at least 3	Included	Included	2	Excluded	Included
F7AF9Q	minimum of 3	Included	Included	minimum 2	Excluded	Included
H6PDEM	3	Included	Included	2	Excluded	Included
HAMXGL	At least 3, two of whom are male.	Included	Included	At least two, one of whom is male.	Excluded	Included
HBTH6L		Inconclusive / Uninterpretable	Inconclusive / Uninterpretable		Excluded	Included
JG27HM	3	Included	Included	2	Excluded	Included
KEQHNN	consistent with 3	Included	Included	consistent with 2	Excluded	Included

TABLE 4

WebCode	<u>Item 3 Conclusion</u>			<u>Item 4 Conclusion</u>		
	<u># of Contributors</u>	<u>Item 1</u>	<u>Item 2</u>	<u># of Contributors</u>	<u>Item 1</u>	<u>Item 2</u>
LT7ZPH	Based on PPY23, at least 2 males, but I note that DYS481 indicates a possible 3rd male contributor		Included	Based on PPY23, at least 1 male, although I note that DYS448 indicates a possible 2nd male. If this was a casework result I would want to carry out more PCRs before being certain. Also I note that the reference profile (item 2) has 2 peaks at DYS448.		Included
MFB9HJ	more than 2 contributors	Included	Inconclusive / Uninterpretable	2	Excluded	Included
NWDBVG	3	Included	Included	2	Excluded	Included
PCLLZF	At least 3 (IDP) / at least 2 males (y-filer)	Inconclusive / Uninterpretable	Inconclusive / Uninterpretable	At least 2 (IDP) / single source - Y-filer	Excluded	Included
R6DY2B	3	Included	Included	2	Excluded	Included
R7N4CE	at least 3	Included	Included	2	Excluded	Included
UKHAJE	3	Included	Included	2	Excluded	Included
UVG7GA	3 (three)	Included	Included	2 (two)	Excluded	Included
VCMPR7	3	Included	Included		Excluded	Included
VF6PA8	3	Included	Included	2	Excluded	Included
Y2UFV9	3	Included	Included	2	Excluded	Included

**Response Summary****Participants reporting conclusions: 28**

*Based on the examination of the DNA profiles provided, could the Victim (Item 1) and/or the Suspect (Item 2) be included as a possible contributor to the questioned Item?*

Responses	<u>Item 3</u>		<u>Item 4</u>	
	<u>Item 1</u>	<u>Item 2</u>	<u>Item 1</u>	<u>Item 2</u>
Included	<b>24</b>	<b>24</b>	<b>0</b>	<b>28</b>
Excluded	<b>1</b>	<b>0</b>	<b>27</b>	<b>0</b>
Inconclusive	<b>2</b>	<b>4</b>	<b>0</b>	<b>0</b>

# Statistical Analysis of Item 3

TABLE 5

WebCode	Item 3 Methods	Item 3 Results
47RM4Y	Likelihood Ratio	A mixed DNA profile of at least three contributors was developed from the bloodstains from suspect's shirt (Item 3). The DNA profile represented by Item 1 and Item 2 are consistent with being the contributors to this mixed DNA profile. The probability of a randomly selected unrelated individual having a DNA profile that is consistent with being one of the contributors to this mixed DNA profile (given that the known contributor is represented by Item 2) is approximately: i) 1 in 4.0 billion as calculated based on the [Country] Malay population database. ii) 1 in 29 billion as calculated based on the [Country] Chinese population database. iii) 1 in 940 million as calculated based on the [Country] Indian population database.
6D44BY	Likelihood Ratio	Fusion 5c, Identifiler and Y-STR kits are not validate in our lab. so AT and ST have been setted respectively to 50 and 75 RFU as suggested. LRmix - studio software has been used with following settings: probability of drop -out range 0.01-0.99; probability of drop-in 0.05; theta 0.01. Data are consistent with 3 person mixture senario in which Hp: S+V+U and Hd: S+2U. In this particular case identifiler results are not been considered due to surplus of drop-in. Calculation gives $LR > 10^{11}$ given 0.4 as probability of D.O. (lowest value of 95% confidence interval). Hp is extremly strong supported comparated to Hd. Haplotype has been considered for number of contributors estimation but not for calculation.
6JTJZ7	Likelihood Ratio	The DNA mixture detected in sample Item 3 is consistent with originating from at least three individuals, at least one of whom is male. Under the scenario that this DNA mixture originates from Item 1 (victim), Item 2 (suspect) and one random unrelated individual, it is 379.7 million times more likely to occur than if it originates from the suspect and two random unrelated individuals in the African American population, 116.9 million times more likely to occur than if it originates from the suspect and two random unrelated individuals in the Caucasian population and 147.8 million times more likely to occur than if it originates from the suspect and two unrelated individuals in the Hispanic population.
6UTC9W	Likelihood Ratio	Assuming the presence of Item 2 (suspect), the mixed DNA profile is approximately 3.3782 billion, 45.595 billion, and 11.084 billion times more likely to occur under the scenario that it is a mixture of DNA from the suspect, the victim, and an unknown individual, as opposed to the scenario that it originated from a mixture of DNA from the suspect and two unrelated unknown individuals, in the Caucasian, African American, and Hispanic populations, respectively.
7PC7A2	Likelihood Ratio	The LR was approximately 178 million to one, which means the DNA findings were about 178 million times more probable if (Hp) the victim, the suspect and an unrelated unknown person from the local [country] population were the contributors, than if (Hd) the suspect and two unrelated unknown persons from the local [country] population were the contributors.

TABLE 5

WebCode	Item 3 Methods	Item 3 Results
9W8PP3	Likelihood Ratio	THE VICTIM ITEM 1, THE SUSPECT ITEM 2 AND UNKNOWN MALE ARE NOT EXCLUDED AS CONTRIBUTORS OF THE CELL MIXTURE OBTAINED FOR ITEM 3.
ABM68R		No statistical calculations were performed
AFECQZ	Likelihood Ratio	X TOTAL = 2,12034733599561E-19. Y TOTAL = 1,58521890748689E-48. LR TOTAL = 1,33757383663628E29: 133.757.383.663.628.000.000.000.000
ANN24Y	Likelihood Ratio	TOTAL LR: 1,5832E+31
C6A7NX	Likelihood Ratio	Is 273.831.955.579.344 more likely that the victim, the suspect and an unknown male are the source of the mixture found in item 3 rather than the suspect and two random individuals in the population.
EKDKXQ		No statistical calculations performed. Interpretations for databasing purposes only.
F7AF9Q	Likelihood Ratio	Minimum of three contributors is too complex for a manual statistical interpretation. It is possible that we would use STRmix to calculate a likelihood ratio if the case was submitted to our organisation for review. However, under the STRmix policy for defence scientists, we are unable to access this software for a proficiency test.
H6PDEM	Likelihood Ratio	Software LRMix Studio version 2.2.0-Community Edition. Drop-out probability: 0.1. Drop-in probability: 0.05. Prosecution Hypothesis (Hp): Item1 + Item2 + Unknown. Defense Hypothesis (Hd): Item2 + 2 Unknown. LR=Hp/Hd= 4966630. LR>1000000 Extremely strong support for Hp
HAMXGL		No statistical analysis of autosomal data as it would require LR calculation not available in this lab. Partial haplotype YSTR statistic for S576,S389I,S481,S549,S533,S570,S635,S390,&S439 loci for minor donor match to Item 2 (suspect) = 1 in 433 African Americans; 1 in 217 Asians; 1 in 494 Caucasians; 1 in 318 Hispanics; 1 in 295 Native Americans.
HBTH6L		No statistics were calculated because the profile was determined to be inconclusive.
JG27HM	Likelihood Ratio	LR: (victim + suspect + 1 unkn) vs (3 unkn) = 1.46e11, with 94% d.o. applied to all subjects according to the most conservative LR result obtained with sensitivity test supported by LRMix Studio software

TABLE 5

WebCode	Item 3 Methods	Item 3 Results
KEQHNN	Likelihood Ratio	A mixed DNA profile was obtained from Item 3, the sample from the suspect's shirt. This DNA profile is consistent with the combined known profiles from the victim (Item #1), the suspect (Item #2) and an unknown contributor. It is 280 million times more likely that the observed DNA profile occurred as a result of a mixture of the victim, suspect and an unknown contributor than it having originated from the suspect and two unrelated individuals selected at random from the U.S. population.
LT7ZPH		All of these questions have been completed with respect to just the PPY23 Y-STR results provided. As such it has not been possible to answer question 2, item 1 (above) [Table 4 - DNA Analysis, Item 1 Conclusion]. We do not use any of the autosomal kits provided in this trial and therefore we have not interpreted those results. Statistical analysis of our autosomal results uses the likeLTD software, this is a LR calculation. However, this calculation requires a specific data file for the autosomal kit used. Given we don't use these kits, we do not possess the relevant data file and therefore no calculation has been undertaken. With respect to the Y-STR result, we cannot clearly determine one profile for a YHRD database comparison, but a subjective evaluation comparing the suspect's reference profile to the crime stain result could be considered however this is not a statistical analysis.
MFB9HJ		none
NWDBVG	Likelihood Ratio	ITEM 3: The LR values obtained by using the semi-continuous software LRmix Studio© v. 2.1.3 (2016) provide very strong support for the first proposition ( $H_p=V+2U$ or $H_p=S+2U$ or $H_p=V+S+1U$ ) [in a three persons mixture the victim, the suspect and one additional unknown person, unrelated to both the victim and the suspect, were the contributors] rather than the alternative ( $H_d=3U$ ) [in a three persons mixture three unknown persons, unrelated to the victim and/or to the suspect, were the contributors] (verbal scale according to: ENFSI guideline for evaluative reporting in forensic science, 2015). $\log_{10}$ (LR) for all the tested scenarios is always $> 5.3$ indicating that both victim and suspect extremely strongly appear to be two out of the three contributors of ITEM 3 mixed stain.
PCLLZF		#2 vs. #3 = Uninterpretable for IDP / Cannot be eliminated for Y-Filer. 1 in 529 males in the African American population, 1 in 1351 males in the Asian population, 1 in 3446 males in the Caucasian population, 1 in 1722 males in the Hispanic population, 1 in 1400 males in the Native American population. Stats performed at all loci except DYS389I, DYS389II, and DYS448

TABLE 5

WebCode	Item 3 Methods	Item 3 Results
R6DY2B	Likelihood Ratio	A mixed DNA profile of at least three contributors was developed from the bloodstains from suspect's shirt (Item 3).The DNA profile represented by Item 1 and Item 2 are consistent with being the contributors to this mixed DNA profile.The probability of a randomly selected unrelated individual having a DNA profile that is consistent with being one of the contributors to this mixed DNA profile (given that the known contributor is represented by Item 2) is approximately: i) 1 in 4.0 billion as calculated based on the [Country] Malay population database. ii) 1 in 29 billion as calculated based on the [Country] Chinese population database. iii) 1 in 940 million as calculated based on the [Country] Indian population database.
R7N4CE		No statistical analysis performed; Reported for databasing purposes only
UKHAJE	Random Match Probability	The discriminating loci were used for this calculation D8S1179, D21S11, CSF1PO, TH01, vWA, D18S51, and FGA. The possible genotypes occurs approximately once out of 338 member of the Caucasian, African American and Hispanic populations.
UVG7GA	Likelihood Ratio	Chance to find Item 1 in DNA Mixture Item 3 is 1,092 E006. Chance to find Item 2 in DNA Mixture Item 3 is 3,152 E007
VCMPR7	Combined Probability of Exclusion/Inclusion	According to the calculation by Combined Probability of Inclusion(CPI) for Item3, 1 in 116 thousand [Country population] can be included as potential contributors to this mixture. *CPE= 99.9991% for [Country population]
VF6PA8	Likelihood Ratio	A mixed DNA profile of at least three contributors was developed from the bloodstains from suspect's shirt (Item 3).The DNA profile represented by Item 1 and Item 2 are consistent with being the contributors to this mixed DNA profile. The probability of a randomly selected unrelated individual having a DNA profile that is consistent with being one of the contributors to this mixed DNA profile (given that the known contributor is represented by Item 2) is approximately: 1) 1 in 4.0 billion as calculated based on [Country] Malay population database. 2) 1 in 29 billion as calculated based on [Country] Chinese population database. 3) 1 in 940 million as calculated based on [Country] Indian population database.
Y2UFV9	Combined Probability of Exclusion/Inclusion	CPE/CPI of the combined major profile of Item 3: 99.9999992633% or all but 1 in 130 million in Caucasians, 99.999998118% or all but 1 in 530 million in African American, and 99.999995863% or all but 1 in 240 million in Southwest Hispanic. YSTR Statistics of the minor YSTR profile of Item 3: 1 in 2,500

# Statistical Analysis of Item 4

## TABLE 6

WebCode	Item 4 Methods	Item 4 Results
47RM4Y	Likelihood Ratio	A mixed DNA profile of at least two contributors was developed from the bloodstains from knife blade (Item 4). The DNA profile represented by Item 2 is consistent with being one of the contributors to this mixed DNA profile. The probability of a randomly selected unrelated individual having a matching DNA profile with the DNA profile of Item 2 and consistent with being one of the contributors to this mixed DNA profile is approximately: i) 1 in 460 trillion as calculated based on the [Country] Malay population database. ii) 1 in 89 trillion as calculated based on the [Country] Chinese population database. iii) 1 in 22 trillion as calculated based on the [Country] Indian population database.
6D44BY	Likelihood Ratio	Calculation has been performed under the same conditions of the previous one (ITEM 3). Number of contributors has been set to 2 by allele counting. The following scenario has been investigated-Hp: S+U compared to Hd: 2U. The Whole range of probability D.O. has been searched. In this case LR values range between $10^{20}$ to $10^{-5}$ . LRs get $<1$ for a probability D.O. $>0.7$ which is quite unusual in real cases. A 0.5 probability D.O. with a corresponding LR value of $10^{10}$ has been considered quite conservative. Moreover, a non-contributor test has been performed. No one LR $>1$ has been obtained so that Hp has been considered the true hypothesis and "very strong supported".
6JTJZ7	Combined Probability of Exclusion/Inclusion	The DNA mixture detected in Item 4 is consistent with originating from at least two individuals, at least one of whom is male. The suspect (item 2) is included as a contributor to the DNA mixture detected in Item 4. The probability of randomly selecting an unrelated individual who would be included as a contributor to the DNA mixture is 1 in 25.21 million in the African American population, 1 in 2.02 million in the Caucasian population and 1 in 6.305 million in the Hispanic population. The victim (Item 1) is excluded as a contributor to the DNA mixture detected in this sample.
6UTC9W	Likelihood Ratio	The observed mixture profile is approximately 1.4743 quintillion, 3.647 quadrillion, and 387.16 quadrillion times more likely to occur under the scenario that it is a mixture of DNA from the suspect and an unknown individual, as opposed to the scenario that it originated from a mixture of DNA from two unrelated unknown individuals, in the Caucasian, African American, and Hispanic population, respectively.
7PC7A2	Likelihood Ratio	The LR was approximately 54.9 billion to one, which means the DNA findings were about 54.9 billion times more probable if (Hp) the suspect and an unrelated unknown person from the local [country] population were the contributors, than if (Hd) two unrelated unknown persons from the local [country] population were the contributors.
9W8PP3	Likelihood Ratio	THE SUSPECT ITEM 2 AND UNKNOWN FEMALE ARE NOT EXCLUDED AS CONTRIBUTORS OF THE CELL MIXTURE OBTAINED FOR ITEM 4.
ABM68R	Likelihood Ratio	Total Likelihood Ratio is $1.00291 \times 10^{25}$

TABLE 6

WebCode	Item 4 Methods	Item 4 Results
ANN24Y	Likelihood Ratio	TOTAL LR: 4,1619E+22
C6A7NX	Likelihood Ratio	Is 41.755.302.810.081.400.000.000 more likely that the suspect and an unknown individual are the source of the mixture found in item 4, rather than 2 random individuals in the population.
EKDKXQ		No statistical calculations performed. Interpretations for databasing purposes only.
F7AF9Q	Likelihood Ratio	It is a general policy that we do not manually calculate statistical weightings for mixed DNA profiles. It is possible that we would use STRmix to calculate a likelihood ratio if the case was submitted to our organisation for review. However, under the STRmix policy for defence scientists, we are unable to access this software for a proficiency test.
H6PDEM	Likelihood Ratio	Software LRMix Studio version 2.2.0-Community Edition. Drop-out probability: 0.1. Drop-in probability: 0.05. Prosecution Hypothesis (Hp):Item2 + Unknown. Defense Hypothesis (Hd): 2 Unknown. LR=Hp/Hd= 422590000. LR>1000000 Extremely strong support for Hp
HAMXGL		No statistical analysis of autosomal data as it would require LR calculation not available in this lab. Partial haplotype YSTR statistic for S576, S389I, S448, S391, S481, S549, S570, S635, S390, S393, S458 & S385 loci = 1 in 433 African Americans; 1 in 217 Asians; 1 in 494 Caucasians; 1 in 318 Hispanics; 1 in 295 Native Americans.
HBTH6L	Combined Probability of Exclusion/Inclusion	1 in 588 million African Americans. 1 in 1 billion Caucasian Americans. 1 in 576 million Hispanics
JG27HM	Likelihood Ratio	LR: (suspect + 1 unkn) vs (2 unkn) = 1.64e17 (suspect + victim) vs (suspect + 1 unkn) = 1.26e-29
KEQHHN	Likelihood Ratio	A mixed DNA profile was obtained from Item 4, the sample from the knife blade found at the scene. This DNA profile is consistent with the combined profiles of the known suspect (Item #2) and an unknown contributor. It is 210 billion times more likely that the observed DNA profile occurred as a result of a mixture of the suspect and an unknown contributor than it having originated from two unrelated individuals selected at random from the U.S. population.



TABLE 6

WebCode	Item 4 Methods	Item 4 Results
LT7ZPH		All of these questions have been completed with respect to just the PPY23 Y-STR results provided. As such it has not been possible to answer question 2, item 1 (above) [Table 4 - DNA Analysis, Item 1 Conclusion]. We do not use any of the autosomal kits provided in this trial and therefore we have not interpreted those results. Statistical analysis of our autosomal results uses the likeLTD software, this is a LR calculation. However, this calculation requires a specific data file for the autosomal kit used. Given we don't use these kits, we do not possess the relevant data file and therefore no calculation has been undertaken. With respect to the Y-STR result, the profile could be compared to the YHRD international database to establish a frequency of occurrence, but ordinarily further PCRs would have to be undertaken to confirm the presence of some peaks, to establish a likely single source and if possible the ethnic origin of the suspect would be required.
MFB9HJ	Likelihood Ratio	1 in 2,873,368,758,374,990. Posterior Probability more than 99.99999999%
NWDBVG	Likelihood Ratio	ITEM 4: The LR values obtained by using the semi-continuous software LRmix Studio© v. 2.1.3 (2016) provide extremely strong support for the first proposition (Hp=S+1U) [in a two persons mixture the suspect and one additional unknown person, unrelated to the suspect, were the contributors] rather than the alternative (Hd=2U) [in a two persons mixture two unknown persons, unrelated to the suspect, were the contributors] (verbal scale according to: ENFSI guideline for evaluative reporting in forensic science, 2015). Log10 (LR) is > 13 indicating that suspect extremely strongly appears to be one out of the two contributors of ITEM 4 mixed stain. The LR values obtained by using the semi-continuous software LRmix Studio© v. 2.1.3 (2016) provide extremely strong support for the second proposition (Hd=2U) [in a two persons mixture two unknown persons, unrelated to the victim, were the contributors] rather than the alternative (Hp= V+1U) [in a two persons mixture the victim and one additional unknown person, unrelated to the victim, were the contributors] (verbal scale according to: ENFSI guideline for evaluative reporting in forensic science; 2015). Log10 (LR) is < -22 indicating that victim extremely strongly appears to be excluded as contributor of ITEM 4 mixed stain.
PCLLZF	Combined Probability of Exclusion/Inclusion	CPI - IDP: ~1 in 918 million in the African American population, ~1 in 155 million in the Caucasian population, ~1 in 315 million in the Hispanic population. Counting Method - Y-filer: 1 in 2294 males in the African American population, 1 in 1353 males in the Asian population, 1 in 2770 males in the Caucasian population, 1 in 1745 males in the Hispanic population, 1 in 1222 males in the Native American population. Stats performed at all loci except DYS448

TABLE 6

WebCode	Item 4 Methods	Item 4 Results
R6DY2B	Likelihood Ratio	A mixed DNA profile of at least two contributors was developed from the bloodstains from knife blade (Item 4).The DNA profile represented by Item 2 is consistent with being one of the contributors to this mixed DNA profile. The probability of a randomly selected unrelated individual having a matching DNA profile with the DNA profile of Item 2 and consistent with being one of the contributors to this mixed DNA profile is approximately: i) 1 in 460 trillion as calculated based on the [Country] Malay population database. ii) 1 in 89 trillion as calculated based on the [Country] Chinese population database. iii) 1 in 22 trillion as calculated based on the [Country] Indian population database.
R7N4CE		No statistical analysis performed; Reported for databasing purposes only
UKHAJE	Random Match Probability	The genotypes occur approximately once out of one billion member of the Caucasian, African American and Hispanic populations.
UVG7GA	Likelihood Ratio	Chance to find Item 1 in DNA Mixture Item 4 is 8.038 E-020. Chance to find Item 2 in DNA Mixture Item 4 is 6,079 E012
VCMPR7	Combined Probability of Exclusion/Inclusion	According to the calculation by Combined Probability of Inclusion(CPI) for Item4, 1 in 1.0 billion [Country population] can be included as potential contributors to this mixture. *CPE= 99.9999% for [Country population]
VF6PA8	Likelihood Ratio	A mixed DNA profile of at least two contributors was developed from the bloodstains from knife blade (Item 4).The DNA profile represented by Item 2 is consistent with being one of the contributors to this mixed DNA profile. The probability of a randomly selected unrelated individual having a matching DNA profile with the DNA profile of Item 2 and consistent with being one of the contributors to this mixed DNA profile is approximately: 1) 1 in 460 trillion as calculated based on [Country] Malay population database. 2) 1 in 89 trillion as calculated based on [Country] Chinese population database. 3) 1 in 22 trillion as calculated based on [Country] Indian population database.
Y2UFV9	Combined Probability of Exclusion/Inclusion	CPE/CPI of the combined major profile of Item 3: 99.9999989460% or all but 1 in 96 million in Caucasians, 99.9999997970% or all but 1 in 490 million in African American, and 99.9999995351% or all but 1 in 210 million in Southwest Hispanic

# Databases Used

TABLE 7

WebCode	Databases Used
47RM4Y	<p>Item 3: 1. [Country] Malay population database. 2. [Country] Chinese population database. 1. [Country] Indian population database.</p> <p>Item 4: 1. [Country] Malay population database. 2. [Country] Chinese population database. 1. [Country] Indian population database.</p>
6D44BY	<p>Item 3: Penta E and Penta D caucasian population allele frequencies published on NIST web page have been used. For the rest of loci, caucasian population allele frequencies published on NGM Select and Identifiler plus have been used.</p> <p>Item 4: Penta E and Penta D caucasian population allele frequencies published on NIST web page have been used. For the rest of loci, caucasian population allele frequencies published on NGM Select and Identifiler plus have been used.</p>
6JTJZ7	<p>Item 3: [Laboratory] Allele frequency data is not available for D19S433 and D2S1338 loci for the population groups above.</p> <p>Item 4: [Laboratory] Allele frequency data is not available for D19S433 and D2S1338 loci for the three population groups.</p>
6UTC9W	<p>Item 3: Lab Retriever, US Y-STR database</p> <p>Item 4: Lab Retriever, US Y-STR database</p>
7PC7A2	<p>Item 3: Alleles frequencies are quoted from the local [country] population data published in Chan et al, Forensic Science International 152 (2005) 307-309.</p> <p>Item 4: Allele frequencies are quoted from the local [country] population data published in Chan et al, Forensic Science International 152 (2005) 307-309.</p>
9W8PP3	<p>Item 3: DNA MIX, WEIR B.S et al., 1997. PAREDES et al., J. For. Sci. Int. Vol 137:67-73, 2003. [Location] Yunis et al., J. For. Sci. Vol 50: 1-18,N°3,2005. Penta E and Penta D Porras et al., J. For. Sci. Int. Genetics e7-8,2008. D2S1338 and D19S433. [Location] population Burgos et al., J. For. Sci. Genetics, supplement series. Vol 5, e81-e82, 2015. D10S1248 and D22S10245 Hill et al., J.For.Sci.Int. Genetics, 5, 2011. D2S441 and D1S656. Hispanic population.</p> <p>Item 4: DNA MIX, WEIR B.S et al., 1997. PAREDES et al., J. For. Sci. Int. Vol 137:67-73, 2003. [Location] Yunis et al., J. For. Sci. Vol 50: 1-18,N°3,2005. Penta E and Penta D Porras et al., J. For. Sci. Int. Genetics e7-8,2008. D2S1338 and D19S433. [Location] population Burgos et al., J. For. Sci. Genetics, supplement series. Vol 5, e81-e82, 2015. D10S1248 and D22S10245 Hill et al., J.For.Sci.Int. Genetics, 5, 2011. D2S441 and D1S656. Hispanic population.</p>
ABM68R	<p>Item 4: Inhouse (Laboratory) database</p>

TABLE 7

WebCode	Databases Used
AFECQZ	<p>Item 3: [Participant created a manually formatted table within the free form text space. This special formatting was not transferable into the final report.] D8S1179: 10 = 0,06; 11 = 0,079; 12 = 0,122; 13 = 0,333; 14 = 0,251; 15 = 0,11; 16 = 0,027; 8 = 0,006; 9 = 0,012. D21S11: 26 = 0,001; 26,2 = 0,002; 27 = 0,015; 28 = 0,098; 29 = 0,207; 30 = 0,293; 30,2 = 0,031; 31 = 0,067; 31,2 = 0,089; 32 = 0,021; 32,2 = 0,127; 33 = 0,002; 33,2 = 0,042; 34 = 0,001; 34,2 = 0,004. D7S820: 10 = 0,281, 11 = 0,285; 12 = 0,174; 13 = 0,038; 14 = 0,003; 5 = 0,001; 6 = 0,001; 7 = 0,022; 8 = 0,107; 9 = 0,088. D3S1358: 13 = 0,003; 14 = 0,101; 15 = 0,372; 16 = 0,268; 17 = 0,139; 18 = 0,105; 19 = 0,011; 20 = 0,001. CSF1PO: 10 = 0,228; 11 = 0,297; 12 = 0,364; 13 = 0,066; 14 = 0,009; 7 = 0,006; 8 = 0,009; 9 = 0,021. TH01: 10 = 0,008; 6 = 0,374; 7 = 0,246; 8 = 0,076; 9 = 0,117; 9,3 = 0,179. D13S317: 10 = 0,066; 11 = 0,219; 12 = 0,295; 13 = 0,124; 14 = 0,059; 14,2 = 0,002; 8 = 0,083; 9 = 0,151 Rest Allele 0,001. D16S539: 10 = 0,159 ;11 = 0,266; 12 = 0,26; 13 = 0,119; 14 = 0,024; 15 = 0,001; 5 = 0,001; 8 = 0,011; 9 = 0,159. D2S1338: 15 = 0,0003; 16 = 0,0379; 17 = 0,1704; 18 = 0,0572; 19 = 0,1485; 20 = 0,1294; 21 = 0,0342; 22 = 0,1268; 23 = 0,1298; 24 = 0,0755; 25 = 0,0779; 26 = 0,0071; 27 = 0,005. D19S433: 10 = 0,0008;11 = 0,0064; 11,2 = 0,0015; 12 = 0,0781; 12,2 = 0,0064; 13 = 0,2798; 13,2 = 0,0773; 14 = 0,2716; 14,2 = 0,036; 15 = 0,1358; 15,2 = 0,0517; 16 = 0,0386; 16,2 = 0,0129; 17 = 0,0023; 17,2 = 0,0008. VWA: 13 = 0,002; 14 = 0,047; 15 = 0,089; 16 = 0,358; 17 = 0,28; 18 = 0,165; 19 = 0,047; 20 = 0,01; 21 = 0,002. TPOX: 10 = 0,046; 11 = 0,263; 12 = 0,105; 13 = 0,003; 14 = 0,001; 6 = 0,003; 7 = 0,002; 8 = 0,505; 9 = 0,072. D18S51: 10 = 0,011; 11 = 0,009; 12 = 0,126; 13 = 0,121; 14 = 0,164; 14,2 = 0,001; 15 = 0,136; 16 = 0,134; 17 = 0,149; 18 = 0,062; 19 = 0,039; 20 = 0,027; 21 = 0,013; 22 = 0,004; 23 = 0,003 Rest Allele 0,001. D5S818: 10 = 0,073; 11 = 0,418; 12 = 0,256; 13 = 0,132; 14 = 0,001; 7 = 0,029; 8 = 0,008; 9 = 0,078 Rest Allele 0,005. FGA: 18 = 0,012; 19 = 0,066; 19,2 = 0,001; 20 = 0,082; 20,2 = 0,001; 21 = 0,118; 21,2 = 0,002; 22 = 0,135; 22,2 = 0,004; 23 = 0,148; 24 = 0,169; 25 = 0,149; 25,2 = 0,001; 26 = 0,076; 27 = 0,024; 28 = 0,01; 29 = 0,002. PENTA E: 10 = 0,0574; 11 = 0,0867; 12 = 0,1689; 13 = 0,0876; 14 = 0,0911; 15 = 0,1044; 16 = 0,0611; 17 = 0,0385; 18 = 0,032; 19 = 0,0287; 20 = 0,0379; 21 = 0,0243; 22 = 0,0114; 23 = 0,006; 24 = 0,0031; 25 = 0,0008; 26 = 0,0002; 5 = 0,0383; 6 = 0,0012; 7 = 0,0894; 8 = 0,0216; 9 = 0,0094. PENTA D: 10 = 0,2222; 11 = 0,1967; 12 = 0,1464; 13 = 0,1499; 14 = 0,0551; 15 = 0,0123; 16 = 0,0042; 17 = 0,0006; 2,2 = 0,0083; 3,2 = 0,0006; 5 = 0,0025; 6 = 0,0004; 7 = 0,0044; 8 = 0,0185; 9 = 0,1767 Rest Allele 0,0012. D10S1248: 10 = 0,0033; 11 = 0,0111; 12 = 0,0322; 13 = 0,2667; 14 = 0,35; 15 = 0,23; 16 = 0,0833; 17 = 0,02; 18 = 0,0033 Rest Allele 0,0001. D2S441: 10 = 0,348; 11 = 0,284; 11,3 = 0,049; 12 = 0,039; 12,3 = 0,001; 13 = 0,021; 14 = 0,21; 15 = 0,046; 16 = 0,001; 17 = 0,001. D1S1656: 11 = 0,024; 12 = 0,077; 13 = 0,107; 14 = 0,122; 14,3 = 0,003; 15 = 0,15; 15,3 = 0,054; 16 = 0,177; 16,3 = 0,055; 17 = 0,039; 17,3 = 0,149; 18 = 0,006; 18,3 = 0,025; 19 = 0,01 Rest Allele 0,002. D12S391: 15 = 0,0333; 16 = 0,0067; 17 = 0,0567; 17,3 = 0,01; 18 = 0,2233; 18,3 = 0,02; 19 = 0,2433; 19,3 = 0,01; 20 = 0,1767; 21 = 0,0633; 22 = 0,0533; 23 = 0,08; 24 = 0,0133; 25 = 0,0033; 26 = 0,0067 Rest Allele 0,0001</p>

TABLE 7

WebCode	Databases Used
ANN24Y	<p>Item 3: The allelic frequencies used for the statistical analyzes correspond to the [Location] (Paredes, et al., For. Sci. Int. Vol 137: 67-73, 2003); [Location] population systems: D2S1338 and D19S433 (Porras et al., For. Sci. Int. Genetics e7-e8, 2008), SE33 (Paredes, M. and Laverde, L. Book of Abstracts, 18th Triennial Meeting of IAFS, 2008) , D10S1248 and D22S1045 (Burgos et al., For. Sci. Int. Gen. Supplement Series, Volume 5, e81-e82, 2015), D12S391 (Jiménez M., 1999), PENTA E and PENTA D (Yunis et al. Sci. Vol. 50: 1-18, 2005).</p> <p>Item 4: The allelic frequencies used for the statistical analyzes correspond to the [Location] (Paredes, et al., For. Sci. Int. Vol 137: 67-73, 2003); [Location] population systems: D2S1338 and D19S433 (Porras et al., For. Sci. Int. Genetics e7-e8, 2008), SE33 (Paredes, M. and Laverde, L. Book of Abstracts, 18th Triennial Meeting of IAFS, 2008) , D10S1248 and D22S1045 (Burgos et al., For. Sci. Int. Gen. Supplement Series, Volume 5, e81-e82, 2015), D12S391 (Jiménez M., 1999), PENTA E and PENTA D (Yunis et al. Sci. Vol. 50: 1-18, 2005).</p>
C6A7NX	<p>Item 3: Población de la [Location] (Paredes et al., For. Sci. Int. Vol 137:67-73, 2003), población [Location] para los sistemas D2S1338 D19S433 (Porras et al., For. Sci. Int. Genetics e7-e8, 2008), para los sistemas D10S1248 y D22S1045 (Burgos et al., Tesis Universidad de Antioquia, 2008), para el sistema D12S391 (Jiménez M., 1999), para los sistemas PENTA E y PENTA D (Yunis, et al., J. For. SciVol 50:1-18, 2005) y población hispana sistemas D2S441 y D1S1656 (Hill et al., For. Sci. Int. Gen. 5, 2011).</p> <p>Item 4: Población de la [Location] (Paredes et al., For. Sci. Int. Vol 137:67-73, 2003), población [Location] para los sistemas D2S1338 D19S433 (Porras et al., For. Sci. Int. Genetics e7-e8, 2008), para los sistemas D10S1248 y D22S1045 (Burgos et al., Tesis Universidad de Antioquia, 2008), para el sistema D12S391 (Jiménez M., 1999), para los sistemas PENTA E y PENTA D (Yunis, et al., J. For. SciVol 50:1-18, 2005) y población hispana sistemas D2S441 y D1S1656 (Hill et al., For. Sci. Int. Gen. 5, 2011).</p>
EKDKXQ	<p>Item 3: n/a</p> <p>Item 4: n/a</p>
F7AF9Q	<p>Item 3: N/A</p> <p>Item 4: N/A</p>
H6PDEM	<p>Item 3: A.Berti et al. "Allele frequencies of the new European Standard Set (ESS) loci in the [Country] population." Forensic Science International: Genetics 5 (2011) 548–549.</p> <p>Item 4: A.Berti et al. "Allele frequencies of the new European Standard Set (ESS) loci in the [Country] population." Forensic Science International: Genetics 5 (2011) 548–549.</p>
HAMXGL	<p>Item 3: US YSTR database (<a href="http://www.usystrdatabase.org">www.usystrdatabase.org</a>).</p> <p>Item 4: US YSTR database (<a href="http://www.usystrdatabase.org">www.usystrdatabase.org</a>)</p>
HBTH6L	Item 4: NIST
JG27HM	<p>Item 3: NIST caucasian</p> <p>Item 4: NIST caucasian</p>
KEQHNN	<p>Item 3: FBI, Amended 2015: BLK, CAU, SWH.</p> <p>Item 4: FBI, Amended 2015: BLK, CAU, SWH.</p>
MFB9HJ	<p>Item 3: none</p> <p>Item 4: Caucasian FBI STR Population Data 2015</p>

TABLE 7

WebCode	Databases Used
NWDBVG	<p>Item 3: [Country] caucasian allelic frequencies: Allele frequencies of fifteen STRs in a representative sample of the [Country] population. Brisighelli F, Capelli C, Boschi I, Garagnani P, Lareu MV, Pascali VL, Carracedo A. Forensic Sci Int Genet. 2009 Mar;3(2):e29-30. Allele frequencies of the new European Standard Set (ESS) loci in the [Country] population. Berti A, Brisighelli F, Bosetti A, Pilli e, Trapani C, Tullio V, Franchi C, Lago G, Capelli C. Forensic Sci Int Genet. 2011 Nov;5(5):548-9.</p> <p>Item 4: [Country] caucasian allelic frequencies: Allele frequencies of fifteen STRs in a representative sample of the [Country] population. Brisighelli F, Capelli C, Boschi I, Garagnani P, Lareu MV, Pascali VL, Carracedo A. Forensic Sci Int Genet. 2009 Mar;3(2):e29-30. Allele frequencies of the new European Standard Set (ESS) loci in the [Country] population. Berti A, Brisighelli F, Bosetti A, Pilli e, Trapani C, Tullio V, Franchi C, Lago G, Capelli C. Forensic Sci Int Genet. 2011 Nov;5(5):548-9.</p>
PCLLZF	<p>Item 3: usystrdatabase.org - [Laboratory] - Y-Mixture Tool</p> <p>Item 4: IDP - CT DNA Database. Y-Filer - usystrdatabase.org</p>
R6DY2B	<p>Item 3: i) [Country] Malay population database. ii)[Country] Chinese population database. iii) [Country] Indian population database.</p> <p>Item 4: i) [Country] Malay population database. ii)[Country] Chinese population database. iii) [Country] Indian population database.</p>
UKHAJE	<p>Item 3: Modified FBI</p> <p>Item 4: Modified FBI</p>
UVG7GA	<p>Item 3: Software used: LR-MIX Studio Database: Frequency values reported in Garofano et al. "Allele frequencies of [country] population data on thirteen short tandem repeat loci". FSI (98) 1998.</p> <p>Item 4: Software used: LR-MIX Studio Database: Frequency values reported in Garofano et al. "Allele frequencies of [country] population data on thirteen short tandem repeat loci". FSI (98) 1998.</p>
VCMR7	<p>Item 3: [Country] population DNA database set</p> <p>Item 4: [Country] population DNA database set</p>
VF6PA8	<p>Item 3: 1) [Country] Malay population database. 2) [Country] Chinese population database. 3) [Country] Indian population database.</p> <p>Item 4: 1) [Country] Malay population database. 2) [Country] Chinese population database. 3) [Country] Indian population database.</p>
Y2UFV9	<p>Item 3: US Y-STR Database POPSTATS UBFS_BASS_Calc</p> <p>Item 4: POPSTATS UBFS_BASS_Calc</p>

## Amplification Kit Survey

Please list all PCR amplification kits (Autosomal and YSTR) utilized as well as any future kits to be implemented in your laboratory.

TABLE 8

WebCode	Amplification Kit
7PC7A2	Identifiler Plus, Yfiler, Minifiler, Profiler Plus
ABM68R	Autosomal kits: Powerplex Fusion, Powerplex ESX, Powerplex ESI, AmpFISTR NGM. Y-STR kits: Powerplex Y23, AmpFISTR Y-Filer
HAMXGL	I work for a consulting group and we do not currently do DNA analysis on site.
KEQHNN	The PowerPlex Fusion 6C amplification kit will be used as of January 1st of 2017. PowerPlex Y23 will replace the Yfiler kit and will be introduced in early 2017.
LT7ZPH	NGM SElect. PPY23.
NWDBVG	In our laboratory, when the epg suggest a typical Low-Template DNA condition, even if it is referred to the minor contributor/contributors in the mixture, we replicate the DNA typing procedure at leasty twice in order to evaluate the overall result. Thus, for the next future, we would suggest to replicate the DNA typing on LT DNA evidence. We also suggest introducing the Fusion 6C and/or the GlobalFiler kits.
R7N4CE	Identifiler, GlobalFiler, PPY23
VCMPR7	Powerplex Fusion(5C), Globalfiler, Identifiler, Identifiler Plus, Y23, Yfiler, Y-filer Plus
Y2UFV9	Current Kits: Identifiler Plus, YFiler Future Kits: Globalfiler, YFiler Plus

# Additional Comments

TABLE 9

WebCode	Additional Comments
47RM4Y	The AT and ST for STR analysis are based on GeneMapper ID-X and GA 3130xL. The statistical calculation was done using DNA-VIEW Software Ver 34.22.
7PC7A2	Instead of using our own laboratory's interpretation guidelines, the guidelines as provided on Page 2 have been applied for the evaluation of this test. Different genetic analyzers and testing conditions will lead to different performance characteristics, hence, it is considered inappropriate to apply our own set of in-house guidelines developed for the testing platforms and conditions in our laboratory, to data generated by another laboratory. Our laboratory's in-house interpretation guidelines are: ID Plus using AB 3500: The range of AT is 85-225 rfu; the range of ST is 295-635 rfu (Dye channel specific); minimum PHR is 53.1-77.3% (locus specific). Yfiler using AB 3130: AT is 146 rfu. I have doubt on the interpretation guidelines given on Page 1 as it is unreasonable that STR stochastic threshold (50 rfu) is lower than the analytical threshold (75 rfu).
ABM68R	Standard options used for fragments analyses in GeneMarker: peak detection threshold -> min. intensity: 30rfu, percentage:>3% global max. local region:>15% local max, stutter peak filter; left 45% and right 15%. it also depends on the positive control, negative control and ladder used in the kit. For degraded or weak samples we call the peaks for heterozygosity above 20 rfu and for homozygosity above 30 rfu. For mixed profiles containing both low and high peaks, whether a low peak is called or not, also depends on factors such as the likelihood of the peak being stutter and the amount of background noise in the profile in general. Statistical analyses were performed on autosomal results only.
ANN24Y	Item 3: The D2S1338 systems in autosomics and DYS19, DYS643 and DYS456 in Y chromosome were not considered for the analysis taking into account reproducibility, peak heights and Stutter, so you do not favor any of the hypotheses.
EKDKXQ	Item 3, locus DYS635 marked inconclusive (INC) due to 21 allele detected in Reagent Blank ND-Q at DYS635. The alleles detected for item 4, locus DYS635 were reported because there was no 21 allele present.
HAMXGL	At least one unidentified DNA donor is present in both Items 3 and 4 so additional reference samples should be compared to these samples. The PHR imbalance (46.2%) in the positive control at D7S820 is acceptable as there is no other indication of a second donor. The [21] alleled present in the "Reagent Blank-ND's" DYS635 locus is beneath our lab's analytical threshold of 75 rfu and does not affect the interpretation of the YSTR data.
JG27HM	the analysis of the two stains demonstrates that on the suspect's shirt there is high evidence of the presence of the victim DNA, together with suspect DNA and a third unknown person, while on the knife blade there is no evidence about the presence of the victim's DNA.
LT7ZPH	If NGM SElect results were provided I would be able to properly attempt every section of this test and would be able to attempt statistical analysis of the results, where appropriate.
MFB9HJ	1. STR Analysis for Item 1: used SF034258 16-589 Item 1 profile. Item 2: used SF034258 16-589 Item 2 profile. Item 3: used 16-589 Item 3 profile. Item 4: used SF034258 16-589 Item 4 profile. 2. Our laboratory do not use Identifiler Plus Kit. In this case, we used Interpretation guidelines that the test specified (except Stochastic Threshold used 150 rfu).
NWDBVG	Reference samples (ITEM 1 and ITEM 2). We reported only signals referred to the person originating the biological material and we excluded (we cut-off) additional (low height) signals because we considered them as artefactual. Mixed stain ITEM 3. We reported all the signals detected above the 50 RFU threshold (excluding only the clear artifacts such as the OL and OMR signals) and we used the reported signals in the autosomal STRs profiles for the probabilistic analysis of the weight of evidence (LR). The DNA mixture ITEM 3 was stated as originated from 3 individuals and this was also suggested by the



TABLE 9

WebCode	Additional Comments
	Y-STRs haplotypes. The LR was calculated by the semicontinuous software LRmix Studio v. 2.1.3 (2016) considering a drop-out probability of 0.1. The LR results very strongly supported the inclusion of both the victim and the suspect. We also consider allele 26 at DYS481 as artefactual signal and we exclude it for number of contributor estimation. Mixed stain ITEM 4. We reported all the signals detected above the 50 RFU threshold (excluding only the clear artifacts such as the OL and OMR signals) and we used the reported autosomal signals for the probabilistic analysis of the weight of evidence (LR). Nonetheless we argued that the following signals should be reasonably considered as artefactual: signal 36 at D21S11 locus; signals 17.2, 21.2, 32.2 at locus FGA; signal 10 at TPOX locus. Considering the detected signals in the autosomal epg but also considering that the aforementioned signals could be artifacts we the DNA mixture ITEM 4 was stated as originated from 2 individuals and this was also suggested by the Y-STRs haplotypes. The LR was calculated by the semicontinuous software LRmix Studio v. 2.1.3 (2016).
PCLLZF	The Identifiler Plus results demonstrate that item #3 is a mixture of at least 3 individuals. Based upon the complexity of the Identifiler Plus DNA profile, no comparisons can be made to this mixture. The Y-filer results demonstrate that item #3 is a mixture of at least 2 males. The suspect (item #2)(or another member of the same paternal lineage) cannot be eliminated as a contributor to the Y-filer DNA profile from item #3. The Identifiler Plus results demonstrate that item #4 is a mixture of at least 2 individuals. The victim (item #1) is eliminated as a contributor to the Identifiler DNA profile from item #4. The suspect (item #2) is included as a contributor to the Identifiler DNA profile from item #4. The results are consistent with the suspect (item #2)(or another member of the same paternal lineage) being the source of the Y-filer DNA profile from item #4.
R6DY2B	The statistical calculation was done using DNA-VIEW Software Ver 34.22
R7N4CE	Y-STR results @ DYS635 reported as INC for Item 3 due to an allele above analytical threshold (21 @ DYS635) in the associated reagent blank, given that the item had the same allele at same locus.
UKHAJE	*The laboratory's interpretation protocols use a 5-second injection time. This data set contained 10-second injection time samples only. The amount of DNA amplified was not stated. The laboratory protocol uses template amounts for interpretation processes. Since the template amount was unknown the PHR of 40% was used. The laboratory's stochastic level for a 5-second injection is 150 RFU; the 5-second injection is used in the evaluation of genotype calls in 10-second injections. The 5-second injection data was not available. Thus alleles less than 300 RFU were deemed to be at a potential stochastic level.
UVG7GA	Victim genotype from Item 1 is NOT present in DNA mixture Item 4. Suspect genotype from Item 2 is present in DNA mixture Item 4. DNA mixture from Item 3 is originated from at least 3 contributors. Victim genotype (item 1) and Suspect genotype (item 2) are both contributors of DNA mixture Item 3.
VCMPR7	We interpreted A-STR using the common allele from the Identifier and ProFlexFusion(5C) kit. But Y-STR, we combined the data together(Y-Filer and Y23) to get more information.
VF6PA8	The statistical calculation was done using the DNA-View Software Ver 34.22
Y2UFV9	Item 3 STR Analysis: contains a 3 person mixture. Item 3 contains a two person indistinguishable major profile. No conclusions shall be drawn regarding the minor profile. Item 3 YSTR Analysis: contains a 2 person YSTR mixture with a Major and Minor Profile. Item 4 STR Analysis: contains an indistinguishable 2 person mixture. Item 4 YSTR Analysis: contains a single male contributor. Interpretation of this profile is inconclusive. Item 2 (reference) matches Item 4 at all loci except DYS448. At this locus Item 2 has a 20,21 and Item 4 has a 20, with possible allele activity at 21 but below analytical threshold. Without the ability to reamplify these samples, they would be reported as inconclusive.

# Appendix: Data Sheet

Collaborative Testing Services ~ Forensic Testing Program

## Test No. 16-589: DNA Interpretation

DATA MUST BE RECEIVED BY December 19, 2016 TO BE INCLUDED IN THE REPORT

Participant Code:

WebCode:

### Accreditation Release Statement

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and A2LA. Please select one of the following statements to ensure your data is handled appropriately.

- This participant's data is intended for submission to ASCLD/LAB, ANAB, and/or A2LA. (Accreditation Release section on the last page must be completed and submitted.)
- This participant's data is **NOT** intended for submission to ASCLD/LAB, ANAB or A2LA.

#### Scenario:

The victim was slashed and stabbed while at the nightclub with her friends. The suspect, who was apprehended by the police outside of the nightclub, was an ex-boyfriend of the victim. Bloodstains were noted on the suspect's shirt, and this was collected as evidence (Item 3). Several bystanders attempted to subdue the suspect after the attack on the victim, and they were injured as well. A search of the crime scene revealed a broken knife blade on the floor of the nightclub that contained presumptive bloodstains (Item 4). The Serology unit reported that only blood was found on the evidence items. The DNA unit has completely consumed all evidence items and has provided you with DNA profiles obtained from the items. You are requested to evaluate the DNA profiles using your laboratory specific analysis guidelines and report interpretations and statistical results.

**Both .fsa and .pdf formats are provided for use in this test, choose one or both formats for evaluation.**

#### Items Submitted (Sample Pack INT2):

- Item 1: DNA profile from reference sample (Female Victim)
- Item 2: DNA profile from reference sample (Male Suspect)
- Item 3: DNA profile from questioned blood stain from suspect's shirt
- Item 4: DNA profile from questioned blood stain from the knife blade

**Please return all pages of this data sheet.**

Page 1 of 12

**Part I: DNA ANALYSIS INSTRUCTIONS**

**\* Use your laboratory's Interpretation guidelines for evaluation of this test.**

Please report Laboratory Specific Interpretation Guidelines below per amplification kit.

Analytical Threshold: \_\_\_\_\_

Peak Height Ratio (%): \_\_\_\_\_

Stochastic Threshold (Peak Amplitude): \_\_\_\_\_

**If you do not have Interpretation guidelines, please use the following guidelines and report these values above:**

For STR Analysis: Analytical Threshold: 75 rfu, Peak Height Ratio: 60%, Stochastic Threshold (Peak Amplitude): 50 rfu

For YSTR Analysis: Analytical Threshold: 75 rfu, Peak Height Ratio: 50%, Stochastic Threshold (Peak Amplitude): 75 rfu

**!!! IMPORTANT NOTE !!!**

If you opt to analyze the .FSA files for Identifiler Plus, please note that you must change your analysis settings for the LIZ GS500 size standard to ignore the 250 and 340 bp peaks.

If you opt to analyze the .FSA files for Yfiler, please note that you must change your analysis settings for the LIZ GS500 size standard to ignore the 250 bp peak.

\* Report the allelic results for each Item in the appropriate response boxes.

\* Report alleles in numerical order, separated by a comma.

\* If major and minor contributor(s) can be distinguished and your laboratory normally reports this distinction, report the results of the major profile and the minor profile in the appropriately labeled boxes; otherwise, list the alleles in numerical order in the remaining row of boxes labeled with the Item number.

\* Please Note: Samples were completely consumed during extraction.

<b>Example</b>	D2S1338	D3S1358	D5S818	D7S820	D8S1179	D13S317
<b>3</b>	14,15,16			6,10,11		
Major		12,13	12		14	8,11
Minor		14,15	12,17		18,19	12,13

**Please return all pages of this data sheet.**

Page 2 of 12

Test No. 16-589 Data Sheet, continued

Participant Code:

WebCode:

**Part I: DNA ANALYSIS****STR & Amelogenin Results for Known Item 1**

<b>STR Amplification Kit Used:</b> Please indicate the electropherogram(s) reviewed for this test.					
<input type="checkbox"/> Identifiler® Plus	<input type="checkbox"/> PowerPlex® Fusion 5C	<input type="checkbox"/> .fsa format	<input type="checkbox"/> .pdf format		

<b>ITEM</b>	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
<b>1</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
<b>1</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
<b>1</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	Penta D	Penta E	SE33	TH01	TPOX	vWA
<b>1</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**YSTR Results for Known Item 1**

<b>YSTR Amplification Kit Used:</b> Please indicate the electropherogram(s) reviewed for this test.							
<input type="checkbox"/> YFiler®	<input type="checkbox"/> PowerPlex® Y23	<input type="checkbox"/> .fsa format	<input type="checkbox"/> .pdf format				

<b>ITEM</b>	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
<b>1</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
<b>1</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	
<b>1</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Please return all pages of this data sheet.**

Page 3 of 12

**Part I: DNA ANALYSIS (continued)**

**STR & Amelogenin Results for Known Item 2**

**STR Amplification Kit Used:** Please indicate the electropherogram(s) reviewed for this test.

Identifiler® Plus    
  PowerPlex® Fusion 5C    
  .fsa format    
  .pdf format

<b>ITEM</b>	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
<b>2</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
<b>2</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
<b>2</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	Penta D	Penta E	SE33	TH01	TPOX	vWA
<b>2</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**YSTR Results for Known Item 2**

**YSTR Amplification Kit Used:** Please indicate the electropherogram(s) reviewed for this test.

YFiler®    
  PowerPlex® Y23    
  .fsa format    
  .pdf format

<b>ITEM</b>	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
<b>2</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
<b>2</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	
<b>2</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Part I: DNA ANALYSIS (continued)**

**STR & Amelogenin Results for Questioned Item 3**

**STR Amplification Kit Used:** Please indicate the electropherogram(s) reviewed for this test.  
 Identifiler® Plus     PowerPlex® Fusion 5C     .fsa format     .pdf format

ITEM	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
<b>3</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

ITEM	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
<b>3</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

ITEM	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
<b>3</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

ITEM	Penta D	Penta E	SE33	TH01	TPOX	vWA
<b>3</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Please return all pages of this data sheet.**

**Part I: DNA ANALYSIS (continued)**

**YSTR Results for Questioned Item 3**

<b>YSTR Amplification Kit Used:</b> Please indicate the electropherogram(s) reviewed for this test.			
<input type="checkbox"/> YFiler®	<input type="checkbox"/> PowerPlex® Y23	<input type="checkbox"/> .fsa format	<input type="checkbox"/> .pdf format

	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
<b>ITEM</b>								
<b>3</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
major	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
minor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	<b>DYS437</b>	<b>DYS438</b>	<b>DYS439</b>	<b>DYS448</b>	<b>DYS456</b>	<b>DYS458</b>	<b>DYS481</b>	<b>DYS533</b>
<b>3</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
major	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
minor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>ITEM</b>	<b>DYS549</b>	<b>DYS570</b>	<b>DYS576</b>	<b>DYS635</b>	<b>DYS643</b>	<b>Y GATA H4</b>	<b>Y Indel</b>	
<b>3</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
major	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
minor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Please return all pages of this data sheet.**





**Part I: DNA ANALYSIS (continued)**

**STR & Amelogenin Results for Questioned Item 4**

**STR Amplification Kit Used:** Please indicate the electropherogram(s) reviewed for this test.

Identifiler® Plus    
  PowerPlex® Fusion 5C    
  .fsa format    
  .pdf format

ITEM	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

ITEM	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

ITEM	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

ITEM	Penta D	Penta E	SE33	TH01	TPOX	vWA
4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Please return all pages of this data sheet.**

**Part I: DNA ANALYSIS (continued)**

**YSTR Results for Questioned Item 4**

**YSTR Amplification Kit Used:** Please indicate the electropherogram(s) reviewed for this test.

<input type="checkbox"/> YFiler®	<input type="checkbox"/> PowerPlex® Y23	<input type="checkbox"/> .fsa format	<input type="checkbox"/> .pdf format
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ITEM	DYS19	DYS385	DYS389-I	DYS389-II	DYS390	DYS391	DYS392	DYS393
<b>4</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ITEM	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
<b>4</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ITEM	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	
<b>4</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
major	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
minor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	

**Please return all pages of this data sheet.**



**Part II: ADDITIONAL COMMENTS**

Comments regarding any part of this test.

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**Part III: AMPLIFICATION KIT SURVEY (optional)**

To accommodate your laboratory's future needs, please list all PCR amplification kits (Autosomal and YSTR) utilized as well as any future kits to be implemented in your laboratory.

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<p><b>Return Instructions:</b> Data must be received via online data entry, fax (please include a cover sheet), or mail by <i>December 19, 2016</i> to be included in the report. Emailed data sheets are not accepted.</p>	<p>Participant Code:</p> <p>ONLINE DATA ENTRY: <a href="http://www.cts-portal.com">www.cts-portal.com</a></p> <p>FAX: +1-571-434-1937</p> <p>MAIL: Collaborative Testing Services, Inc. P.O. Box 650820 Sterling, VA 20165-0820 USA</p>
<p>QUESTIONS?</p> <p>TEL: +1-571-434-1925 (8 am - 4:30 pm EST)</p> <p>EMAIL: <a href="mailto:forensics@cts-interlab.com">forensics@cts-interlab.com</a></p> <p><a href="http://www.ctsforensics.com">www.ctsforensics.com</a></p>	

**Please return all pages of this data sheet.**

Collaborative Testing Services ~ Forensic Testing Program

**RELEASE OF DATA TO ACCREDITATION BODIES**

The following Accreditation Releases will apply only to:

Participant Code:

WebCode:

for Test No. **16-589: DNA Interpretation**

This release page must be completed and received by **December 19, 2016** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

Have the laboratory's designated individual complete the following steps **only if your laboratory is accredited in this testing/calibration discipline** by one or more of the following Accreditation Bodies.

**Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory**

**ASCLD/LAB** Certificate No. \_\_\_\_\_

**ANAB** Certificate No. \_\_\_\_\_

**A2LA** Certificate No. \_\_\_\_\_

**Step 2: Complete the Laboratory Identifying Information in its entirety**

Signature and Title \_\_\_\_\_

Laboratory Name \_\_\_\_\_

Location (City/State) \_\_\_\_\_

**Accreditation Release**

**Return Instructions**

*Please submit the completed Accreditation Release at the same time as your full data sheet. See Data Sheet Return Instructions on the previous page.*

*Questions? Contact us 8 am-4:30 pm EST  
Telephone: +1-571-434-1925  
email: forensics@cts-interlab.com*

**Please return all pages of this data sheet.**

Page 12 of 12