



## **DNA Interpretation Test No. 17-589**

### **Summary Report**

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Each participant received a sample pack consisting of a digital download packet through the CTS portal containing electropherograms and raw data files which they were requested to evaluate using their existing protocols. Data were returned from 19 participants and are compiled into the following tables:

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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 male donor (Male 1) and Item 2 was created using blood collected from a different male donor (Male 2). The Item 3 mixture was created by combining one part of blood from the Item 1 male donor (Male 1) and four parts of blood from a female donor (Female 1). The Item 4 mixture was created using five parts of blood from Item 1 male donor (Male 1), one part of blood from Item 2 male donor (Male 2), and three parts of blood collected from the female donor (Female 1).

**SAMPLE SET ASSEMBLY:** Once sample preparation and verification was completed, the digital upload was checked to ensure all items were accessible.

**VERIFICATION:** Laboratories that conducted pre-distribution testing of the electropherograms reported consistent results for all loci. All associations were consistent amongst the pre-distribution 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	SE33	TH01	TPOX	vWA
1	15,3,16,3	19,20	14,15	16,16	11,12	10,10
	12,13	13,14	16,21	9,11	10,12	15,15
	13,14	29,30	15,16	X,Y	12,13	23,25
	*	*	19,26,2	6,9,3	8,9	16,17
2	13,14	21,22	14,14	15,18	13,13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14,14	29,30	11,17	X,Y	9,13	20,23
	*	*	18,25,2	7,9,3	8,11	14,17
3	14,15,3,16,16,3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13,14	16,17,3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	*	23,25,26
	*	*	14,19,26,2,31,2	9,3†	*	16,17
3major	14,16	19,23	10,14	18,18	9,11	*
	8,15	13,13	17,3,20	11,12	9,11	16,16
	*	30,31	*	X,X	11,11	23,26
	*	*	14,31,2	*	6,12	*
3minor	15,3,16,3	20†	15†	16,16	*	*
	12,13	*	16,21	*	10,12	15,15
	*	29†	*	Y†	12†	25†
	*	*	19,26,2	*	9†	*
4	13,14,15,3,16,16,3	19,20,23†	10,14,15	15,16,18	9,11,12,13	8,9,10†
	8,12,13,14,15	13,14,15	16,17,17,3,20,21	9,11,12,13,14	9,10,11,12†	15,16,20
	13,14	29,30,31	15,16	X,Y	11,12,13†	23,25,26†
	*	*	14,18,19,25,2,26,2,31,2	6,9,3†	6,8,9,12†	16,17†

## 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	Y Indel	
	1	14	13,18	13	31	23	10	11
14		10	11	20	14	17.2	24	11
12		18	18	21	9	11	2	
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11	2	
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	*	
4	14,15	13,16,17,18	13†	31†	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17,2	*	11
	12	17,18	18†	21	*	11	*	

\* Results were not received from a minimum of 10 participants for the loci indicated.

† Additional alleles may be present depending on laboratory thresholds.

## Summary Comments

This test was designed to allow participants to assess their proficiency in evaluating electropherograms (EPGs) and interpreting data. Each participant received electropherograms (in FSA, HID, and PDF formats, as available) of four items; two reference items and two evidence items. The EPG data included was produced from the following amplification kits: GlobalFiler™, PowerPlex® Fusion 6C, YFiler™, PowerPlex® Y23.

Item 1 was the male victim's reference sample. Item 2 was the male suspect's reference sample. Item 3 was a mixture of two individuals including the Item 1 male victim and a female contributor (1:4 ratio respectively). Item 4 was a mixture of three individuals including the Item 1 male victim, the Item 2 male suspect and the female contributor that was also used in the Item 3 mixture (5:1:3 ratio respectively).

### STR Data

Seventeen participants evaluated the provided STR data. Of these eight reported examining the GlobalFiler™, five reported both amplification kits, three reported PowerPlex® Fusion 6C and one did not report a kit. All participants that reported data were concordant for reference Items 1 and 2.

Fourteen participants reported allelic results for Item 3 and, of those participants, eight also reported allelic results for both the 3 major and 3 minor components. For Item 3, the consensus reported a "13,14" at D10S1248 while two participants were missing the "14" with one of these participants also reporting an inconsistent allele at TPOX.

Sixteen participants reported results for Item 4 and one participant reported results for Item 4 as well as for the 4 major and 4 minor components. Item 4 was a more complex three person mixture which may be the reason that fewer participants separated the profiles into major and minor components. Two participants were missing alleles at multiple loci and one participant reported an inconsistent allele at locus D21S11.

### YSTR Data

Seventeen participants reported YSTR results and two participants reported only results for YSTR loci associated with STR multiplex amplification systems. Seven participants reported examining the Powerplex® Y23 data, six the YFiler™ data and three participants reported examining both YSTR amplification data sets.

For known Item 1, all participants that reported data were concordant.

For known Item 2, one participant reported an inconsistent allele at *DYS389\_II*, all remaining allelic results were concordant with the other responding participants.

For questioned Item 3, all participants that reported data were concordant.

For questioned Item 4, all participants reported data that were concordant with the exception of one participant. This participant was missing alleles at multiple YSTR loci following the review of the PowerPlex® Y23 results using the FSA data files.

### Conclusions

The majority of participants reported that two or at least two individuals contributed to the Item 3 mixture. Two participants reported that there was only one contributor to the Item 3 mixture; these participants only reported evaluating the YSTR data. For Item 3 in comparison with Item 1 (victim reference), all nineteen participants reported that Item 1 was included as a component of the Item 3 mixture. In comparison with Item 2 (suspect reference), all nineteen participants reported that Item 2 was excluded from the Item 3 mixture.

The majority of participants reported that three or at least three individuals contributed to the Item 4 mixture. Two participants reported that there were only two contributors to the Item 4 mixture; these participants only reported evaluating the YSTR data. For Item 4 in comparison with Item 1 (victim reference), seventeen participants reported that Item 1 was included as a component and two reported "Inconclusive/Uninterpretable". In comparison with Item 2 (suspect reference), fourteen participants reported that Item 2 was included in the Item 4 mixture, four reported "Inconclusive/Uninterpretable" and one reported that Item 2 was excluded. The participant that reported exclusion had missing alleles at multiple STR and YSTR loci for this item.

# Interpretation Guidelines

TABLE 1

WebCode	Analytical Threshold	Peak Height Ratio	Stochastic Threshold
478GVD	Globalfiler 75 RFUs, PPY23 50 RFUs	Globalfiler 60%, PPY23 None	Globalfiler 150 RFUs, PPY23 200 RFUs for DYS385 only
8WBF8Y	75	60	150
C3PMWT	50	50	50
DBC6QR	175	60%	350
DJLU4Q	50 RFU	60%	50 RFU
EYRDD3	Used CTS analytical thresholds for GlobalFiler & YFiler	Used CTS peak height ratios for GlobalFiler & YFiler	Used CTS stochastic thresholds for GlobalFiler & YFiler
GEG3NP	65	50	315 (DYS385 a/b)
GMYD2Q	YSTR: 65 rfu	YSTR: 50%	YSTR: 315 rfu (DYS385)
HLV9YM	175	60	350
HNM8BY	[Participant did not provide interpretation guidelines]		
MUQ2WU	[Guidelines provided by participant have been moved to Table 9: Additional Comments.]	60	PowerPlex Fusion 6C = 326, PowerPlex Y23 = 631
PFMCVE	75 rfu	60%	150 rfu
R83X6E	150	70%	600
T7PQFQ	GF 75 RFUs, PPY23 50 RFUs	GF 60% PPY23 none	GF 150 RFUs, PPY23 200 RFUs for DYS385 only
TL3WQP	100 (also apply a 10% global threshold cut-off)	55	250
VC4BDM	75, 50	70%,60%	200,150
WQKN79	175	60	350
ZVJCC6	70 RFU	600-1299 RFU: 25%, 1300-3999 RFU: 40%, >3999 RFU: 60%	600 RFU
ZZYJZ6	75 rfu	60%	150

**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	SE33	TH01	TPOX	vWA

## Item 1 - STR Results

478GVD GlobalFiler™ (PDF Format)

1	15,3,16,3	19,20	14,15	16,16	11,12	10,10
	12,13	13,14	16,21	9,11	10,12	15,15
	13,14	29,30	15,16	X,Y	12,13	23,25
			19,26.2	6,9.3	8,9	16,17

8WBF8Y (PDF Format)

1	15,3,16,3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	12,14	12	19,26.2	6,9.3	8,9	16,17

C3PMWT GlobalFiler™ (PDF Format)

1	15,3,16,3	19,20	14,15	16,16		
	12,13	13,14	16,21		10,12	15,15
	13,14	29,30	15,16	X,Y		23,25
			19,26.2	6,9.3		16,17

DBC6QR GlobalFiler™ (HID Format)

1	15,3,16,3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	-	-	19,26.2	6,9.3	8,9	16,17

DJLU4Q GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

1	15,3,16,3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
			19,26.2	6,9.3	8,9	16,17

EYRDD3 GlobalFiler™ (PDF Format)

1	15,3,16,3	19,20	14,15	16,16	11,12	10,10
	12,13	13,14	16,21	9,11	10,12	15,15
	13,14	29,30	15,16	X,Y	12,13	23,25
	N/A	N/A	19,26.2	6,9.3	8,9	16,17

HLV9YM GlobalFiler™ (HID Format)

1	15,3,16,3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	-	-	19,26.2	6,9.3	8,9	16,17

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

## Item 1 - STR Results

HNM8BY GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

1	15.3,16.3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	12,14	12	19,26.2	6,9.3	8,9	16,17

MUQ2WU PowerPlex® Fusion 6C (HID Format)

1	15.3,16.3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	12,14	12	19,26.2	6,9.3	8,9	16,17

PFMCVE GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

1	15.3,16.3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	12,14	12	19,26.2	6,9.3	8,9	16,17

R83X6E GlobalFiler™ (HID Format)

1	15.3,16.3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
			19,26.2	6,9.3	8,9	16,17

T7PQFQ GlobalFiler™ (PDF Format)

1	15.3,16.3	19,20	14,15	16,16	11,12	10,10
	12,13	13,14	16,21	9,11	10,12	15,15
	13,14	29,30	15,16	X,Y	12,13	23,25
			19,26.2	6,9.3	8,9	16,17

TL3WQP GlobalFiler™, PowerPlex® Fusion 6C (HID Format)

1	15.3,16.3	19,20	14,15	16,16	11,12	10,10
	12,13	13,14	16,21	9,11	10,12	15,15
	13,14	29,30	15,16	X,Y	12,13	23,25
	12,14	12,12	19,26.2	6,9.3	8,9	16,17

VC4BDM PowerPlex® Fusion 6C (HID Format)

1	15.3,16.3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	12,14	12	19,26.2	6,9.3	8,9	16,17

WQKN79 GlobalFiler™ (HID Format)

1	15.3,16.3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	-	-	19,26.2	6,9.3	8,9	16,17

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

## Item 1 - STR Results

ZVJCC6 PowerPlex® Fusion 6C (HID Format)

1	15,3,16,3	19,20	14,15	16,16	11,12	10,10
	12,13	13,14	16,21	9,11	10,12	15,15
	13,14	29,30	15,16	X,Y	12,13	23,25
	12,14	12,12	19,26.2	6,9,3	8,9	16,17

ZZYJZ6 GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

1	15,3,16,3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	12,14	12	19,26.2	6,9,3	8,9	16,17



WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

## Item 2 - STR Results

478GVD GlobalFiler™ (PDF Format)

2	13,14	21,22	14,14	15,18	13,13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14,14	29,30	11,17	X,Y	9,13	20,23
			18,25.2	7,9.3	8,11	14,17

8WBF8Y (PDF Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
	8,11	8	18,25.2	7,9.3	8,11	14,17

C3PMWT GlobalFiler™ (PDF Format)

2	13,14	21,22	14,14	15,18		
	13,14	14,15	17,21		8,11	15,20
	14,14	29,30	11,17	X,Y		20,23
			18,25.2	7,9.3		14,17

DBC6QR GlobalFiler™ (HID Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
	-	-	18,25.2	7,9.3	8,11	14,17

DJLU4Q GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
			18,25.2	7,9.3	8,11	14,17

EYRDD3 GlobalFiler™ (PDF Format)

2	13,14	21,22	14,14	15,18	13,13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14,14	29,30	11,17	X,Y	9,13	20,23
	N/A	N/A	18,25.2	7,9.3	8,11	14,17

HLV9YM GlobalFiler™ (HID Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
	-	-	18,25.2	7,9.3	8,11	14,17

HNM8BY GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
	8,11	8	18,25.2	7,9.3	8,11	14,17

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

## Item 2 - STR Results

MUQ2WU PowerPlex® Fusion 6C (HID Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
	8,11	8	18,25.2	7,9.3	8,11	14,17

PFMCVE GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
	8,11	8	18,25.2	7,9.3	8,11	14,17

R83X6E GlobalFiler™ (HID Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
			18,25.2	7,9.3	8,11	14,17

T7PQFQ GlobalFiler™ (PDF Format)

2	13,14	21,22	14,14	15,18	13,13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14,14	29,30	11,17	X,Y	9,13	20,23
			18,25.2	7,9.3	8,11	14,17

TL3WQP GlobalFiler™, PowerPlex® Fusion 6C (HID Format)

2	13,14	21,22	14,14	15,18	13,13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14,14	29,30	11,17	X,Y	9,13	20,23
	8,11	8,8	18,25.2	7,9.3	8,11	14,17

VC4BDM PowerPlex® Fusion 6C (HID Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
	8,11	8	18,25.2	7,9.3	8,11	14,17

WQKN79 GlobalFiler™ (HID Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
	-	-	18,25.2	7,9.3	8,11	14,17

ZVJCC6 PowerPlex® Fusion 6C (HID Format)

2	13,14	21,22	14,14	15,18	13,13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14,14	29,30	11,17	X,Y	9,13	20,23
	8,11	8,8	18,25.2	7,9.3	8,11	14,17

<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>SE33</b>	<b>TH01</b>	<b>TPOX</b>	<b>vWA</b>

## Item 2 - STR Results

ZZYJZ6 GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

2	13,14	21,22	14	15,18	13	8,11
	13,14	14,15	17,21	13,14	8,11	15,20
	14	29,30	11,17	X,Y	9,13	20,23
	8,11	8	18,25.2	7,9.3	8,11	14,17

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

Item 3 - STR Results

478GVD GlobalFiler™ (PDF Format)

3						
	13,14		15,16			
				9,3		16,17
3major	14,16	19,23	10,14	18,18	9,11	9,10
	8,15	13,13	17,3,20	11,12	9,11	16,16
		30,31		X,X	11,11	23,26
			14,31.2		6,12	
3minor	15,3,16.3	20	14,15	16	12	10,10
	12,13	14	16,21	9	10,12	15
		29,30		X,Y	12	23,25
			19,26.2		8,9	

8WBF8Y (PDF Format)

3	14,15,3,16,16.3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13,14	16,17,3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
	9,12,13,14	7,12	14,19,26,2,31.2	6,9,3	6,8,9,12	16,17
3major	14,16	19,23	10,14	18	9,11	9,10
	8,15	13	17,3,20	11,12	9,11	16
	13,14	30,31	15,16	X	11	23,26
	9,13	7	14,31.2	9,3	6,12	16,17
3minor	15,3,16.3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12,13	23,25
	12,14	12	19,26.2	6,9,3	8,9	16,17

C3PMWT GlobalFiler™ (PDF Format)

3	14,15,3,16,16.3	19,20,23	10,14,15	16,18		
	8,12,13,15	13,14	16,17,3,20,21		9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y		23,25,26
			14,19,26,2,31.2	9,3,9,3		16,17
3major	14,16	19,23	10,14	18		
	8,15	13	17,3,20		9,11	16
		30,31		X		23,26
			14,31.2			
3minor	15,3,16.3	20	15	16		
	12,13	14	16,21		10,12	15
		29		Y		25
			19,26.2			

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

## Item 3 - STR Results

DBC6QR GlobalFiler™ (HID Format)

3

	-	-				
3major	14,16	19,23	10,14	18	9,11	9,10
	8,15	13	17.3,20	11,12	9,11	16
	13,14	30,31	15,16	X,X	11	23,26
			14,31.2	9.3	6,12	16,17
3minor	15.3,16.3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12	23,25
			19,26.2	9.3	8,9	16,17

DJLU4Q GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

3

	14,15.3,16,16.3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13,14	16,17.3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
			14,19,26.2,31.2			16,17

EYRDD3 GlobalFiler™ (PDF Format)

3

	14,15.3,16,16.3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13,14	16,17.3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	11,12	23,25,26
	N/A	N/A	14,19,26.2,31.2	9.3	6,8,9,12	16,17

HLV9YM GlobalFiler™ (HID Format)

3

	-	-	-	-	-	-
	-	-	-	-	-	-
	-	-	-	-	-	-
	-	-	-	-	-	-
3major	14,16	19,23	10,14	18	9,11	9,10
	8,15	13	17.3,20	11,12	9,11	16
	13,14	30,31	15,16	X,X	11	23,26
	-	-	14,31.2	9.3	6,12	16,17
3minor	15.3,16.3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
	13,14	29,30	15,16	X,Y	12	23,25
	-	-	19,26.2	9.3	8,9	16,17

HNM8BY PowerPlex® Fusion 6C (PDF Format)

3

	14,15.3,16,16.3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13,14	16,17.3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
	9,12,13,14	7,12	14,19,26.2,31.2	6,9.3	6,8,9,12	16,17

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

## Item 3 - STR Results

MUQ2WU PowerPlex® Fusion 6C (HID Format)

3	14,15.3,16,16.3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13	16,17.3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	11,12	23,25,26
	9,12,13,14	7,12	14,19,26.2,31.2	6,9.3	6,9,12	16,17
3major	14,16	19,23	10,14	18	9,11	9,10
	8,15	13	17.3,20	11,12	9,11	16
	13,14	30,31	15,16	X	11	23,26
	9,13	7	14,31.2	9.3	6,12	16,17
3minor	15.3,16.3	19,20	15	16	12	
	12,13		16,21	9,11	10,12	15
		29,30		X,Y	12	23,25
	12,14	12	19,26.2	6	6,9	

PFMCVE GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

3	14,15.3,16,16.3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13,14	16,17.3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
	9,12,13,14	7,12	14,19,26.2,31.2	6,9.3	6,8,9,12	16,17

R83X6E GlobalFiler™ (HID Format)

3		19,20,23	10,14,15	16,18	9,11,12	9,10
		13,14		9,11,12		15,16
	13,14	29,30,31	15,16	X,Y		23,25,26
				9.3		16,17
3major	14,16					
	8,15		17.3,20		9,11	
					11	
			14,31.2		6,12	
3minor	15.3,16.3					
	12,13		16,21		10,12	
					12,13	
			19,26.2		8,9	

<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>SE33</b>	<b>TH01</b>	<b>TPOX</b>	<b>vWA</b>

Item 3 - STR Results

T7PQFQ GlobalFiler™ (PDF Format)

3

3major	14,16	19,23	10,14	18,18	9,11	9,10
	8,15	13,13	17.3,20	11,12	9,11	16,16
	13,14	30,31	15,16	X,X	11,11	23,26
			14,31.2	9.3,9.3	6,12	16,17
3minor	15.3,16.3	20,X	14,15	16,16	12,X	10,10
	12,13	14,X	16,21	9,X	10,12	15,15
	13,14	29,30	15,16	X,Y	12,X	23,25
			19,26.2	9.3,X	8,9	16,17

TL3WQP GlobalFiler™, PowerPlex® Fusion 6C (HID Format)

3

	14,15.3,16,16.3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13	16,17.3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	11,12	23,25,26
	9,12,13,14	7,12	14,19,26.2,31.2	6,9.3	6,8,9,12	16,17
3major	14,16	19,23	10,14	18,18	9,11	9,10
	8,15	13,13	17.3,20	11,12	9,11	16,16
	13,14	30,31	15,16	X,X	11,11	23,26
	9,13	7,7	14,31.2	9.3,9.3	6,12	16,17
3minor	15.3,16.3	20	15	16	12	
	12,13		16,21	9	10,12	15
		29		X,Y	12	25
	12,14	12	19,26.2	6	8,9	

VC4BDM PowerPlex® Fusion 6C (HID Format)

3

						9,10
		13,14				
	13,14		15,16			
						16,17
3major	14,16	19,23	10,14	18	9,11	
	8,15		17.3,20	11,12	9,11	16
		30,31		X	11	23,26
	9,13	7	14,31.2	9.3	6,12	
3minor	15.3,16.3	19,20	14,15	16	11,12	
	12,13		16,21	9,11	10,12	15
		29,30		X,Y	12,13	23,25
	12,14	12	19,26.2	6,9.3	8,9	

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

Item 3 - STR Results

WQKN79 GlobalFiler™ (HID Format)

3

	13,14		15,16			
	-	-		9,3		16,17
3major	14,16	19,23	10,14	18	9,11	9,10
	8,15	13	17,3,20	11,12	9,11	16
		30,31		X,X	11	23,26
			14,31.2		6,12	
3minor	15,3,16,3	19,20	14,15	16	11,12	10
	12,13	13,14	16,21	9,11	10,12	15
		29,30		X,Y	12	23,25
			19,26.2		8,9	

ZVJCC6 PowerPlex® Fusion 6C (HID Format)

3

	14,15,3,16,16.3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13,14	16,17,3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
	9,12,13,14	7,12	14,19,26,2,31.2	6,9,3	6,8,9,11,12	16,17
3major	14,16	19,23	10,14	18,18	9,11	9,10
	8,15	13,13	17,3,20	11,12	9,11	16,16
	13,14	30,31	15,16		11,11	23,26
	9,13	7,7	14,31.2	9,3,9,3	6,12	16,17

ZZYJZ6 GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

3

	14,15,3,16,16.3	19,20,23	10,14,15	16,18	9,11,12	9,10
	8,12,13,15	13,14	16,17,3,20,21	9,11,12	9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
	9,12,13,14	7,12	14,19,26,2,31.2	6,9,3	6,8,9,12	16,17



WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

## Item 4 - STR Results

478GVD GlobalFiler™ (PDF Format)

4	13,14,15.3,16,16.3	19,20,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
			14,18,19,25.2,26.2,31.2	6,9.3	6,8,9,12	16,17

8WBF8Y (PDF Format)

4	13,14,15.3,16,16.3	19,20,21,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10,11
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	8,9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	9,11,12,13	20,23,25,26
	8,9,11,12,13,14	7,8,12	14,18,19,25.2,26.2,31.2	6,7,9.3	6,8,9,11,12	14,16,17

C3PMWT GlobalFiler™ (PDF Format)

4	13,14,15.3,16,16.3	19,20,22,23	10,14,15	15,16,18		
	8,12,13,14,15	13,14,15	16,17,17.3,20,21		9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y		23,25,26
			14,18,19,25.2,26.2,31.2	6,9.3		16,17

4major

16,18

4minor

13

22

15

14

15

17

20

19,25.2

DBC6QR GlobalFiler™ (HID Format)

4	13,14,15.3,16,16.3	19,20,23	10,14,15	15,16,18	9,11,12,13	8,9,10
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
	-	-	14,18,19,25.2,26.2,31.2	6,9.3	6,8,9,12	16,17

DJLU4Q GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

4	13,14,15.3,16,16.3	19,20,21,22,23	10,14,15	15,16,18	9,11,12,13	
	8,12,13,14,15	13,14,15		9,11,12,13,14	8,9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	9,11,12,13	20,23,25,26
						14,16,17

EYRDD3 GlobalFiler™ (PDF Format)

4	13,14,15.3,16,16.3	19,20,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
	N/A	N/A	14,18,19,25.2,26.2,31.2	6,9.3	6,8,9,12	16,17

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

## Item 4 - STR Results

HLV9YM GlobalFiler™ (HID Format)

4	13,14,15.3,16,16.3	19,20,23	10,14,15	15,16,18	9,11,12,13	8,9,10
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
	-	-	14,18,19,25.2,26.2,31.2	6,9.3	6,8,9,12	16,17

HNM8BY PowerPlex® Fusion 6C (PDF Format)

4	13,14,15.3,16,16.3	19,20,21,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10,11
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	8,9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	9,11,12,13	20,23,25,26
	8,9,11,12,13,14	7,8,12	14,18,19,25.2,26.2,31.2	6,7,9.3	6,8,9,11,12	14,16,17

MUQ2WU PowerPlex® Fusion 6C (HID Format)

4	13,14,15.3,16,16.3	19,20,23	10,14,15	15,16,18	9,11,12,13	9,10
	8,12,13,14,15	13,14	16,17.3,20,21	9,11,12	8,9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	9,11,12,13	23,25,26
	8,9,11,12,13,14	7,8,12	14,18,19,25.2,26.2,31.2	6,9.3	6,8,9,12	16,17

PFMCVE GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

4	13,14,15.3,16,16.3	19,20,21,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10,11
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	8,9,10,11,12	15,16,20
	13,14	29,30,31		X,Y	9,11,12,13	20,23,25,26
	8,9,11,12,13,14	7,8,12	14,18,19,25.2,26.2,31.2	6,7,9.3	6,8,9,11,12	14,16,17

R83X6E GlobalFiler™ (HID Format)

4	13,14,15.3,16,16.3	19,20,21,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	8,9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
			14,18,19,25.2,26.2,31.2	6,9.3	6,8,9,12	16,17

T7PQFQ GlobalFiler™ (PDF Format)

4	13,14,15.3,16,16.3	19,20,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
			14,18,19,25.2,26.2,31.2	6,9.3	6,8,9,12	16,17

TL3WQP GlobalFiler™, PowerPlex® Fusion 6C (HID Format)

4	13,14,15.3,16,16.3	19,20,23	10,14,15	15,16,18	9,11,12,13	9,10
	8,12,13,14,15	13,14	16,17,17.3,20,21	9,11,12	8,9,10,11,12	15,16
	13,14	29,30,31	15,16	X,Y	9,11,12,13	23,25,26
	8,9,11,12,13,14	7,8,12	14,18,19,25.2,26.2,31.2	6,9.3	6,8,9,12	16,17

WebCode	D1S1656	D2S1338	D2S441	D3S1358	D5S818	D7S820
	D8S1179	D10S1248	D12S391	D13S317	D16S539	D18S51
	D19S433	D21S11	D22S1045	Amelogenin	CSF1PO	FGA
	Penta D	Penta E	SE33	TH01	TPOX	vWA

## Item 4 - STR Results

VC4BDM PowerPlex® Fusion 6C (HID Format)

4	13,14,15.3,16,16.3	19,20,21,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10,11
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	8,9,10,11,12	15,16,20
	13,14	29,30,21	15,16	X,Y	9,11,12,13	20,23,25,26
	8,9,11,12,13,14	7,8,12	14,18,19,25.2,26.2,31.2	6,7,9.3	6,8,9,11,12	14,16,17

WQKN79 GlobalFiler™ (HID Format)

4	13,14,15.3,16,16.3	19,20,23	10,14,15	15,16,18	9,11,12,13	8,9,10
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	11,12,13	23,25,26
	-	-	14,18,19,25.2,26.2,31.2	6,9.3	6,8,9,12	16,17

ZVJCC6 PowerPlex® Fusion 6C (HID Format)

4	13,14,15.3,16,16.3	19,20,21,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10,11
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	8,9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	9,11,12,13	20,23,25,26
	8,9,11,12,13,14	7,8,12	14,18,19,25.2,26.2,31.2	6,7,9.3	6,8,9,11,12	14,16,17

ZZYJZ6 GlobalFiler™, PowerPlex® Fusion 6C (PDF Format)

4	13,14,15.3,16,16.3	19,20,21,22,23	10,14,15	15,16,18	9,11,12,13	8,9,10,11
	8,12,13,14,15	13,14,15	16,17,17.3,20,21	9,11,12,13,14	8,9,10,11,12	15,16,20
	13,14	29,30,31	15,16	X,Y	9,11,12,13	20,23,25,26
	8,9,11,12,13,14	7,8,12	14,18,19,25.2,26.2,31.2	6,7,9.3	6,8,9,11,12	14,16,17

See Additional Comments (Table 9) for laboratory specific notations.

# YSTR Results

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y InDel	

Item 1 - YSTR Results

478GVD	PowerPlex® Y23, GlobalFiler™ (PDF Format)							
1	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	

8WBF8Y	(PDF Format)							
1	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	

C3PMWT	PowerPlex® Y23 (PDF Format)							
1	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11		

DBC6QR	Yfiler® (FSA Format)							
1	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	-	-
	-	-	-	21	-	11	-	

DJLU4Q	Yfiler®, PowerPlex® Y23 (PDF Format)							
1	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	

EYRDD3	Yfiler® (PDF Format)							
1	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	OLA	N/A	N/A
	N/A	N/A	N/A	21	N/A	11	2	

GEG3NP	Yfiler® (PDF Format)							
1	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2		
				21		11		

GMYD2Q	Yfiler® (PDF Format)							
1	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2		
				21		11		

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	


## Item 1 - YSTR Results

HLV9YM	Yfiler® (FSA Format)								
1	14	13,18	13	31	23	10	11	12	
	14	10	11	20	14	17.2	-	-	
	-	-	-	21	-	11	-		
HNM8BY	Yfiler®, PowerPlex® Y23, GlobalFiler™, PowerPlex® Fusion (FSA Format), (PDF Format)								
1	14	13,18	13	31	23	10	11	12	
	14	10	11	20	14	17.2	24	11	
	12	18	18	21	9	11	2		
MUQ2WU	PowerPlex® Y23 (FSA Format)								
1	14	13,18	13	31	23	10	11	12	
	14	10	11	20	14	17.2	24	11	
	12	18	18	21	9	11			
PFMCVE	Yfiler®, PowerPlex® Y23								
1	14	13,18	13	31	23	10	11	12	
	14	10	11	20	14	17.2	24	11	
	12	18	18	21	9	11	2		
R83X6E	GlobalFiler™ (HID Format)								
1						10			
							2		
T7PQFQ	PowerPlex® Y23 (PDF Format)								
1	14	13,18	13	31	23	10	11	12	
	14	10	11	20	14	17.2	24	11	
	12	18	18	21	9	11	2		
TL3WQP	Yfiler®, PowerPlex® Y23, GlobalFiler™, PowerPlex® Fusion (HID Format)								
1	14	13,18	13	31	23	10	11	12	
	14	10	11	20	14	17.2	24	11	
	12	18	18	21	9	11	2		
VC4BDM	PowerPlex® Y23 (HID Format)								
1	14	13,18	13	31	23	10	11	12	
	14	10	11	20	14	17.2	24	11	
	12	18	18	21	9	11			
WQKN79	Yfiler® (FSA Format)								
1	14	13,18	13	31	23	10	11	12	
	14	10	11	20	14	17.2	-	-	
	-	-	-	21	-	11	-		

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 1 - YSTR Results

ZVJCC6	PowerPlex® Fusion (HID Format)							
1						10		
								
		18	18					

ZZYJZ6	PowerPlex® Y23 (PDF Format)							
1	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 2 - YSTR Results

478GVD	PowerPlex® Y23, GlobalFiler™ (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11	2	
8WBF8Y	(PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11	2	
C3PMWT	PowerPlex® Y23 (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11		
DBC6QR	Yfiler® (FSA Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	-	-
	-	-	-	21	-	11	-	
DJLU4Q	Yfiler®, PowerPlex® Y23 (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11	2	
EYRDD3	Yfiler® (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	N/A	N/A
	N/A	N/A	N/A	21	N/A	11	2	
GEG3NP	Yfiler® (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16		
				21		11		
GMYD2Q	Yfiler® (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16		
				21		11		
HLV9YM	Yfiler® (FSA Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	-	-
	-	-	-	21	-	11	-	

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 2 - YSTR Results

HNM8BY	Yfiler®, PowerPlex® Y23, GlobalFiler™, PowerPlex® Fusion (FSA Format), (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11	2	
MUQ2WU	PowerPlex® Y23 (FSA Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11		
PFMCVE	Yfiler®, PowerPlex® Y23 (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11	2	
R83X6E	GlobalFiler™ (HID Format)							
2						10		
							2	
T7PQFQ	PowerPlex® Y23 (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11	2	
TL3WQP	Yfiler®, PowerPlex® Y23, GlobalFiler™, PowerPlex® Fusion (HID Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11	2	
VC4BDM	PowerPlex® Y23 (HID Format)							
2	15	16,17	14	23	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11		
WQKN79	Yfiler® (FSA Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	-	-
	-	-	-	21	-	11	-	
ZVJCC6	PowerPlex® Fusion (HID Format)							
2						10		
		17	16					



TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 2 - YSTR Results

ZZYJZ6	PowerPlex® Y23 (PDF Format)							
2	15	16,17	14	32	21	10	11	15
	14	11	11	21	15	16	25	11
	12	17	16	21	13	11	2	

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 3 - YSTR Results

478GVD	PowerPlex® Y23, GlobalFiler™ (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	
8WBF8Y	(PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	
C3PMWT	PowerPlex® Y23 (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11		
DBC6QR	Yfiler® (FSA Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	-	-
	-	-	-	21	-	11	-	
DJLU4Q	Yfiler®, PowerPlex® Y23 (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2		
		18	18	21		11	2	
EYRDD3	Yfiler® (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	OLA	N/A	N/A
	N/A	N/A	N/A	21	N/A	11	2	
GEG3NP	Yfiler® (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2		
				21		11		
GMYD2Q	Yfiler® (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2		
				21		11		
HLV9YM	Yfiler® (FSA Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	-	-
	-	-	-	21	-	11	-	

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

## Item 3 - YSTR Results

HNM8BY	PowerPlex® Y23, PowerPlex® Fusion (FSA Format), (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11		
MUQ2WU	PowerPlex® Y23 (FSA Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11		
PFMCVE	Yfiler®, PowerPlex® Y23 (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	
R83X6E								
3						10		
							2	
T7PQFQ	PowerPlex® Y23 (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	
TL3WQP	Yfiler®, PowerPlex® Y23, GlobalFiler™, PowerPlex® Fusion (HID Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	
VC4BDM	PowerPlex® Y23 (HID Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11		
WQKN79	Yfiler® (FSA Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	-	-
	-	-	-	21	-	11	-	
ZVJCC6	PowerPlex® Fusion (HID Format)							
3						10		
		18	18					

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 3 - YSTR Results

ZZYJZ6	PowerPlex® Y23 (PDF Format)							
3	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11	2	

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 4 - YSTR Results

478GVD	PowerPlex® Y23, GlobalFiler™ (PDF Format)							
4	14,15	13,16,17,18	13,14	31	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	24,25	11
	12	17,18	16,18	21	9,13	11	2	
8WBF8Y	(PDF Format)							
4	14,15	13,16,17,18	13,14	31	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	24,25	11
	12	17,18	16,18	21	9,13	11	2	
4major	14	13,18	13		23			12
		10		20	14	17.2	24	
		18	18		9			
4minor	15	16,17	14		21			15
		11		21	15	16	25	
		17	16		13			
C3PMWT	PowerPlex® Y23 (PDF Format)							
4	14,15	13,16,17,18	13,14	31	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	24,25	11
	12	17,18	16,18	21	9,13	11		
4major	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11		
4minor	15	16,17	14		21			15
		11		21	15	16	25	
		17	16		13			
DBC6QR	Yfiler® (FSA Format)							
4	14,15	13,16,17,18	13	31,32	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	-	-
	-	-	-	21	-	11	-	
DJLU4Q	Yfiler®, PowerPlex® Y23 (PDF Format)							
4	14,15	13,16,17,18	13,14		21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2		
		17,18	16,18	21		11	2	
EYRDD3	Yfiler® (PDF Format)							
4	14,15	13,16,17,18	13,14	31,32	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,OLA	N/A	N/A
	N/A	N/A	N/A	21	N/A	11	2	

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 4 - YSTR Results

GEG3NP Yfiler® (PDF Format)

4

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4major	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2		
				21		11		
4minor	15	16,17	14	32	21	Inc	Inc	15
	Inc	11	Inc	21	15	16		
				Inc		Inc		

GMYD2Q Yfiler® (PDF Format)

4

--	--	--	--	--	--	--	--	--

4major	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2		
				21		11		
4minor	15	16,17	14	32	21	Inc	Inc	15
	Inc	11	Inc	21	15	16		
				Inc		Inc		

HLV9YM Yfiler® (FSA Format)

4

	14,15	13,16,17,18	13	31,32	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	-	-
	-	-	-	21	-	11	-	-

HNM8BY PowerPlex® Y23, PowerPlex® Fusion (PDF Format)

4

	14,15	13,16,17,18	13,14	31	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	24,25	11
	12	17,18	16,18	21	9,13	11		

MUQ2WU PowerPlex® Y23 (FSA Format)

4

	14	13,17,18	13	31	21,23	10	11	12
	14	10	11	20,21	14	17.2	24	11
	12	17,18	18	21	9	11		

4major

		13,18			23			
				20				
		18						

4minor

		17			21			
				21				
		17						

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 4 - YSTR Results

PFMCVE	Yfiler®, PowerPlex® Y23 (PDF Format)							
4	14,15	13,16,17,18	13,14	31,32	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	24,25	11
	12	17,18	16,18	21	9,13	11	2	
R83X6E	GlobalFiler™ (HID Format)							
4						10		
							2	
T7PQFQ	PowerPlex® Y23 (PDF Format)							
4				31		10	11	
	14		11					11
	12			21		11	2	
4major	14	13,18	13		23			12
		10		20	14	17.2	24	
		18	18		9			
4minor	15	16,17	14		21			15
		11		21	15	16	25	
		17	16		13			
TL3WQP	Yfiler®, PowerPlex® Y23, GlobalFiler™, PowerPlex® Fusion (HID Format)							
4	14,15	13,16,17,18	13	31	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	24,25	11
	12	17,18	18	21	9,13	11	2	
4major	14	13,18	13	31	23	10	11	12
	14	10	11	20	14	17.2	24	11
	12	18	18	21	9	11		
VC4BDM	PowerPlex® Y23 (HID Format)							
4	14,15	13,16,17,18	13,14	31	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	24,25	11
	12	17,18	16,18	21	9,13	11		
WQKN79	Yfiler® (FSA Format)							
4	14,15	13,16,17,18	13	31,32	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	-	-
	-	-	-	21	-	11	-	
ZVJCC6	PowerPlex® Fusion (HID Format)							
4						10		
		17,18	16,18					

TABLE 3

WebCode	DYS19	DYS385	DYS389_I	DYS389_II	DYS390	DYS391	DYS392	DYS393
Item	DYS437	DYS438	DYS439	DYS448	DYS456	DYS458	DYS481	DYS533
	DYS549	DYS570	DYS576	DYS635	DYS643	Y GATA H4	Y Indel	

Item 4 - YSTR Results

ZZYJZ6	Yfiler®, PowerPlex® Y23 (PDF Format)							
4	14,15	13,16,17,18	13,14	31,32	21,23	10	11	12,15
	14	10,11	11	20,21	14,15	16,17.2	24,25	11
	12	17,18	16,18	21	9,13	11	2	



## DNA Conclusions

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>
478GVD	2	Included	Excluded	3 or more	Included	Included
8WBF8Y	2	Included	Excluded	3	Included	Included
C3PMWT	2	Included	Excluded	3	Included	Included
DBC6QR	2	Included	Excluded	3	Included	Included
DJLU4Q	2	Included	Excluded	3	Included	Included
EYRDD3	2	Included	Excluded	3 or more	Included	Inconclusive / Uninterpretable
GEG3NP	1	Included	Excluded	2	Included	Included
GMYD2Q	1	Included	Excluded	2	Included	Included
HLV9YM	2	Included	Excluded	3	Included	Included
HNM8BY	at least 2 individuals	Included	Excluded	At least 3 individuals	Included	Included
MUQ2WU	2	Included	Excluded	3	Included	Excluded
PFCVVE	2	Included	Excluded	3	Included	Included
R83X6E	TWO	Included	Excluded		Inconclusive / Uninterpretable	Inconclusive / Uninterpretable
T7PQFQ	at least 2	Included	Excluded	at least 3	Included	Included
TL3WQP	2	Included	Excluded	At least 3	Included	Inconclusive / Uninterpretable
VC4BDM	2	Included	Excluded	3	Included	Included
WQKN79	2	Included	Excluded	3	Included	Included
ZVJCC6	2	Included	Excluded	at least 3	Inconclusive / Uninterpretable	Inconclusive / Uninterpretable
ZZYJZ6	at least 2	Included	Excluded	At least 3	Included	Included

**Conclusions Response Summary****Participants reporting conclusions: 19**

*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?*

<b>Responses</b>	<b>Item 3</b>		<b>Item 4</b>	
	<u>Item 1</u>	<u>Item 2</u>	<u>Item 1</u>	<u>Item 2</u>
	Included	<b>19</b>	<b>0</b>	<b>17</b>
Excluded	<b>0</b>	<b>19</b>	<b>0</b>	<b>1</b>
Inconclusive	<b>0</b>	<b>0</b>	<b>2</b>	<b>4</b>
No Response	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Total	<b>19</b>	<b>19</b>	<b>19</b>	<b>19</b>

# Statistical Analysis for Item 3

TABLE 5

WebCode	Item 3 Methods & Results
478GVD	<p><b>Method(s):</b> [Participant did not report a Method]</p> <p><b>Stats Analysis:</b> No statistical analysis performed</p>
8WBF8Y	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> H1: The victim and a random person unrelated with the victim have contributed to the mixture. H2: Two random person unrelated have contributed to the mixture. [Participant created a manually formatted table within the free form text space. This special formatting was not transferable into the final report. Data is presented as is.] LR(IP) = X / Y X = P(E/h1) Y = P(E/h2) GFF 2.7.72 BETA 2017-11-29 08:06:55 a.m. Nombre muestra mezcla: ITEM 3 (shirt) Nombre muestra A: ITEM 1 (Victim) ===== D3S1358 ===== ALELOS MEZCLA : 18 16 A : 16 - 16 ----- 18 - 0,105 16 - 0,268 ----- X = 0,067305 Y = 0,01407664104 LR = 4,78132530400875 ===== VWA ===== ALELOS MEZCLA : 17 16 A : 16 - 17 ----- 17 - 0,28 16 - 0,358 ----- X = 0,407044 Y = 0,14311224704 LR = 2,84422897703668 ===== D16S539 ===== ALELOS MEZCLA : 9 10 11 12 A : 10 - 12 ----- 9 - 0,159 10 - 0,159 11 - 0,266 12 - 0,26 ----- X = 0,084588 Y = 0,04196241504 LR = 2,01580390259636 ===== CSF1PO ===== ALELOS MEZCLA : 11 12 13 A : 12 - 13 ----- 11 - 0,297 12 - 0,364 13 - 0,066 ----- X = 0,343629 Y = 0,062246856672 LR = 5,52042333335318 ===== TPOX ===== ALELOS MEZCLA : 6 8 9 12 A : 8 - 9 ----- 6 - 0,003 8 - 0,505 9 - 0,072 12 - 0,105 ----- X = 0,00063 Y = 0,0002748816 LR = 2,29189585625229 ===== D8S1179 ===== ALELOS MEZCLA : 8 12 13 15 A : 12 - 13 ----- 8 - 0,006 12 - 0,122 13 - 0,333 15 - 0,11 ----- X = 0,00132 Y = 0,00064351584 LR = 2,05123155942828 ===== D21S11 ===== ALELOS MEZCLA : 29 30 31 A : 29 - 30 ----- 29 - 0,207 30 - 0,293 31 - 0,067 ----- X = 0,071489 Y = 0,027648850068 LR = 2,58560481988144 ===== D18S51 ===== ALELOS MEZCLA : 16 15 A : 15 - 15 ----- 16 - 0,134 15 - 0,136 ----- X = 0,054404 Y = 0,004649890048 LR = 11,7000616011125 ===== D19S433 ===== ALELOS MEZCLA : 14 13 A : 13 - 14 ----- 14 - 0,2716 13 - 0,2798 ----- X = 0,30404196 Y = 0,0808709908593664 LR = 3,7595923676603 ===== TH01 ===== ALELOS MEZCLA : 9,3 6 A : 6 - 9,3 ----- 9,3 - 0,179 6 - 0,374 ----- X = 0,305809 Y = 0,072927223424 LR = 4,19334489429307 ===== FGA ===== ALELOS MEZCLA : 23 25 26 A : 23 - 25 ----- 23 - 0,148 25 - 0,149 26 - 0,076 ----- X = 0,05092 Y = 0,007501561152 LR = 6,78792040326488 ===== D5S818 ===== ALELOS MEZCLA : 9 11 12 A : 11 - 12 ----- 9 - 0,078 11 - 0,418 12 - 0,256 ----- X = 0,111228 Y = 0,075319934976 LR = 1,4767405207591 ===== D13S317 ===== ALELOS MEZCLA : 9 11 12 A : 9 - 11 ----- 9 - 0,151 11 - 0,219 12 - 0,295 ----- X = 0,305325 Y = 0,0778477329 LR = 3,92207953431615 ===== D7S820 ===== ALELOS MEZCLA : 10 9 A : 10 - 10 ----- 10 - 0,281 9 - 0,088 ----- X = 0,0572 Y = 0,012245008864 LR = 4,6712910243917 ===== D2S1338 ===== ALELOS MEZCLA : 19 20 23 A : 19 - 20 ----- 19 - 0,1485 20 - 0,1294 23 - 0,1298 ----- X = 0,08899088 Y = 0,012202740616968 LR = 7,29269618959675 ===== PentaE ===== ALELOS MEZCLA : 12 7 A : 12 - 12 ----- 12 - 0,1689 7 - 0,0894 ----- X = 0,03819168 Y = 0,0035737307540784 LR = 10,6867815815209 ===== PentaD ===== ALELOS MEZCLA : 9 12 13 14 A : 12 - 14 ----- 9 - 0,1767 12 - 0,1464 13 - 0,1499 14 - 0,0551 ----- X = 0,05297466 Y = 0,0051279301361088 LR = 10,3306126631824</p>

TABLE 5

WebCode	Item 3 Methods & Results
	<pre> ===== D10S1248 ===== ALELOS MEZCLA : 14 13 A : 13 - 14 ----- 14 - 0,35 13 - 0,2667 ----- X = 0,38031889 Y = 0,1245768890982 LR = 3,05288479069506 ===== D1S1656 ===== ALELOS MEZCLA : 14 15,3 16 16,3 A : 15,3 - 16,3 ----- 14 - 0,122 15,3 - 0,054 16 - 0,177 16,3 - 0,055 ----- X = 0,043188 Y = 0,00153922032 LR = 28,0583613916947 ===== D2S441 ===== ALELOS MEZCLA : 10 14 15 A : 14 - 15 ----- 10 - 0,348 14 - 0,21 15 - 0,046 ----- X = 0,29928 Y = 0,02436545664 LR = 12,2829629020242 ===== D12S391 ===== ALELOS MEZCLA : 16 17,3 20 21 A : 16 - 21 ----- 16 - 0,0067 17,3 - 0,01 20 - 0,1767 21 - 0,0633 ----- X = 0,003534 Y = 1,798565688E-5 LR = 196,489904348715 ===== D22S1045 ===== ALELOS MEZCLA : 16 15 A : 15 - 16 ----- 16 - 0,4678 15 - 0,3489 ----- X = 0,66699889 Y = 0,382179469231982 LR = 1,74525044827861 ===== SE33 ===== ALELOS MEZCLA : 14 19 26,2 31,2 A : 19 - 26,2 ----- 14 - 0,0274 19 - 0,0824 26,2 - 0,0637 31,2 - 0,029 ----- X = 0,0015892 Y = 0,000100098241152 LR = 15,8764028389548 ***** X TOTAL = 7,85340200980224E-29 Y TOTAL = 2,73263577484568E-46 LR TOTAL = 2,8739292964302E17 ***** 287.392.929.643.020.000 ***** </pre>
C3PMWT	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> PPY results would be reported as frequency of occurrence. Only NGM Select loci considered for autosomal results.</p>
DBC6QR	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> The probability of a randomly selected unrelated individual having a DNA profile matching with the DNA profile of "Item 1" that is consistent with being one of the contributors to the mixed DNA profile developed from bloodstains on shirt "Item 3" (at 19 loci) is approximately: a) 1 in 24 quadrillion as calculated based on the [Country] Malay population database. b) 1 in 15 quadrillion as calculated based on the [Country] Chinese population database. c) 1 in 700 quadrillion as calculated based on the [Country] Indian population database.</p>
DJLU4Q	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> 623 Billones</p>
EYRDD3	<p><b>Method(s):</b> [Participant did not report a Method]</p> <p><b>Stats Analysis:</b> N/A = Not Applicable, INC = Inconclusive, OLA = Off ladder allele</p>
GEG3NP	<p><b>Method(s):</b> [Participant did not report a Method]</p> <p><b>Stats Analysis:</b> The profile probability was calculated using the method described by Clopper and Pearson (1934) Biometrika 26:404-413. African American 1-in-2083; Caucasian 1-in-1613; Hispanic 1-in-1592.</p>
GMYD2Q	<p><b>Method(s):</b> [Participant did not report a Method]</p> <p><b>Stats Analysis:</b> 1 in 5556 (total database); 1 in 2083 (African American); 1 in 1337 (Asian); 1 in 1613 (Caucasian); 1 in 1592 (Hispanic)</p>
HLV9YM	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> The probability of a randomly selected unrelated individual having a DNA profile matching with the DNA profile of "Item 1" that is consistent with being one of the contributors of the mixed DNA profile developed from bloodstains on shirt "Item 3" (at 19 loci) is approximately: (i) 1 in 24 quadrillion as calculated based on the [Country] Malay population database; (ii) 1 in 15 quadrillion as calculated based on the [Country] Chinese population database; and (iii) 1 in 700 quadrillion as calculated based on the [Country] Indian population database.</p>

TABLE 5

WebCode	Item 3 Methods & Results
HNM8BY	<p><b>Method(s):</b> Combined Probability of Exclusion/Inclusion</p> <p><b>Stats Analysis:</b> The Fusion 6C DNA profile from item #3 (DNA profile from questioned blood stain from male victim's outer shirt) is consistent with being a mixture of at least two individuals. The victim (Item #1) is included as a potential contributor to the Fusion 6C DNA profile from item #3. The suspect (item #2) is excluded as a contributor to the Fusion 6C DNA profile from item #3. The victim (item #1) is consistent with being the source of the PowerPlex Y23 YSTR DNA profile from item #3. The suspect is excluded as being the source of the PowerPlex Y23 YSTR DNA profile from item #3. The expected frequency of male individuals who could be included as a contributor to the Fusion 6C DNA profile and is the source of the PowerPlex Y23 YSTR DNA profile from item #3 is less than 1 in 7 billion in the African American, Caucasian, and Hispanic populations. (Ceiling statistic)</p>
MUQ2WU	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> LR calculated with LRmixStudio. LR 1 = (Item 1 + 1 Unk) / (2 Unk) = 7.46E+11 (d.o.= 0.1). LR 2 = (Item 2 + 1 Unk) / (2 Unk) = 1.63E-42 (d.o.= 0.1)</p>
PFMCVE	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> The victim (Item 1) and an unknown contributor are not excluded as the source of the cell mixture of the blood stain from male victim's outer shirt (Item 3). Is 287.392.929.643.019.000 more probable this finding if the cell mixture in the blood stain from male victim's outer shirt comes from the victim and a stranger, that if it comes from two strangers of the population not genetically related.</p>
R83X6E	<p><b>Method(s):</b> Combined Probability of Exclusion/Inclusion</p> <p><b>Stats Analysis:</b> The victim (Item 1) cannot be excluded as a contributor to the mixture of DNA identified on item 3. Using 18 of 21 loci, the combined probability of exclusion and the combined probability of inclusion are as follows: Caucasian population: 99.99999999278%, 1 in 138 billion. African American population: 99.99999999113%, 1 in 1.12 trillion. Hispanic population: 99.999999973967%, 1 in 38.4 billion.</p>
T7PQFQ	<p><b>Method(s):</b> [Participant did not report a Method]</p> <p><b>Stats Analysis:</b> No statistical analysis performed.</p>
TL3WQP	<p><b>Method(s):</b> [Participant did not report a Method]</p>
VC4BDM	<p><b>Method(s):</b> Random Match Probability</p> <p><b>Stats Analysis:</b> A mixed DNA profile (PowerPlex™ Fusion 6C) consisting of DNA from at least two contributors was obtained from the questioned sample from the male victim's outer shirt; item 3. A major female contributor was obtained from item 3 at all loci except D10S1248, vWA, D19S433, and D22S1045. A minor male contributor was obtained from item 3 at all loci except for D21S11, D10S1248, vWA, D19S433, and D22S1045. The individual represented by reference blood sample from the suspect, item 2 is excluded as the major contributor of the mixed DNA profile obtained from the male victim's outer shirt; item 3. The individual represented by reference blood sample from the victim, item 1 cannot be excluded as the minor contributor of the mixed DNA obtained from his outer shirt; item 3. The probability of selecting a random unrelated individual having a DNA profile identical to the minor contributor (item 1) obtained from item item 3 at the loci observed is 1 in 3.65E26 for African Americans, 1 in 1.08E24 for Caucasian Americans, 1 in 7.31E23 for Hispanic Americans, and 1 in 9.40E28 for Asian Americans.</p>
WQKN79	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> The probability of a randomly selected unrelated individual having a DNA profile of "Item 1" that is consistent with being one of the contributor to this mixed DNA profile (at 19 loci) is approximately; (i) 1 in 24 quadrillion as calculated based on [Country] Malay population database. (ii) 1 in 15 quadrillion as calculated based on [Country] Chinese population database. (iii) 1 in 700</p>

TABLE 5

WebCode	Item 3 Methods & Results
ZVJCC6	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> A mixed DNA typing profile was obtained from Item 3, the sample from the victim's outer shirt. This DNA profile is consistent with the combined known profile from the victim (Item #1) and an unknown contributor. It is 92 trillion times more likely that the observed DNA profile originated from the victim and an unknown individual than it having originated from two unknown individuals selected at random from the U.S. population.</p>
ZZYJZ6	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> LR: (male victim + 1 unknown person) vs (2 unknown unrelated persons) = 287.392.929.643.019.000 (2.8739E17)</p>

# Statistical Analysis for Item 4

TABLE 6

WebCode	Item 4 Methods & Results
478GVD	<p><b>Method(s):</b> [Participant did not report a Method]</p> <p><b>Stats Analysis:</b> No statistical analysis performed</p>
8WBF8Y	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> H1: The victim, the suspect and a random person have contributed to the mixture. H2: Three a random person unrelated with the victim and the suspect have contributed to the mixture. [Participant created a manually formatted table within the free form text space. This special formatting was not transferable into the final report. Data is presented as is.] LR(IP) = X / Y X = P(E/h1) Y = P(E/h2) GFF 2.7.72 BETA 24/11/2017 02:29:06 p.m. Nombre muestra mezcla: ITEM 4 (knife) Nombre muestra A: ITEM 1 (Victim) Nombre muestra B: ITEM 2 (Suspect)</p> <p>===== D3S1358 ===== ALELOS MEZCLA: 15 16 18 A: 16 - 16 B: 15 - 18 ----- 15- 0,372 16- 0,268 18- 0,105 ----- X = 0,555025 Y = 0,090807277188852 LR = 6,11212027474091 ===== VWA ===== ALELOS MEZCLA: 14 16 17 A: 16 - 17 B: 14 - 17 ----- 14- 0,047 16- 0,358 17- 0,28 ----- X = 0,469225 Y = 0,032820799739196 LR = 14,2965742373313 ===== D16S539 ===== ALELOS MEZCLA: 8 9 10 11 12 A: 10 - 12 B: 8 - 11 ----- 8- 0,011 9- 0,159 10- 0,159 11- 0,266 12- 0,26 ----- X = 0,246609 Y = 0,00591984770176775 LR = 41,6579973715133 ===== CSF1PO ===== ALELOS MEZCLA: 9 11 12 13 A: 12 - 13 B: 9 - 13 ----- 9- 0,021 11- 0,297 12- 0,364 13- 0,066 ----- X = 0,356103 Y = 0,00855879167038893 LR = 41,6066909575587 ===== TPOX ===== ALELOS MEZCLA: 6 8 9 11 12 A: 8 - 9 B: 8 - 11 ----- 6- 0,003 8- 0,505 9- 0,072 11- 0,263 12- 0,105 ----- X = 0,000629999999999816 Y = 0,00102801870057614 LR = 0,612829318811748 ===== D8S1179 ===== ALELOS MEZCLA: 8 12 13 14 15 A: 12 - 13 B: 13 - 14 ----- 8- 0,006 12- 0,122 13- 0,333 14- 0,251 15- 0,11 ----- X = 0,00131999999999982 Y = 0,00199157212710715 LR = 0,662792967441848 ===== D21S11 ===== ALELOS MEZCLA: 29 30 31 A: 29 - 30 B: 29 - 30 ----- 29- 0,207 30- 0,293 31- 0,067 ----- X = 0,071489 Y = 0,0157140856918974 LR = 4,54935790740033 ===== D18S51 ===== ALELOS MEZCLA: 15 16 20 A: 15 - 15 B: 15 - 20 ----- 15- 0,136 16- 0,134 20- 0,027 ----- X = 0,06164 Y = 0,000274864138797601 LR = 224,256246266412 ===== D19S433 ===== ALELOS MEZCLA: 14 13 A: 13 - 14 B: 14 - 14 ----- 14- 0,2716 13- 0,2798 ----- X = 0,30404196 Y = 0,0272248690549147 LR = 11,1678024745215 ===== TH01 ===== ALELOS MEZCLA: 6 7 9,3 A: 6 - 9,3 B: 7 - 9,3 ----- 6- 0,374 7- 0,246 9,3- 0,179 ----- X = 0,638401 Y = 0,171883091182291 LR = 3,7141582433082 ===== FGA ===== ALELOS MEZCLA: 20 23 25 26 A: 23 - 25 B: 20 - 23 ----- 20- 0,082 23- 0,148 25- 0,149 26- 0,076 ----- X = 0,063384 Y = 0,0027939675123456 LR = 22,6860189747831 ===== D5S818 ===== ALELOS MEZCLA: 9 11 12 13 A: 11 - 12 B: 13 - 13 ----- 9- 0,078 11- 0,418 12- 0,256 13- 0,132 ----- X = 0,13182 Y = 0,0862057569101415 LR = 1,52913221488683 ===== D13S317 ===== ALELOS MEZCLA: 9 11 12 13 14 A: 9 - 11 B: 13 - 14 ----- 9- 0,151 11- 0,219 12- 0,295 13- 0,124 14- 0,059 ----- X = 0,413295 Y = 0,0217878876895105 LR = 18,9690256297298 ===== D7S820 ===== ALELOS MEZCLA: 8 9 10 11 A: 10 - 10 B: 8 - 11 ----- 8- 0,107 9- 0,088 10- 0,281 11- 0,285 ----- X = 0,126192 Y = 0,0433613249216137 LR = 2,91024317702753 ===== D2S1338 ===== ALELOS MEZCLA: 19 20 21 22 23 A: 19 - 20 B: 21 - 22 ----- 19- 0,1485 20- 0,1294 21- 0,0342 22- 0,1268 23- 0,1298 ----- X = 0,13078648 Y = 0,00221445322388144 LR = 59,0603940465089 ===== PentaE ===== ALELOS MEZCLA: 7 8 12 A: 12 - 12 B: 8 - 8 ----- 7- 0,0894 8- 0,0216 12- 0,1689</p>

TABLE 6

**WebCode** **Item 4 Methods & Results**

----- X = 0,04205376 Y = 0,000157927549359761 LR = 266,28514258903  
 ===== PentaD ===== ALELOS MEZCLA: 8 9 11  
 12 13 14 A: 12 - 14 B: 8 - 11 ----- 8- 0,0185 9- 0,1767 11- 0,1967 12- 0,1464 13- 0,1499  
 14- 0,0551 ----- X = 0,05297466 Y = 0,000559808441063721 LR = 94,6299771745852  
 ===== D10S1248 ===== ALELOS MEZCLA: 13  
 14 15 A: 13 - 14 B: 14 - 15 ----- 13- 0,2667 14- 0,35 15- 0,23 ----- X =  
 0,71690089 Y = 0,26269982367556 LR = 2,72897362460886 =====  
 D1S1656 ===== ALELOS MEZCLA: 13 14 15,3 16 16,3 A: 15,3 - 16,3 B:  
 13 - 14 ----- 13- 0,107 14- 0,122 15,3- 0,054 16- 0,177 16,3- 0,055 ----- X =  
 0,150981 Y = 0,00127228103600401 LR = 118,669535839505 =====  
 D2S441 ===== ALELOS MEZCLA: 10 14 15 A: 14 - 15 B: 14 - 14  
 ----- 10- 0,348 14- 0,21 15- 0,046 ----- X = 0,29928 Y = 0,0162071707932288 LR  
 = 18,4659002992081 ===== D12S391  
 ===== ALELOS MEZCLA: 16 17 17,3 20 21 A: 16 - 21 B: 17 - 21  
 ----- 16- 0,0067 17- 0,0567 17,3- 0,01 20- 0,1767 21- 0,0633 ----- X =  
 0,00353399999999999999 Y = 4,79401748869662E-6 LR = 737,168775110327  
 ===== SE33 ===== ALELOS MEZCLA: 14 18 19  
 25,2 26,2 31,2 A: 19 - 26,2 B: 18 - 25,2 ----- 14- 0,0274 18- 0,0974 19- 0,0824 25,2-  
 0,046 26,2- 0,0637 31,2- 0,029 ----- X = 0,0015892 Y = 1,34544047897218E-5 LR =  
 118,117451112667 \*\*\*\*\* X TOTAL = 3,75763556772451E-25 Y TOTAL =  
 9,72633673783007E-53 LR TOTAL = 3,8633615810456E27 \*\*\*\*\*  
 3.863.361.581.045.600.000.000.000 \*\*\*\*\* El sistema D22S1045 no se incluye  
 para el cálculo estadístico.

C3PMWT **Method(s):** Likelihood Ratio  
**Stats Analysis:** Item 1 - one of major contributors. Item 2 - possible minor contributor + one unknown major - likely female

DBC6QR **Method(s):** Likelihood Ratio  
**Stats Analysis:** 1. The probability of a randomly selected unrelated individual having a DNA profile matching with the DNA profile of "Item 1" that is consistent with being one of the contributors (major) to the mixed DNA profile developed from bloodstains on the handle of the pocket knife "Item 4" (at 21 loci) is approximately: a) 1 in 500 trillion as calculated based on the [Country] Malay population database. b) 1 in 540 trillion as calculated based on the [Country] Chinese population database. c) 1 in 1.9 quadrillion as calculated based on the [Country] Indian population database. 2. The probability of a randomly selected unrelated individual having a DNA profile matching with the DNA profile of "Item 2" that is consistent with being one of the contributors (minor) to the mixed DNA profile developed from bloodstains on the handle of the pocket knife "Item 4" (at 12 loci) is approximately: a) 1 in 330 million as calculated based on the [Country] Malay population database. b) 1 in 310 million as calculated based on the [Country] Chinese population database. c) 1 in 61 million as calculated based on the [Country] Indian population database.

DJLU4Q **Method(s):** Likelihood Ratio  
**Stats Analysis:** 265162 Billones

EYRDD3 **Method(s):** [Participant did not report a Method]  
**Stats Analysis:** Comparison of the DNA profile obtained from item #2 to the GlobalFiler mixture profile obtained from item #4 is inconclusive. Comparison of the YFiler profile obtained from item #2 to the YFiler mixture profile obtained from item #4, the suspect cannot be excluded as a contributor to the YFiler mixture profile that was obtained from item #4. There doesnot appear to be a good way to enter the conflicting GlobalFiler and yFiler interpretations on the CTS results packet. In addition to the conflict between the yFiler data and the GlobalFiler data is the limitation of using the pdf electropherograms and the CTS analytical threshold of 75rfu for GlobalFiler. Using the pdf files and analytical threshold of 75rfu, there appears to be alleles below 75rfu at many of the loci. Working from a pdf prevents the analyst from evaluating what is present below 75rfu. If alleles are present below 75rfu and above 50rfu



TABLE 6

WebCode	Item 4 Methods & Results
	(which is a common GlobalFiler analytical threshold for many forensic laboratories) those alleles could result in the inclusion of the suspect's DNA profile if I were using an analytical threshold of 50rfu. That is why I marked the entire comparison as "inconclusive" on the CTS results packet. N/A = Not Applicable, INC = Inconclusive, OLA = Off ladder allele
GEG3NP	<p><b>Method(s):</b> [Participant did not report a Method]</p> <p><b>Stats Analysis:</b> Major (victim included)= The profile probability was calculated using the method described by Clopper and Pearson (1934) Biometrika 26:404-413. African American 1-in-2083; Caucasian 1-in-1613; Hispanic 1-in-1592. Minor (suspect included)= The profile probability was calculated using the method described by Clopper and Pearson (1934) Biometrika 26:404-413. African American 1-in-2083; Caucasian 1-in-2488; Hispanic 1-in-1592.</p>
GMYD2Q	<p><b>Method(s):</b> [Participant did not report a Method]</p> <p><b>Stats Analysis:</b> Minor: 1 in 8696 (total database); 1 in 2083 (African American); 1 in 1337 (Asian); 1 in 2488 (Caucasian); 1 in 1592 (Hispanic). Major: 1 in 5556 (total database); 1 in 2083 (African American); 1 in 1337 (Asian); 1 in 1613 (Caucasian); 1 in 1592 (Hispanic)</p>
HLV9YM	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> 1. The probability of a randomly selected unrelated individual having a DNA profile matching with the DNA profile of "Item 1" that is consistent with being one of the contributors (major) of the mixed DNA profile developed from bloodstains on handle of pocket knife "Item 4" (at 21 loci) is approximately: (i) 1 in 500 trillion as calculated based on the [Country] Malay population database; (ii) 1 in 540 trillion as calculated based on the [Country] Chinese population database; and (iii) 1 in 1.9 quadrillion as calculated based on the [Country] Indian population database. 2. The probability of a randomly selected unrelated individual having a DNA profile matching with the DNA profile of "Item 2" that is consistent with being one of the contributors (minor) of the mixed DNA profile developed from bloodstains on handle of pocket knife "Item 4" (at 12 loci) is approximately: (i) 1 in 330 million as calculated based on the [Country] Malay population database; (ii) 1 in 310 million as calculated based on the [Country] Chinese population database; and (iii) 1 in 61 million as calculated based on the [Country] Indian population database.</p>
HNM8BY	<p><b>Method(s):</b> Combined Probability of Exclusion/Inclusion</p> <p><b>Stats Analysis:</b> The Fusion C6 DNA profile from item #4 (DNA profile from questioned blood stain from handle of pocket knife) is consistent with being a mixture of at least three individuals. The victim (Item #1) is included as a potential contributor to the Fusion 6C DNA profile from item #4. The suspect (Item #2) is included as a potential contributor to the Fusion 6C DNA profile from item #4 (at all loci tested except D22S1045). The PowerPlex Y23 DNA profile from item #4 is consistent with being a mixture of at least two males. The victim (Item #1) is included as a potential contributor to the PowerPlex Y23 DNA profile from item #4. The suspect (Item #2) is included as a potential contributor to the PowerPlex Y23 DNA profile from item #4 (at all loci tested except DYS389II). No statistics calculated in house for Fusion and PPY23 mixture stats when PPY23 is a mixture. Sample would be outsourced for combination statistic.</p>
MUQ2WU	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> LR calculated with LRmixStudio. LR1 = (Item 1 + 2 Unk) / (3 Unk) = 6.20E09 (d.o.= 0.31). LR2 = (Item 2 + 2 Unk) / (3 Unk) = 7.61E-05 (d.o.=0.1). LR3 = (Item 1 + Item 2 + 1 Unk) / (Item 1 + 2 Unk) = 4.66E-06 (d.o.=0.1)</p>
PFMCVE	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> The victim (Item 1), the suspect (Item 2) and an unknown contributor are not excluded as the source of the cell mixture of the blood stain from handle of pocket knife (Item 4). Is 3.863.361.581.045.600.000.000.000.000 more probable this finding if the cell mixture in the blood stain from handle of pocket knife comes from the victim, the suspect and a stranger, that if it comes from at least three strangers of the population not genetically related.</p>
T7PQFQ	<p><b>Method(s):</b> [Participant did not report a Method]</p>

TABLE 6

WebCode	Item 4 Methods & Results
	<b>Stats Analysis:</b> No statistical analysis performed
VC4BDM	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> A mixed DNA profile (PowerPlex™ Fusion 6C) consisting of DNA from at least three contributors was obtained from the questioned sample from the handle of the pocket knife; item 4. The observed mixture profile is approximately 2.16E10 times more likely to occur under the scenario that it is a mixture of DNA from the victim, the suspect, and an unknown individual, as opposed to the scenario that it originated from a mixture of DNA from the victim, and two unrelated unknown individuals, in the Caucasian population. The observed mixture profile is approximately 5.42E7 times more likely to occur under the scenario that it is a mixture of DNA from the victim, the suspect, and an unknown individual, as opposed to the scenario that it originated from a mixture of DNA from the victim, and two unrelated unknown individuals, in the African American population. The observed mixture profile is approximately 3.81E9 times more likely to occur under the scenario that it is a mixture of DNA from the victim, the suspect, and an unknown individual, as opposed to the scenario that it originated from a mixture of DNA from the victim, and two unrelated unknown individuals, in the Hispanic population.</p>
WQKN79	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> The probability of a randomly selected unrelated individual having a DNA profile of "Item 1" that is consistent with being one of the contributors (major) to this mixed DNA profile (at 21 loci) is approximately; (i) 1 in 500 trillion as calculated based on [Country] Malay population database. (ii) 1 in 540 trillion as calculated based on [Country] Chinese population database. (iii) 1 in 1.9 quadrillion as calculated based on [Country] Indian population database. The probability of a randomly selected unrelated individual having a DNA profile of "Item 2" that is consistent with being one of the contributors (minor) to this mixed DNA profile (at 12 loci) is approximately; (i) 1 in 330 million as calculated based on [Country] Malay population database. (ii) 1 in 310 million as calculated based on [Country] Chinese population database. (iii) 1 in 61 million as calculated based on [Country] Indian population database.</p>
ZVJCC6	<p><b>Method(s):</b> [Participant did not report a Method]</p> <p><b>Stats Analysis:</b> A mixed DNA typing profile consistent with three or more contributors was obtained from Item 4, the sample from the handle of the pocket knife. Due to the complexity of the DNA profile, no meaningful comparison can be made to any known samples.</p>
ZZYJZ6	<p><b>Method(s):</b> Likelihood Ratio</p> <p><b>Stats Analysis:</b> LR: (male victim + male suspect + 1 unknown person) vs (3 unknown unrelated persons) = 3.863.361.581.045.600.000.000.000.000. (3.8633E27). Stats performed at all loci except D22S1045</p>

# Databases Used

TABLE 7

WebCode	Databases Used
478GVD	Item 3: No statistical analysis performed Item 4: No statistical analysis performed
8WBF8Y	<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. Data is presented as is.] D3S1358 13 14 15 16 17 18 19 20 0,003 0,101 0,372 0,268 0,139 0,105 0,011 0,001 VWA 13 14 15 16 17 18 19 20 21 0,002 0,047 0,089 0,358 0,28 0,165 0,047 0,01 0,002 D16S539 10 11 12 13 14 15 5 8 9 0,159 0,266 0,26 0,119 0,024 0,001 0,001 0,011 0,159 CSF1PO 10 11 12 13 14 7 8 9 0,228 0,297 0,364 0,066 0,009 0,006 0,009 0,021 TPOX 10 11 12 13 14 6 7 8 9 0,046 0,263 0,105 0,003 0,001 0,003 0,002 0,505 0,072 D8S1179 8 11 12 13 14 15 16 17 18 9 Rest 0,006 0,079 0,122 0,333 0,251 0,11 0,027 0,0010 0,005 0,012 0,054 D21S11 26 26,2 27 28 29 30 30,2 31 31,2 32 32,2 33 33,2 34 34,2 0,001 0,002 0,015 0,098 0,207 0,293 0,031 0,067 0,089 0,021 0,127 0,002 0,042 0,001 0,004 D18S51 10 11 12 13 14 14,2 15 16 17 18 19 20 21 22 23 Rest 0,011 0,009 0,126 0,121 0,164 0,001 0,136 0,134 0,149 0,062 0,039 0,027 0,013 0,004 0,003 0,001 D19S433 10 11 11,2 12 12,2 13 13,2 14 14,2 15 15,2 16 16,2 17 17,2 0,0008 0,0064 0,0015 0,0781 0,0064 0,2798 0,0773 0,2716 0,036 0,1358 0,0517 0,0386 0,0129 0,0023 0,0008 TH01 10 6 7 8 9 9,3 0,009 0,374 0,246 0,076 0,116 0,179 FGA 18 19 19,2 20 20,2 21 21,2 22 22,2 23 24 25 25,2 26 27 28 29 0,012 0,066 0,001 0,082 0,001 0,118 0,002 0,135 0,004 0,148 0,169 0,149 0,001 0,076 0,024 0,01 0,002 D5S818 10 11 12 13 16 7 8 9 Rest 0,073 0,418 0,256 0,132 0,001 0,029 0,008 0,078 0,005 D13S317 10 11 12 13 14 14,2 8 9 Rest 0,066 0,219 0,295 0,124 0,059 0,002 0,083 0,151 0,001 D7S820 10 11 12 13 14 5 6 7 8 9 0,281 0,285 0,174 0,038 0,003 0,001 0,001 0,022 0,107 0,088 D2S1338 15 16 17 18 19 20 21 22 23 24 25 26 5 6 7 8 9 0,0574 0,0867 0,1689 0,0876 0,0911 0,1044 0,0611 0,0385 0,032 0,0287 0,0379 0,0243 0,0114 0,006 0,0031 0,0008 0,0002 0,0383 0,0012 0,0894 0,0216 0,0094 Penta D 11 12 13 14 15 16 17 2,2 3,2 5 6 7 8 9 Rest 0,1967 0,1464 0,1499 0,0551 0,0123 0,0042 0,0006 0,0083 0,0006 0,0025 0,0004 0,0044 0,0185 0,1767 0,0012 D10S1248 10 11 12 13 14 15 Rest 0,0033 0,0111 0,0322 0,2667 0,3500 0,2300 0,1067 D1S1656 14 14,3 15 15,3 16 16,3 17 17,3 18 13 Rest 0,122 0,003 0,15 0,054 0,1770 0,0550 0,0390 0,1490 0,0060 0,1070 0,1380 D2S441 10 11 11,3 12 13 14 15 Rest 0,348 0,284 0,049 0,039 0,021 0,21 0,046 0,0030 D12S391 15 16 17 18 19 20 21 22 23 17,3 Rest 0,0333 0,0067 0,0567 0,2233 0,2433 0,1767 0,0633 0,0533 0,08 0,0100 0,0534 D22S1045 11 15 16 17 Rest 18 0,0644 0,3489 0,4678 0,0533 0,0556 0,01 SE33 14 18 19 25,2 26,2 31,2 Rest 0,0274 0,0974 0,0824 0,046 0,0637 0,029 0,6541</p> <p>Item 4: [Participant created a manually formatted table within the free form text space. This special formatting was not transferable into the final report. Data is presented as is.] D3S1358 13 14 15 16 17 18 19 20 0,003 0,101 0,372 0,268 0,139 0,105 0,011 0,001 VWA 13 14 15 16 17 18 19 20 21 0,002 0,047 0,089 0,358 0,28 0,165 0,047 0,01 0,002 D16S539 10 11 12 13 14 15 5 8 9 0,159 0,266 0,26 0,119 0,024 0,001 0,001 0,011 0,159 CSF1PO 10 11 12 13 14 7 8 9 0,228 0,297 0,364 0,066 0,009 0,006 0,009 0,021 TPOX 10 11 12 13 14 6 7 8 9 0,046 0,263 0,105 0,003 0,001 0,003 0,002 0,505 0,072 D8S1179 8 11 12 13 14 15 16 17 18 9 Rest 0,006 0,079 0,122 0,333 0,251 0,11 0,027 0,0010 0,005 0,012 0,054 D21S11 26 26,2 27 28 29 30 30,2 31 31,2 32 32,2 33 33,2 34 34,2 0,001 0,002 0,015 0,098 0,207 0,293 0,031 0,067 0,089 0,021 0,127 0,002 0,042 0,001 0,004 D18S51 10 11 12 13 14 14,2 15 16 17 18 19 20 21 22 23 Rest 0,011 0,009 0,126 0,121 0,164 0,001 0,136 0,134 0,149 0,062 0,039 0,027 0,013 0,004 0,003 0,001 D19S433 10 11 11,2 12 12,2 13 13,2 14 14,2 15 15,2 16 16,2 17 17,2 0,0008 0,0064 0,0015 0,0781 0,0064 0,2798 0,0773 0,2716 0,036 0,1358 0,0517 0,0386 0,0129 0,0023 0,0008 TH01 10 6 7 8 9 9,3 0,009 0,374 0,246 0,076 0,116 0,179 FGA 18 19 19,2 20 20,2 21 21,2 22 22,2 23 24 25 25,2 26 27 28 29 0,012 0,066 0,001 0,082 0,001 0,118 0,002 0,135</p>

TABLE 7

WebCode	Databases Used
	0,004 0,148 0,169 0,149 0,001 0,076 0,024 0,01 0,002 D5S818 10 11 12 13 16 7 8 9 Rest 0,073 0,418 0,256 0,132 0,001 0,029 0,008 0,078 0,005 D13S317 10 11 12 13 14 14,2 8 9 Rest 0,066 0,219 0,295 0,124 0,059 0,002 0,083 0,151 0,001 D7S820 10 11 12 13 14 5 6 7 8 9 0,281 0,285 0,174 0,038 0,003 0,001 0,001 0,022 0,107 0,088 D2S1338 15 16 17 18 19 20 21 22 23 24 25 26 27 0,0003 0,0379 0,1704 0,0572 0,1485 0,1294 0,0342 0,1268 0,1298 0,0755 0,0779 0,0071 0,005 Penta E 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 5 6 7 8 9 0,0574 0,0867 0,1689 0,0876 0,0911 0,1044 0,0611 0,0385 0,032 0,0287 0,0379 0,0243 0,0114 0,006 0,0031 0,0008 0,0002 0,0383 0,0012 0,0894 0,0216 0,0094 Penta D 11 12 13 14 15 16 17 2,2 3,2 5 6 7 8 9 Rest 0,1967 0,1464 0,1499 0,0551 0,0123 0,0042 0,0006 0,0083 0,0006 0,0025 0,0004 0,0044 0,0185 0,1767 0,0012 D10S1248 10 11 12 13 14 15 Rest 0,0033 0,0111 0,0322 0,2667 0,3500 0,2300 0,1067 D1S1656 14 14,3 15 15,3 16 16,3 17 17,3 18 13 Rest 0,122 0,003 0,15 0,054 0,1770 0,0550 0,0390 0,1490 0,0060 0,1070 0,1380 D2S441 10 11 11,3 12 13 14 15 Rest 0,348 0,284 0,049 0,039 0,021 0,21 0,046 0,0030 D12S391 15 16 17 18 19 20 21 22 23 17,3 Rest 0,0333 0,0067 0,0567 0,2233 0,2433 0,1767 0,0633 0,0533 0,08 0,0100 0,0534 D22S1045 11 15 16 17 Rest 18 0,0644 0,3489 0,4678 0,0533 0,0556 0,01 SE33 14 18 19 25,2 26,2 31,2 Rest 0,0274 0,0974 0,0824 0,046 0,0637 0,029 0,6541
C3PMWT	Item 3: Y-HRO database. NDNADB frequency database. Item 4: Y-HRD. NDNADB frequency database.
DBC6QR	Item 3: The [Country] Malay, Chinese and Indian population database. Item 4: [Country] Malay, Chinese and Indian population database.
DJLU4Q	Item 3: Población Región Andina de Colombia (Paredes, et al., For. Sci. Int. Vol 137:67-73, 2003); población colombiana sistemas: D2S1338 y D19S433 (Porrás et al., For. Sci. Int. Genetics e7-e8, 2008), SE33 (Paredes, M. y Laverde, L. Book of Abstracts, 18th Triennial Meeting of IAFS, 2008), D10S1248 y D22S1045 (Burgos et al., For. Sci. Int. Gen. Supplement Series, Volume 5 , e81 - e82 , 2015), D12S391 (Jiménez M., 1999); población hispana sistemas D2S441 y D1S1656 (Hill et al., For. Sci. Int. Gen. 5, 2011). Item 4: Población Región Andina de Colombia (Paredes, et al., For. Sci. Int. Vol 137:67-73, 2003); población colombiana sistemas: D2S1338 y D19S433 (Porrás et al., For. Sci. Int. Genetics e7-e8, 2008), D10S1248 (Burgos et al., For. Sci. Int. Gen. Supplement Series, Volume 5 , e81 - e82 , 2015), población hispana sistemas D2S441 y D1S1656 (Hill et al., For. Sci. Int. Gen. 5, 2011).
EYRDD3	Item 3: N/A Item 4: N/A
GEG3NP	Item 3: US Y-STR Database, Release 4.2 Item 4: US Y-STR Database, Release 4.2
GMYD2Q	Item 3: US Y-STR Database Release 4.2 Item 4: US Y-STR Database Release 4.2
HLV9YM	Item 3: [Country] Malay, Chinese and Indian Population Database. Item 4: [Country] Malay, Chinese and Indian Population Databases.
HNM8BY	Item 3: Autosomal: [State] DNA Database Frequencies. YSTR: National YSTR Database ( <a href="https://www.usystrdatabase.org">https://www.usystrdatabase.org</a> ) Item 4: See above
MUQ2WU	Item 3: Nist Caucasian Allele Frequencies Item 4: Nist Caucasian Allele Frequencies

TABLE 7

WebCode	Databases Used
PFMCVE	<p>Item 3: Population of the Andean Region of Colombia (Paredes, et al., For. Sci. Int. Vol 137:67-73, 2003); Colombian population Systems: D2S1338 y D19S433 (Porras et al., For. Sci. Int. Genetics e7-e8, 2008), SE33 (Paredes, M. y Laverde, L. Book of Abstracts, 18th Triennial Meeting of IAFS, 2008), D10S1248 y D22S1045 (Burgos et al., For. Sci. Int. Gen. Supplement Series, Volume5 , e81 - e82 , 2015), D12S391 (Jiménez M., 1999), PENTA E and PENTA D (Yunis, et al., J. For. SciVol 50:1-18, 2005), Hispanic population systems D2S441 y D1S1656 (Hill et al., For. Sci. Int. Gen. 5, 2011).</p> <p>Item 4: Population of the Andean Region of Colombia (Paredes, et al., For. Sci. Int. Vol 137:67-73, 2003); Colombian population Systems: D2S1338 y D19S433 (Porras et al., For. Sci. Int. Genetics e7-e8, 2008), SE33 (Paredes, M. y Laverde, L. Book of Abstracts, 18th Triennial Meeting of IAFS, 2008), D10S1248 y D22S1045 (Burgos et al., For. Sci. Int. Gen. Supplement Series, Volume5 , e81 - e82 , 2015), D12S391 (Jiménez M., 1999), PENTA E and PENTA D (Yunis, et al., J. For. SciVol 50:1-18, 2005), Hispanic population systems D2S441 y D1S1656 (Hill et al., For. Sci. Int. Gen. 5, 2011).</p>
R83X6E	Item 3: 2017 NIST DATABASE: CAUCASIAN, AFRICAN AMERICAN, HISPANIC
T7PQFQ	<p>Item 3: N/A</p> <p>Item 4: N/A</p>
VC4BDM	<p>Item 3: Promega</p> <p>Item 4: Lab Retriever</p>
WQKN79	<p>Item 3: [Country] Malay, Chinese and Indian databases.</p> <p>Item 4: [Country] Malay, Chinese and Indian databases.</p>
ZVJCC6	Item 3: FBI Amended 2015, BLK, CAU, SWH
ZZYJZ6	<p>Item 3: D3S1358, D5S818, D7S820, D8S1179, D13S317, D16S539, D18S51, D21S11, CSF1PO, FGA, TH01, TPOX, vWA: Colombia Andean region: (Paredes, et al., For. Sci. Int. Vol 137:67-73, 2003). D1S1656, D2S441: Hispanic population (Hill et al., For. Sci. Int. Gen. 5, 2011). D2S1338, D19S433: Colombian population (Porras et al., For. Sci. Int. Genetics e7-e8, 2008). D10S1248, D22S1045: Central Andean Colombian region (Burgos et al., For. Sci. Int. Gen. Supplement Series, Volume 5, e81 - e82 , 2015). D12S391: Bogota population (Jiménez M., 1999). PENTA E, PENTA D: Bogota population (Yunis, et al., J. For. Sci Vol 50:1-18, 2005). SE33. Andean region (Paredes, M. y Laverde, L. Book of Abstracts, 18th Triennial Meeting of IAFS, 2008).</p> <p>Item 4: D3S1358, D5S818, D7S820, D8S1179, D13S317, D16S539, D18S51, D21S11, CSF1PO, FGA, TH01, TPOX, vWA: Colombia Andean region: (Paredes, et al., For. Sci. Int. Vol 137:67-73, 2003). D1S1656, D2S441: Hispanic population (Hill et al., For. Sci. Int. Gen. 5, 2011). D2S1338, D19S433: Colombian population (Porras et al., For. Sci. Int. Genetics e7-e8, 2008). D10S1248: Central Andean Colombian region (Burgos et al., For. Sci. Int. Gen. Supplement Series, Volume 5, e81 - e82 , 2015). D12S391: Bogota population (Jiménez M., 1999). PENTA E, PENTA D: Bogota population (Yunis, et al., J. For. Sci Vol 50:1-18, 2005). SE33. Andean region (Paredes, M. y Laverde, L. Book of Abstracts, 18th Triennial Meeting of IAFS, 2008).</p>

## Amplification Kit Survey

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

TABLE 8

WebCode	Amplification Kit
478GVD	GlobalFiler, PPY23, Yfiler Plus
C3PMWT	NGM SElect.
DBC6QR	1. AmpFISTR Identifiler Plus Kit. 2. AmpFISTR Identifiler Direct Kit. 3. AmpFISTR Y Filer Kit
GMVD2Q	Current: Yfiler; Investigator 24plex QS. Future: Investigator 24plex GO; Yfiler Plus
HLV9YM	1. Identifiler Direct. 2. Identifiler Plus. 3. Yfiler
T7PQFQ	Globalfiler, PPY23, YF Plus
ZVJCC6	PowerPlex Fusion 6C, YFiler, PowerPlex Y23

# Additional Comments

TABLE 9

WebCode	Additional Comments
478GVD	Item 3: reported minor alleles
8WBF8Y	D22S1045 system STR wasn't included in the Total LR, because our laboratory has not calculated the drop-out probabilities. We used the PDF electropherograms.
C3PMWT	The listed autosomal kits are not used at the lab - only NGM SElect loci considered.
DBC6QR	The statistical calculations were carried out using DNA View Software.
EYRDD3	I am a forensic consultant that reviews DNA case folders that are submitted to me as evidence. I review the analyst allele calls and evidence to reference sample comparisons so I can understand how the original analyst arrived at their opinions and conclusions. I do not calculate population statistics as part of my case reviews. I accept that the population calculations are correct. On future tests could you give participants an additional option of GlobalFiler pdf files that have an analytical threshold of 50rfu?
HLV9YM	The statistical calculations were carried out using DNA View Software.
MUQ2WU	[From Interpretation Guidelines, Analytical Threshold] PowerPlex Fusion 6C for Item 1 and Item 2: B = 72 rfu, G = 127 rfu, Y = 65 rfu, R = 121 rfu, P = 77 rfu. PowerPlex Fusion 6C for Item 3 and Item 4: B = 73 rfu, G = 125 rfu, Y = 67 rfu, R = 123 rfu, P = 78 rfu. PowerPlex Y23 Item 1 and Item 2: B = 38 rfu, G = 53 rfu, Y = 69 rfu, R = 63 rfu. PowerPlex Y23 for Item 3 and Item 4: B = 28 rfu, G = 38 rfu, Y = 52 rfu, R = 45 rfu.
WQKN79	The statistical calculations were carried out using DNA View Software.
ZVJCC6	Item 3, allele 11 at TPOX was interpreted as enhanced stutter but is included in the allele calls.