### **DNA Interpretation Software**

## **Enhancing Forensic Casework**

BY

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### THESIS

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# LIST OF ABBREVIATIONS

ABI	Applied Biosystems
BJS	Bureau of Justice Statistics
CODIS	Combined DNA Indexing System
СРІ	Combined Probability of Inclusion
DNA	Deoxyribonucleic Acid
DOJ	Department of Justice
EPG	Electropherogram
GMID	GeneMapper®ID
ISPFSCC	Illinois State Police Forensic Science Center Chicago
LR	Likelihood Ratio
NDIS	National DNA Index System
NIJ	National Institute of Justice
OL	Off Ladder
OSIRIS	Open Source Independent Review Interpretation System
RFU	Relative Fluorescent Units
RMP	Random Match Probability
STR	Short Tandem Repeat
SWGDAM	Scientific Working Group on DNA Analysis Methods

#### **SUMMARY**

Ample declarations have been established in efforts to enhance forensic science. More specifically, a lot of devotion has been exerted on deoxyribonucleic acid (DNA). With acts such as the DNA Backlog Reduction Program, and the DNA Fingerprinting Act and even the DNA Identification Act – it is obvious that assistance is continually appraised. Provisions are commonplace for forensic DNA analysis; and these amendments can serve as a platform that contributes a large majority to the DNA backlog. The introduction of robotics and automation into laboratories has shifted the delay from sample preparation to DNA analysis. With mixture interpretation systems becoming more profuse in laboratories, analyst are spending less time at the bench and more time where human intervention is desired – areas that are controversial to automate, such as the DNA interpretation aspect.

ArmedExpert<sup>™</sup> is DNA interpretation software that can assist the analyst in a variety of ways. Calculations including peak-height ratios and random match probabilities are simply completed in a matter of seconds – hand calculations for peak height ratios across 13 short tandem repeat (STR) loci do not even compare. The user-friendly interface is not only aesthetically pleasing, but it also allows the freedom to view the data as desired. Forensic laboratories that chose to implement their workflow analysis with ArmedXpert can greatly increase their time efficacy and potentially reduce the DNA backlog.

#### 1. INTRODUCTION

### 1.1 Background

Title I Law Enforcement of the Assistance of the Omnibus Crime Control and Safe Streets Act of 1968 states:

...It is the purpose of this title to (1) encourage States and units of general local government to prepare and adopt comprehensive plans based upon their evaluation of State and local problems of law enforcement; (2) authorize grants to States and units of local government in order to improve and strengthen law enforcement; and (3) encourage research and development directed toward the improvement of law enforcement and the development of new methods for the prevention and reduction of crime and the detection and apprehension of criminals. (Pub. L. 90-351)

The Omnibus Crime Control and Safe Streets Act was amended of late, and such established the Paul Coverdell National Forensic Sciences Improvement Act of 2000. The act strives to improve the quality, timeliness, and credibility of forensic science services (PART BB, Sec. 2804). Moreover, in regards to deoxyribonucleic acid (DNA) – Part X, Section 2401 decrees the Attorney General must provide funds to enhance the capacity of DNA analysis.

#### 1.2 Statement of the Problem

DNA evidence prominence has become increasingly apparent over the last few years. Public awareness has increased DNA evidence popularity; DNA evidence that convicts a suspect of a crime intrigues the public. Classic examples include the Scott Peterson case as well as O. J. Simpson's trial. Additionally, the media has exposed a lot of attention centered on convictions from cases involving DNA. The first instance of post-conviction DNA exoneration occurred in 1989.

On August 14, 1989, the Cook County Circuit Court in Chicago, Illinois, vacated Gary Dotson's 1979 rape conviction and dismissed the charges. Mr. Dotson – who had spent 10 years in and out of prison and on parole for this conviction – was not the first innocent prisoner to be exonerated and released in America. But his case was a breakthrough nonetheless: he was the first who was cleared by DNA identification technology. (Gross *et al.* 2005)

Great efforts have been invested in post-conviction DNA exoneration as demonstrated by The Innocence Project affiliated with the Benjamin N. Cardozo School of Law at Yeshiva University. Since 1988, The Innocence Project contributed to at least 172 of more than 300 exonerations (2013). DNA typing is a viable method for exonerating potential suspects. It saves time in searching for perpetrators by quickly excluding suspects. DNA is a powerful element when applied and investigated correctly.

There have been copious declarations to enhance the quality of forensics from the federal government since the Omnibus Crime Control Act and the emergence of DNA technology. For instance, the 1994 bill – DNA Identification Act, passed by President Clinton identifies the authorization of a collection of an index of DNA records and samples from persons convicted and/or charged of crimes, analyses of samples collected from crime scenes, unidentified human remains and voluntary samples offered from relatives of missing persons stored specifically in the National DNA Index System (NDIS) (42 U.S.C. §14132). After that act, the Crime Information Technology Act of 1998 was implemented designating a program for the funding to enhance the participation in national databases, extending to Combined DNA Index System

(CODIS) (Pub. L. 105-251). CITA allowed for grants for programs relating to the identification and analysis of DNA. According to the FBI, CODIS has by generated more than 234,200 hits and aided in more than 224,800 criminal investigations as of January of 2014. President Bush issued the DNA Analysis Backlog Elimination Act in 2000; it combines previous Acts and claims to provide funding to "States for carrying out DNA analyses for use in the Combined DNA Index System of the Federal Bureau of Investigation (FBI), to provide for the collection and analysis of DNA samples from certain violent and sexual offenders for use in such system" (Pub. L. 106-546). Then, in 2004, the Justice for All Act was proposed to establish enforceable rights for victims of crimes, enhanced DNA collection and analysis efforts, provide for postconviction DNA testing, and authorizes grants to improve the quality of representation in state capital cases (Pub. L. 108-405). Furthermore, the DNA Fingerprint Act of 2005 allows for more regulation with the DNA profiles obtained from those samples of persons arrested under federal authority. This is not a comprehensive list; emphasis is still being placed on DNA analysis and amends to pre-existing acts continue to evolve.

There are numerous agencies available to aid in the reduction of DNA backlogs. One such agency is a branch of the U.S. Department of Justice (DOJ) that is responsible for the research, development and evaluation namely, the National Institute of Justice (NIJ). A platform that NIJ specifically offers is the DNA Backlog Reduction Program. Ideally, the program was employed to assist the units at both the state and local level to "process, record, screen, and analyze forensic DNA and/or DNA database samples, and to increase the capacity of public forensic DNA and DNA database laboratories to process more DNA samples, thereby helping to reduce the number of forensic DNA and DNA database samples awaiting analysis" (2013).

The U.S. DOJ - Office of Justice Programs, Bureau of Justice Statistics (BJS) reports bulletins offering findings from a national survey of crime labs conducted periodically. It was reported in the *Census of Publicly Funded Forensic Crime Laboratories, 2002* that "For every five DNA analysis requests completed in 2002, approximately six requests remained outstanding at yearend" (Peterson and Hickman 2005).

According to a congruent census from 2005 by the U.S. DOJ, BJS:

Information on work performance (the average number of requests an examiner completed in 2005) was used to determine which forensic disciplines were most understaffed to handle their workload. DNA work needed the largest increase in full-time examiners to eliminate the yearend backlog. Based on the average performance of a DNA analyst in 2005 (77), laboratories performing DNA analysis would have needed an estimated 73% more staff to complete all DNA requests in 2005. Biology screening (usually in preparation of DNA analysis) represented the next highest need for an increase in full-time analysis (57%)....

It was recognized that the percent backlog trends by yearend of 2005 were nearly parallel to the census conducted in 2002 (Durose 2008).

Another examination was conducted by NIJ and reported in 2007 DNA Evidence & Offender Analysis Measurement DNA Backlogs, Capacity and Funding. This report suggests similar findings as the Census of Publicly Funded Crime Laboratories (CPFFCL) reports from 2005 data; the difference lying in considering only DNA analysis requests rather than having biological screening request and DNA analysis requests separate. With nearly 100% representation of labs in the United States, it was found that crime labs "reported an existing DNA backlog of 54,000 requests ... [Crime labs] reported receiving more than 140,000 new

requests and completing more than 124,000 requests ... [and crime labs reported] an increase of nearly 30% over the initial backlog" (Hurst and Lothridge 2010).

More recently, a third bulletin from the BJS was published in 2012 pertaining to the backlog of 2009. The CPFFCL finds that "[w]hile forensic biology accounted for about a third of all requests received during 2009, about three- quarters of the total backlog that year was for these types of requests." The same bulletin also reports "DNA samples collected from convicted offenders and arrestees for a database of DNA profiles accounted for the majority of all forensic biology requests received in 2009" (Durose, Walsh and Burch 2012). This contribution to the increased DNA backlog is a result of the federal regulation mandate in January of 2009 to the DNA Analysis Backlog Elimination Act of 2000. The mandate requires the collection of DNA samples of arrested individuals, or those detained and facing charges - in addition to the previously standing convicted offenders for qualifying Federal offenses (28 CFR 28.12; 42 U.S.C. 14135a).

#### 1.3 Significance of the Problem

DNA is interdisciplinary; hence, DNA technology is continually being refined and striving to advance techniques, analysis and results of DNA research. The advent of DNA technology powers the accelerated advancement of techniques affecting forensic biology/DNA. The authors of *Making Sense of DNA Backlogs, 2012 - Myths vs. Reality* point out the increased productivity of lab(s) that utilized automation; the use of robotics instead of manual-labor increased efficiency by enabling staff to process more samples via batching as well as utilize associated downtime with the instruments for other tasks (Nelson, Chase and DePalma 2013). The bottleneck in sample preparation of biological evidence has been rectified by automation. The encumbrance has not been alleviated, rather transpired to DNA analysis.

Forensic laboratories develop interpretation guidelines for DNA analysis. Procedure manuals, often determined by validation studies, scientific literature and professional experience – often outline assessment of data, assessment of a peak, how to interpret a single source profile, as well as mixtures, and even extend to final report wording. A statistical value is often reported with an interpretation, when applicable, to give weight to the analytical results. It is encouraged to have concise standard operating procedures to eliminate subjectivity in DNA analyses. The Scientific Working Group on DNA Analysis Methods (SWGDAM) has generated its second set of guidelines in 2010, namely *SWGDAM Interpretation Guidelines for Autosomal STR Typing by Forensic DNA Testing Laboratories* in order to establish a more universal interpretation method across analysts in forensic DNA laboratories. This document acknowledges, "[d]ue to the multiplicity of forensic sample types and the potential complexity of DNA typing results, it is impractical and infeasible to cover every aspect of DNA interpretation by a preset rule" (FBI). DNA interpretation can be a complex, time consuming, delicate process - for one incorrect analysis can have a deleterious effect on the justice of a case.

Interpretation of a DNA profile can be multifaceted and many aspects must be considered. Number of contributors, analytical thresholds (AT), stochastic thresholds (ST), potential for allelic dropout, artifacts such as stutter product, minus A and spikes need to be taken into account when evaluating a DNA sample. The tedious hand-calculations of peak height ratios (PHr), relative fluorescent unit (RFU) loads, stutter percentages, single source frequency, random match probabilities (RMP), likelihood ratios (LR), combined probability of inclusion (CPI), and other quantitative values is time consuming. This is particularly relevant when all 13 core autosomal short tandem repeat (STR) loci have to be taken into account - not to mention the time that will be expended when the core loci requirements are augmented (Butler 2006). Time consumption can be a major contributor to the pandemic DNA backlog.

#### 1.4 Purpose of the Study

The integration of mixture interpretation software into a laboratory is becoming more abundant. Forensic Magazine published an article by Schwandt and Cowan and explains, "[e]xpert systems which automate some level of DNA analysis ... can alleviate some of the bottleneck associated with routine sample analysis" (2008). The NIJ Expert System Testbed (NEST) declares that incorporation of expert systems into a laboratory workflow can help to abate the convicted offenders DNA backlog. In an examination of three expert systems, Roby affirms that they are "able to rapidly and accurately conduct routine reviews ... and can significantly reduce the time spent in the human review of DNA profiles" (2008). There are a variety of statistical tools available to help aid the deconvolution of a DNA mixture. To name a few include STRmix, i-Cubed<sup>™</sup>, Lab Retriever, Forensic Statistical Tool (FST), TrueAllele<sup>™</sup> and, what the subject of this study explores, ArmedXpert<sup>TM</sup> v3.0.7.997 (hereafter, referred to as ArmedXpert). The United States Army Criminal Investigation Laboratory (USACIL) located in Atlanta, Georgia, developed DNA DataAnalysis, an in-house Microsoft Excel based software "designed to aid analyst in routine DNA analysis" (Dolph 2009). In 2010, USACIL granted a license to NicheVision Forensics, LLC of Akron, Ohio to commercialize the technology (2014).

In this study, files generated by GeneMapper®*ID* v3.2.1 (GMID) (Applied Biosystems, Foster City, CA) were converted into files from intermediate software – Open Source, Independent Review and Interpretation System v2.2 (OSIRIS) and imported into ArmedXpert. The aim of the study was to observe concordant allele calls from DNA samples processed under relatively consistent analytical parameters set forth by the Illinois State Police Forensic Science Center at Chicago (ISPFSCC). Other capabilities of ArmedXpert were also explored; these features included match and comparison tool, mixture interpretation tool, as well as a few statistical calculations.

## 1.5 Significance of the Study

Time efficacy can be tremendously increased with the integration of DNA interpretation software. Transcription errors associated with manual calculations can be reduced. Forensic DNA crime laboratories can leverage their casework turnover with the assistance of mixture tools like ArmedXpert to ultimately reduce the ever-growing backlog.

#### 2. METHODS AND MATERIALS

#### 2.1 Data Received

Forensic Science trainees from ISPFSCC supplied the study with 204 samples (n=204). Known samples were created containing single source profiles and two and/or three person contributor mixtures. In total, 114 were standards and 90 were unknowns. Of those 90 unknown samples, 5 samples did not detect DNA, 41 samples were single source and 44 samples were mixtures. In the 44 samples determined to be mixtures, 34 samples consisted of at least two contributors, and 10 samples were found to have consisted of at least three contributors. Refer to TABLE I for a detailed depiction of samples received for this study according to analysts' conclusions using GMID. Column headings refer to each analyst, separated by case numbers, followed by type of sample, the type of unknown sample, the number of contributors and fraction of the differential extraction that was present.

Extraction of the samples occurred by both organic phenol-chloroform isoamyl alcohol (25:24:1) as well as DNA IQ® System (Promega, Madison, WI). Quantitation was completed with Quantifiler® Duo DNA Quantification Kit (ABI) using 7500 Real-Time PCR System (ABI). Amplification of the DNA samples was accomplished with the AmpFLSTR® Identifiler®Plus PCR Amplification Kit (ABI) and GeneAmp® PCR System 9700 (ABI). Fragment separation was conducted on an Applied Biosystems 3130 Genetic Analyzer platform and data analysis was performed in GeneMapper®ID<sup>TM</sup> *ID* Version 3.2.1. Laboratory standard operating procedures were followed for all kits used.

Analyst	Case #	Standards	Unknowns	Not Detected	Single Source	Mixture	≤2 Persons	≤3 Persons	F1	F2	F3
DLK	Z13_49	2	1		1	0				•	•
WG	Z13_49	2	1		1	0					
KH	Z13_49	2	1		1	0					
JAC	Z13_49	2	1		1	0					
DLK	Z13_50	2	1		0	1	1				
WG	Z13 50	2	1		0	1	1				
KH	Z13_50	2	1		0	1	1				
JAC	Z13 50	2	1		0	1	1				
DLK	Z13_51	2	2		2	0					
WG	Z13_51	2	2		2	0					
KH	Z13_51	2	2		2	0					
JAC	Z13_51	2	2		2	0					
DLK	Z13_52	2	2		1	1	1				
WG	Z13_52	2	2		1	1		1			
KH	Z13_52	2	2		2	0					
JAC	Z13_52	2	2		1	1	1				
DLK	Z13_55	3	2		0	2	1	1	1	1	
WG	Z13_55	3	2		0	2	2		1	1	
KH	Z13_55	3	2		0	2	1	1	1	1	
JAC	Z13_55	3	2		0	2	2		1	1	

## TABLE I SAMPLES RECEIVED DETAILS

Analyst	Case #	Standards	Unknowns	Not Detected	Single Source	Mixture	≤2 Persons	≤3 Persons	F1	F2	F3
DLK	Z13 56	3	3		1	2	2		1	1	1
WG	Z13_56	3	3		2	1	1		1	1	1
KH	Z13_56	3	3		3	0			1	1	1
JAC	Z13_56	3	3		1	2	2		1	1	1
DLK	Z13_57	1	2		1	1	1		1	1	
WG	Z13_57	1	2		1	1	1		1	1	
KH	Z13_57	1	2		0	2	2		1	1	
JAC	Z13_57	1	2		1	1	1		1	1	
DLK	Z13_60	5	5		2	3	2	1	2	2	1
WG	Z13_60	5	5		2	3	1	2	2	2	1
KH	Z13_60	5	6	1	2	3	2	1	2	2	2
JAC	Z13_60	5	6	1	1	4	2	2	2	2	2
WG	Z13_61	8	1		0	1	1				
KH	Z13_61	8	2	1	0	1	1				
JAC	Z13_61	8	2	1	0	1		1			
DLK	Z13_63	3	3		2	1	1				
WG	Z13_63	3	3		2	1	1				
KH	Z13_63	3	3	1	1	1	1				
JAC	Z13_63	3	3		2	1	1				
Colum	n Total	114	90	5	41	44	34	10	20	20	10
Category Total		2	04		90		4	4		50	

TABLE I SAMPLES RECEIVED DETAILS (CONTINUED)

#### 2.2 <u>GeneMapper®ID Software v3.2.1</u>

Files (.fsa) were generated, under conditions established by ISPFSCC, by Forensic Science Trainees in DNA Analysis using GMID. GeneScan® 600 Liz® Size Standard v2.0 was used to size the samples. The analytical threshold (AT) of 75 relative fluorescent values (RFU) and stochastic thresholds (ST) of 188RFU and 469RFU for amplification targets greater than or equal to 0.25ng of DNA and less than 0.25ng of DNA respectively, were in place for peak detection. The stutter percentages were defined as: 11% D8S1179, 14% D21S11, 10% D7S820, 10% CSF1PO, 16% D3S1358, 5% TH01, 12% D13S317, 13% D16S539, 13% D2S1338, 12% D19S433, 13% vWA, 7% TPOX, 15% D18S51, 11% D5S818 and 13% FGA. Light smoothing was applied. Sizing began at the 80 peak and ended at 460 peak. The size calling method employed was Local Southern Method. In regards to peak quality, the signal level resolves homozygotes to have a minimum peak height of 200RFU and a heterozygote to have a minimum peak height of 100RFU. Minimum peak height ratio was 0.70 and max peak width was 1.5 bp.

#### 2.3 Open Source, Independent Review Interpretation System v.2.2

Files generated from GMID (.fsa) were imported into OSIRIS to create a usable extension for ArmedXpert (.oar). There was no human intervention at this stage. The analysis method for Identifiler®Plus consisted of raw data being analyzed with minimum RFU values for sample analysis at 75, for detection at 75 and for interlocus at 75. Similarly, the ladder and internal lane size standard was 75RFU. Maximum stutter thresholds were defined as stated in section 2.2. Minimum heterozygote balance was set at 0.50 and minimum homozygote threshold was set to 350RFU. With fractional filters and pull-up fractional filters set to zero. See APPENDIX A for further analysis methods.

#### 2.4 <u>ArmedXpert<sup>TM</sup>v3.0.7.997</u>

ArmedXpert imported the .oar files that OSIRIS generated and analyzed in a similar manner to the previously stated. The mixture interpretation settings were set to have the peak height ratio (PHr) defaulted to 0.50, with the minimum peak height set to 50 RFU. The default homozygote threshold (HT) was 300 RFU. The same stutter percentages were applied as defined in section 2.2.

Interpretation was conducted considering ISPFSCC models: for samples containing less than 0.25ng of DNA, the stochastic threshold was 469RFU and samples containing greater than or equal to 0.25ng of DNA required a stochastic threshold of 188RFU in order to consider homozygous at that allele. Heterozygous loci require a minimum 75RFU per allele to be considered a complete genotype.

Using the multi-compare plug-in and combine sources option, GMID and ArmedXpert allele calls could be compared and contrasted. Differences are highlighted in the tables that this plug-in generated. The genotype tables from GMID were exported in a .txt format in order for the tool to work properly. Random match probabilities were conducted to check for concordance between an in-house statistical program at the ISPFSCC – Identifiler<sup>+</sup> and ArmedXpert. Likelihood ratios and probability of inclusions were generated on select samples also. For frequency calculations, theta was equal to 0.01 ( $\theta = 0.01$ ) for Caucasian, Hispanic and Black populations. The match and comparison tool was utilized to find a possible suspect in the table after a mixture interpretation had been conducted. Electropherograms in ArmedXpert from OSIRIS options were explored as well.

#### **3. RESULTS**

## 3.1 GeneMapper®ID v3.2.1 and ArmedXpert<sup>™</sup> v3.0.7.997 Allele Call Comparison

### **3.1.1 Total Number of Differences**

A total of 7376 loci were compared in this study. Overall, there were 215 differences found when comparing the loci as a whole (2.91%). Review TABLE II for further detail. For visual representation of highlighted differences, refer to APPENDIX B.

 TABLE II

 TOTAL DIFFERENCES BETWEEN GMID AND ARMEDXPERT ALLELE CALLS BY

 LOCUS

	Quality Control Samples	Samples	Total
Differences	41	174	215
No Differences	3975	3186	7161
Total	4016	3360	7376

## **3.1.2 Total Number of Differences between Quality Control Samples**

In examining the quality control sample tables, there were 41 instances where the software designated the peak differently and 3975 instances where the peak calls were concordant. This results in only a 1.02% margin where the software disagree (TABLE III).

Percent<br/>(%)Differences1.02No Differences98.98

TABLE III
PERCENTAGE OF QUALITY CONTROL DIFFERENCES AND NON-DIFFERENCES

For a detailed list of differences of the quality control samples that includes the number of differences per analyst per case, refer to TABLE IV.

# TABLE IV DETAILED DESCRIPTION OF QUALITY CONTROL SAMPLES DIFFERENCES

Analyst	Case Number	Differences	No Differences			
DLK	Z13 49	1	79			
WG	Z13_49	0	80			
КН	Z13_49	4	76			
JAC	Z13 49	2	78			
DLV		1	70			
DLK	Z13_50		79			
KH	Z13_50	4	76			
JAC	Z13_50	2	/8			
DLK	Z13_51	1	95			
WG	Z13_51	0	80			
KH	Z13_51	4	76			
JAC	Z13_51	2	126			
DLK	Z13 52	1	95			
WG	Z13_52	0	144			
КН	Z13_52	4	76			
JAC	Z13_52	2	78			
		_				
DLK	Z13_55	0	80			
WG	Z13_55	3	77			
KH	Z13_55	0	80			
JAC	Z13_55	1	111			
DLK	Z13_56	0	80			
WG	Z13_56	3	125			
KH	Z13_56	0	112			
JAC	Z13_56	1	111			
DLK	713 57	0	80			
WG	713_57		109			
КН	Z13_57	0	80			
IAC	Z13_57	1	79			
DLK	Z13_60		96			
WG	Z13_60		192			
KH	Z13_60		176			
JAC	Z13_60	0	160			
WG	Z13_61	1	191			
KH	Z13_61	0	192			
JAC	Z13_61	0	112			
	713 63	0	96			
WG	713 63		128			
КН	713 63		96			
JAC	Z13_63	0	96			
	Frequency	41	3975			

## **3.1.3 Total Number of Differences between Samples**

In examining the samples tables, there were 174 occasions where the software designated the allele call differently and 3186 occasions where the allele calls coincide. In contrast to the quality control samples, the samples resulted in a slightly higher percentage of difference; the differences occurring at 5.18% (TABLE V).

 TABLE V

 PERCENTAGE OF SAMPLES DIFFERENCES AND NON-DIFFERENCES

	Percent
	(%)
Differences	5.18
No Differences	94.82

For a detailed list of differences for the samples that includes the number of differences per analyst per case, refer to TABLE VI.

# TABLE VI DETAILED DESCRIPTION OF SAMPLES DIFFERENCES

Analyst	Case Number	Differences	No Differences
DLK	Z13_49	13	35
WG	Z13_49	7	41
KH	Z13_49	11	37
JAC	Z13_49	8	40
DLK	Z13_50	3	61
KH	Z13_50	8	40
JAC	Z13_50	3	45
DLK	Z13_51	5	59
WG	Z13_51	0	64
KH	Z13_51	5	59
JAC	Z13_51	1	79
DLK	Z13_52	8	72
WG	Z13_52	2	62
КН	Z13_52	10	54
JAC	Z13_52	6	58
DLK	Z13_55	0	80
WG	Z13_55	0	80
КН	Z13_55	3	77
JAC	Z13_55	0	80
DLK	Z13_56	1	95
WG	Z13_56	7	89
KH	Z13_56	1	95
JAC	Z13_56	8	88
DLK	Z13_57	5	59
WG	Z13_57	0	48
КН	Z13_57	2	46
JAC	Z13_57	0	48
DLK	Z13_60	4	156
WG	Z13_60	14	162
КН	Z13_60	13	163
JAC	Z13_60	10	182
WG	Z13_61	7	137
КН	Z13_61	3	157
JAC	Z13_61	3	157
DLK	Z13_63	0	96
WG	Z13_63	1	95
KH	Z13_63	1	95
JAC		1	95
	Frequency	174	3186

#### **3.1.4 Collective Explanation of Differences between Software**

There are five main categories to separate these differences in software allele calls. As noted in APPENDIX B by footnotes, there are allele calls designated as a, b, and c; GMID designated allele call that analyst manually labeled as "pull-up" or "minus A", ArmedXpert designated allele call that GMID did not, and ArmedXpert<sup>™</sup> is missing allele call, not manually labeled as "pull-up" or "minus A" by analyst, respectively. Not recognized in footnotes in the appendix are the differences in which an off-ladder (OL) is present. The OL labels are present and highlighted in both GMID and ArmedXpert. Furthermore, a fifth category is labeled as Other when either one or the other software did not label anything. Collectively, there are 234 total differences. It should be recognized that this number exceeds the number of differences reported in section 3.10, TABLE II. This is a result of more than one difference being detected per locus. The anomaly break down with frequencies and percentages can be seen in TABLE VII. Refer to APPENDIX C for a more detailed explanation for a case-by-case, analyst by analyst representation of the anomalies.

	a	b	c	OL	Other
Total	30	66	1	106	31
Frequency	0.1282	0.2821	0.0043	0.4530	0.1325
Percent (%)	13	28	0	45	13

**TABLE VII**TOTAL ANOMALY DIFFERENCES

## **<u>3.1.5 Comparison of Re-amplified Samples</u>**

In the instance of DLK\_Z13-57, sample 1BF1 was re-amplified with a higher DNA target. According to ArmedXpert, the re-amplified sample (Z13-571BF1) reports the same information as the original sample (Z13-57\_1B\_F1) (TABLE VIII).

# TABLE VIIIREAMPLIFIED SAMPLE DLK\_Z13-57\_1B\_F1

GMID	Z13-57_1B_F1	12,13,14	29,30	8	11,12	15,16	9,9.3	9,11	12	21,27	13,14,15.2	17	8	16	Х	9,11	24
ArmedXpert	Z13-57_1B_F1	12,13,14	29,30,31	8	11,12	15,16	9,9.3	9,11	12	21,27	13,14,15.2	17	8	16	X,Y	9,11,12	22,24,25
GMID	Z13-57_1BF1	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	9,12	17,21,27	13,14,15.2	17	8	12,15,16,22	X,Y	9,11,12	22,24,25
ArmedXpert	Z13-57_1BF1	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	9,12	17,21,27	13,14,15.2	17	8	12,15,16,22	X,Y	9,11,12	22,24,25

In another instance, DLK\_Z13-50 required a re-amplification of sample 1A. According to GMID, there was an additional allele gained at vWA on the re-amplification (Z13-50\_1A) but an allele was lost at D18S51 that was present on the original injection (DLK\_Z13-50\_1A). ArmedXpert did not lose the allele at D18S51 on the re-amplification (TABLE IX).

# TABLE IXREAMPLIFIED SAMPLE DLK\_Z13-50 1A

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18851	AMEL	D5S818	FGA
GMID	Z13-50_1A	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	14,17,18,19	8,11	14,17,19	X,Y	11,13	22,24
ArmedXpert	Z13-50_1A	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	14,17,18,19	8,11	14,16,17,19	X,Y	11,13	22,24
GMID	DLK_Z13-50_1A	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	17,18,19	8,11	14,16,17,19	X,Y	11,13	22,24
ArmedXpert	DLK_Z13-50_1A	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	17,18,19	8,11	14,16,17,19	X,Y	11,13	22,24

## **3.2 ArmedXpert Mixture Interpretation**

KH\_Z13\_55 was selected to complete a two-person mixture interpretation. Three standards were provided - a suspect standard, an elimination standard, and the victim standard. A differential extraction was performed on one unknown that produced an F1 fraction and an F2 fraction. The unknown was a victim swab spiked with a 1:10 mixture of semen (elimination standard:suspect standard). Refer to TABLE X for estimated amount of DNA for amplification.

Sample	Estimated amount of DNA (ng)
Z13-55, 1BF1	0.927
Z13-55, 1BF2	<mark>0.864</mark>
Z13-55, 1A Victim Std.	0.808
Z13-55, 2 Suspect Std.	0.747
Z13-55, 3 Elimination Std.	0.782
DRB1 9313	NE
SRB1 9513	NE
Pos. Control	~0.5
Neg. Control	NE

# TABLE XTARGET DNA FROM KH Z13 55

The sample highlighted in yellow in TABLE X, Z13-55, 1BF2 is the sample of focus. According to the electropherogram (EPG), this mixture is consistent with two people (Figure 1). There are, at most, four allele calls at any given peak.



Figure 1. Electropherogram displaying peak calls for sample KH Z13-55, 1BF2.

In the mixture interpretation window (Figure 2) of sample 1BF2, loci were arranged from highest number of alleles to lowest number of alleles. Person 1 and Person 2 allele calls were determined by peak height ratio and proportion of each contributor, which are listed in parenthesis after each possible allele combination. It is important to acknowledge that ISPFSCC interpretation guidelines, detailed in section 2.4, were not considered in this mixture interpretation. Figure 3 displays the final call report generated by ArmedXpert; the proportions at each locus are represented at the bottom of the page as well as the average for each contributor. Person 1 is contributing to approximately 60% of the mixture and Person 2 is contributing approximately 40%. See APPENDIX D for interpretation report and list of all potential allele call combinations.

Figure 2. ArmedXpert Mixture Interpretation Window with locus D2S1338 being the first locus for interpretation because it labeled four alleles.

Mixture Interpretation - DD	A Interpretation KH_55_1B	F2_B	×
Setup Pick via mouse KH_55_1BF2_B	• Operations •		Contributor # 2
Locus D251338 (4) • • • > Aldes 16.17, 20, 21 RFUs 621, 767, 796, 345 BPs 308.52, 312, 54, 325 09, 329, 15	KH_5 Person 1 17, 20 P. Avg(0.62) [1.6] KH_5 Person 2 n/a	Highest to lowest # Ignore alleles below mPH Lock locus on report	References           PHr         0.50         Image: The second seco
Peaks         •           Apply         100 💭 %           KH_5 Person •         6           0.13         0.13	6 17 20 21 21 787 796 345 V V		
Mixture Information All combinations have: PHr >= 0.5, MPh	n >= 75, mP >= 0		1 🗘
For a 2-contributor 4-allele mixture of ty 17, 20(phr = 0.99; p = 0.62)(KH_5 Per	pes AD & BC: 1/3-combination(s): (son 1) (16, 21(nhr = 0.56 p = 0.38) [1.6 (Send to KH_5 Person 1) (Send to KH_5 Person 2) (Comment)	: 1]	

Figure 3. Call report generated by ArmedXpert for KH\_Z13-55, 1BF2 after mixture interpretation. Person 2 does not have the contributor proportions at D3S1358 and D19S433 graphed because they are indistinguishable for each person; the same holds true for Amelogenin.


#### 3.2.1 Match and Comparison Tool

The Match & Comparison Tool in ArmedXpert is used to easily identify a reference in the table of choice. Person 1 from the call report generated for KH\_Z13-55, 1BF2 was set as the reference. In the Standards Table, created by using the Combine Sources option, the Find Where Reference is Included tool was applied. Figure 4 displays the exact match at 16 loci of Person 1 with the Suspect Std.

Figure 4. Find Where Reference is Included tool was used to quickly compare a contributor to a mixture with the standards of this case.

	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	Amel	D5S818	FGA	Ex.+Incl.	Ex.	Incl.	Not Incl.
KH_5 Person 1 [1 Reference]	10, 13	29, 31	8, 12	11, 12	14, 16	9.3	11, 13	12, 13	17, 20	14, 15	15, 16	8	12, 16	X, Y	12, 13	22, 25				
KH_55_1A Victim Std.	12, 15	29, 30	10, 11	10, 12	15, 16	6	11, 12	8, 10	17, 23	15.2	16, 19	8	12, 15	Х	9, 10	19, 22	1	1	0	0
KH_55_2 Suspect Std.	10, 13	29, 31	8, 12	11, 12	14, 16	9.3	11, 13	12, 13	17, 20	14, 15	15, 16	8	12, 16	X, Y	12, 13	22, 25	16	16	0	0
KH_55_3 Elimination Std.	12, 13	28, 29	7, 10	11	14, 16	6, 8	10, 11	12	16, 21	14, 15	16	10, 11	14, 16	X, Y	11, 12	21, 22	3	3	0	0
Exact match																				
Find Where Reference Included																				

A similar comparison was done for the other contributor in the mixture. Person 2 was set as the reference and the Find Included in Reference tool was applied. Figure 5 displays the match of 16 loci between Person 2 and Elimination Std. There are also two partial matches highlighted yellow in the table.

Figure 5. Find Included in Reference tool was used to quickly compare a contributor to a mixture with the standards of a case and identify other locations where the reference can be considered.

	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	Amel	D5S818	FGA	Ex.+Incl.	Ex.	Incl.	Not Incl.
KH_5 Person 2 [1 Reference]	12, 13	28, 29	7, 10	11	14, 16	6, 8	10, 11	12	16, 21	14, 15	16	10, 11	14, 16	X, Y	11, 12	21, 22				
KH_55_1A Victim Std.	12, 15	29, 30	10, 11	10, 12	15, 16	6	11, 12	8, 10	17, 23	15.2	16, 19	8	12, 15	Х	9, 10	19, 22	2	0	2	0
KH_55_2 Suspect Std.	10, 13	29, 31	8, 12	11, 12	14, 16	9.3	11, 13	12, 13	17, 20	14, 15	15, 16	8	12, 16	X, Y	12, 13	22, 25	3	3	0	0
KH_55_3 Elimination Std.	12, 13	28, 29	7, 10	11	14, 16	6, 8	10, 11	12	16, 21	14, 15	16	10, 11	14, 16	X, Y	11, 12	21, 22	16	16	0	0
Exact match																				
Included																				
Find Included in the Reference																				

#### **3.3 ArmedXpert Generated Calculations**

Continuing with the same sample, KH\_Z13-55, 1BF2, statistical analysis was carried out.

#### **3.3.1 Random Match Probability**

The mixture, KH\_Z13-55, 1BF2 was selected to create a RMP report. Person 1 of the call report suggests the same profile as Suspect Standard. There is 1 in 241 quadrillion chance, that another person randomly selected from the Caucasian population will have the same profile as Suspect Standard (TABLE XI).

#### TABLE XI

#### ARMEDXPERT - RANDOM MATCH PROBABILITY KH\_Z13-55, 1BF2 MIXTURE

					<u> </u>	<del>.</del>			
Locus	Locus Profile	Allele 1	Allele 2	Allele 3	Allele 4			1	Sum of
D8S1179	10, 12, 13	10	12	13	7 📲		10	13	
		0.102	0.1454	0.3393			0.0	692	0.0692
		0.025	0.1083	0.2222			0.0	111	0.0111
		0.0936	0.1207	0.3251			0.0	609	0.0609
D21S11	28, 29, 31	28	29	31	7 8		29	31	
		0.1658	0.1811	0.0714			0.0	259	0.0259
		0.2151	0.1899	0.0922			0.0	350	0.0350
		0.069	0.2044	0.069			0.0	282	0.0282
D7S820	7, 8, 10, 12	7	8	10	12		8	12	
		0.0172	0.1626	0.2906	0.1404		0.0	457	0.0457
		0.0119	0.1738	0.3238	0.0905		0.0	315	0.0315
		0.0215	0.0981	0.3062	0.1914		0.0	376	0.0376
CSF1PO	11, 12	11	12			I	11	12	
		0.3005	0.3251				0.1	954	0.1954
		0.2048	0.3				0.1	229	0.1229
		0.2656	0.3923				0.2	084	0.2084

KH\_55\_1BF2\_B

# TABLE XI (continued)

# ARMEDXPERT - RANDOM MATCH PROBABILITY KH\_Z13-55, 1BF2 MIXTURE

Locus	Locus Profile	Allele 1	Allele 2	Allele 3	Allele 4			1		Sum of
D3S1358	14, 16	14	16		L		14	16	$\neg$	
		0.1404	0.2315				0.0	650	$\neg$	0.0650
		0.1214	0.3071				0.0	)746	$\dashv$ $\vdash$	0.0746
		0.079	0.2656				0.0	)420	$\dashv$ $\vdash$	0.0420
		L	1	1						
TH01	6, 8, 9.3	6	8	9.3		9	<del>)</del> .3	9.3		
		0.2266	0.1256	0.3054			0.0	954	7	0.0954
		0.1095	0.1857	0.1048			0.0	)119	7 [	0.0119
		0.2321	0.0813	0.2416			0.0	602	7 [	0.0602
D13S317	10, 11, 13	10	11	13			11	13		
		0.051	0.3189	0.1097			0.0	)700		0.0700
		0.0503	0.2374	0.1257			0.0	)597		0.0597
		0.101	0.202	0.1379			0.0	)557		0.0557
				_						
D16S539	12, 13	12	13				12	13		
		0.3391	0.1634				0.1	.108		0.1108
		0.1866	0.1651				0.0	0616		0.0616
		0.2861	0.1034				0.0	)592		0.0592
D2S1338	16, 17, 20, 21	16	17	20	21		17	20		
		0.02961	0.19408	0.15461	0.01974		0.0	0600		0.0600
		0.04491	0.1018	0.06287	0.15269		0.0	0128		0.0128
		0.01761	0.22183	0.14085	0.01761		0.0	625		0.0625
									_	
D19S433	14, 15	14	15				14	15		
		0.33553	0.13487				0.0	905	$\dashv$ $\vdash$	0.0905
		0.1976	0.03892				0.0	)154	$\dashv$ $\vdash$	0.0154
		0.32042	0.11972				0.0	)767		0.0767
									_	
vWA	15, 16	15	16				15	16		
		0.1122	0.2015				0.0	0452	$\dashv$ $\vdash$	0.0452
		0.2361	0.2694				0.1	.272	$\dashv$ $\vdash$	0.1272
		0.0764	0.3596	_			0.0	)549		0.0549
					1			-	-	
ТРОХ	8, 10, 11	8	10	11			8	8	-	
		0.5443	0.037	0.2537			0.2	.987	$\dashv$ $\vdash$	0.2987
		0.3684	0.0933	0.2249		<u> </u>	0.1	.380	$\dashv$ $\vdash$	0.1380
		0.555	0.0335	0.2/2/			0.3	105		0.3105
D19551	12 14 16	12	14	16	1		12	16	7	
010331	12, 14, 10	0 1276	0 1735	0 1071			12	10	$\dashv$ $\vdash$	0.0273
		0.1270	0.1/33	0.1071			0.0	1220	$\dashv$ $\vdash$	0.0275
		0.0565	0.0039	0.1009			0.0	0220	$\dashv$ $\vdash$	0.0220
		0.1029	0.17	0.1158			0.0	1243		0.0245

#### **TABLE XI (continued)**

## ARMEDXPERT - RANDOM MATCH PROBABILITY KH\_Z13-55, 1BF2 MIXTURE



Calculations were performed using conventional formulas for homozygotes and heterozygotes. ArmedXpert allows for the calculations to be viewed on a separate sheet within the RMP window (TABLE XII).

 TABLE XII

 CALCULATIONS FOR A HETEROZYGOUS AND HOMOZYGOUS LOCUS

D3S1358	(2pq)	
	(2 * 14*16)	
	0.0650052	0.0650
	0.07456388	0.0746
	0.0419648	0.0420
TH01	$(p^2 + p(1-p)Theta)$	
	$(9.3^2 + 9.3(1-9.3)$ Theta)	
	0.095390468	0.0954
	0.01192121	0.0119
	0.060202854	0.0602

#### **3.3.1.1** ArmedXpert RMP Calculation Compared to Identifiler<sup>+</sup>

An RMP was performed with all allele call combinations considered by analyst for KH\_Z13-55, 1BF2 that would result from adhering to the interpretation guidelines as detailed in section 2.4 by the ISPFSCC. ArmedXpert and ISPFSCC in-house statistical program generated equivalent results. Both produced an RMP in the Caucasian population as 1 in 8.7 billion, in a black population as 1 in 862.1 billion, and in a Hispanic population as 1 in 36.3 billion.

#### **3.3.2 Likelihood Ratio**

ArmedXpert LR calculation from KH\_Z13-55, 1BF2 declared in the numerator, the prosecution's hypothesis, the Suspect Standard and Elimination Standard were applied as known contributors. In the denominator, the defense's hypothesis – the elimination standard was applied as a known. The likelihood ratio suggest that it is 40.2 trillion times more likely that the mixture KH\_Z13-55, 1BF2 and Suspect Standard came from the same person than as having come from a random person in the population. Refer to APPENDIX E for further detail on calculations.

#### **3.3.3Combined Probability of Inclusion**

ArmedXpert CPI calculation from KH\_Z13-55, 1BF2 by default also calculates the combined probability of exclusion. There is an estimated 1 in 529 million individuals from the Caucasian population who could contribute to a portion of the mixture. Refer to APPENDIX F for further detail on calculations.

#### **3.4 OSIRIS Electropherogram Labels in ArmedXpert**

ArmedXpert has implemented the benefits offered by OSIRIS in that the user can control information viewed on an EPG. Still using the same sample, KH\_Z13-55, 1BF2 the EPG

controls were explored. The standard ability to display RFU, BP, and allele call is still available as seen in Figure 1, but the possibilities extend beyond that. The 11.3 OL at D16 was changed to a true peak manually; all changes are recorded on the sources table as seen in Figure 6 when the 11 peak label at that same locus was changed to stutter. The ability to see only relabeled peaks is shown in Figure 7 of a zoomed out view of the entire EPG.

Figure 6. Directory of recorded manual changes to peaks.

C:\Documents	s and Set	tings\A	dministra	tor\Des	ktop\Kl	H Data	I\E KH_55	\Osiris R	esults\fsa	Files\20	014030	6_175	311\fs		
	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	vWA	TPOX	D18S51	Amel	1
KH_55_1A_H	12, 15	29, 30	10, 11	10, 12	15, 16	6	11, 12	8, 10	17, 23	15.2	16, 19	8	12, 15	Х	
KH 55 1BF1 A	10, 12, 13, 15	29, 30, 31	7, 8, 10, 11, 12	10, 11, 12	14, 15, 16	6, 9.3	10, 11, 12, 13	8, 10, 12, 13	17, 20, 23	14, 15, 15.2	15, 16, 19	8	12, 14, 15, 16	X, Y	9, 1
KH 55 1BF2 B	10, 12, 13	28, 29, 31	7, 8, 10, 12	11, 12	14, 16	6, 8, 9.3	10, 11, 13	12, 13	16, 17, 20, 21	14, 15	15, 16	8, 10, 11	12, 14, 16	X, Y	
KH_55_2_I	10, 13	29, 31	8, 12	11, 12	14, 16	9.3	11, 13	12, 13	17, 20	14, 15	15, 16	8	12, 16	X, Y	
KH_55_3_J	12, 13	28, 29	7, 10	11	14, 16	6, 8	10, 11	12	16, 21	14, 15	16	10, 11	14, 16	X, Y	
KH_DRB1_9313_G															
KH_NEG_R															
KH_POS_Q	13	30	10, 11	10, 12	14, 15	8, 9.3	11	11, 12	19, 23	14, 15	17, 18	8	15, 19	X	
KH_SRB1_9513_P															-
Ladder	8, 9, 10, 11,	24, 24.2,	6, 7, 8, 9, 10,	6, 7, 8, 9,	12, 13,	4, 5, 6,	8, 9, 10, 11,	5, 8, 9, 10,	15, 16, 17,	9, 10, 11,	11, 12,	6, 7, 8,	7, 9, 10, 10.2,	X, Y	7,
	[KH_55_1BF2	_B] [D16S5	39 - 11] change	d from a pe	ak to stutte	r									
	[KH_55_1BF2	_B] [D16S5	39 - 11] change	d from a pe	ak to stutte	r									
															1

Figure 7. Electropherogram of KH\_Z13-55, 1BF2 relabeled peak at D16S539.



The ability to zoom in on the baseline is still present as well as the ability to hover over an allele call box to view additional information imported from OSIRIS (Figure 8).

Figure 8. Zoomed –in baseline of KH\_Z13-55, 1BF2 with alleles, RFU, BPS of peaks, relabeled peaks (12 at D16S539) and relabeled artifacts (11 at D16S359 and 24 at FGA) presented with an overlay of the ladder. Additional OSIRIS information is available for viewing at D18S51, allele 16 by hovering.



#### 4. DISCUSSION

#### 4.1 General Overview

Efforts to create sterile known samples were not maintained; this allowed for a more applicable 'casework' scenario to be achieved. In some cases, three people of a known threecontributor mixture could be recovered; on the other hand, some analysts only detected two contributors from a known three-contributor mixture. More samples than previously indicated in TABLE I are included in this study due to still allowing the comparison between samples 'not used' by the analyst in their final report. Such samples would originate when a reinjection, reamplification or re-preparation is necessary, albeit not all were considered for comparison purposes.

#### **4.2 Software Comparison**

Overall, the frequency of differences between allele calls made by ArmedXpert and GeneMapperID are minimal. Maintaining no human intervention allowed for a true assessment between the software in regards to allele calls. As reported, there were 234 differences in total. Based on the categorization provided by TABLE VII, a vast majority (45%) of the differences was attributed to an OL call. GMID placed the OL call in the genotype tables that were compared; ArmedXpert did not report the OL calls according to a preference setting that was enabled. It is logical that ArmedXpert has this setting available so such artifacts do not distract the analyst.

The one instance that GMID has an allele call that ArmedXpert did not, referred to as category c, is accounted for by an OL call not reported by ArmedXpert. While it may seem that GMID was able to detect a peak that ArmedXpert did not, this is not the case; rather, ArmedXpert just omitted the 10.3 OL call from the genotype table.

Additionally, encompassing the Other category, there were 9 instances when an OL call caused the multi-compare tool to count a difference. There would again, be no allele present in ArmedXpert due to an OL call being made. In 19 cases, a rare allele was not labeled in ArmedXpert – a 22.2 allele at FGA. It appears this is related to virtual bins integrated into GMID that allowed such a call, despite a 22.2 not appearing in the ladder. This profile appeared in many of the mixture fractions and is therefore counted multiple times, resulting in such a high value. There also were three instances that ArmedXpert detected an allele that GMID did not label. These alleles are expected to be present and are just barely above stochastic threshold. While no major discrepancies surfaced during this study, it is sensible to acknowledge that ArmedXpert would need to be independently validated by the laboratory in order to establish appropriate thresholds analytically and stochastically. In this case, there would not be differences such as those listed in the Other category.

After further analysis of category b, 28% of the time ArmedXpert labeled a peak that GMID failed to. In 44 out of 66 instances, the called alleles can be confirmed as being expected at the locus and could potentially be evidence of an additional contributor. There were only 22 times ArmedXpert labeled an artifact. Again, the RFU value is very low; just barely above stochastic threshold of 75RFU at times, but none-the-less, ArmedXpert still recognized and labeled those peaks. It is also important to note at this point that OSIRIS, and therefore ArmedXpert has a slightly higher baseline due to OSIRIS analyzing the raw data. OSIRIS does not perform a 'smoothing baseline' as found in GMID. This difference in software analysis is also the culprit for the difference that exists between the RFU values and basepairs relative to GMID.

In regards to category a, there were 30 cases that a difference was counted due to GMID labeling artifacts that the analyst had to manually label. These labels include pull-up and minus A. ArmedXpert filtered those out. Overall, the results between GMID and ArmedXpert were in agreement with only a few occasions of differences that have resulted from the difference in settings and algorithms.

In order to obtain more information, often times, analysts will re-amplify, re-prepare or re-inject a sample. On several occasions, had ArmedXpert been used – this additional step could have been prevented. ArmedXpert obtained the same information from both injections as shown in TABLES VIII and IX. This is an example where the use of ArmedXpert could spare resources of the laboratory as well as time of the analysts'.

#### **4.3 Mixture Interpretation**

The interpretation guidelines as established by the ISPFSCC were not strictly followed for the interpretation of KH\_Z13-55, 1BF2. The analysts at ISPFSCC held a more conservative approach in that the mixture was not resolved. In this study, due to lack of formal training and experience, the mixture was resolved and two profiles were able to be determined. When determining profiles, keen attention was paid to the peak height ratio as well as the adaptive contributor proportion calculations that were automatically generated in the Mixture Interpretation Window. The capability to make calls while viewing the EPG is made possible by the Pop Out Calls option, inspecting the EPG while interpreting has become a preference among forensic scientists. Another convenience offered by the interpretation window includes allele combinations that are flagged for being below the set threshold; this enables the analyst to use caution when interpreting. The Match and Comparison tool allowed for matching profiles between a person in the mixture and the standards to be quickly highlighted. In this case, Person

1 from the KH\_Z13-55, 1BF2 mixture was a match at 16 loci to Suspect Standard. Furthermore, Person 2 was a match to the Elimination Standard at 14 loci.

#### 4.4 Calculations

The only caveat that exists between ArmedXpert and ISPFSCC in-house statistical program is when only one allele is present at a locus. The calculation for what ISPFSCC terms an "inc" is not necessarily equivalent to ArmedXpert's "Any". This could be a result of differing frequencies or a rounding difference caused by truncating. ArmedXpert allows users to manually input frequencies as desired and also performs calculations using the entire number rather than the truncated number. The RMP generated for KH\_Z13-55, 1BF2 via ArmedXpert was congruent with Identifiler<sup>+</sup> when all the same allele combinations were considered. This can be representative of all RMP reports that were generated among the cases on account that the calculation formulas remaining constant. The LR and CPI reports were easily generated with a few clicks the mouse as well.

#### **4.5 OSIRIS Electropherogram Benefits**

The FBI, as of January of 2014, has accepted OSIRIS as an expert system for use with NDIS. ArmedXpert has integrated some of the components from OSIRIS to take advantage of even more automation. The user is able to control what is viewed on the EPG. OSIRIS has fewer artifacts at equivalent RFU values and requires minimal human intervention relative to peak editing. Unlike GMID, OSIRIS allows data to drop below zero and does not perform any smoothing. Moreover, OSIRIS finds the best ladder by comparing the size standard of each ladder to that of the sample and then compares the center of each peak in the size standard to that of the sample to determine an allele call.

#### **5. CONCLUSIONS**

#### 5.1 Integration of Expert Systems into Laboratories

The fact remains that the DNA backlog is troublesome. Recent legislation and evolving statutes continue to hinder the reduction of the backlog despite the dedication through innovative grant programs and advancements in technology. In the instance of databasing, an expert system can be implemented into a laboratory. An expert system, as defined by the FBI that is approved for use with NDIS, "is a software program or set of software programs that interprets the data generated from a DNA analysis instrument (or platform) in accordance with laboratory defined quality assurance rules and accurately identifies the data that does and does not satisfy such rules" (2014). NIJ has hosted the NEST project to evaluate expert systems; NEST evaluated three commercially available expert systems that could be applicable to offender single-source samples. The primary goal of that project was to simply inform the forensic community about expert systems as well as advise laboratories on what details to focus on when considering adoption (Roby and Jones 2005).

An article published in *Forensic Magazine* suggests that expert systems are expected to analyze a given set of samples parallel to an expert human guided by user-defined rules. The article continues to outline that while expert systems are not widespread embraced, the use of the existing data analysis functionality within these systems should not be overlooked; laboratories are able to set thresholds for a variety of peak detection as well as parameters to label alleles and samples are flagged for loci that fall below these thresholds for the analyst to easily track. The Toronto Center of Forensic Science has incorporated an expert system into their analysis workflow reducing data analysis from four and a half hours to less than one hour per 96-well plate (Frappier, Calandro and Schade 2008).

#### **5.2 Integration of ArmedXpert into Laboratories**

ArmedXpert is one of those DNA data analysis software programs that Frappier, Calandro and Schade had indicated should not be neglected - which is not to be confused with an expert system. According to an analyst from USACIL, the implementation of ArmedXpert into forensic DNA examinations provides "a complete tool for all aspects needed to go from allele calls to final report. In addition to tremendous time savings, it has eliminated things such as transcription errors, arithmetic errors, highlighters, and pages of manual calculations that traditionally hamper the interpretation process" (Kalafut, Sutton and Armogida 2013). A few laboratories striving for increased efficiency have accepted the integration of ArmedXpert into their laboratories. Currently, there are over 30 installations of ArmedXpert with over half being validated and in use for forensic casework (Mels, 2014, *personal communication*). As recognized in this study, utilizing what ArmedXpert has to offer can certainly aid in the reduction of the DNA backlog and overall enhance forensic casework.

#### **APPENDICES**

## **APPENDIX A**

# TABLE XII OSIRIS SETTINGS: SAMPLE THRESHOLDS

Sample Limits	Value	Units
Max. No. of pullups peaks per sample	1000	peaks
Max. residual for allele (<0.5bp)	0.25	Sample/Ladder BP
		alignment
Incomplete profile threshold for Reamp More/Reamp Less	5000	RFU
Ignore artifacts smaller than	85	bps
Max. No. of tri-allelic loci in unmixed sample	1	
Max. No. of craters in a sample	0	
Raised baseline threshold for samples	250	RFU
Raised baseline threshold for sample ILS channels	250	RFU
Min. height for primer-dimer peaks	2000	RFU
Min. No. of peaks per channel in primer-dimer for negative	2	
control		
Percentage of standard noise threshold for peak	100	
identification		

# TABLE XIV OSIRIS SETTINGS: SAMPLE THRESHOLD CHECKS

Sample Limits	
Test for presence of sub-analytical peaks in negative control	1
Test for excessive noise above analysis threshold	1
Enable test for excessive noise	1
Make pullup at allele artifact non-critical	1
Flag mixed samples and triallelic loci	1
Select reamp (versus reinject)	1
Recommend rework if laser off scale is found	1
Test for primer dimer peaks in negative controls	1
Apply fractional filters to peaks below analysis threshold (homozygous	1
loci)	
Ignore effects of negative relative baseline	1

#### **APPENDIX B**

## TABLE XV DLK\_Z13\_49 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_49 QC.txt	DLK_SRB1_080913																
Armedxpert DLK_49 QC.txt	DLK_SRB1_080913																
GMID DLK_49 QC.txt	POS_CONTROL	13	OL,30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
Armedxpert DLK_49 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID DLK_49 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
Armedxpert DLK_49 QC.txt	LADDER.3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.:
GMID DLK_49 QC.txt	NEG_CONTROL																
Armedxpert DLK_49 QC.txt	NEG_CONTROL																
GMID DLK_49 QC.txt	DLK_URB1_080813																
Armedxpert DLK_49 QC.txt	DLK_URB1_080813																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	79	98.75%
	1-Diffs	1	1.25%

## TABLE XVI DLK\_Z13\_49 GENEMAPPER®ID AND ARMEDXPERT<sup>TM</sup> SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_49 Samples.txt	DLK_Z13-49_1A	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17,19 <sup>a</sup>	8,11	12,14	Х	11,12	20,26
Armedxpert DLK_49 Samples.txt	DLK_Z13-49_1A	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
GMID DLK_49 Samples.txt	DLK_Z13-49_3	12,13	28,29	OL,7,10	- 11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
Armedxpert DLK_49 Samples.txt	DLK_Z13-49_3	12,13	28,29	7,10	- 11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
GMID DLK_49 Samples.txt	DLK_Z13-49_2	OL,8,13	OL,24.2ª,28,32.2	OL,8,10	OL,10,11	14,16	8ª,9.3	12,13	11,12	20	OL,12,15.2	17,19 <sup>a</sup>	OL,8,11	OL,10.2,11.2ª,12,14	Х	OL,11,12	OL,20,26
Armedxpert DLK_49 Samples.txt	DLK_Z13-49_2	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	10.2,12,14	Х	11,12	20,26

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	35	72.92%
	1-Diffs	13	27.08%

## TABLE XVII WG\_Z13\_49 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_49 QC.txt	082313_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert WG_49 QC.tx	082313_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	- 11	23,24
GMID WG_49 QC.txt	082313_NAC																
ArmedXpert WG_49 QC.tx	082313_NAC																
GMID WG_49 QC.txt	081413_SRB1																
ArmedXpert WG_49 QC.tx	081413_SRB1																
GMID WG_49 QC.txt	Ladder_H3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_49 QC.tx	Ladder_H3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
	_																
GMID WG_49 QC.txt	081313_URB1																
ArmedXpert WG 49 QC.tx	081313 URB1																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

#### TABLE XVIII WG\_Z13\_49 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_49 Samples.txt	WG_Z130049_Ex3	12,13	28,29	OL,7,10	11	14,16	6,8	10,11	12	16,21	OL,14,15	16,17ª	OL,10,11	11.2 <sup>a</sup> ,14,16	X,Y	OL,11,12	21,22
ArmedXpert WG_49 Samples.tx	WG_Z130049_Ex3	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
GMID WG_49 Samples.txt	WG_Z130049_Ex2	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	OL,17	8,11	12,14	Х	11,12	20,26
ArmedXpert WG_49 Samples.tx	WG_Z130049_Ex2	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
GMID WG_49 Samples.txt	WG_Z130049_Ex1A	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
ArmedXpert WG_49 Samples.tx	WG_Z130049_Ex1A	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	41	85.42%
	1-Diffs	7	14.58%

## **TABLE XIX** KH\_Z13\_49 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_49 QC.txt	KH_DRB1_8713_O																
ArmedXpert KH_49 QC.txt	KH_DRB1_8713_O																
GMID KH_49 QC.txt	KH_SRB1_8813_Q																
ArmedXpert KH_49 QC.txt	KH_SRB1_8813_Q																
GMID KH_49 QC.txt	KH_NEGC_S																
ArmedXpert KH_49 QC.txt	KH_NEGC_S																
GMID KH_49 QC.txt	KH_POSC_R	OL,13	OL,30	OL,10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	OL,8	15,19	Х	11	23,24
ArmedXpert KH_49 QC.txt	KH_POSC_R	13	30	10,11	10,12	14,15	8,9.3	- 11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID KH_49 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert KH_49 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	76	95.00%
	1-Diffs	4	5.00%

#### TABLE XX KH\_Z13\_49 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	ТРОХ	D18S51	AMEL	D5S818	FGA
ArmedXpert KH_49 Samples.txt	KH_49_2_B	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
GMID KH_49 Samples.txt	KH_49_2_B	8,13	24.2ª,28,32.2	8,10	OL,10,11	14,16	9.3	12,13	11,12	20	12,15.2	OL,17	8,11	12,14	Х	11,12	20,26
ArmedXpert KH_49 Samples.txt	KH_49_3_C	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
GMID KH_49 Samples.txt	KH_49_3_C	OL,12,13	28,29	OL,7,10	- 11	14,16	6,8	10,11	12	16,21	OL,14,15	16,17ª	10,11	11.2 <sup>a</sup> ,14,1	X,Y	OL,11,12	21,22
ArmedXpert KH_49 Samples.txt	KH_49_1A_A	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
GMID KH_49 Samples.txt	KH_49_1A_A	8,13	24.2ª,28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	OL,17	8,11	12,14	Х	11,12	20,26

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	37	77.08%
	1-Diffs	11	22.92%

## TABLE XXI JAC Z13 49 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_49 QC.txt	JAC_SRB1_0808_15																
ArmedXpert JAC_49 QC.txt	JAC_SRB1_0808_15																
GMID JAC_49 QC.txt	JAC_NEGC_19																
ArmedXpert JAC_49 QC.txt	JAC_NEGC_19																
GMID JAC_49 QC.txt	JAC_POSC_18	13	OL,30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	OL,8	15,19	Х	11	23,24
ArmedXpert JAC_49 QC.txt	JAC_POSC_18	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID JAC_49 QC.txt	JAC_URB1_0807_16																
ArmedXpert JAC_49 QC.txt	JAC_URB1_0807_16																
GMID JAC_49 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_49 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	78	97.50%
	1-Diffs	2	2.50%

## TABLE XXII JAC\_Z13\_49 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	ТРОХ	D18S51	AMEL	D5S818	FGA
GMID JAC_49 Samples.txt	JAC_49_3_3	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
ArmedXpert JAC_49 Samples.txt	JAC_49_3_3	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
GMID JAC_49 Samples.txt	JAC_49_1A_1	8,13	24.2ª,28,32.2	OL,8,10	OL,10,11	14,16	9.3	12,13	11,12	20	12,15.2	OL,17	8,11	12,14	Х	11,12	20,26
ArmedXpert JAC_49 Samples.txt	JAC_49_1A_1	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
GMID JAC_49 Samples.txt	JAC_49_2_2	8,13	OL,28,32.2	8,10	OL,10,11	14,16	9.3	12,13	11,12	20	12,15.2	OL,17	8,11	12,14	Х	11,12	20,26
ArmedXpert JAC_49 Samples.txt	JAC_49_2_2	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,14.2 <sup>b</sup> ,15.2	17	8,11	12,14	Х	11,12	20,26

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	40	83.33%
	1-Diffs	8	16.67%

<sup>a</sup> GeneMapper®ID designated allele call that analyst manually labeled as "pull-up" or "minus A". <sup>b</sup> ArmedXpert<sup>TM</sup> designated allele call that GeneMapper®ID did not.

## TABLE XXIII DLK\_Z13\_50 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_50 QC.txt	DLK_SRB1_080913																
ArmedXpert DLK_50 QC.txt	DLK_SRB1_080913																
GMID DLK_50 QC.txt	POS_CONTROL	13	OL,30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert DLK_50 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID DLK_50 QC.txt	NEG_CONTROL																
ArmedXpert DLK_50 QC.txt	NEG_CONTROL																
GMID DLK_50 QC.txt	DLK_URB1_080813																
ArmedXpert DLK_50 QC.txt	DLK_URB1_080813																
		_															
GMID DLK_50 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert DLK_50 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	79	98.75%
	1-Diffs	1	1.25%

## TABLE XIV DLK\_Z13\_50 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_50 Samples.txt	DLK_Z13-50_3	11,13	28	10,12	10,11	15,19	9,9.3	12	11,12	17,24	14.2,16	14,17	8,11	14,16	X,Y	11,13	22,24
ArmedXpert DLK_50 Samples.txt	DLK_Z13-50_3	11,13	28	10,12	10,11	15,19	9,9.3	12	11,12	17,24	14.2,16	14,17	8,11	14,16	X,Y	11,13	22,24
GMID DLK_50 Samples.txt	DLK_Z13-50_2	13,14	28,33.2	7,11	10,12	15,19	6,9	9,11	11,12	23,24	14	17,18,19	8	17,19	Х	11,13	22,24
ArmedXpert DLK_50 Samples.txt	DLK_Z13-50_2	13,14	28,33.2	7,11	10,12	15,19	6,8 <sup>,</sup> 9	9,11	11,12	23,24	14	17,18,19	8	17,19	Х	11,12 <sup>b</sup> ,13	22,24
GMID DLK_50 Samples.txt	Z13-50_1A	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	14,17,18,19	8,11	14,17,19	X,Y	11,13	22,24
ArmedXpert DLK_50 Samples.txt	Z13-50_1A	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	14,17,18,19	8,11	14,16 <sup>b</sup> ,17,19	X,Y	11,13	22,24
GMID DLK_50 Samples.txt	DLK_Z13-50_1A	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	17,18,19	8,11	14,16,17,19	X,Y	11,13	22,24
ArmedXpert DLK_50 Samples.txt	DLK_Z13-50_1A	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	17,18,19	8,11	14,16,17,19	X,Y	11,13	22,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	61	95.31%
	1-Diffs	3	4.69%

<sup>b</sup> ArmedXpert<sup>TM</sup> designated allele call that GeneMapper®ID did not.

#### TABLE XXV KH\_Z13\_50 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON



Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	76	95.00%
	1-Diffs	4	5.00%

#### TABLE XXVI KH\_Z13\_50 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_50 Samples.txt	KH_50_1A_D	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	14,17,18,19	8,11	14,16,17,19	X,Y	11,13	22,24
ArmedXpert KH_50 Samples.txt	KH_50_1A_D	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	14,17,18,19	8,11	14,16,17,19	X,Y	11,13	22,24
GMID KH_50 Samples.txt	KH_50_2_E	13,14	28,33.2	7,11	10,12	15,19	6,9	9,11	11,12	23,24	14	17,18,19	8	17,19	Х	11,13	22,24
ArmedXpert KH_50 Samples.txt	KH_50_2_E	13,14	28,33.2	7,11	10,12	15,19	6,9	9,11	11,12	23,24	14	17,18,19	8	17,19	Х	11,13	22,24
GMID KH_50 Samples.txt	KH_50_3_F	OL,11,13	OL,24.2ª,28	OL,10,12	OL,10,11	15,19	9,9.3	12	11,12	17,24	OL,14.2,16	OL,14,17,18ª	OL,8,11	10.2ª,14,16	X,Y	11,13	22,24
ArmedXpert KH_50 Samples.txt	KH_50_3_F	11,13	28	10,12	10,11	15,19	9,9.3	12	11,12	17,24	14.2,16	14,17	8,11	14,16	X,Y	11,13	22,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	40	83.33%
	1-Diffs	8	16.67%

## TABLE XXVII JAC\_Z13\_50 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_50 QC.txt	JAC_SRB1_0808_15																
ArmedXpert JAC_50 QC.txt	JAC_SRB1_0808_15																
GMID JAC_50 QC.txt	JAC_NEGC_19																
ArmedXpert JAC_50 QC.txt	JAC_NEGC_19																
GMID JAC_50 QC.txt	JAC_POSC_18	13	OL,30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	OL,8	15,19	Х	11	23,24
ArmedXpert JAC_50 QC.txt	JAC_POSC_18	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	- 11	23,24
GMID JAC_50 QC.txt	JAC_URB1_0807_16																
ArmedXpert JAC_50 QC.txt	JAC_URB1_0807_16																
	-																
GMID JAC_50 QC.txt	LADDER	2,13,14,15,	,2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_50 QC.txt	LADDER	2,13,14,15,	,2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID JAC_50 QC.txt ArmedXpert JAC_50 QC.txt GMID JAC_50 QC.txt ArmedXpert JAC_50 QC.txt	JAC_URB1_0807_16 JAC_URB1_0807_16 LADDER LADDER	2,13,14,15, 2,13,14,15,	2,31,31.2,3 2,31,31.2,3	10,11,12,1 10,11,12,1	10,11,12,1 10,11,12,1	14,15,16,17 14,15,16,17	8,9,9.3,10, 8,9,9.3,10,	),11,12,13, ),11,12,13,	0,11,12,13 0,11,12,13	20,21,22,23 20,21,22,23	2,14,14.2,1 2,14,14.2,1	.6,17,18,19 .6,17,18,19	8,9,10,11,1 8,9,10,11,1	.2,15,16,17 .2,15,16,17	X,Y X,Y	,11,12,13, ,11,12,13,	1

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	78	97.50%
	1-Diffs	2	2.50%

## TABLE XXVIII JAC\_Z13\_50 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_50 Samples.txt	JAC_50_1A_4	OL,11,13,14	23.2ª,28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	14,17,18,19	8,11	14,16,17,19	X,Y	11,13	22,24
ArmedXpert JAC_50 Samples.tx	JAC_50_1A_4	11,13,14	28,33.2	7,10,11,12	10,11,12	15,19	6,9,9.3	9,11,12	11,12	17,23,24	14,14.2,16	14,17,18,19	8,11	14,16,17,19	X,Y	11,13	22,24
GMID JAC_50 Samples.txt	JAC_50_2_5	13,14	28,33.2	7,11	10,12	15,19	6,9	9,11	11,12	23,24	14	17,18,19	8	17,19	Х	11,13	22,24
ArmedXpert JAC_50 Samples.tx	JAC_50_2_5	13,14	28,33.2	7,11	10,12	15,19	6,9	9,11	11,12	23,24	14	17,18,19	8	17,19	Х	11,13	22,24
			-														
GMID JAC_50 Samples.txt	JAC_50_3_6	11,13	OL,28	10,12	10,11	15,19	9,9.3	12	11,12	17,24	14.2,16	14,17	8,11	14,16	X,Y	11,13	22,24
ArmedXpert JAC_50 Samples.tx	JAC_50_3_6	11,13	28	10,12	10,11	15,19	9,9.3	12	11,12	17,24	14.2,16	14,17	8,11	14,16	X,Y	11,13	22,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	45	93.75%
	1-Diffs	3	6.25%

# TABLE XXIX DLK\_Z13\_51 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_51 QC.txt	DLK_SRB1_080913																
ArmedXpert DLK_51 QC.txt	DLK_SRB1_080913																
GMID DLK_51 QC.txt	POS_CONTROL	13	OL,30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert DLK_51 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
		_							-								
GMID DLK_51 QC.txt	NEG_CONTROL																
ArmedXpert DLK_51 QC.txt	NEG_CONTROL																
	-					-			-								
GMID DLK_51 QC.txt	DLK_URB1_080813																
ArmedXpert DLK_51 QC.txt																	
GMID DLK_51 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert DLK_51 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
		-				-			-								
GMID DLK_51 QC.txt																	
ArmedXpert DLK_51 QC.txt	DLK_URB2_080713																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	95	98.96%
	1-Diffs	1	1.04%

## TABLE XXX DLK\_Z13\_51 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	ТРОХ	D18S51	AMEL	D5S818	FGA
GMID DLK_51 Samples.txt	DLK_Z13-51_1	13,14	32.2,33.2	11	10,11	16,18	7,9	- 11	11,13	17,24	15	15,16	8	12,15	X,Y	12	19,21
ArmedXpert DLK_51 Samples.txt	DLK_Z13-51_1	13,14	32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	X,Y	12	19,21
GMID DLK_51 Samples.txt	DLK_Z13-51_3A	OL,12,15	28	10,11	9,10	16	6,7	11,14	9,11	16,18	OL,12,14.2	16,17	8,11	15,17	Х	12,13	19,20
ArmedXpert DLK_51 Samples.txt	DLK_Z13-51_3A	12,15	28	10,11	9,10	16	6,7	11,14	9,11	16,18	12,14.2	16,17	8,11	15,17	Х	12,13	19,20
GMID DLK_51 Samples.txt	DLK_Z13-51_2	12,14	OL,29,33.2	OL,8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
ArmedXpert DLK_51 Samples.txt	DLK_Z13-51_2	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
GMID DLK_51 Samples.txt	DLK_Z13-51_3B	13,14	29,30	8,11	11,12	16,18	6,7	10,12	9,11	18,19	13,14	17	8,11	12,15	X	OL,10,12	21,25
ArmedXpert DLK_51 Samples.txt	DLK_Z13-51_3B	13,14	29,30	8,11	11,12	16,18	6,7	10,12	9,11	18,19	13,14	17	8,11	12,15	X	10,12	21,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	59	92.19%
	1-Diffs	5	7.81%

## TABLE XXXI WG\_Z13\_51 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_51 QC.txt	082313_PAC	13	30	10,11	10,12	14,15	8,9.3	- 11	11,12	19,23	14,15	17,18	8	15,19	Х	- 11	23,24
ArmedXpert WG_51 QC.txt	082313_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID WG_51 QC.txt	082313_NAC																
ArmedXpert WG_51 QC.txt	082313_NAC																
GMID WG_51 QC.txt	081413_SRB1																
ArmedXpert WG_51 QC.txt	081413_SRB1																
GMID WG_51 QC.txt	Ladder_H3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,Þ,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_51 QC.txt	Ladder_H3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,Þ,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID WG_51 QC.txt	081313_URB1																
ArmedXpert WG_51 QC.txt	081313_URB1																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

# **TABLE XXXII** WG\_Z13\_51 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_51 Samples.txt	WG_Z130051_Ex2	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
ArmedXpert WG_51 Samples.txt	WG_Z130051_Ex2	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
GMID WG_51 Samples.txt	WG_Z130051_Ex1	13,14	32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	X,Y	12	19,21
ArmedXpert WG_51 Samples.txt	WG_Z130051_Ex1	13,14	32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	X,Y	12	19,21
GMID WG_51 Samples.txt	WG_Z130051_Ex3B	12,15	28	10,11	9,10	16	6,7	11,14	9,11	16,18	12,14.2	16,17	8,11	15,17	Х	12,13	19,20
ArmedXpert WG_51 Samples.txt	WG_Z130051_Ex3B	12,15	28	10,11	9,10	16	6,7	11,14	9,11	16,18	12,14.2	16,17	8,11	15,17	Х	12,13	19,20
GMID WG_51 Samples.txt	WG_Z130051_Ex3A	13,14	29,30	8,11	11,12	16,18	6,7	10,12	9,11	18,19	13,14	17	8,11	12,15	Х	10,12	21,25
ArmedXpert WG_51 Samples.txt	WG_Z130051_Ex3A	13,14	29,30	8,11	11,12	16,18	6,7	10,12	9,11	18,19	13,14	17	8,11	12,15	Х	10,12	21,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	64	100.00%

## TABLE XXXIII KH\_Z13\_51 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_51 QC.txt	KH_SRB1_8813_Q																
ArmedXpert KH_51 QC.txt	KH_SRB1_8813_Q																
GMID KH_51 QC.txt	KH_NEGC_S																
ArmedXpert KH_51 QC.txt	KH_NEGC_S																
GMID KH_51 QC.txt	KH_DRB1_8813_P																
ArmedXpert KH_51 QC.txt	KH_DRB1_8813_P																
GMID KH_51 QC.txt	KH_POSC_R	OL,13	OL,30	OL,10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	OL,8	15,19	Х	11	23,24
ArmedXpert KH_51 QC.txt	KH_POSC_R	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID KH_51 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	9,10,11,12,13,	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert KH_51 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	9,10,11,12,13	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	76	95.00%
	1-Diffs	4	5.00%

## **TABLE XXXIV** KH\_Z13\_51 GENEMAPPER®ID AND ARMEDXPERT<sup>™</sup> SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
ArmedXpert KH_51 Samples.txt	KH_51_1_G	13,14	32.2,33.2	- 11	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	X,Y	12	19,21
GMID KH_51 Samples.txt	KH_51_1_G	13,14	OL,32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	15	15,16,18 <sup>a</sup>	OL,8	12,15	X,Y	12	19,21
ArmedXpert KH_51 Samples.txt	KH_51_2_H	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
GMID KH_51 Samples.txt	KH_51_2_H	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
ArmedXpert KH_51 Samples.txt	KH_51_3A_I	13,14	29,30	8,11	11,12	16,18	6,7	10,12	9,11	18,19	13,14	17	8,11	12,15	Х	10,12	21,25
GMID KH_51 Samples.txt	KH_51_3A_I	13,14	29,30	8,11	11,12	16,18	6,7	10,12	9,11	18,19	13,14	17	8,11	12,15	Х	10,12	21,25
ArmedXpert KH_51 Samples.txt	KH_51_3B_J	12,15	28	10,11	9,10	16	6,7	11,14	9,11	16,18	12,14.2	16,17	8,11	15,17	X	12,13	19,20
GMID KH_51 Samples.txt	KH_51_3B_J	OL,12,15	28	10,11	9,10	16	6,7	11,14	9,11	16,18	OL,12,14.2	16,17	8,11	15,17	X	12,13	19,20

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	59	92.19%
	1-Diffs	5	7.81%

# TABLE XXXV JAC\_Z13\_51 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_51 QC.txt	082313_NAC																
ArmedXpert JAC_51 QC.txt	082313_NAC																
GMID JAC_51 QC.txt	Ladder_A1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_51 QC.txt	Ladder_A1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID JAC_51 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_51 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID JAC_51 QC.txt	082313_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC_51 QC.txt	082313_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID JAC_51 QC.txt	JAC_NEGC_19																
ArmedXpert JAC_51 QC.txt	JAC_NEGC_19																
GMID JAC_51 QC.txt	JAC_URB1_0808_17																
ArmedXpert JAC_51 QC.txt	JAC_URB1_0808_17																
GMID JAC_51 QC.txt	JAC_SRB1_0808_15																
ArmedXpert JAC_51 QC.txt	JAC_SRB1_0808_15																
GMID JAC_51 QC.txt	JAC_POSC_18	13	OL,30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	OL,8	15,19	X	11	23,24
ArmedXpert JAC_51 QC.txt	JAC_POSC_18	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	126	98.44%
	1-Diffs	2	1.56%

# TABLE XXXVI JAC\_Z13\_51 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_51 Samples.txt	JAC_51_1_7	13,14	32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	X,Y	12	19,21
ArmedXpert JAC_51 Samples.txt	JAC_51_1_7	13,14	32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	X,Y	12	19,21
GMID JAC_51 Samples.txt	JAC_51_2_8	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	OL	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
ArmedXpert JAC_51 Samples.txt	JAC_51_2_8	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9		19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
GMID JAC_51 Samples.txt	JAC_51_2_8_reprep	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
ArmedXpert JAC_51 Samples.txt	JAC_51_2_8_reprep	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
GMID JAC_51 Samples.txt	JAC_51_3A_9	12,15	28	10,11	9,10	16	6,7	11,14	9,11	16,18	12,14.2	16,17	8,11	15,17	Х	12,13	19,20
ArmedXpert JAC_51 Samples.txt	JAC_51_3A_9	12,15	28	10,11	9,10	16	6,7	11,14	9,11	16,18	12,14.2	16,17	8,11	15,17	Х	12,13	19,20
GMID JAC_51 Samples.txt	JAC_51_3B_10	13,14	29,30	8,11	11,12	16,18	6,7	10,12	9,11	18,19	13,14	17	8,11	12,15	Х	10,12	21,25
ArmedXpert JAC_51 Samples.txt	JAC_51_3B_10	13,14	29,30	8,11	11,12	16,18	6,7	10,12	9,11	18,19	13,14	17	8,11	12,15	X	10,12	21,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	79	98.75%
	1-Diffs	1	1.25%

# TABLE XXXVII DLK\_Z13\_52 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_52 QC.txt	DLK_SRB1_080913																
ArmedXpert DLK_52 QC.txt	DLK_SRB1_080913																
GMID DLK_52 QC.txt	LADDER BR.2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert DLK_52 QC.txt	LADDER BR.2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID DLK_52 QC.txt	POS_CONTROL	13	OL,30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert DLK_52 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID DLK_52 QC.txt	NEG_CONTROL																
ArmedXpert DLK_52 QC.txt	NEG_CONTROL																
GMID DLK_52 QC.txt	DLK_URB1_080813																
ArmedXpert DLK_52 QC.txt	DLK_URB1_080813																
GMID DLK_52 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert DLK_52 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	95	98.96%
	1-Diffs	1	1.04%

## TABLE XXXVIII DLK\_Z13\_52 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_52 Samples.txt	DLK_Z13-52_2	OL,8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	15°,17,18	12	12,13	X,Y	- 11	23,24
ArmedXpert DLK_52 Samples.txt	DLK_Z13-52_2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID DLK_52 Samples.txt	Z13-52_1B	8,10,13	29,31.2	11,13	9,11	14,15,16,18	6,9.3	9,10,11	10,12	17,22	13,14,15	16,17,18	8,12	12,13	X,Y	11	22,23,24
ArmedXpert DLK_52 Samples.txt	Z13-52_1B	8,10,13	29,31 <sup>b</sup> ,31.2	11,13	9,11	14,15,16,18	6,9.3	9,10,11	10,12	17,22	13,14,15	16,17,18	8,12	12,13	X,Y	11,12 <sup>b</sup>	22,23,24
GMID DLK_52 Samples.txt	DLK_Z13-52_1B	8,10	29,31.2	11,13	9,11	14,15,16,18	6,9.3	9,10	10,12	17,22	13,14	15,16,17,18	8,12	12,13	X,Y	11	22,23,24
ArmedXpert DLK_52 Samples.txt	DLK_Z13-52_1B	8,10,13 <sup>b</sup>	29,31.2	11,13	9,11	14,15,16,18	6,9.3	9,10	10,12	17,22	13,14,15 <sup>b</sup>	15,16,17,18	8,12	12,13	X,Y	11,12 <sup>b</sup>	22,23,24
GMID DLK_52 Samples.txt	DLK_Z13-52_1A	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert DLK_52 Samples.txt	DLK_Z13-52_1A	10,12 <sup>b</sup> ,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID DLK_52 Samples.txt	DLK_Z13-52_3	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert DLK_52 Samples.txt	DLK_Z13-52_3	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	72	90.00%
	1-Diffs	8	10.00%

<sup>&</sup>lt;sup>a</sup> GeneMapper®ID designated allele call that analyst manually labeled as "pull-up" or "minus A". <sup>b</sup> ArmedXpert<sup>™</sup> designated allele call that GeneMapper®ID did not.

# TABLE XXXIX WG\_Z13\_52 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_52 QC.txt	082313_NAC																
ArmedXpert WG_52 QC.t	x 082313_NAC																
GMID WG_52 QC.txt	Ladder_H3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_52 QC.t	x Ladder_H3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID WG_52 QC.txt	WG_081313URB1_CONC																
ArmedXpert WG_52 QC.t	x WG_081313URB1_CONC																
GMID WG_52 QC.txt	WG_082913_PAC_reinject	12,13,14	29,30,31	8,10,11,12	10,11,12	14,15,16	8,9,9.3	9,11,13	9,11,12	,19,21,23,	3,14,15,15.	17,18	8	,15,16,19,	X,Y	9,11,12	2,23,24,25
ArmedXpert WG_52 QC.t	x WG_082913_PAC_reinject	12,13,14	29,30,31	8,10,11,12	10,11,12	14,15,16	8,9,9.3	9,11,13	9,11,12	,19,21,23,	3,14,15,15.	17,18	8	,15,16,19,	X,Y	9,11,12	2,23,24,25
GMID WG_52 QC.txt	WG_082913_NAC																
ArmedXpert WG_52 QC.1	x WG_082913_NAC																
GMID WG_52 QC.txt	082313_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert WG_52 QC.1	x 082313_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID WG_52 QC.txt	081413_SRB1																
ArmedXpert WG_52 QC.1	x 081413_SRB1																
GMID WG_52 QC.txt	081313_URB1																
ArmedXpert WG_52 QC.1	x 081313_URB1																
GMID WG_52 QC.txt	Ladder_D3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_52 QC.t	x Ladder_D3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXperf WG_52 QC.1	x Ladder_D3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,p,11,12,13,	0,11,12,13	0,21,22,23	2,14,14.2,1	16,17,18,19	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	144	100.00%

# TABLE XL WG\_Z13\_52 GENEMAPPER®ID AND ARMEDXPERT<sup>TM</sup> SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D198433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_52 Samples.txt	WG_Z130052_Ex1A	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert WG_52 Samples.txt	WG_Z130052_Ex1A	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID WG_52 Samples.txt	WG_Z13_52_Ex1B_CONC_reinject	8,10,12,13	29,30,31,31.2	8,11,12,13	9,11,12	14,15,16,17,18	6,7,9.3	9,10,11,12,13	10,12,13	17,20,22	12,13,14,15	15,16,17,18	8,12	12,13,16	X,Y	11,12,13	22,23,24,25
ArmedXpert WG_52 Samples.txt	WG_Z13_52_Ex1B_CONC_reinject	8,10,12,13	28 <sup>b</sup> ,29,30,31,31.2	8,11,12,13	9,11,12	14,15,16,17,18	6,7,9.3	9,10,11,12,13	10,11 <sup>b</sup> ,12,13	17,20,22	12,13,14,15	15,16,17,18	8,12	12,13,16	X,Y	11,12,13	22,23,24,25
GMID WG_52 Samples.txt	WG_Z130052_Ex2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert WG_52 Samples.txt	WG_Z130052_Ex2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID WG_52 Samples.txt	WG_Z130052_Ex3	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert WG_52 Samples.txt	WG_Z130052_Ex3	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	62	96.88%
	1-Diffs	2	3.13%

<sup>&</sup>lt;sup>b</sup> ArmedXpert<sup>TM</sup> designated allele call that GeneMapper®ID did not.

## TABLE XLI KH\_Z13\_52 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_52 QC.txt	KH_DRB1_8713_O																
ArmedXpert KH_52 QC.t	KH_DRB1_8713_O																
													-				
GMID KH_52 QC.txt	KH_SRB1_8813_Q																
ArmedXpert KH_52 QC.t	KH_SRB1_8813_Q																
GMID KH_52 QC.txt	KH_NEGC_S																
ArmedXpert KH_52 QC.t	KH_NEGC_S																
GMID KH_52 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	,9,10,11,12,13,	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert KH_52 QC.t	LADDER.4	2,13,14,15,	2,31,31.2,3	,9,10,11,12,13,	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.:
GMID KH_52 QC.txt	KH_POSC_R	OL,13	OL,30	OL,10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	OL,8	15,19	X	11	23,24
ArmedXpert KH_52 QC.t	KH_POSC_R	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	76	95.00%
	1-Diffs	4	5.00%

## TABLE XLII KH\_Z13\_52 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_52 Samples.txt	KH_52_3_N	10,13	24.2ª,29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	OL,15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert KH_52 Samples.txt	KH_52_3_N	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID KH_52 Samples.txt	KH_52_1B_L	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert KH_52 Samples.txt	KH_52_1B_L	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID KH_52 Samples.txt	KH_52_2_M	OL,8,10	OL,29,31.2,34ª	OL,11,13	9,11	15,18	6	9,10	10,12	17,22	OL,13,14	15°,17,18	12	12,13	X,Y	11	OL,23,24
ArmedXpert KH_52 Samples.txt	KH_52_2_M	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID KH_52 Samples.txt	KH_52_1A_K	10,13	24.2ª,29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	OL,15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert KH_52 Samples.txt	KH_52_1A_K	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	54	84.38%
	1-Diffs	10	15.63%

## TABLE XLIII JAC Z13 52 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_52 QC.txt	JAC_SRB1_0808_15																
ArmedXpert JAC_52 QC.txt	JAC_SRB1_0808_15																
GMID JAC_52 QC.txt	JAC_NEGC_19																
ArmedXpert JAC_52 QC.txt	JAC_NEGC_19																
GMID JAC_52 QC.txt	JAC_POSC_18	13	OL,30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	OL,8	15,19	Х	11	23,24
ArmedXpert JAC_52 QC.txt	JAC_POSC_18	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID JAC_52 QC.txt	JAC_URB1_0807_16																
ArmedXpert JAC_52 QC.txt	JAC_URB1_0807_16																
GMID JAC_52 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_52 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	78	97.50%
	1-Diffs	2	2.50%

#### TABLE XLIV JAC\_Z13\_52 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_52 Samples.txt	JAC_52_1B_12	OL,8,10,12,13	29,31.2	11,13	9,11	4,15,16,18	6,9.3	9,10,11,13	10,12,13	17,22	13,14,15	15,16,17,18	8,12	12,13	X,Y	11,12	22,23,24
ArmedXpert JAC_52 Samples.txt	JAC_52_1B_12	8,10,12,13	29,31.2	11,12 <sup>b</sup> ,13	9,11	4,15,16,18	6,9.3	9,10,11,13	10,12,13	17,22	13,14,15	15,16,17,18	8,12	12,13	X,Y	11,12,13 <sup>b</sup>	22,23,24
GMID JAC_52 Samples.txt	JAC_52_2_13	OL,8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert JAC_52 Samples.txt	JAC_52_2_13	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID JAC_52 Samples.txt	JAC_52_1A_11	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert JAC_52 Samples.txt	JAC_52_1A_11	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID JAC_52 Samples.txt	JAC_52_3_14	10,13	24.2ª,29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	OL,15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert JAC_52 Samples.txt	JAC_52_3_14	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	58	90.63%
	1-Diffs	6	9.38%

<sup>a</sup> GeneMapper®ID designated allele call that analyst manually labeled as "pull-up" or "minus A". <sup>b</sup> ArmedXpert<sup>™</sup> designated allele call that GeneMapper®ID did not.

## TABLE XLV DLK\_Z13\_55 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_55 QC.txt	SRB1-082913																
ArmedXpert DLK_55 QC.txt	SRB1-082913																
GMID DLK_55 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert DLK_55 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID DLK_55 QC.txt	NEG_CONTROL																
ArmedXpert DLK_55 QC.txt	NEG_CONTROL																
GMID DLK_55 QC.txt	DRB1-082813																
ArmedXpert DLK_55 QC.txt	DRB1-082813																
GMID DLK_55 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert DLK_55 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

# TABLE XLVI DLK\_Z13\_55 GENEMAPPER®ID AND ARMEDXPERT<sup>TM</sup> SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_55 Samples.txt	Z13-55_2	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert DLK_55 Samples.txt	Z13-55_2	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID DLK_55 Samples.txt	Z13-55_1B_F1	10,12,13,15	29,30,31	8,10,11,12	10,11,12	14,15,16	6,9.3	11,12,13	8,10,12,13	17,20,23	14,15,15.2	15,16,19	8	12,15,16	X,Y	9,10,11,12,13	19,22,25
ArmedXpert DLK_55 Samples.txt	Z13-55_1B_F1	10,12,13,15	29,30,31	8,10,11,12	10,11,12	14,15,16	6,9.3	11,12,13	8,10,12,13	17,20,23	14,15,15.2	15,16,19	8	12,15,16	X,Y	9,10,11,12,13	19,22,25
GMID DLK_55 Samples.txt	Z13-55_1B_F2	10,12,13	28,29,31	7,8,10,12	11,12	14,16	6,8,9.3	10,11,13	12,13	16,17,20,21	14,15	15,16	8,10,11	12,14,16	X,Y	11,12,13	21,22,25
ArmedXpert DLK_55 Samples.txt	Z13-55_1B_F2	10,12,13	28,29,31	7,8,10,12	11,12	14,16	6,8,9.3	10,11,13	12,13	16,17,20,21	14,15	15,16	8,10,11	12,14,16	X,Y	11,12,13	21,22,25
GMID DLK_55 Samples.txt	Z13-55_1A	12,15	29,30	10,11	10,12	15,16	6	11,12	8,10	17,23	15.2	16,19	8	12,15	Х	9,10	19,22
ArmedXpert DLK_55 Samples.txt	Z13-55_1A	12,15	29,30	10,11	10,12	15,16	6	11,12	8,10	17,23	15.2	16,19	8	12,15	Х	9,10	19,22
GMID DLK_55 Samples.txt	Z13-55_3	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
ArmedXpert DLK_55 Samples.txt	Z13-55_3.4	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

## TABLE XLVII WG\_Z13\_55 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_55 QC.txt	WG_090413DRB1																
ArmedXpert WG_55 QC.txt	WG_090413DRB1																
GMID WG_55 QC.txt	WG_091213_PAC	13	30	10,11	10,12	OL,14,15	OL,7.3 <sup>a</sup> ,8,9.3	11	11,12	19,23	14,15	OL,17,18	8	15,19	Х	11	23,24
ArmedXpert WG_55 QC.txt	WG_091213_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID WG_55 QC.txt	Ladder_D3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	,7,8,9,9.3,10,11	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_55 QC.txt	Ladder_D3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	,7,8,9,9.3,10,11	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID WG_55 QC.txt	WG_091013SRB1																
ArmedXpert WG_55 QC.txt	WG_091013SRB1																
GMID WG_55 QC.txt	WG_091213_NAC																
ArmedXpert WG_55 QC.txt	WG_091213 NAC																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	77	96.25%
	1-Diffs	3	3.75%

#### TABLE XLVIII WG\_Z13\_55 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_55 Samples.txt	WG_Z13_55_2	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert WG_55 Samples.txt	WG_Z13_55_2	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID WG_55 Samples.txt	WG_Z13_55_Ex1B_F2	10,12,13	28,29,31	7,8,10,12	11,12	14,16	6,8,9.3	10,11,13	12,13	16,17,20,21	14,15	15,16	8,10,11	12,14,16	X,Y	11,12,13	21,22,25
ArmedXpert WG_55 Samples.txt	WG_Z13_55_Ex1B_F2	10,12,13	28,29,31	7,8,10,12	11,12	14,16	6,8,9.3	10,11,13	12,13	16,17,20,21	14,15	15,16	8,10,11	12,14,16	X,Y	11,12,13	21,22,25
GMID WG_55 Samples.txt	WG_Z13_55_1A	12,15	29,30	10,11	10,12	15,16	6	11,12	8,10	17,23	15.2	16,19	8	12,15	Х	9,10	19,22
ArmedXpert WG_55 Samples.txt	WG_Z13_55_1A	12,15	29,30	10,11	10,12	15,16	6	11,12	8,10	17,23	15.2	16,19	8	12,15	Х	9,10	19,22
GMID WG_55 Samples.txt	WG_Z13_55_Ex1B_F1	10,12,13,15	29,30,31	8,10,11,12	10,11,12	14,15,16	6,9.3	11,12,13	8,10,12,13	17,20,23	14,15,15.2	15,16,19	8	12,15,16	X,Y	9,10,12,13	19,22,25
ArmedXpert WG_55 Samples.txt	WG_Z13_55_Ex1B_F1	10,12,13,15	29,30,31	8,10,11,12	10,11,12	14,15,16	6,9.3	11,12,13	8,10,12,13	17,20,23	14,15,15.2	15,16,19	8	12,15,16	X,Y	9,10,12,13	19,22,25
GMID WG_55 Samples.txt	WG_Z13_55_3	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
ArmedXpert WG_55 Samples.txt	WG_Z13_55_3	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

## **TABLE XLIX** KH\_Z13\_55 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_55 QC.txt	KH_SRB1_9513_P																
ArmedXpert KH_55 QC 2.txt	KH_SRB1_9513_P																
GMID KH_55 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	8,9,10,11,1	1.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.:
ArmedXpert KH_55 QC 2.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID KH_55 QC.txt	KH_NEG_R																
ArmedXpert KH_55 QC 2.txt	KH_NEG_R																
GMID KH_55 QC.txt	KH_POS_Q	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	- 11	23,24
ArmedXpert KH_55 QC 2.txt	KH_POS_Q	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	- 11	23,24
GMID KH_55 QC.txt	KH_DRB1_9313_G																
ArmedXpert KH_55 QC 2.txt	KH_DRB1_9313_G																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

#### TABLE L KH\_Z13\_55 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_55 Samples.txt	KH_55_2_I	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert KH_55 Samples 2.txt	KH_55_2_I	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID KH_55 Samples.txt	KH_55_1BF1_A	10,12,13,15	29,30,31	7,8,10,11,12	10,11,12	14,15,16	6,9.3	10,11,12,13	8,10,12,13	17,20,23	14,15,15.2	15,16,19	8	12,15,16	X,Y	9,10,11,12,13	19,22,25
ArmedXpert KH_55 Samples 2.txt	KH_55_1BF1_A	10,12,13,15	29,30,31	7,8,10,11,12	10,11,12	14,15,16	6,9.3	10,11,12,13	8,10,12,13	17,20,23	14,15,15.2	15,16,19	8	12,14 <sup>b</sup> ,15,16	X,Y	9,10,11,12,13	19,22,25
GMID KH_55 Samples.txt	KH_55_3_J	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
ArmedXpert KH_55 Samples 2.txt	KH_55_3_J	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
GMID KH_55 Samples.txt	KH_55_1A_H	12,15	29,30	10,11	10,12	15,16	6	11,12	8,10	17,23	15.2	16,19	8	12,15	Х	9,10	19,22
ArmedXpert KH_55 Samples 2.txt	KH_55_1A_H	12,15	29,30	10,11	10,12	15,16	6	11,12	8,10	17,23	15.2	16,19	8	12,15	Х	9,10	19,22
GMID KH_55 Samples.txt	KH_55_1BF2_B	10,12,13	28,29,31	7,8,10,12	11,12	14,16	6,8,9.3	10,11,13	12,13	16,17,20,21	14,15	15,16	8,10,11	12,14,16	X,Y	11,12,13	21,22,25
ArmedXpert KH_55 Samples 2.txt	KH_55_1BF2_B	10,12,13	28,29,31	7,8,10,12	11,12	14,16	6,8,9.3	10,11,13	11,13	16,17,20,21	14,15	15,16	8,10,11	12,14,16	X,Y	11,12,13	21,22,24 <sup>b</sup> ,25
TimedApert Ril_55 Sumples 2.txt		10,12,15	20,29,51	7,0,10,12	11,12	14,10	0,0,7.5	10,11,15	11,15	10,17,20,21	14,15	15,10	0,10,11	12,14,10	<i>A</i> ,1	11,12,15	21,22,24,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	77	96.25%
	1-Diffs	3	3.75%
# TABLE LI JAC\_Z13\_55 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_55 QC.txt	JAC_pos_control_16	13	30	10,11	10,12	14,15	8,9.3	- 11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC_52 QC.txt	JAC_pos_control_16	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID JAC_55 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,),11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_52 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,),11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID JAC_55 QC.txt	JAC_neg_control_17																
ArmedXpert JAC_52 QC.txt	JAC_neg_control_17																
GMID JAC_55 QC.txt	JAC_DRB1_0903_7																
ArmedXpert JAC_52 QC.txt	JAC_DRB1_0903_7																
GMID JAC_55 QC.txt	JAC_pos_conrol_16	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC_52 QC.txt	JAC_pos_conrol_16	13	30	10,11	10,12	14,15	8,9.3	11		19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID JAC_55 QC.txt	Ladder-2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,Þ,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_52 QC.txt	Ladder-2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,),11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID JAC_55 QC.txt	JAC_SRB1_0905_15																
ArmedXpert JAC_52 QC.txt	JAC_SRB1_0905_15																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	111	99.11%
	1-Diffs	1	0.89%

# TABLE LII JAC\_Z13\_55 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_55 Samples.txt	JAC_55_1A_8 reinject	12,15	29,30	10,11	10,12	15,16	6	11,12	8,10	17,23	15.2	16,19	8	12,15	Х	9,10	19,22
ArmedXpert JAC_52 Samples.txt	JAC_55_1A_8 reinjectbr	12,15	29,30	10,11	10,12	15,16	6	11,12	8,10	17,23	15.2	16,19	8	12,15	Х	9,10	19,22
GMID JAC_55 Samples.txt	JAC_55_1BF2_2	10,12,13	28,29,31	7,8,10,12	11,12	14,16	6,8,9.3	10,11,13	12,13	16,17,20,21	14,15	15,16	8,10,11	12,14,16	X,Y	11,12,13	21,22,25
ArmedXpert JAC_52 Samples.txt	JAC_55_1BF2_2	10,12,13	28,29,31	7,8,10,12	11,12	14,16	6,8,9.3	10,11,13	12,13	16,17,20,21	14,15	15,16	8,10,11	12,14,16	X,Y	11,12,13	21,22,25
GMID JAC_55 Samples.txt	JAC_55_1BF1-1	10,12,13,15	29,30,31	8,10,11,12	10,11,12	14,15,16	6,9.3	11,12,13	8,10,12,13	17,20,23	14,15,15.2	15,16,19	8	12,15,16	X,Y	9,10,12,13	19,22,25
ArmedXpert JAC_52 Samples.txt	JAC_55_1BF1-1	10,12,13,15	29,30,31	8,10,11,12	10,11,12	14,15,16	6,9.3	11,12,13	8,10,12,13	17,20,23	14,15,15.2	15,16,19	8	12,15,16	X,Y	9,10,12,13	19,22,25
GMID JAC_55 Samples.txt	JAC_55_3_10	12,13	28,29	7,10	11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
ArmedXpert JAC_52 Samples.txt	JAC_55_3_10	12,13	28,29	7,10	- 11	14,16	6,8	10,11	12	16,21	14,15	16	10,11	14,16	X,Y	11,12	21,22
GMID JAC_55 Samples.txt	JAC_55_2_9	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert JAC_52 Samples.txt	JAC_55_2_9	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

# TABLE LIII DLK\_Z13\_56 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_56 QC.txt	SRB1-082913																
ArmedXpert DLK_56 QC.txt	SRB1-082913																
GMID DLK_56 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert DLK_56 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID DLK_56 QC.txt	NEG_CONTROL																
ArmedXpert DLK_56 QC.txt	NEG_CONTROL																
GMID DLK_56 QC.txt	DRB1-082813																
ArmedXpert DLK_56 QC.txt	DRB1-082813																
GMID DLK_56 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert DLK_56 QC.txt	LADDER.2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
	Di la D'Britis	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-,01,01,0,0	,,,	,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0,11,12,10	,,,	,, ,, ,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,,,.	,.	,,,,.	2,0112,021

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

# TABLE LIV DLK\_Z13\_56 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_56 Samples.txt	Z13-56_2	13,14	28,29	9,10	11,12	16	9.3	12,13	11	16,25	13,15	17,18	8	14	X,Y	11,13	20,22
ArmedXpert DLK_56 Samples.tx	Z13-56_2	13,14	28,29	9,10	11,12	16	9.3	12,13	11	16,25	13,15	17,18	8	14	X,Y	11,13	20,22
GMID DLK_56 Samples.txt	Z13-56_1BF3	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,11,12	17,22	13,14	17,18	8,12	12,13	X,Y	11	21,23,24
ArmedXpert DLK_56 Samples.tx	Z13-56_1BF3	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,11,12	17,22	13,14	17,18	8,12	12,13	X,Y	11	21,23,24
GMID DLK_56 Samples.txt	Z13-56_1A	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
ArmedXpert DLK_56 Samples.tx	Z13-56_1A	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
GMID DLK_56 Samples.txt	Z13-56_1B_F1	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,11,12	21,24,25
ArmedXpert DLK_56 Samples.tx	Z13-56_1B_F1	13,14	31,33.2	9,12	11,12	15,16 <sup>b</sup> ,17,18 <sup>b</sup>	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,11,12	21,24,25
GMID DLK_56 Samples.txt	Z13-56_1B_F2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert DLK_56 Samples.tx	Z13-56_1B_F2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID DLK_56 Samples.txt	Z13-56_3	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert DLK_56 Samples.tx	Z13-56_3	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	95	98.96%
	1-Diffs	1	1.04%

<sup>&</sup>lt;sup>b</sup> ArmedXpert<sup>TM</sup> designated allele call that GeneMapper®ID did not.

## TABLE LV WG\_Z13\_56 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_56 QC.txt	WG_091013SRB1																
ArmedXpert WG_56 QC.txt	WG_091013SRB1																
GMID WG_56 QC.txt	Ladder_E1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	7,8,9,9.3,10,1	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_56 QC.txt	Ladder_E1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	7,8,9,9.3,10,1	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
				-													
GMID WG_56 QC.txt	WG_091213_PAC	13	30	10,11	10,12	OL,14,15	OL,7.3ª,8,9.3	11	11,12	19,23	14,15	OL,17,18	8	15,19	Х	11	23,24
ArmedXpert WG_56 QC.txt	WG_091213_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID WG_56 QC.txt	101613_NAC																
ArmedXpert WG_56 QC.txt	101613_NAC																
GMID WG_56 QC.txt	WG_090413DRB1																
ArmedXpert WG_56 QC.txt	WG_090413DRB1																
GMID WG_56 QC.txt	Ladder_D3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	7,8,9,9.3,10,1	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_56 QC.txt	Ladder_D3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	7,8,9,9.3,10,1	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID WG_56 QC.txt	WG_091213_NAC																
ArmedXpert WG_56 QC.txt	WG_091213_NAC																
GMID WG_56 QC.txt	101613_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24
ArmedXpert WG_56 QC.txt	101613_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	125	97.66%
	1-Diffs	3	2.34%

<sup>a</sup> GeneMapper®ID designated allele call that analyst manually labeled as "pull-up" or "minus A".

## **TABLE LVI** WG\_Z13\_56 GENEMAPPER®ID AND ARMEDXPERT<sup>™</sup> SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D168539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_56 Samples.txt	WG_Z13_56_3	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert WG_56 Samples.txt	WG_Z13_56_3	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID WG_56 Samples.txt	Z13_56_Ex1B_F3	8,10,13,14	29,31,31.2,33.2	9,11,13	9,11	15,18	6,9.3	9,10	10,12,13	17,22	13,14,15.2	15°,17,18	8,12	12,13,14	X,Y	11,12	21,23,24
ArmedXpert WG_56 Samples.txt	Z13_56_Ex1B_F3	8,10,13,14	29,31,31.2,33.2	9,11,12 <sup>b</sup> ,13	9,11,12 <sup>b</sup>	15,18	6,9.3	9,10	10,11 <sup>b</sup> ,12,13	17,22	13,14,15.2	17,18	8,12	12,13,14	X,Y	11,12	21,23,24
GMID WG_56 Samples.txt	WG_Z13_56_Ex1B_F2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert WG_56 Samples.txt	WG_Z13_56_Ex1B_F2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID WG_56 Samples.txt	WG_Z13_56_2	13,14	28,29	9,10	11,12	16	9.3	12,13	11	16,25	13,15	17,18	8	14	X,Y	11,13	20,22
ArmedXpert WG_56 Samples.txt	WG_Z13_56_2	13,14	28,29	9,10	11,12	16	9.3	12,13	11	16,25	13,15	17,18	8	14	X,Y	11,13	20,22
GMID WG_56 Samples.txt	WG_Z13_56_1A	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
ArmedXpert WG_56 Samples.txt	WG_Z13_56_1A	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
GMID WG_56 Samples.txt	WG_Z13_56_Ex1B_F1	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	X	10,12	21,25
ArmedXpert WG_56 Samples.txt	WG_Z13_56_Ex1B_F1	13,14	31,33.2	9,11 <sup>b</sup> ,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	X	10,11 <sup>b</sup> ,12	21,24 <sup>b</sup> ,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	89	92.71%
	1-Diffs	7	7.29%

<sup>a</sup> GeneMapper®ID designated allele call that analyst manually labeled as "pull-up" or "minus A". <sup>b</sup> ArmedXpert<sup>™</sup> designated allele call that GeneMapper®ID did not.

# TABLE LVII KH\_Z13\_56 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_56 QC.txt	KH_SRB1_9513_P																
ArmedXpert KH_56 QC.txt	KH_SRB1_9513_P																
GMID KH_56 QC.txt	KH_NEG_R																
ArmedXpert KH_56 QC.txt	KH_NEG_R																
GMID KH_56 QC.txt	KH_POS_Q	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert KH_56 QC.txt	KH_POS_Q	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	- 11	23,24
GMID KH_56 QC.txt	KH_DRB1_9313_G																
ArmedXpert KH_56 QC.txt	KH_DRB1_9313_G																
GMID KH_56 QC.txt	KH_Pos_control	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	- 11	23,24
ArmedXpert KH_56 QC.txt	KH_Pos_control	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID KH_56 QC.txt	KH_Neg_control																
ArmedXpert KH_56 QC.txt	KH_Neg_control																
GMID KH_56 QC.txt	Ladder.2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert KH_56 QC.txt	Ladder.2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,2	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	112	100.00%

# TABLE LVIII KH\_Z13\_56 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	ТРОХ	D18S51	AMEL	D5S818	FGA
GMID KH_56 Samples.txt	KH_Z13-56-1BF3	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert KH_56 Samples.txt	KH_Z13-56-1BF3	8,10,13 <sup>b</sup>	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID KH_56 Samples.txt	KH_56_1A_K	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
ArmedXpert KH_56 Samples.txt	KH_56_1A_K	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
GMID KH_56 Samples.txt	KH_56_1BF2_D	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert KH_56 Samples.txt	KH_56_1BF2_D	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID KH_56 Samples.txt	KH_56_2_L	13,14	28,29	9,10	11,12	16	9.3	12,13	11	16,25	13,15	17,18	8	14	X,Y	11,13	20,22
ArmedXpert KH_56 Samples.txt	KH_56_2_L	13,14	28,29	9,10	11,12	16	9.3	12,13	11	16,25	13,15	17,18	8	14	X,Y	11,13	20,22
GMID KH_56 Samples.txt	KH_56_1BF1_C	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
ArmedXpert KH_56 Samples.txt	KH_56_1BF1_C	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
GMID KH_56 Samples.txt	KH_56_3_M	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert KH_56 Samples.txt	KH_56_3_M	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	95	98.96%
	1-Diffs	1	1.04%

<sup>&</sup>lt;sup>b</sup> ArmedXpert<sup>TM</sup> designated allele call that GeneMapper®ID did not.

# TABLE LIX JAC\_Z13\_56 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_56 QC.txt	JAC_Neg_control																
ArmedXpert JAC_56 QC.txt	JAC_Neg_control																
GMID JAC_56 QC.txt	JAC_Pos_control	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC_56 QC.txt	JAC_Pos_control	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID JAC_56 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_56 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
										-			-				
GMID JAC_56 QC.txt	JAC_neg_control_17																
ArmedXpert JAC_56 QC.txt	JAC_neg_control_17																
GMID JAC_56 QC.txt	JAC_DRB1_0903_7																
ArmedXpert JAC_56 QC.txt	JAC_DRB1_0903_7																
								-									
GMID JAC_56 QC.txt	JAC_pos_conrol_16	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC_56 QC.txt	JAC_pos_conrol_16	13	30	10,11	10,12	14,15	8,9.3	11		19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID JAC_56 QC.txt	JAC_SRB1_0905_15																
ArmedXpert JAC_56 QC.txt	JAC_SRB1_0905_15																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	111	99.11%
	1-Diffs	1	0.89%

## TABLE LX JAC\_Z13\_56 GENEMAPPER®ID AND ARMEDXPERT<sup>TM</sup> SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	ТРОХ	D18S51	AMEL	D5S818	FGA
GMID JAC_56 Samples.txt	JAC_56_1BF1_3	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,11,12	21,25
ArmedXpert JAC_56 Samples.tx	GJAC_56_1BF1_3	10 <sup>b</sup> ,13,14	29 <sup>b</sup> ,31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	X,Y <sup>b</sup>	10,11,12	21,24 <sup>b</sup> ,25
GMID JAC_56 Samples.txt	JAC_56_2_12	13,14	28,29	9,10	11,12	16	9.3	12,13	11	16,25	13,15	17,18	8	14	X,Y	11,13	20,22
ArmedXpert JAC_56 Samples.tx	GJAC_56_2_12	13,14	28,29	9,10	11,12	16	9.3	12,13		16,25	13,15	17,18	8	14	X,Y	11,13	20,22
GMID JAC_56 Samples.txt	JAC_56_1A_11	13,14	31,33.2	9,12	11,12	15,17	6,9.3	9,12	11,13	17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
ArmedXpert JAC_56 Samples.tx	GJAC_56_1A_11	13,14		9,12	11,12	15,17	6,9.3	9,12		17,19	14,15.2	16,17	8	13,14	Х	10,12	21,25
GMID JAC_56 Samples.txt	JAC_56-1BF3	8,10	29,31,31.2	11,13	9,11	15,18	6,9.3	9,10	10,12,13	17,22	13,14	16,17,18	12	12,13	X,Y	11	23,24
ArmedXpert JAC_56 Samples.tx	JAC_56-1BF3	8,10,14 <sup>b</sup>	29,31,31.2	11,13	9,11	15,18	6,9.3	9,10	10,12,13	17,22	13,14	16,17,18	12	12,13	X,Y	11	23,24
GMID JAC_56 Samples.txt	JAC_56_3_13	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert JAC_56 Samples.tx	GJAC_56_3_13	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID JAC_56 Samples.txt	JAC_56_1BF2_4	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert JAC_56 Samples.tx	JAC_56_1BF2_4	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	88	91.67%
	1-Diffs	8	8.33%

#### TABLE LXI DLK\_Z13\_57 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_57 QC.txt	SRB1-082913																
ArmedXpert DLK_57 QC.txt	SRB1-082913																
GMID DLK_57 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert DLK_57 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	- 11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID DLK_57 QC.txt	NEG_CONTROL																
ArmedXpert DLK_57 QC.txt	NEG_CONTROL																
GMID DLK_57 QC.txt	DRB1-082813																
ArmedXpert DLK_57 QC.txt	DRB1-082813																
GMID DLK_57 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert DLK_57 QC.txt	LADDER.3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

#### TABLE LXII DLK Z13 57 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_57 Samples.txt	Z13-57_1A	13,14	29,31	8,10	11,12	15,16	9,9.3	9,11	12	21,27	13,15.2	17	8	12,16	Х	9,11	22,24
ArmedXpert DLK_57 Samples.txt	Z13-57_1A	13,14	29,31	8,10	11,12	15,16	9,9.3	9,11	12	21,27	12 <sup>b</sup> ,13,15.2	17	8	12,16	X	9,11	22,24
GMID DLK_57 Samples.txt	Z13-57_1B_F1	12,13,14	29,30	8	11,12	15,16	9,9.3	9,11	12	21,27	13,14,15.2	17	8	16	Х	9,11	24
ArmedXpert DLK_57 Samples.txt	Z13-57_1B_F1	12,13,14	29,30,31 <sup>b</sup>	8	11,12	15,16	9,9.3	9,11	12	21,27	13,14,15.2	17	8	16	X,Y <sup>b</sup>	9,11,12 <sup>b</sup>	22 <sup>b</sup> ,24,25 <sup>b</sup>
GMID DLK_57 Samples.txt	Z13-57_1B_F2	12,13	29,30	8,12	11,12	15	9,9.3	9,13	9,12	17	14	17	8	15,22	X,Y	11,12	24,25
ArmedXpert DLK_57 Samples.txt	Z13-57_1B_F2	12,13	29,30	8,12	11,12	15	9,9.3	9,13	9,12	17	14	17	8	15,22	X,Y	11,12	24,25
GMID DLK_57 Samples.txt	Z13-57_1BF1	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	9,12	17,21,27	13,14,15.2	17	8	12,15,16,22	X,Y	9,11,12	22,24,25
ArmedXpert DLK_57 Samples.txt	Z13-57 1BF1	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	9,12	17,21,27	13,14,15.2	17	8	12,15,16,22	X,Y	9,11,12	22,24,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	59	92.19%
	1-Diffs	5	7.81%

#### TABLE LXIII WG\_Z13\_57GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_57 QC.txt	WG_091013SRB1																
ArmedXpert WG_57 QC.txt	WG_091013SRB1																
GMID WG_57 QC.txt	Ladder_A1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	,14,15,16,17,	,7,8,9,9.3,10,11	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_57 QC.txt	Ladder_A1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	,14,15,16,17,	,7,8,9,9.3,10,11	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
		_	-														
GMID WG_57 QC.txt	WG_091213_PAC	13	30	10,11	10,12	OL,14,15	OL,7.3ª,8,9.3	11	11,12	19,23	14,15	OL,17,18	8	15,19	Х	11	23,24
ArmedXpert WG_57 QC.txt	WG_091213_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
		_		_													
GMID WG_57 QC.txt	101613_NAC																
ArmedXpert WG_57 QC.txt	101613_NAC																
GMID WG_57 QC.txt	WG_090413DRB1																
ArmedXpert WG_57 QC.txt	WG_090413DRB1																
GMID WG_57 QC.txt	WG_091213_NAC																
ArmedXpert WG_57 QC.txt	WG_091213_NAC																
GMID WG_57 QC.txt	101613_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24
ArmedXpert WG_57 QC.txt	101613_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	109	97.32%
	1-Diffs	3	2.68%

#### TABLE LXIV WG\_Z13\_57 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_57 Samples.txt	WG_Z13_57_1A	13,14	29,31	8,10	11,12	15,16	9,9.3	9,11	12	21,27	13,15.2	17	8	12,16	Х	9,11	22,24
ArmedXpert WG_57 Samples.txt	WG_Z13_57_1A	13,14	29,31	8,10	11,12	15,16	9,9.3	9,11	12	21,27	13,15.2	17	8	12,16	Х	9,11	22,24
GMID WG_57 Samples.txt	Z13_57_Ex1B_F2	12,13	29,30	8,12	11,12	15	9,9.3	9,13	9,12	17	14	17	8	15,22	X,Y	11,12	24,25
ArmedXpert WG_57 Samples.txt	Z13_57_Ex1B_F2	12,13	29,30	8,12	11,12	15	9,9.3	9,13	9,12	17	14	17	8	15,22	X,Y	11,12	24,25
GMID WG_57 Samples.txt	Z13_57_Ex1B_F1	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	9,12	17,21,27	13,14,15.2	17	8	12,15,16,22	X,Y	9,11,12	22,24,25
ArmedXpert WG_57 Samples.txt	Z13_57_Ex1B_F1	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	9,12	17,21,27	13,14,15.2	17	8	12,15,16,22	X,Y	9,11,12	22,24,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diff:	s 48	100.00%

<sup>a</sup> GeneMapper®ID designated allele call that analyst manually labeled as "pull-up" or "minus A".

#### TABLE LXV KH\_Z13\_57 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_57 QC.txt	KH_SRB1_9513_P																
ArmedXpert KH_57 QC.txt	KH_SRB1_9513_P																
GMID KH_57 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert KH_57 QC.txt	Ladder.3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
	-																
GMID KH_57 QC.txt	KH_NEG_R																
ArmedXpert KH_57 QC.txt	KH_NEG_R																
	-																
GMID KH_57 QC.txt	KH_POS_Q	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	- 11	23,24
ArmedXpert KH_57 QC.txt	KH_POS_Q	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
			-		-					-							
GMID KH_57 QC.txt	KH_DRB1_9313_G																
ArmedXpert KH_57 QC.txt	KH_DRB1_9313_G																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	80	100.00%

#### TABLE LXVI KH\_Z13\_57 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_57 Samples.txt	KH_57_1A_N	13,14	29,31	8,10	11,12	15,16	9,9.3	9,11	12	21,27	13,15.2	17	8	12,16	X	9,11	22,24
ArmedXpert KH_57 Samples.txt	KH_57_1A_N	13,14	29,31	8,10	11,12	15,16	9,9.3	9,11	12	21,27	13,15.2	17	8	12,16	X	9,11	22,24
GMID KH_57 Samples.txt	KH_57_1BF1_E	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	12	21,27	13,14,15.2	17	8	12,16	X,Y	9,11	22,24
ArmedXpert KH_57 Samples.txt	KH_57_1BF1_E	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	12	21,27	13,14,15.2	17	8	12,16	X,Y	9,11,12 <sup>b</sup>	22,24,25 <sup>b</sup>
GMID KH_57 Samples.txt	KH_57_1BF2_F	12,13	29,30	8,12	11,12	15,16	9,9.3	9,13	9,12	17	14	17	8	15,21,22	X,Y	11,12	24,25
ArmedXpert KH_57 Samples.txt	KH_57_1BF2_F	12,13	29,30	8,12	11,12	15,16	9,9.3	9,13	9,12	17	14	17	8	15,21,22	X,Y	11,12	24,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	46	95.83%
	1-Diffs	2	4.17%

#### TABLE LXVII JAC\_Z13\_57 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_57 QC.txt	JAC_pos_conrol_16	13	30	10,11	10,12	14,15	8,9.3	11	11°,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC_57 QC.txt	JAC_pos_conrol_16	13	30	10,11	10,12	14,15	8,9.3	11	12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID JAC_57 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,Þ,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_57 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
	-																
GMID JAC_57 QC.txt	JAC_neg_control_17																
ArmedXpert JAC_57 QC.txt	JAC_neg_control_17																
GMID JAC_57 QC.txt	JAC_DRB1_0903_7																
ArmedXpert JAC_57 QC.txt	JAC_DRB1_0903_7																
GMID JAC_57 QC.txt	JAC_SRB1_0905_15																
ArmedXpert JAC_57 QC.txt	JAC_SRB1_0905_15																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	79	98.75%
	1-Diffs	1	1.25%

#### TABLE LXVIII JAC\_Z13\_57 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_57 Samples.txt	JAC_57_1BF2_6	12,13	29,30	8,12	11,12	15	9,9.3	9,13	9,12	17	14	17	8	15,22	X,Y	11,12	24,25
ArmedXpert JAC_57 Samples.txt	JAC_57_1BF2_6	12,13	29,30	8,12	11,12	15	9,9.3	9,13	9,12	17	14	17	8	15,22	X,Y	11,12	24,25
GMID JAC_57 Samples.txt	JAC_57_1A_14	13,14	29,31	8,10	11,12	15,16	9,9.3	9,11	12	21,27	13,15.2	17	8	12,16	Х	9,11	22,24
ArmedXpert JAC_57 Samples.txt	JAC_57_1A_14	13,14	29,31	8,10	11,12	15,16	9,9.3	9,11	12	21,27	13,15.2	17	8	12,16	Х	9,11	22,24
GMID JAC_57 Samples.txt	JAC_57_1BF1_5	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	9,12	17,21,27	13,14,15.2	17	8	12,15,16,22	X,Y	9,11,12	22,24,25
ArmedXpert JAC_57 Samples.txt	JAC_57_1BF1_5	12,13,14	29,30,31	8,10,12	11,12	15,16	9,9.3	9,11,13	9,12	17,21,27	13,14,15.2	17	8	12,15,16,22	X,Y	9,11,12	22,24,25

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	48	100.00%

<sup>c</sup> ArmedXpert<sup>TM</sup> is missing allele call, not manually labeled as "pull-up" or "minus A" by analyst.

# TABLE LXIX DLK\_Z13\_60 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_60 QC.txt	SRB1_10813																
ArmedXpert DLK_60 QC.tx	t SRB1_10813																
GMID DLK_60 QC.txt	DRB1_F2_10313																
ArmedXpert DLK_60 QC.tx	t DRB1_F2_10313																
GMID DLK_60 QC.txt	DRB2_F1_10313																
ArmedXpert DLK_60 QC.tx	t DRB2_F1_10313																
GMID DLK_60 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert DLK_60 QC.tx	t POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID DLK_60 QC.txt	NEG_CONTROL																
ArmedXpert DLK_60 QC.tx	t NEG_CONTROL																
GMID DLK_60 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert DLK_60 OC tx	t LADDER	2 13 14 15	2 31 31 2 3	10 11 12 1	10 11 12 1	4 15 16 17	899310	0.11.12.13	0 11 12 13	0 21 22 23	2 14 14 2 1	6 17 18 19	8 9 10 11 1	2 15 16 17	XY	11 12 13 1	2 31 2 32

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	96	100.00%

# TABLE LXX DLK\_Z13\_60 GENEMAPPER®ID AND ARMEDXPERT<sup>TM</sup> SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_60 Samples.txt	Z13-60_1BF1	8,12,13	28,29,30,32.2	8,10,12	10,11,12,14	14,16,17,18	6,7,8,9.3	10,11,12,13	10,11,12	17,19,20,21,22	12,13,14	14,15,16,19	8,9,10,11	12,14,15,18,23	X,Y	9,11,12,13	21,22,22.2,24
ArmedXpert DLK_60 Samples.txt	Z13-60_1BF1	8,12,13	28,29,30,32.2	8,10,12	10,11,12,14	14,16,17,18	6,7,8,9.3	10,11,12,13	10,11,12	17,19,20,21,22	12,13,14	14,15,16,19	8,9,10,11	12,14,15,18,23	X,Y	9,11,12,13	21,22,24
GMID DLK_60 Samples.txt	Z13-60_6	8,12	30,32.2	8,10	10,14	17	7,8	10,13	10,11	17,21	13	14,15	8	12,15	X,Y	11	22,22.2
ArmedXpert DLK_60 Samples.txt	Z13-60_6	8,12	30,32.2	8,10	10,14	17	7,8	10,13	10,11	17,21	13	14,15	8	12,15	X,Y	11	22
GMID DLK_60 Samples.txt	Z13-60_1BF2	8,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,23	X,Y	9,11	21,22,22.2
ArmedXpert DLK_60 Samples.txt	Z13-60_1BF2	8,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,23	X,Y	9,11	21,22
							-										
GMID DLK_60 Samples.txt	Z13-60_4	13,14	32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	X,Y	12	19,21
ArmedXpert DLK_60 Samples.txt	Z13-60_4	13,14	32.2,33.2	П	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	Х,Ү	12	19,21
CMID DI K (0.0 - 1 - t - t	DIK 712 (0.24F1	10.12	20.21			14.16	0.2		10.10	17.00	14.15	15.16	0		X X	10.10	22
GMID DLK_60 Samples.txt	DLK_Z13-60_2AF1	10,13	29,31			14,16	9.3		12,13	17,20	14,15	15,16	8		X,Y XX	12,13	22
ArmedApert DLK_60 Samples.txt	DLK_213-00_2AF1	10,15	29,51			14,10	9.5		12,15	17,20	14,15	15,10	8		А, І	12,15	22
GMID DI K 60 Samples tyt	713-60 14	12	29.30	10	12.14	16	603	11.12	11	20.22	13.14	15	0.10	12.14	v	12.13	21.24
ArmedVpert DLK_60 Samples tyt	Z13-60_1A	12	29,30	10	12,14	16	6.0.3	11,12	11	20,22	13,14	15	9,10	12,14	A V	12,13	21,24
AnneuXpert DER_00 Samples.txt	215-00_IA	12	29,50	10	12,14	10	0,7.5	11,12	11	20,22	15,14	15	9,10	12,17	Δ	12,15	21,24
GMID DLK 60 Samples txt	Z13-60 2AF2	10.13	29.31	8.12	11.12	14.16	93	11.13	12.13	17.20	14.15	15.16	8	12.16	XY	12.13	22.25
ArmedXpert DLK 60 Samples.txt	Z13-60_2AF2	10,13	29.31	8.12	11,12	14.16	9.3	11,13	12,13	17.20	14.15	15,16	8	12.16	X.Y	12,13	22.25
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							• = (	,			,,	,		
GMID DLK 60 Samples.txt	Z13-60 5	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert DLK 60 Samples.txt	Z13-60 5	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID DLK_60 Samples.txt	Z13-60_3	13	28,29	10,12	- 11	14,18	7,8	11	12	19	12,13	16,19	8,11	18,23	X,Y	9,11	21
ArmedXpert DLK_60 Samples.txt	Z13-60_3	13	28,29	10,12	11	14,18	7,8	11	12	19	12,13	16,19	8,11	18,23	X,Y	9,11	21
GMID DLK_60 Samples.txt	DLK_Z13-60_1BF3 (2)	8,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19	12,13	15,16,19	8,11	12,15,23	X,Y	9,11	21,22,22.2
ArmedXpert DLK_60 Samples.txt	DLK_Z13-60_1BF3	8,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19	12,13	15,16,19	8,11	12,15,23	X,Y	9,11	21,22

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	156	97.50%
	1-Diffs	4	2.50%

# TABLE LXXI WG\_Z13\_60 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG 60 QC.txt	WG 103113 NAC																
ArmedXpert WG 60 QC.txt	WG 103113 NAC																
`																	
GMID WG 60 QC.txt	WG 103113 PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert WG 60 QC.txt	WG 103113 PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
<b>_</b>																	
GMID WG 60 QC.txt	102513 NAC																
ArmedXpert WG 60 QC.txt	102513 NAC																
<b>_</b>																	
GMID WG 60 QC.txt	Ladder H2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	, <b>)</b> , 11, 12, 13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG 60 QC.txt	Ladder H2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	0,11,12,13	0,11,12,13	20,21,22,2	2,14,14.2,1	16,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
	_																
GMID WG 60 QC.txt	092513 DRB2																
ArmedXpert WG 60 QC.txt	092513 DRB2																
	_																
GMID WG_60 QC.txt	Ladder_A1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	, ), 11, 12, 13,	0,11,12,13	20,21,22,2	2,14,14.2,1	6,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.:
ArmedXpert WG_60 QC.txt	Ladder_A1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID WG_60 QC.txt	101613_NAC																
ArmedXpert WG_60 QC.txt	101613_NAC																
GMID WG_60 QC.txt	102513_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert WG_60 QC.txt	102513_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID WG_60 QC.txt	092513_DRB1																
ArmedXpert WG_60 QC.txt	092513_DRB1																
								_	_			_					
GMID WG_60 QC.txt	102113_SRB1																
ArmedXpert WG_60 QC.txt	102113_SRB1																
GMID WG_60 QC.txt	Ladder_B3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13,	, 0,11,12,13	20,21,22,2	2,14,14.2,1	16,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.:
ArmedXpert WG_60 QC.txt	Ladder_B3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,p,11,12,13,	,0,11,12,13	\$20,21,22,2	2,14,14.2,1	6,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
				10.11													
GMID WG_60 QC.txt	101613_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24
ArmedXpert WG_60 QC.txt	101613_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	192	100.00%

## TABLE LXXII WG\_Z13\_60 GENEMAPPER®ID AND ARMEDXPERT<sup>TM</sup> SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	ТРОХ	D18S51	AMEL	D5S818	FGA
GMID WG_60 Samples.txt	Z13_60_Ex1B_F1	8,12,13	28,29,30,32.2	8,10,12	10,11,12,14	14,16,17,18	6,7,8,9.3	10,11,12,13	10,11,12	17,19,20,21,22	12,13	14,15,16,19	8,9,10,11	12,14,15,18,23	X,Y	9,11,12,13	21,22,22.2,24
ArmedXpert WG_60 Samples.txt	Z13_60_Ex1B_F1	8,12,13	28,29,30,32.2	8,10,12	10,11,12,14	14,16,17,18	6,7,8,9.3	10,11,12,13	10,11,12	17,19,20,21,22	12,13	14,15,16,19	8,9,10,11	12,14,15,18,23	X,Y	9,11,12,13	21,22,24
												•					
GMID WG_60 Samples.txt	Z13_60_EX3	13	28,29	10,12	11	14,18	7,8	11	12	19	12,13	16,19	8,11	18,23	X,Y	9,11	21
ArmedXpert WG_60 Samples.txt	Z13_60_EX3	13	28,29	10,12	11	14,18	7,8	11	12	19	12,13	16,19	8,11	18,23	X,Y	9,11	21
GMID WG_60 Samples.txt	Z13_60_Ex2A_F2	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert WG_60 Samples.txt	Z13_60_Ex2A_F2	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID WG_60 Samples.txt	Z13_60_EX6	8,12	30,32.2	8,10	10,14	17	7,8	10,13	10,11	17,21	13	14,15	8	12,15	X,Y	11	22,22.2
ArmedXpert WG_60 Samples.txt	Z13_60_EX6	8,12	30,32.2	8,10	10,14	17	7,8	10,13	10,11	17,21	13	14,15	8	12,15	X,Y	11	22
GMID WG_60 Samples.txt	WG_Z13-60_Ex1B_F2	8,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,23	X,Y	9,11	21,22,22.2
ArmedXpert WG_60 Samples.txt	WG_Z13-60_Ex1B_F2.2	8,12,13	28,29,30,32.2	8,10,11 <sup>b</sup> ,12	10,11,13 <sup>b</sup> ,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,22 <sup>b</sup> ,23	X,Y	9,11	21,22
GMID WG_60 Samples.txt	WG_Z13-60_Ex1B_F3	8,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,12,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,22,23	X,Y	9,11	21,22,22.2
ArmedXpert WG_60 Samples.txt	WG_Z13-60_Ex1B_F3	8,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,12,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,22,23	X,Y	9,11	21,22
GMID WG_60 Samples.txt	Z13_60_EX1A	12	29,30	10	12,14	16	6,9.3	11,12	- 11	20,22	13,14	15	9,10	12,14	X	12,13	21,24
ArmedXpert WG_60 Samples.txt	Z13_60_EX1A	12	29,30	10	12,14	16	6,9.3	11,12	11	20,22	13,14	15	9,10	12,14	Х	12,13	21,24
GMID WG_60 Samples.txt	Z13_60_EX5	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert WG_60 Samples.txt	Z13_60_EX5	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID WG_60 Samples.txt	Z13_60_Ex1B_F2	8,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,23	X,Y	9,11	21,22,22.2
ArmedXpert WG_60 Samples.txt	Z13_60_Ex1B_F2	8,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,23	X,Y	9,11	21,22
GMID WG_60 Samples.txt	Z13_60_EX2A_F1	10,13	29			14,16	9.3				14,15	15,16	8		X,Y	12,13	
ArmedXpert WG_60 Samples.txt	Z13_60_EX2A_F1	10,13	29			14,16	9.3		12		14,15	15,16	8		X,Y	12,13	22
GMID WG_60 Samples.txt	Z13_60_EX4	13,14	OL,32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	OL,15	15,16	OĹ,8	12,15	X,Y	12	19,21
ArmedXpert WG_60 Samples.txt	Z13_60_EX4	13,14	32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	X,Y	12,13°	19,21

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	162	92.05%
	1-Diffs	14	7.95%

# TABLE LXXIII KH\_Z13\_60 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH 60 QC.txt	KH DRB1 102213 F1																
ArmedXpert KH 60 QC.txt	KH DRB1 102213 F1																
						11		•									
GMID KH 60 QC.txt	KH NEG CONTROL																
ArmedXpert KH_60 QC.txt	KH_NEG_CONTROL																
GMID KH_60 QC.txt	KH_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert KH_60 QC.txt	KH_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID KH_60 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert KH_60 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.:
GMID KH_60 QC.txt	KH_DRB1_102413_F2																
ArmedXpert KH_60 QC.txt	KH_DRB1_102413_F2																
GMID KH_60 QC.txt	KH_DRB1_102413_F1																
ArmedXpert KH_60 QC.txt	KH_DRB1_102413_F1																
GMID KH_60 QC.txt	Ladder_A7	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert KH_60 QC.txt	Ladder_A7	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID KH_60 QC.txt	NEG_CONTROL																
ArmedXpert KH_60 QC.txt	NEG_CONTROL																
	DOG GOVERDOL		20	10.11	10.10		0.0.0			10.00		1					00.01
GMID KH_60 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24
ArmedXpert KH_60 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24
	WHI OPPL LOOOLO																
GMID KH_60 QC.txt	KH_SRB1_102913																
ArmedXpert KH_60 QC.txt	KH_SKB1_102913																
CMID KIL (0.00 tot	KIL DDD1 102212 F2																
GMID KH_60 QC.txt	KH_DKB1_102213_F2																
ArmedApert KH_60 QC.txt	KH_DKB1_102213_F2																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	176	100.00%

## TABLE LXXIV KH\_Z13\_60 GENEMAPPER®ID AND ARMEDXPERT<sup>TM</sup> SAMPLES COMPARISON

OMID KH_60 Samplestxt       KH_Z13-60_Ex2A_F1       Image: Constraint of the constraint o	11,22,22.2 21,22 21,22 21,22 21,22 21,22 22,25 22,25 22,25 22,25
ArmedXpert KH_60 Samples.txt       KH_ZI3-60_Ex1B_F2       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_ZI3-60_Ex1B_F2       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_ZI3-60_Ex1B_F3       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_ZI3-60_Ex1B_F3       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_ZI3-60_Ex1B_F3       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,12       17,19,21       12,13 <th< th=""><th>11,22,22.2 21,22 21,22 21,22 21,22 22,25 22,25 22,25</th></th<>	11,22,22.2 21,22 21,22 21,22 21,22 22,25 22,25 22,25
GMID KH_60 Samples.txt         KH_ZI3-60_Ex1B_F2         8,12,13         28,29,30,32.2         8,10,12         10,11,14         14,17,18         7,8         10,11,13         10,11,12         17,19,21         12,13         14,15,16,19         8,11         12,15,18,23         X,Y         9,11         6           GMID KH_60 Samples.txt         KH_ZI3-60_Ex1B_F2         8,12,13         28,29,30,32.2         8,10,12         10,11,14         14,17,18         7,8         10,11,13         10,11,12         17,19,21         12,13         14,15,16,19         8,11         12,15,18,23         X,Y         9,11         6           GMID KH_60 Samples.txt         KH_ZI3-60_Ex1B_F3         8,12,13         28,29,30,32.2         8,10,12         10,11,14         14,17,18         7,8         10,11,12         17,19,21         12,13         14,15,16,19         8,11         12,15,18,23         X,Y         9,11         6           ArmedXpert KH_60 Samples.txt         KH_ZI3-60_Ex1B_F3         8,12,13         28,29,30,32.2         8,10,12         10,11,14         14,17,18         7,8         10,11,12         17,19,21         12,13         14,15,16,19         8,11         12,15,18,23         X,Y         9,11         4         4         4         4         4         4         4         4	21,22,22.2       21,22       21,22       21,22       21,22       21,22       22,25       22,25       22,25       22,25
GMID KH_60 Samples.txt       KH_Z13-60_Ex1B_F2       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         ArmedXpert KH_60 Samples.txt       KH_Z13-60_Ex1B_F2       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_Z13-60_Ex1B_F3       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_Z13-60_Ex1B_F3       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_Z13-60_Ex1B_F3       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,12       17,19,21       12,13 <th< th=""><th>21,22,22.2 21,22 21,22 21,22 21,22 22,25 22,25 22,25 22,25</th></th<>	21,22,22.2 21,22 21,22 21,22 21,22 22,25 22,25 22,25 22,25
ArmedXpert KH_60 Samples.txt       KH_ZI3-60_Ex1B_F2       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_ZI3-60_Ex1B_F3       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_ZI3-60_Ex1B_F3       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_ZI3-60_Ex1B_F3       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH_60 Samples.txt       KH_ZI3-60_Ex2A_F3       0,10,11,13,14,15,16       24,22,29,31       8,12       11,12       01,14,15,16,17,18       01,11,23       17,20       01,13,14,15,16.2       01,12,15,16,18	21,22 11,22,22.2 21,22 22,25 22,25 22,25
GMID KH 60 Samples.txt         KH Z13-60 Ex1B F3         8,12,13         28,29,30,32.2         8,10,12         10,11,14         14,17,18         7,8         10,11,12         17,19,21         12,13         14,15,16,19         8,11         12,15,18,23         X,Y         9,11           ArmedXpert KH 60 Samples.txt         KH Z13-60 Ex1B F3         8,12,13         28,29,30,32.2         8,10,12         10,11,14         14,17,18         7,8         10,11,12         17,19,21         12,13         14,15,16,19         8,11         12,15,18,23         X,Y         9,11           GMID KH 60 Samples.txt         KH Z13-60 Ex2A F3         0,11,13,14,15,16         24,2*,29,31         8,12         11,12         0,14,15,16,17,18         0,7,9,3         8,11,13         9,12,13         17,20         0,11,3,14,15,16         0,18,11         12,16         X,Y         0,12,13           GMID KH 60 Samples.txt         KH Z13-60 Ex2A F3         0,11,13,14,15,16         24,2*,29,31         8,12         11,12         0,14,15,16,17,18         0,7,9,3         8,11,13         9,12,13         17,20         0,11,3,14,15,16         0,18,14         12,16         X,Y         0,12,13,14,15           ArmedXpert KH 60 Samples.txt         KH Z13-60 Ex2A F3         10,11,13,14,15,16         29,31         8,12         11,12         12,14,15,16,1	21,22,22.2 21,22 22,25 22,25 22,25
GMID KH_60 Samples.txt         KH_Z13-60_Ex1B_F3         8,12,13         28,29,30,32.2         8,10,12         10,11,14         14,17,18         7.8         10,11,12         17,19,21         12,13         14,15,16,19         8,11         12,15,18,23         X,Y         9,11           ArmedXper KH_60 Samples.txt         KH_Z13-60_Ex1B_F3         8,12,13         28,29,30,32.2         8,10,12         10,11,14         14,17,18         7.8         10,11,12*.13         11,12         12,13         14,15,16,19         8,11         12,15,18,23         X,Y         9,11           GMID KH_60 Samples.txt         KH_Z13-60_Ex2A_F3         0,11,13,14,15,16         24,2*,29,31         8,12         11,12         01,14,516,17,18         07,93         8,11,13         9,12,13         17,20         01,13,14,15,16         01,2,15,16,18         01,2,15,16,18         01,2,15,16,18         01,2,15,16,18         01,2,12,13         12,16         X,Y         01,2,13,14           ArmedXpert KH_60 Samples.txt         KH_Z13-60_Ex2A_F3         0,11,13,14,15,16         24,2*,29,31         8,12         11,12         02,14,15,16,17,18         07,23         8,11,13         9,12,13         17,20         01,13,14,15,16         04,2,15,16,18         04,2,15         12,16         X,Y         01,2,13,14*	21,22,22.2 21,22 22,25 22,25 22,25
ArmedXpert KH_60 Samples.txt       KH_Z13-60_Ex2A_F3       ØL,10,11,13,14,15,16       28,29,30,32.2       8,10.2       10,11,14       14,17,18       7,8       10,11,12',13       11,12',13       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11         GMID KH 60 Samples.txt       KH_Z13-60_Ex2A_F3       OL,10,11,13,14,15,16       24.2°,29,31       8,12       11,12       0L,14,15,16,17,18       0L,79,3       8,11,13       9,12,13       17,20       OL,13,14,15,16.2       OL,12,15,16,18       OL,8,11       12,16       X,Y       OL,12,13,14         ArmedXpert KH_60 Samples.txt       KH_Z13-60_Ex2A_F3       10,11,13,14,15,16       29,31       8,12       11,12       12',14,15,16,17,18       0,79,3       8,11,13       9,12,13       17,20       0L,13,14,15,16.2       OL,12,15,16,18       0L,8,11       12,16       X,Y       0L,12,1,3,14         ArmedXpert KH_60 Samples.txt       KH_Z13-60_Ex2A_F3       10,11,13,14,15,16       29,31       8,12       11,12       12',14,15,16,17,18       78',93       8,11,13       9,12,13       17,20       0L,13,14,15,16.2       0L,12,15,16,18       8,11       12,16       X,Y       0L,12,1,3,14	21,22 22,25 22,25 22,25
GMID KH_60 Samples.txt         KH_Z13-60_Ex2A_F3         OL,10,11,13,14,15,16         24.2°,29,31         8,12         11,12         OL,14,15,16,17,18         OL,79,3         8,11,13         9,12,13         17,20         OL,13,14,15,16.2         OL,8,11         12,16         X,Y         OL,12,13,14           ArmedXpert KH_60 Samples.txt         KH_Z13-60_Ex2A_F3         10,11,13,14,15,16         29,31         8,12         11,12         12,14,15,16,17,18         7,8°,9.3         8,11,13         9,12,13         17,20         01,13,14,15,16.2         01,2,15,16,18         01,8,11         12,16         X,Y         11°,12,13,14°	22,25 22,25 22 25
GMID KH_60 Samples.txt         KH_Z13-60_Ex2A_F3         OI,10,11,13,14,15,16         24.2*,29,31         8,12         11,12         OL,14,15,16,17,18         OL,7,9.3         8,11,13         9,12,13         17,20         OL,12,15,16,18         OL,8,11         12,16         X,Y         OL,2,13,14,15,16           ArmedXpert KH_60 Samples.txt         KH_Z13-60_Ex2A_F3         10,11,13,14,15,16         29,31         8,12         11,12         12,14,15,16,17,18         7,8*,9.3         8,11,13         9,12,13         17,20         01,13,14,15,16         01,8,11         12,16         X,Y         11*,12,13,14*	22,25 22,25 22 25
ArmedXpert KH_60 Samples.txt KH_Z13-60 Ex2A_F3 10,11,13,14,15,16 29,31 8,12 11,12 12 <sup>h</sup> ,14,15,16,17,18 7,8 <sup>h</sup> ,9,3 8,11,13 9,12,13 17,20 13,14,15,15,2 <sup>h</sup> ,16.2 12,15,16,18 8,11 12,16 X,Y 11 <sup>h</sup> ,12,13,14 <sup>h</sup> -	22,25
	22.25
	22.25
GMID KH_60 Samples.txt KH_Z13-60_Ex2A_F2 10,13 29,31 8,12 11,12 14,16 9,3 11,13 12,13 17,20 14,15 15,16 8 12,16 X,Y 12,13	
ArmedXpert KH_60 Samples.txt KH_ZI3-60_Ex2A_F2 10,13 29,31 8,12 11,12 14,16 9.3 11,13 12,13 17,20 14,15 15,16 8 12,16 X,Y 12,13	22,25
GMID KH_60 Samples.txt KH_Z13-60_Ex6 8,12 30,32.2 8,10 10,14 17 7,8 10,13 10,11 17,21 13 14,15 8 12,15 X,Y 11	22,22.2
ArmedXpert KH_60 Samples.txt KH_Z13-60_Ex6 8,12 30,32.2 8,10 10,14 17 7,8 10,13 10,11 17,21 13 14,15 8 12,15 X,Y 11	22
GMID KH_60 Samples.txt even KH_ZI3-60 Ex4 13,14 32.2,33.2 11 10,11 16,18 7,9 11 11,13 17,24 15 15,16 8 12,15 X,Y 12	19,21
ArmedXpert KH_60 Samples.txt KH_ZI3-60_Ex4 13,14 32.2,33.2 11 10,11 16,18 7,9 11 11,13 17,24 15 15,16 8 12,15 X,Y 12	19,21
	00.05
CMUDKH_60_Samples.txt end K_ZI3-60_Ex2 10,13 22,31 8,12 11,12 14,16 9,3 11,13 12,13 17,20 14,15 15,16 8 12,16 X,Y 12,13	22,25
ArmedApert KH_00 Samples.ixt KH_213-60_Ex3 10,15 29,31 8,12 11,12 14,16 9,3 11,13 12,13 17,20 14,15 15,16 8 12,16 X,Y 12,13	22,25
	21
UMUL Kn 00 Samples Kiel Kn Z13-00 EX3 13 20,29 10,12 11 14,16 7,5 11 12 19 12,13 10,19 6,11 16,23 X,1 9,11	21
Armed Apert KH $_{00}$ Samples Xt KH $_{213}$ $-00^{-}$ XX 13 28,29 10,12 11 14,18 7,8 11 12 19 12,13 10,19 8,11 16,23 A, Y 9,11	- 21
GMID KW 60 Samples for 9 713 60 IEEE OPIC 912 13 28 20 20 22 2 9 10 12 10 11 12 13 14 14 16 17 18 6 78 03 10 11 12 13 10 11 12 17 10 20 21 22 12 14 14 15 16 10 20 10 11 12 14 15 16 20 2 VX 0 11 12 12 15	22 22 2 24
Umite An ov Satisfica And Sati	21.22.24
	21,22,24
GMID KH 60 Samples fri 201 KH 713-60 Ev1A 12 2930 10 1214 16 693 1112 11 2022 1314 15 910 1214 X 1213	21.24
$\frac{1}{12} \frac{1}{12} \frac$	21,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	163	92.61%
	1-Diffs	13	7.39%

# TABLE LXXV JAC\_Z13\_60 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_60 QC.txt	JAC_DRB1_F1_1022																
ArmedXpert JAC_60 QC.txt	JAC_DRB1_F1_1022																
	•																
GMID JAC_60 QC.txt	Ladder_A1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_60 QC.txt	Ladder_A1	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	, <b>)</b> ,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID JAC_60 QC.txt	KH_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	- 11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC_60 QC.txt	KH_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
						-											
GMID JAC_60 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_60 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,D,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
											-						
GMID JAC_60 QC.txt	JAC_NEG_CONTROL																
ArmedXpert JAC_60 QC.txt	JAC_NEG_CONTROL																
GMID JAC_60 QC.txt	JAC_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	- 11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC_60 QC.txt	JAC_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID JAC_60 QC.txt	JAC_DRB1_F2_1024																
ArmedXpert JAC_60 QC.txt	JAC_DRB1_F2_1024																
	LLC DDDD DA DA LOAA																
GMID JAC_60 QC.txt	JAC_DRB2_F2_1022																
ArmedXpert JAC_60 QC.txt	JAC_DRB2_F2_1022																
	LLC DDDD DL 1001																
GMID JAC_60 QC.txt	JAC_DRB2_F1_1024																
ArmedXpert JAC_60 QC.txt	JAC_DRB2_F1_1024																
	IAC CDD1 1020																
GMID JAC_60 QC.txt	JAC_SKB1_1029																
ArmedXpert JAC 60 QC.txt	JAC SRB1 1029																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	160	100.00%

## TABLE LXXVI JAC\_Z13\_60 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

OMD DAK Of Samplesket         IAC 2114-0 Ex1B F 3         81,12 3         28,290.022 8         81,012 10,11,12 44,12,18         7.8         10,11,13 10,112 17,20         12,13 14,15,16 9         8,11         12,15,18.3 X         X         9,11         12,12,18 2X         X         9,11         12,15,18.3 X         X         9,11         12,12,18.2 X         X         9,11         12,15,18.3 X         X         9,11         12,15,18.3 X         X         9,11         12,15,18.3 X         X         9,11         12,15,18.3 X         X         9,11         12,16,18.3 X         X         9,11         12,15,18.3 X         X         9,11         12,16,18.3 X         X         9,11         12,16,18.3 X         X         9,11         12,16         X/I         11,21         12,16         X/I         11,21         22,25           ArmoCypert AC (6 Samplestxt IAC 213-0 Ex3         0,13         29,31         8,12         11,12         14,16         9,3         11,13         12,10         12,16         8         12,16         X/I         12,16         X/I         12,11         22,25           CMD DAC 60 Samplestxt IAC 213-0 Ex1         12         29,31         11,12         11,12         11,11         12,10         12,14         X         12,12         12,12         <	Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D198433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
ArmeCkypert JAC (0) Samplesktt       JAC 211-00       Ex.11       9       9       11       21.22       14       15       10       12       11.12       14       11.12       14       17.10 <t< td=""><td>GMID JAC 60 Samples.txt</td><td>JAC Z13-60 Ex1B F3</td><td>8,12,13</td><td>28,29,30,32.2</td><td>8,10,12</td><td>10,11,14</td><td>14,17,18</td><td>7,8</td><td>10,11,13</td><td>10,11,12</td><td>17,19,21</td><td>12,13</td><td>14,15,16,19</td><td>8,11</td><td>12,15,18,23</td><td>X,Y</td><td>9,11</td><td>21,22,22.2</td></t<>	GMID JAC 60 Samples.txt	JAC Z13-60 Ex1B F3	8,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,23	X,Y	9,11	21,22,22.2
And Di AC 60 Sampleskt         JAC 213-00         EAZ F1         0013,16         24.2'39,31         8,12         11,12         14,15,16,17,18         79.3         8,11,13         91,213         17,20         13,44,15,162         DELSIGN         51,16         8,11         12,16         XV         11,22,13         22,23           CMID JAC 60 Sampleskt         JAC 213-00         ESS         10,31         29,31         8,12         11,12         14,15,16,7,18         79.3         8,11,13         91,213         17,20         14,15         15,16         8         12,16         XV         11,21         22,23           GMID JAC 60 Sampleskt         JAC 213-00         ESS         10,31         29,31         8,12         11,12         14,16         9,3         11,13         12,13         17,20         14,15         15,16         8         12,16         XV         12,12         22,23           GMID JAC 60 Sampleskt         JAC 60 IA         12         29,30         10         12,14         16         69,33         11,12         11         202         13,14         15         9,10         12,14         X         12,12         X         12,13         14,15         9,10         12,14         X         12,12         X	ArmedXpert JAC 60 Samples.txt	JAC Z13-60 Ex1B F3	8,12,13	28,29,30,32.2	8,10,12	10,11,13 <sup>b</sup> ,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,23	X,Y	9,11	21,22
GMID JAC 00 Samplestati         JAC 213-00 ESA F3         101,16         242:2931         8,12         11.2         141,516,17,18         79.3         8,11,13         91,213         17.20         131,41,516,12         751,618         8,11         12,16         XY         11,12,13         22.25           GMID JAC 60 Samplestati         JAC 213-00 ESA F3         10,113         29,31         8,12         11.2         14,16         9.3         11,13         12,13         17.20         14,15         15,16         8.1         21.6         XY         11,21         22.25           GMID JAC 60 Samplestati         JAC 213-00 ESA         10,13         29,31         8,12         11.2         14,16         9.3         11,13         12,13         17.20         14,15         15,16         8         12,14         XY         12,13         22.25           GMID JAC 60 Samplestati         JAC 213-00 ES1A         12         29,30         10         12,14         16         6.93         11,12         11         20.22         13,14         15         9,10         12,14         X         12,13         14,15,16         8,11         21,15         XY         11,21         21,24           GMID JAC 60 Samplestati         JAC (0 ,1A         12	· · · · ·																	
ArmedXpert ALC 00 Samples M       IAC Z13-40 EXA F       IDUI, 1A: 47.16       P301       S,11       P10, 3       P12,0       P12,16	GMID JAC_60 Samples.txt	JAC_Z13-60_Ex2A_F3	10,13,16	24.2°,29,31	8,12	11,12	14,15,16,17,18	7,9.3	8,11,13	9,12,13	17,20	13,14,15,16.2	OL,15,16,18	8,11	12,16	X,Y	11,12,13	22,25
GMID JAC 60 Samplesktit       IAC 213-00 Ex5       10.13       29.31       8,12       11,12       14,16       9.3       11,13       12,13       17,20       14,15       15,16       8       12,16       X,Y       12,13       22,25         ArmeXpert JAC 60 Samplesktit       IAC 213-00 Ex5       10,13       29,31       8,12       11,12       14,16       9.3       11,13       12,13       17,20       14,15       15,16       8       12,16       X,Y       12,13       22,25         GMID JAC 60 Samplesktit       IAC 213-00 Ex1A       12       29,30       10       12,14       16       6.93       11,12       11       22       13,14       15       9,10       12,14       X       12,13       21,24         GMID JAC 60 Samplesktit       IAC 20 1A       12       29,30       10       12,14       16       6.93       11,12       11       20,22       13,14       15       9,10       12,14       X       12,13       12,13       14,15,19       8,11       12,14       X       12,13       14,15,19       8,11       12,14       X       12,13       14,15,16,19       8,11       12,14       X       12,13       12,14       X       12,13       14,15,16,19       8,	ArmedXpert JAC_60 Samples.txt	JAC_Z13-60_Ex2A_F3	10,11 <sup>b</sup> ,13,14 <sup>b</sup> ,16	29,31	8,12	11,12	14,15,16,17,18	7,9.3	8,11,13	9,12,13	17,20	13,14,15,16.2	15,16,18	8,11	12,16	X,Y	11,12,13	22,25
GMID JAC 60 Samplesity         JAC 21-50 Est         01,13         23,31         8,12         11,12         11,12         12,13         17,20         14,15         15,16         8         12,16         XY         12,13         22,25           GMID JAC 60 Samplesity         JAC 21-50 Est A         12         23,30         10         12,14         16         6,93         11,12         11         22         13,14         15         9,10         12,14         X         12,13         22,25           GMID JAC 60 Samplesity         JAC 21-50 Est A         12         29,30         10         12,14         16         6,93         11,12         11         222         13,14         15         9,10         12,14         X         12,13         12,24         16         6,93         11,12         11         2022         13,14         15         9,10         12,14         X         12,13         12,12           GMID JAC 60 Samplesist         JAC 60 JA         12         9,01         12,14         16         6,93         11,12         11         20,22         13,14         15         9,10         12,14         X         12,12           GMID JAC 60 Samplesist         JAC 21-50 Est B         2         8,101																		
AmedXpert IAC 00 samplesixt       IAC 21-60 Ext       10,1       29,3       8,12       11,12       14,16       9,3       11,13       12,13       17,20       14,15       15,16       8       12,16       X       12,13       22,23         GMD IAC 00 samplesixt       IAC 21-60 Ext A       12       29,30       10       12,14       16       69,3       11,12       11       22       13,14       15       9,10       12,14       X       12,13       21,24         GMD IAC 00 samplesixt       IAC 01-A       12       29,30       10       12,14       16       69,3       11,12       11       20,22       13,14       15       9,10       12,14       X       12,13       21,24       21,34       21,34       15       9,10       12,14       X       12,13       21,24       21,34	GMID JAC_60 Samples.txt	JAC_Z13-60_Ex5	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
And MD JAC 60 Samplestatt       JAC 213-60 Ex1A       12       29,30       10       12,14       16       6.9.3       11,12       11       22       13,14       15       9,10       12,14       X       12,13       21,23         GMID JAC 60 Samplestatt       JAC 213-60 Ex1A       12       29,30       10       12,14       16       6.9.3       11,12       11       20.22       13,14       15       9,10       12,14       X       12,13       21,24         GMID JAC 60 Samplestatt       JAC 60 1A       12       29,30       10       12,14       16       6.9.3       11,12       11       20.22       13,14       15       9,10       12,14       X       12,13       21,24         AmedXpert JAC 60 Samplestatt       JAC 60 1A       12       29,30       10       12,14       16       6.9.3       11,12       11       20,22       13,14       15       9,10       12,14       X       12,13       21,23       21	ArmedXpert JAC_60 Samples.txt	JAC_Z13-60_Ex5	10,13	29,31	8,12	11,12	14,16	9.3	11,13	12,13	17,20	14,15	15,16	8	12,16	X,Y	12,13	22,25
GMID JAC 60 Samplestri       JAC 213-60 Ex1A       12       29,00       10       12,14       16       6,93       11,12       11       22       13,14       15       9,10       12,14       X       12,13       21,24         AmedAper JAC (0 Samplestri       JAC (213-60 Ex1A       12       29,30       10       12,14       16       6,93       11,12       11       202       13,14       15       9,10       12,14       X       12,13       21,24         GMID JAC (0 Samplestri       JAC (0 IA       12       29,30       10       12,14       16       6,93       11,12       11       20,22       13,14       15       9,10       12,14       X       12,13       21,24         GMID JAC 60 Samplestri       JAC 213-60 Ex1B F2       8,12,13       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       XY       9,11       21,222.2         ArmedXperi JAC 60 Samplestri       JAC 213-60 Ex4       13,14       32,23,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,12       17,19,20       12,13       14,15,16,19       8,12,13       XY       9,11       21,																		
ArmedXpert JAC 60 Samplesktt       JAC 60 IA       12       29,0       10       12,14       16       6,93       11,12       11       22       13,14       15       9,10       12,14       X       12,13       12,14         GMID JAC 60 Samplesktt       JAC 60 IA       12       29,30       10       12,14       16       69,3       11,12       11       20,22       13,14       15       9,10       12,14       X       12,13       21,24         GMID JAC 60 Samplesktt       JAC 60 IA       12       28,29,30,322       8,101       10,11,14       14,17,18       78       10,11,13       10,11,2       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       XY       9,11       21,222,22         GMID JAC 60 Samplesktt       JAC 213-60 Ex1B F2       8,119,1210       28,29,30,322       8,1012       10,11,14       14,17,18       78       10,11,13       10,11,2       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       XY       9,11       21,222,23         GMID JAC 60 Samplesktt       JAC 213-60 Ex4       13,14       32,233.2       11       10,11       16,18       79       11       11,13       17,24       15       15,16       8       12,15<	GMID JAC_60 Samples.txt	JAC_Z13-60_Ex1A	12	29,30	10	12,14	16	6,9.3	11,12	11	22	13,14	15	9,10	12,14	X	12,13	21,24
GMID JAC 60 Samples.txt       JAC 60 1A       12       29,30       10       12,14       16       6.9.3       11,12       11       20.22       13,14       15       9,10       12,14       X       12,13       21,23         AmedXper JAC 60 Samples.txt       JAC 60 1A       12       29,30       10       12,14       16       6.9.3       11,12       11       20.22       13,14       15       9,10       12,14       X       12,13       21,23         GMID JAC 60 Samples.txt       JAC 213-60 Ex1B F2       8,11,12,13       28,29,30,322       8,10,12       10,11,14       14,17,18       7.8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       XY       9,11       21,252         ArmedXper JAC 60 Samples.txt       JAC 213-60 Ex4       13,14       32,233.2       81,01       10,11       16,18       7,9       11       11,13       17,24       15       15,16       8       12,15       XY       9,11       21,222       21,23         GMID JAC 00 Samples.txt       JAC 213-60 Ex4       13,14       32,233.2       11       0,11       16,18       7,9       11       11,13       17,24       15       15,16       8       12,1	ArmedXpert JAC_60 Samples.txt	JAC_Z13-60_Ex1A	12	29,30	10	12,14	16	6,9.3	11,12	11	22	13,14	15	9,10	12,14	X	12,13	21,24
GMID JAC 60 Samplesixt       JAC (a) L       I2       29,30       10       I2,14       16       6,93       I1,12       I1       20,22       I3,14       15       9,10       I2,14       X       I2,13       I2,13       I2,14       X       I2,14       X       I2,13       I2,14       X       I2,13       I2,14       X       I2,13       I2,14       X       I2,13       I2,14       X       I2,14       X       I2,14       X       I2,13       I2,14       X       I2,13       I2,13       I2,14       X																		
ArmedXpert JAC 60 Samplestxt       JAC 60 1A       12       29,30       10       12,14       16       6,93       11,12       11       20,22       13,14       15       9,10       12,14       X       12,13       21,24         GMID JAC 60 Samplestxt       JAC Z13-60 Ex1B F2       8,12       12,13       28,29,30,32.2       8,101       10,11,14       14,17,18       7.8       10,11,13       10,11,12       17,192.1       12,13       14,15,16,19       8,11       12,5,18,23       X.Y       9,11       21,222         GMID JAC 60 Samplestxt       JAC Z13-60 Ex4       13,14       32,2,33.2       11       10,11       16,18       7.9       11       11,13       17,24       15       15,16       8       12,15       X.Y       9,11       21,22         GMID JAC 60 Samplestxt       JAC Z13-60 Ex4       13,14       32,233.2       11       10,11       16,18       7.9       11       11,13       17,24       15       15,16       8       12,15       X.Y       9,11       21,222         GMID JAC 60 Samplestxt       JAC Z13-60 Ex1B F1       8,12,13       28,29,30,32.2       8,10,12       10,11,12,13       10,11,21       11,13       11,12,14       14,15,16,19       8,9,10,11       12,14,15,18,23	GMID JAC_60 Samples.txt	JAC_60_1A	12	29,30	10	12,14	16	6,9.3	11,12	11	20,22	13,14	15	9,10	12,14	Х	12,13	21,24
GMD JAC 60 Samples.tt       IAC Z13-60 Ex1B F2       8,1(2,13)       28,29,30,32.2       8,10,12       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11       21,222         AmedXpert JAC 60 Samples.tt       IAC Z13-60 Ex4       13,14       32,2,33.2       11       10,11       16,18       7,9       11       11,13       17,24       15       15,16       8       12,15       X,Y       9,11       21,22         GMID JAC 60 Samples.tt       IAC Z13-60 Ex4       13,14       32,2,33.2       11       10,11       16,18       7,9       11       11,13       17,24       15       15,16       8       12,15       X,Y       9,11       21,22         GMID JAC 60 Samples.tt       IAC Z13-60 Ex1B F1       8,12,13       28,29,30,32.2       8,10,12       10,11,2,14       14,16,17,18       6,78,9.3       10,11,21       17,19,20,21,22       12,13,14       14,15,16,19       8,9,10,11       12,14,18,23       X,Y       9,11,2,13       21,22,22,24         GMID JAC 60 Samples.tt       IAC Z13-60 Ex1B F1       8,12,13       28,29,30,32.2       8,10,12       10,11,2,14       14,16,17,18       6,78,9.3       10,11,213       10,11,2 <td>ArmedXpert JAC_60 Samples.txt</td> <td>JAC_60_1A</td> <td>12</td> <td>29,30</td> <td>10</td> <td>12,14</td> <td>16</td> <td>6,9.3</td> <td>11,12</td> <td>11</td> <td>20,22</td> <td>13,14</td> <td>15</td> <td>9,10</td> <td>12,14</td> <td>X</td> <td>12,13</td> <td>21,24</td>	ArmedXpert JAC_60 Samples.txt	JAC_60_1A	12	29,30	10	12,14	16	6,9.3	11,12	11	20,22	13,14	15	9,10	12,14	X	12,13	21,24
GMID JAC 60 Samples.txt       JAC 213-60       Ex.IB       F2       8,11       12,15,18,23       X.Y       9,11       21,222.22         ArmedXpert JAC 60 Samples.txt       JAC 213-60       Ex.IB       F2       8,11       12,15,18,23       X.Y       9,11       21,222.22         ArmedXpert JAC 60 Samples.txt       JAC 213-60       Ex.IB       F2       8,11       12,15,18,23       X.Y       9,11       21,222.22         GMID JAC 60 Samples.txt       JAC 213-60       Ex.A       13,14       32,2,33.2       11       10,11       16,18       7.9       11       11,13       17,24       15       15,16       8       12,15       X,Y       9,11       21,12       12,13       14,15,16,19       8,10,11       12,15,18,23       X,Y       9,11       21,222.22         GMID JAC 60 Samples.txt       JAC 213-60       Ex.IB       13,14       32,2,33.2       11       10,11       16,18       7.9       11       11,13       17,24       15       15,16       8       12,15       X,Y       9,11,2,13       12,222.22         GMID JAC 60 Samples.txt       JAC 213-60       Ex.IB       F1       8,12,13       28,293,32.2       8,10,12       10,11,12,14       14,16,17,18       6,78,9.3       10,11,12,13																		
ArmedSpert JAC       60 Samples txt       JAC       Z13-60       Ex1F 12,13       28,29,30,32.2       8,10,1       10,11,14       14,17,18       7,8       10,11,13       10,11,12       17,19,21       12,13       14,15,16,19       8,11       12,15,18,23       X,Y       9,11       21,22         GMID JAC       60 Samples txt       JAC       JAC       13,14       32,2,33.2       11       10,11       16,18       7,9       11       11,13       17,24       15       15,16       8       12,15       X,Y       12       19,21         GMID JAC       60 Samples txt       JAC       21,360       Ext B       8,12,13       28,29,30,32.2       8,10,12       10,11,12,14       14,16,17,18       67,8,9.3       10,11,2,13       10,11,2,13       10,11,2,13       11,12,13       11,12,13       11,12,13       12,13,14       14,15,16,19       8,10,11       12,14,15,18,23       X,Y       9,11,12,13       21,22,22,23         ArmedXpert JAC       60 Samples txt       JAC       21,360       Ext B       F1       8,12,13       28,29,30,32.2       8,10,12       10,11,12,14       14,16,17,18       67,8,9.3       10,11,2,13       10,11,2,13       10,11,2,13       11,12,13       11,12,13       11,12,13       11,12,13       11,12,13 <td>GMID JAC_60 Samples.txt</td> <td>JAC_Z13-60_Ex1B_F2</td> <td>8,12,13</td> <td>28,29,30,32.2</td> <td>8,10,12</td> <td>10,11,14</td> <td>14,17,18</td> <td>7,8</td> <td>10,11,13</td> <td>10,11,12</td> <td>17,19,21</td> <td>12,13</td> <td>14,15,16,19</td> <td>8,11</td> <td>12,15,18,23</td> <td>X,Y</td> <td>9,11</td> <td>21,22,22.2</td>	GMID JAC_60 Samples.txt	JAC_Z13-60_Ex1B_F2	8,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,23	X,Y	9,11	21,22,22.2
GMID JAC 60 Samplestation       JAC Z13-60 Ex4       13,14       32.2,33.2       11       10,11       16,18       7,9       11       11,13       17,24       15       15,16       8       12,15       X,Y       12       19,21         ArmedXpert JAC 60 Samplestat       JAC Z13-60 Ex4       13,14       32.2,33.2       11       10,11       16,18       7,9       11       11,13       17,24       15       15,16       8       12,15       X,Y       12       19,21         GMID JAC 60 Samplestat       JAC Z13-60 Ex1B F1       8,12,13       28,29,30,32.2       8,10,12       10,11,2,14       14,16,17,18       67,8,9.3       10,11,12,13       10,11,2       17,19,20,21,22       12,3,14       14,15,16,19       8,9,10,11       12,14,15,18,23       X,Y       9,11,2,13       21,22,22,24         GMID JAC 60 Samplestat       JAC Z13-60 Ex2A F1       IAC Z13-6	ArmedXpert JAC_60 Samples.txt	JAC_Z13-60_Ex1B_F2	8,11°,12,13	28,29,30,32.2	8,10,12	10,11,14	14,17,18	7,8	10,11,13	10,11,12	17,19,21	12,13	14,15,16,19	8,11	12,15,18,23	X,Y	9,11	21,22
GMID JAC_60 Samplestxt       JAC_213-60 Ex4       13,14       32,2,3.2       11       10,11       10,18       7,9       11       11,13       17,24       15       15,16       8       12,15       X,Y       12       19,21         ArmedXpert JAC_60 Samplestxt       JAC_213-60 Ex4       13,14       32,2,33.2       11       10,11       16,18       7,9       11       11,13       17,24       15       15,16       8       12,15       X,Y       12       19,21         GMID JAC_60 Samplestxt       JAC_213-60 Ex1B_F1       8,12,13       28,29,30,32.2       8,10,12       10,11,12,14       14,16,17,18       6,7,8,9.3       10,11,12,13       10,11,2       17,19,20,21,22       12,13,14       14,15,16,19       8,9,10,11       12,14,15,18,23       X,Y       9,11,2,13       21,22,22,24         ArmedXpert JAC_60 Samplestxt       JAC_213-60 Ex1B_F1       8,12,13       28,29,30,32.2       8,10,12       10,11,12,14       14,16,17,18       6,7,8,9.3       10,11,12,13       10,11,2       17,19,20,21,22       12,13,14       14,15,16,19       8,9,10,11       12,14,15,18,23       X,Y       9,11,2,13       21,22,24         GMID JAC 60 Samplestxt       JAC_213-60 Ex2A_F1 $Acc_{213-60}$ Ex2A_F1 $Acc_{213-60}$ Ex2A_F1 $Acc_{213-60}$ Ex2A_F1 $A$			12.14			10.11	16.10				17.04		10.14	0	10.15			
ArmedXpert JAC $c0$ samples.tt       JAC $Z13-60$ Ex4       13,14       32,2,3,2       11       10,11       16,18       7,9       11       11,15       17,24       15       15,16       8       12,15       X,Y       12       19,21         GMID JAC $c0$ samples.tt       JAC $Z13-60$ Ex1B F1       8,12,13       28,29,30,32.2       8,10,12       10,11,2,14       14,16,17,18       6,7,8,9.3       10,11,12,13       10,11,12       17,19,20,21,22       12,13,14       14,15,16,19       8,9,10,11       12,14,15,18,23       X,Y       9,11,12,13       21,22,22,23         ArmedXpert JAC $c0$ samples.tt       JAC $Z13-60$ Ex1B F1       8,12,13       28,29,30,32.2       8,10,12       10,11,2,14       14,16,17,18       6,7,8,9.3       10,11,12,13       10,11,2       17,19,20,21,22       12,13,14       14,15,16,19       8,9,10,11       12,14,15,18,23       XY       9,11,2,13       21,22,2,24         GMID JAC $c0$ samples.tt       JAC Z13-60       Ex.3       13       28,29       10,12       11       14,18       7,8       11       12       19       12,13       16,19       8,11       18,23       XY       9,11       21         GMID JAC $c0$ samples.tt       JAC Z13-60       Ex.3       13       28,29	GMID JAC_60 Samples.txt	JAC_Z13-60_Ex4	13,14	32.2,33.2	11	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	X,Y	12	19,21
GMID JAC_60 Samplestxt       JAC_Z13-60 Ex1B_F1       8,12,13       28,29,30,32.2       8,10,12       10,11,2,14       14,16,17,18       6,7,8,9.3       10,11,12,13       10,11,12       17,19,20,21,22       12,13,14       14,15,16,19       8,9,10,11       12,14,15,18,23       X,Y       9,11,12,13       21,22,22,24         ArmedXpert JAC_60 Samplestxt       JAC_Z13-60 Ex1B_F1       8,12,13       28,29,30,32.2       8,10,12       10,11,2,14       14,16,17,18       6,7,8,9.3       10,11,12,13       10,11,12       17,19,20,21,22       12,13,14       14,15,16,19       8,9,10,11       12,14,15,18,23       X,Y       9,11,12,13       21,22,22,24         GMID JAC_60 Samplestxt       JAC_Z13-60 Ex2A_F1       IAC_Z13-60 Ex	ArmedXpert JAC_60 Samples.txt	JAC_Z13-60_Ex4	13,14	32.2,33.2	П	10,11	16,18	7,9	11	11,13	17,24	15	15,16	8	12,15	Х,Ү	12	19,21
GMID JAC_00 Samplestxt       JAC_213-60       Exils F1       8,12,13       28,29,30,32.2       8,10,12       10,11,2,14       14,16,17,18       6,7,89.3       10,11,12       17,19,20,21,22       12,13,14       14,15,16,19       8,9,10,11       12,14,15,18,23       X,1       9,11,12,13       12,22,24         ArmedXpert JAC_60 Samplestxt       JAC_213-60       Exits F1       8,12,13       28,29,30,32.2       8,10.1       10,11,2,14       14,16,17,18       6,7,89.3       10,11,12       17,19,20,21,22       12,13,14       14,15,16,19       8,9,10,11       12,14,15,18,23       X,Y       9,11,12,13       21,22,24         GMID JAC_60 Samplestxt       JAC_213-60       Ex2A_F1 $$		14 C 712 (0 E 1D E1	0.10.10	20.20.20.22.2	0.10.10	10 11 12 14	14161710	(7002	10.11.10.12	10.11.12	17 10 20 21 22	10.10.14	14.15.16.10	0.0.10.11	112 14 15 10 22	N M	0.11.10.10	01 00 00 0 0 0 4
Armedxpert JAC_60 Samples.tt       JAC_Z13-60_Ex18_F1       8,12,13       28,29,30,32.2       8,10,12       10,11,2,14       14,16,17,18       6,7,8,9.3       10,11,12       17,19,20,2,22       12,13,14       14,15,16,19       8,9,10,11       12,14,15,18,23       X,Y       9,11,12,13       21,22,24         GMID JAC_60 Samples.tt       JAC_Z13-60_Ex2A_F1       Image: Control of the state of the	GMID JAC_60 Samples.txt	JAC_Z13-60_EXIB_F1	8,12,13	28,29,30,32.2	8,10,12	10,11,12,14	14,16,17,18	6,7,8,9.3	10,11,12,13	10,11,12	17,19,20,21,22	12,13,14	14,15,16,19	8,9,10,11	12,14,15,18,23	X,Y XX	9,11,12,13	21,22,22.2,24
GMID JAC_60 Samples.txt       JAC_Z13-60 Ex2A_F1       Image: Constraint of the second	ArmedXpert JAC_60 Samples.txt	JAC_Z13-60_Ex1B_F1	8,12,13	28,29,30,32.2	8,10,12	10,11,12,14	14,16,17,18	6,7,8,9.3	10,11,12,13	10,11,12	17,19,20,21,22	12,13,14	14,15,16,19	8,9,10,11	12,14,15,18,23	Х, Ү	9,11,12,13	21,22,24
GMID JAC_60 Samples.txt         JAC_213-60         ExA F1         Image: Construction of the state	CMID IAC (0. Complete test	IAC 712 (0 E-24 E1																
Anited aperi AC_00 samples, it. JAC_213-60_EXA_F1       C <thc< th=""> <thc< th="">       C       &lt;</thc<></thc<>	Armed X part LAC 60 Samples txt	JAC_Z13-60_EX2A_F1																
GMID JAC_60 Samples.txt       JAC_Z13-60 Ex3       13       28,29       10,12       11       14,18       7,8       11       12       19       12,13       16,19       8,11       18,23       X,Y       9,11       21         ArmedXpert JAC_60 Samples.txt       JAC_Z13-60 Ex3       13       28,29       10,12       11       14,18       7,8       11       12       19       12,13       16,19       8,11       18,23       X,Y       9,11       21         GMID JAC_60 Samples.txt       JAC_Z13-60 Ex2       F2       10,13       29,31       8,12       11,12       14,16       9.3       11,13       12,13       17,20       14,15       15,16       8       12,16       X,Y       9,11       21,24,25         GMID JAC_60 Samples.txt       JAC_Z13-60 Ex2A F2       10,12*/13       29,31       8,12       11,12       14,16       9.3       11,13       12,13       17,20       14,15       15,16       8       12,16       X,Y       12,13       22,24,25         GMID JAC_60 Samples.txt       JAC_Z13-60 ExA F2       10,12*/13       29,31       8,12       11,12       14,16       9.3       11,13       12,13       17,20       14,15       15,16       8       12,16       X,Y <td>Anneuxpert JAC_60 Samples.txt</td> <td>JAC_ZI3-00_EX2A_FI</td> <td></td>	Anneuxpert JAC_60 Samples.txt	JAC_ZI3-00_EX2A_FI																
GMID JAC 60 Samples.txt         JAC Z13-60 Ex2         F2         10,12         11         11,13         12,13         16,19         8,11         16,10         11         11         21           GMID JAC 60 Samples.txt         JAC Z13-60 Ex3         13         28,29         10,12         11         14,18         7,8         11         12         19         12,13         16,19         8,11         18,23         X,Y         9,11         21           GMID JAC 60 Samples.txt         JAC Z13-60 Ex2 F2         10,13         29,31         8,12         11,12         14,16         9,3         11,13         12,13         17,20         14,15         15,16         8         12,16         X,Y         12,13         22,24,25           ArmedXpert JAC 60 Samples.txt         JAC Z13-60 Ex2 F2         10,12*/13         29,31         8,12         11,12         14,16         9,3         11,13         12,13         17,20         14,15         8         12,16         X,Y         12,13         22,24,25           GMID JAC 60 Samples.txt         JAC Z13-60 Ex2 F2         10,12*/13         11,12         14,16         9,3         11,13         12,13         17,20         14,15         8         12,16         X,Y         12,13         22,24,25<	GMID IAC 60 Samples txt	IAC 713-60 Ex3	13	28.29	10.12	11	14.18	7.8	11	12	10	12.13	16.19	8 11	18.23	x v 1	9.11	21
Contractive processing interview       Contractive processing interview <th< td=""><td>ArmedVnert IAC 60 Samples tyt</td><td>IAC 713-60 Ex3</td><td>13</td><td>28.29</td><td>10,12</td><td>11</td><td>14.18</td><td>7,0</td><td>11</td><td>12</td><td>19</td><td>12,13</td><td>16.19</td><td>8.11</td><td>18.23</td><td>X V</td><td>9.11</td><td>21</td></th<>	ArmedVnert IAC 60 Samples tyt	IAC 713-60 Ex3	13	28.29	10,12	11	14.18	7,0	11	12	19	12,13	16.19	8.11	18.23	X V	9.11	21
GMID JAC 60 Samples.txt         JAC Z13-60 Ex2A F2         10,13         29,31         8,12         11,12         14,16         9,3         11,13         12,13         17,20         14,15         15,16         8         12,16         X,Y         12,13         22,24,25           ArmedXpert JAC 60 Samples.txt         JAC Z13-60 Ex2A F2         10,12',13         29,31         8,12         11,12         14,16         9,3         11,13         12,13         17,20         14,15         15,16         8         12,16         X,Y         12,13         22,24,25           GMID JAC 60 Samples.txt         JAC Z13-60 Ex2A F2         10,12',13         29,31         8,12         11,12         14,16         9,3         11,13         12,13         17,20         14,15         15,16         8         12,16         X,Y         12,13         22,24,25           GMID JAC 60 Samples.txt         JAC Z13-60 Ex6         8,12         30,32,2         8,10         10,14         17         7,8         10,13         10,11         17,21         13         14,15         8         12,15         X,Y         11         22,22,22	runicarperente_00 bamples.txt	110_215 00_EAS	.5	20,29	10,12		1,10	-,0		12	.9	12,15	10,17	0,11	10,25	- A, I	2,11	~1
ArmedXpert JAC 60 Samples.txt         JAC Z13-60 Ex2 F2         10.12 H 213         29.1 H 12         11.1 H 16         9.3 H 115         11.1 H 16	GMID JAC 60 Samples txt	JAC Z13-60 Ex2A F2	10.13	29.31	8.12	11.12	14.16	9.3	11.13	12.13	17.20	14.15	15.16	8	12.16	X.Y	12.13	22.24.25
GMID JAC 60 Samples.txt         Gal Jac Z13-60 Exc         8,12         30,32.2         8,10         10,14         17         7,8         10,13         10,11         17,21         13         14,15         8         12,15         X,Y         11         22,22           ArmedXnert JAC 60 Samples.txt         JAC Z13-60 Exc         8,12         30,32.2         8,10         10,14         17         7,8         10,13         10,11         17,21         13         14,15         8         12,15         X,Y         11         22,22	ArmedXpert JAC 60 Samples.txt	JAC Z13-60 Ex2A F2	10.12 <sup>b</sup> .13	29.31	8.12	11.12	14.16	9.3	11.13	12,13	17.20	14.15	15,16	8	12.16	XY	12.13	22.24.25
GMID JAC_60 Samples.txt         JAC_Z13-60 Ex6         8,12         30,32.2         8,10         10,14         17         7,8         10,13         10,11         17,21         13         14,15         8         12,15         X,Y         11         22,22.2           Armed Xnert JAC 60 Samples.txt         JAC_Z13-60 Ex6         8,12         30,32.2         8,10         10,14         17         7,8         10,13         10,11         17,21         13         14,15         8         12,15         X,Y         11         22				21,01	2,12		2.340	10	,			2.440			1,10			
Armed Xnert JAC 60 Samples txt JAC 713-60 Ex6 8.12 30.32.2 8.10 10.14 17 7.8 10.13 10.11 17.21 13 14.15 8 12.15 XY 11 22	GMID JAC 60 Samples.txt	JAC Z13-60 Ex6	8,12	30,32.2	8,10	10,14	17	7,8	10,13	10,11	17,21	13	14,15	8	12,15	X,Y	11	22,22.2
	ArmedXpert JAC 60 Samples.txt	JAC Z13-60 Ex6	8,12	30,32,2	8,10	10,14	17	7,8	10,13	10,11	17.21	13	14,15	8	12,15	X.Y	11	22

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	182	94.79%
	1-Diffs	10	5.21%

<sup>a</sup> GeneMapper®ID designated allele call that analyst manually labeled as "pull-up" or "minus A". <sup>b</sup> ArmedXpert<sup>™</sup> designated allele call that GeneMapper®ID did not.

## **TABLE LXXVII** WG\_Z13\_61GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_61 QC.txt	102513_NAC																
ArmedXpert WG_61 QC.txt	102513_NAC																
GMID WG_61 QC.txt	Ladder_H2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_61 QC.txt	Ladder_H2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,p,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1		X,Y	,11,12,13,1	.2,31.2,32.:
	LADDED	10 14 15		10 11 10 1	10 11 10 1	4.1.5.1.6.1.5	0 0 0 0 10	h 11 10 10	0 11 10 10	h0 01 00 01	h	6 17 10 1	h o 1o 11 1	0.15.16.16		111 10 10 1	0.01.0.00
GMID WG_61 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	p, 11, 12, 13, 12, 13	0,11,12,13	0,21,22,23	2,14,14.2,1	6,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
Armed Apert wG_61 QC.txt	LADDEK	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	,p,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	10,17,18,1	\$,9,10,11,1		А, 1	,11,12,13,1	.2,31.2,32
GMID WG 61 OC tyt	102413 SRB1																
ArmedXpert WG 61 OC txt	102413_SRB1						<u></u>								<u></u>		
	roz no_ordor																
GMID WG 61 QC.txt	101613 NAC																
ArmedXpert WG 61 QC.txt	101613 NAC																
GMID WG_61 QC.txt	102513_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert WG_61 QC.txt	102513_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
												-	1				
GMID WG_61 QC.txt	NEG_CONTROL																
Armed Apert wG_61 QC.txt	NEG_CONTROL																
GMID WG 61 OC tyt	102113 SPB1																
ArmedXpert WG 61 OC txt	102113_SRB1																
	102110_01001																
GMID WG 61 QC.txt	POS CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert WG_61 QC.txt	POS_CONTROL	13,14 <sup>b</sup>	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
			•							•			•			•	
GMID WG_61 QC.txt																	
	100213_URB1																
ArmedXpert WG_61 QC.txt	100213_URB1 100213_URB1																
ArmedXpert WG_61 QC.txt	100213_URB1 100213_URB1																
ArmedXpert WG_61 QC.txt	100213_URB1 100213_URB1 Ladder_B3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	),11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_61 QC.txt GMID WG_61 QC.txt ArmedXpert WG_61 QC.txt	100213_URB1 100213_URB1 Ladder_B3 Ladder_B3	2,13,14,15, 2,13,14,15,	2,31,31.2,3 2,31,31.2,3	10,11,12,1 10,11,12,1	.10,11,12,1 10,11,12,1	14,15,16,17 14,15,16,17	8,9,9.3,10 8,9,9.3,10	),11,12,13, ),11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1 2,14,14.2,1	6,17,18,19	8,9,10,11,1 8,9,10,11,1	.2,15,16,17	X,Y X,Y	,11,12,13,1 ,11,12,13,1	.2,31.2,32. .2,31.2,32.
ArmedXpert WG_61 QC.txt GMID WG_61 QC.txt ArmedXpert WG_61 QC.txt GMID WG_61 QC txt	100213_URB1 100213_URB1 Ladder_B3 Ladder_B3	2,13,14,15, 2,13,14,15,	2,31,31.2,3 2,31,31.2,3	10,11,12,1 10,11,12,1	10,11,12,1	14,15,16,17 14,15,16,17	8,9,9.3,10 8,9,9.3,10 8,9,3	),11,12,13, ),11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1 2,14,14.2,1	16,17,18,19 16,17,18,19	8,9,10,11,1 8,9,10,11,1	.2,15,16,17 .2,15,16,17	X,Y X,Y	,11,12,13,1	.2,31.2,32. .2,31.2,32. .2,324

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	191	99.48%
	1-Diffs	1	0.52%

## TABLE LXXVIII WG\_Z13\_61 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_61 Samples.txt	Z13_61_EX4	13,14	29,30	8,11	9,11	15,17	7	8,9	10,13	18	13.2,15	14,18	11	13,15	X,Y	10,11	22,23
ArmedXpert WG_61 Samples.txt	Z13_61_EX4	13,14	29,30	8,11	9,11	15,17	7	8,9	10,13	18	13.2,14 <sup>b</sup> ,15	14,18	11	13,15	X,Y	10,11	22,23
GMID WG_61 Samples.txt	Z13_61_EX9	8,14	30	11,13	11,12	14,15	6,9	8,11	9,14	17,20	14	15,19	8,9	14,17	Х	11,13	22,24
ArmedXpert WG_61 Samples.txt	Z13_61_EX9	8,14	30	11,13	11,12	14,15	6,9	8,11	9,14	17,20	14	15,19	8,9	14,17	Х	11,13	22,24
GMID WG_61 Samples.txt	Z13_61_EX1	12	28,30	8,12	11	15	8,9.3	11,13	10,12	17,22	13	15,17	9,11	16,18	X	8,14	23,24
ArmedXpert WG_61 Samples.txt	Z13_61_EX1	12	28,30	8,12	11	15	8,9.3	11,13	10,12	17,22	13	15,17	9,11	16,18	X	8,14	23,24
													-				
GMID WG_61 Samples.txt	Z13_61_EX5	12,15	28,29	10	10,11	15,16	7,9	8,10	9,12	17,25	12,13	15,18	8	15,20	X,Y	11,13	19,22
ArmedXpert WG_61 Samples.txt	Z13_61_EX5	12,15	28,29	10	10,11	15,16	7,9	8,10	9,12	17,25	12,13	15,18	8	15,20	X,Y	11,13	19,22
				1.0	10.11			0.40		10.10			0.40				
GMID WG_61 Samples.txt	WG_Z13-61_7	9,13	29,30	10	10,11	16	9,9.3	8,13	11	18,19	12,14	15,16	8,10	12,15	X	11	21,23
ArmedXpert WG_61 Samples.txt	WG_Z13-61_7	9,13	29,30	10	10,11	16	9,9.3	8,13	11	18,19	12,14	15,16	8,10	12,15	X	11	21,23
	712 (1 53/	10.14	20.20	0.11	11.10	16.17	67	10.12	10.10	15.04	10.14	16.10	0.11	14.10	37	10.12	21.22
GMID wG_61 Samples.txt	Z13_61_EX6	13,14	29,30	8,11	11,13	16,17	6,/	10,13	12,13	17,24	12,14	16,19	8,11	14,18	X	10,13	21,22
ArmedApert wG_61 Samples.txt	Z13_61_EX6	13,14	29,30	8,11		16,17	0,/	10,13		17,24	12,14	16,19	8,11	14,18	А	10,13	21,22
CMID WG 61 Samplas tyt	712 61 EV10	12.14	20.22.2	0.12	10.11	16.17	702	0	12	10.26	12 14 2	16.17	0	16.17	VV	12	22.25
Amend We of Samples.txt	Z13_01_EX10	12,14	29,55.2	8,15	10,11	16,17	7,9.5	9	12	19,20	13,14.2	16,17	0	16,17	A, I V V	12	22,25
ArmedApert wG_61 Samples.txt	Z13_01_EX10	12,14	29,33.2	8,15	10,11	10,17	7,9.5	9	12	19,20	15,14.2	10,17	0	10,17	А, І	12	22,23
GMID WG 61 Samples tyt	713 61 EV8	12.14	20.30	11	11.12	16.18	7.0	10.13	0.12	17.20	14.2	1/1 18	80	14.15	V V	12	10.21
ArmedXpert WG 61 Samples txt	713_61_EX8	12,14	29,30	11	11,12	16.18	7,9	10,13	9.12	17,20	14.2	14.18	8.9	14.15	X,I X V	12	19,21
AnneuApert w 5_01 Samples.txt	215_01_170	12,17	29,30	11	11,12	10,10	7,9	10,15	9,12	17,20	17.2	14,10	0,9	14,15	A, I	12	19,21
GMID WG 61 Samples txt	Z13 61 Ex2A	10 12 13 14	29.31		12	14 15 16 18	7993	11 13	9 12 13	17.20	14 14 2 15	15.16	8		XY	12	22
ArmedXpert WG 61 Samples txt	Z13_61_Ex2A	10 12 13 14	29.31	8	12	14 15 16 18	7993	11,13	9 12 13	17.20	12 <sup>b</sup> 13 <sup>b</sup> 14 14 2 15	15,16	8		XY	12 13 <sup>b</sup>	19 <sup>b</sup> 22
runicaripert it 5_01 bamples.txt	LIS_01_DALM	10,12,15,14		0	12	1,10,10,10	,,,,,,.,	11,15	-,12,15	17,20	12,13,14,14.2,15	10,10	3		78,1	12,15	17,22

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	137	95.14%
	1-Diffs	7	4.86%

<sup>&</sup>lt;sup>b</sup> ArmedXpert<sup>TM</sup> designated allele call that GeneMapper®ID did not.

# TABLE LXXIX KH\_Z13\_61 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_61 QC.txt	KH_NEG_CONTROL																
ArmedXpert KH_61 QC.txt	KH_NEG_CONTROL																
GMID KH_61 QC.txt	KH_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert KH_61 QC.txt	KH_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID KH_61 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13	, 0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,	.2,31.2,32.
ArmedXpert KH_61 QC.txt	LADDER	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	, <b>)</b> ,11,12,13	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,	.2,31.2,32.
GMID KH_61 QC.txt	Ladder-3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,0,11,12,13	, 0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,	.2,31.2,32.
ArmedXpert KH_61 QC.txt	Ladder-3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	, <b>P</b> ,11,12,13	, 0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1		X,Y	,11,12,13,1	.2,31.2,32.
													<b>.</b>				
GMID KH_61 QC.txt	Ladder_A7	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	p,11,12,13	, 0, 11, 12, 13	20,21,22,23	2,14,14.2,1	16,17,18,1	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,	.2,31.2,32.
ArmedXpert KH_61 QC.txt	Ladder_A7	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	,p,11,12,13	, 0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1		X,Y	,11,12,13,	.2,31.2,32.
CNUD KIL (1 OC + +	NEC CONTROL																
GMID KH_61 QC.txt	NEG_CONTROL																
ArmedApert KH_61 QC.txt	NEG_CONTROL																
GMID KH 61 OC tyt	KH Dos control	12	20	10.11	10.12	14.15	803	11	11.12	10.22	14.15	1719	0	15 10	v	11	22.24
ArmedVpert KH 61 OC tyt	KH Pos_control BP1	13	30	10,11	10,12	14,15	803	11	11,12	19,23	14,15	17,10	0	15,19	A V	11	23,24
Anneuxpert KII_01 QC.txt	KII_I 05_COILLOI DKI	15	50	10,11	10,12	14,15	0,9.5	11	11,12	19,25	14,15	17,10	0	15,19	Л	11	23,24
GMID KH 61 OC tyt	KH SRB1 10713																
ArmedXpert KH 61 OC txt	KH_SRB1_10713																
rumearpentin_or geam	Idi_5idb1_10/15																
GMID KH 61 OC.txt	KH URB2 10313																
ArmedXpert KH 61 QC.txt	KH URB2 10313																
GMID KH_61 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert KH_61 QC.txt	POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID KH_61 QC.txt	KH_Neg_control																
ArmedXpert KH_61 QC.txt	KH_Neg_control BR1																
GMID KH_61 QC.txt	KH_URB1_10313																
A IV AVIL (1 OC)	VU UDD1 10212															1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	192	100.00%

## TABLE LXXX KH\_Z13\_61 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_61 Samples.txt	KH_Z13-61_Ex3A																
ArmedXpert KH_61 Samples.txt	KH_Z13-61_Ex3A																
GMID KH_61 Samples.txt	KH_Z13-61-4	13,14	29,30	8,11	9,11	15,17	7	8,9	10,13	18	13.2,15	14,18	- 11	13,15	X,Y	10,11	22,23
ArmedXpert KH_61 Samples.txt	KH_Z13-61-4	13,14	29,30	8,11	9,11	15,17	7	8,9	10,13	18	13.2,15	14,18	- 11	13,15	X,Y	10,11	22,23
GMID KH_61 Samples.txt	KH_Z13-61-2A	10,12,13	29,31	8,12	11,12	14,16	7,9,9.3	11,13	12,13	17,20	14,14.2,15	15,16	8	12,16	X,Y	12,13	22,25
ArmedXpert KH_61 Samples.txt	KH_Z13-61-2A	10,12,13	29,31	8,11 <sup>b</sup> ,12	11,12	14,16	7,9,9.3	10 <sup>b</sup> ,11,13	12,13	17,20	14,14.2,15	15,16	8	12,16	X,Y	12,13	19 <sup>b</sup> ,22,25
GMID KH_61 Samples.txt	KH_Z13-61-5	12,15	28,29	10	10,11	15,16	7,9	8,10	9,12	17,25	12,13	15,18	8	15,20	X,Y	11,13	19,22
ArmedXpert KH_61 Samples.txt	KH_Z13-61-5	12,15	28,29	10	10,11	15,16	7,9	8,10	9,12	17,25	12,13	15,18	8	15,20	X,Y	11,13	19,22
		0.14	20	11.10	11.10	1415	6.0	0.11	0.14	17.00		15.10	0.0	14.15	37	11.10	22.24
GMID KH_61 Samples.txt	KH_Z13-61_Ex9	8,14	30	11,13	11,12	14,15	6,9	8,11	9,14	17,20	14	15,19	8,9	14,17	X	11,13	22,24
ArmedXpert KH_61 Samples.txt	KH_Z13-61_Ex9	8,14	30	11,13	11,12	14,15	6,9	8,11	9,14	17,20	14	15,19	8,9	14,17	Х	11,13	22,24
CMID KIL 61 Samples tut	VII 712 61 1	12	20.20	0.10	11	15	802	11.12	10.12	17.00	12	15.17	0.11	16 19	v	0.1.4	22.24
GMID KH_61 Samples.txt	KH_Z13-01-1	12	28,30	8,12	11	15	8,9.3	11,13	10,12	17,22	13	15,17	9,11	16,18	A V	8,14	23,24
ArmedApert KH_61 Samples.txt	KH_Z13-01-1	12	28,30	8,12	11	15	8,9.3	11,15	10,12	17,22	15	15,17	9,11	10,18	Λ	8,14	25,24
GMID KH 61 Samples txt	Z13 61 10 NEW	12.14	29.33.2	8.13	10.11	16.17	7.9.3	9	12	19.26	13.14.2	16.17	8	16.17	XY	12	22.25
ArmedXpert KH 61 Samples.txt	Z13 61 10 NEW	12,14	29,33.2	8.13	10,11	16,17	7.9.3	9	12	19,26	13.14.2	16,17	8	16,17	X.Y	12	22.25
r _ r				- 9			.,			,							
GMID KH 61 Samples.txt	KH Z13-61-7	9,13	29,30	10	10,11	16	9,9.3	8,13	11	18,19	12,14	15,16	8,10	12,15	Х	11	21,23
ArmedXpert KH_61 Samples.txt	KH_Z13-61-7	9,13	29,30	10	10,11	16	9,9.3	8,13	11	18,19	12,14	15,16	8,10	12,15	Х	11	21,23
GMID KH_61 Samples.txt	KH_Z13-61-8	12,14	29,30	11	11,12	16,18	7,9	10,13	9,12	17,20	14.2	14,18	8,9	14,15	X,Y	12	19,21
ArmedXpert KH_61 Samples.txt	KH_Z13-61-8	12,14	29,30	11	11,12	16,18	7,9	10,13	9,12	17,20	14.2	14,18	8,9	14,15	X,Y	12	19,21
GMID KH_61 Samples.txt	KH_Z13-61_Ex6	13,14	29,30	8,11	11,13	16,17	6,7	10,13	12,13	17,24	12,14	16,19	8,11	14,18	Х	10,13	21,22
ArmedXpert KH_61 Samples.txt	KH_Z13-61_Ex6	13,14	29,30	8,11	11,13	16,17	6,7	10,13	12,13	17,24	12,14	16,19	8,11	14,18	Х	10,13	21,22

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	157	98.13%
	1-Diffs	3	1.88%

# TABLE LXXXI JAC\_Z13\_61 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

GMID JAC 61 QC.txt	JAC Neg control																
ArmedXpert JAC_61 QC.txt	JAC_Neg_control																
		-									_						
GMID JAC_61 QC.txt	JAC_Pos_control	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC_61 QC.txt	JAC_Pos_controlbr	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
					-				-	-	-	-					
GMID JAC_61 QC.txt	JAC_NEG_CONTROL																
ArmedXpert JAC_61 QC.txt	JAC_NEG_CONTROL																
					-				-	-	-						
GMID JAC_61 QC.txt	JAC_SRB1_1007																
ArmedXpert JAC_61 QC.txt	JAC_SRB1_1007																
GMID JAC_61 QC.txt	JAC_URB1_1003																
ArmedXpert JAC_61 QC.txt	JAC_URB1_1003																
					-												
GMID JAC_61 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,1	78,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_61 QC.txt	Ladder_A7	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,1	78,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
					-												
GMID JAC_61 QC.txt	JAC_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24
ArmedXpert JAC_61 QC.txt	JAC_POS_CONTROL	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	112	100.00%

## TABLE LXXXII JAC\_Z13\_61 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC 61 Samples.txt	JAC 61-6	13,14	29,30	8,11	11,13	16,17	6,7	10,13	12,13	17,24	12,14	16,19	8,11	14,18	Х	10,13	21,22
ArmedXpert JAC_61 Samples.txt	JAC_61-6	13,14	29,30	8,11	11,13	16,17	6,7	10,13	12,13	17,24	12,14	16,19	8,11	14,18	X	10,13	21,22
GMID JAC_61 Samples.txt	JAC_61-8	12,14	29,30	11	11,12	16,18	7,9	10,13	9,12	17,20	14.2	14,18	8,9	14,15	X,Y	12	19,21
ArmedXpert JAC_61 Samples.txt	JAC_61-8	12,14	29,30	11	11,12	16,18	7,9	10,13	9,12	17,20	14.2	14,18	8,9	14,15	X,Y	12	19,21
GMID JAC_61 Samples.txt	JAC_61-10	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
ArmedXpert JAC_61 Samples.txt	JAC_61-10	12,14	29,33.2	8,13	10,11	16,17	7,9.3	9	12	19,26	13,14.2	16,17	8	16,17	X,Y	12	22,25
									-								
GMID JAC_61 Samples.txt	JAC_61-1	12	28,30	8,12	11	15	8,9.3	11,13	10,12	17,22	13	15,17	9,11	16,18	X	8,14	23,24
ArmedXpert JAC_61 Samples.txt	JAC_61-1	12	28,30	8,12	11	15	8,9.3	11,13	10,12	17,22	13	15,17	9,11	16,18	X	8,14	23,24
													_				
GMID JAC_61 Samples.txt	JAC_61-5	12,15	28,29	10	10,11	15,16	7,9	8,10	9,12	17,25	12,13	15,18	8	15,20	X,Y	11,13	19,22
ArmedXpert JAC_61 Samples.txt	JAC_61-5	12,15	28,29	10	10,11	15,16	7,9	8,10	9,12	17,25	12,13	15,18	8	15,20	X,Y	11,13	19,22
														-			
GMID JAC_61 Samples.txt	JAC_61-2A	10,12,13,14,15	29,30,31	10,11	11,12	14,15,16,18	7,9,9.3	10,11,13	9,12,13	17,20	12,13,14,14.2,15	14,15,16,18	8,9		X,Y	11,12,13	19,21,22
ArmedXpert JAC_61 Samples.txt	JAC_61-2A	10,12,13,14,15	28°,29,30,31	10,11	11,12	14,15,16,18	7,9,9.3	8°,10,11,13	9,12,13	17,20	12,13,14,14.2,15	14,15,16,18	8,9		X,Y	11,12,13	19,21,22
	110.017	0.12	20.20	10	10.11		0.0.2	0.12		10.10	12.14	10.14	0.10	1 10 15			21.22
GMID JAC_61 Samples.txt	JAC_61-7	9,13	29,30	10	10,11	16	9,9.3	8,13	11	18,19	12,14	15,16	8,10	12,15	X	11	21,23
ArmedXpert JAC_61 Samples.txt	JAC_61-7	9,13	29,30	10	10,11	16	9,9.3	8,13	- 11	18,19	12,14	15,16	8,10	12,15	X	11	21,23
CMID IAC (1 Semalar test	IAC 712 (1 E-24																
GMID JAC_61 Samples.txt	JAC_Z13-61_EX3A_swab						0.2										
ArmedApert JAC_61 Samples.txt	JAC_Z13-61_EX3A_swab						9.5										
GMID IAC 61 Samples tyt	IAC 61-9	814	30	11.13	11.12	14.15	6.9	8 11	0.17	17.20	14	15.10	80	14.17	v	11.13	22.24
ArmedVpert IAC 61 Samples tyt	IAC_61-9	8.14	30	11,15	11,12	14,15	6.9	8 11	9,14	17,20	14	15,19	8.9	14,17	X X	11,15	22,24
AnneuApert FAC_01 Samples.txt	JAC_01-9	0,14	50	11,15	11,12	14,15	0,9	0,11	9,14	17,20	14	15,19	0,9	14,17	- A	11,15	22,24
GMID IAC 61 Samples tyt	IAC 61-4	13.14	29.30	8 11	9 11	15.17	7	8.9	10.13	18	13 2 15	14.18	11	13.15	XY	10.11	22.23
ArmedXpert IAC 61 Samples tyt	IAC 61-4	13.14	29,30	8.11	9.11	15,17	7	8.9	10,13	18	13.2,15	14.18	11	13,15	XY	10.11	22,23
ArmedXpert JAC_61 Samples.txt	JAC_61-4	13,14	29,30	8,11	9,11	15,17	7	8,9	10,13	18	13.2,15	14,18	11	13,15	X,Y	10,11	22,23

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	157	98.13%
	1-Diffs	3	1.88%

#### TABLE LXXXIII DLK\_Z13\_63 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON



Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	96	100.00%

#### TABLE LXXXIV DLK\_Z13\_63 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID DLK_63 Samples.txt	Z13-63_1B	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	- 11	23,24
ArmedXpert DLK_63 Samples.txt	Z13-63_1B	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID DLK_63 Samples.txt	Z13-63_1C	8,10,13	28,29,31.2,32.2	8,10,11,13	9,10,11	14,15,16,18	6,9.3	9,10,12,13	10,11,12	17,20,22	12,13,14,15.2	17,18	8,11,12	12,13,14	X,Y	11,12	20,23,24,26
ArmedXpert DLK_63 Samples.txt	Z13-63_1C	8,10,13	28,29,31.2,32.2	8,10,11,13	9,10,11	14,15,16,18	6,9.3	9,10,12,13	10,11,12	17,20,22	12,13,14,15.2	17,18	8,11,12	12,13,14	X,Y	11,12	20,23,24,26
GMID DLK_63 Samples.txt	Z13-63_3	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	X	10,13	22,24
ArmedXpert DLK_63 Samples.txt	Z13-63_3	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
GMID DLK_63 Samples.txt	Z13-63_4	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	X	11,12	20,26
ArmedXpert DLK_63 Samples.txt	Z13-63_4	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
GMID DLK_63 Samples.txt	Z13-63_1A	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	X	10,13	22,24
ArmedXpert DLK_63 Samples.txt	Z13-63_1A	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
GMID DLK_63 Samples.txt	Z13-63_2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert DLK_63 Samples.txt	Z13-63_2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	96	100.00%

# TABLE LXXXV WG\_Z13\_63 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_63 QC.txt	Ladder_H2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	,0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_63 QC.txt	Ladder_H2	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	, 0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID WG_63 QC.txt	102413_SRB1																
ArmedXpert WG_63 QC.txt	102413_SRB1																
							-			-			-			-	
GMID WG_63 QC.txt	101613_NAC																
ArmedXpert WG_63 QC.txt	101613_NAC																
GMID WG_63 QC.txt	102513_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert WG_63 QC.txt	102513_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID WG_63 QC.txt	102113_SRB1																
ArmedXpert WG_63 QC.txt	102113_SRB1																
GMID WG_63 QC.txt	100213_URB1																
ArmedXpert WG_63 QC.txt	100213_URB1																
	r 11 DA								I					امتعددها			
GMID WG_63 QC.txt	Ladder_B3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	, 0, 11, 12, 13	\$20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert WG_63 QC.txt	Ladder_B3	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	p,11,12,13,	,0,11,12,13	\$20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
	101(12 DLC	12	20	10.11	10.10	14.15	0.0.2	11	11.10	10.00	14.15	17.10	0	15.10	37	11	22.24
GMID WG_63 QC.txt	101613_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	11	23,24
ArmedXpert WG_63 QC.txt	101613_PAC	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	X	- 11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	128	100.00%

#### TABLE LXXXVI WG\_Z13\_63 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID WG_63 Samples.txt	WG_Z13-63_3	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
ArmedXpert WG_63 Samples.tx	WG_Z13-63_3	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
GMID WG_63 Samples.txt	Z13_63_EX2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	$15^{\circ}, 17, 18$	12	12,13	X,Y	11	23,24
ArmedXpert WG_63 Samples.tx	Z13_63_EX2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID WG_63 Samples.txt	WG_Z13-63_4	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
ArmedXpert WG_63 Samples.tx	WG_Z13-63_4	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
GMID WG_63 Samples.txt	Z13_63_Ex1C	8,10,13	,29,31.2,32	8,10,11,13	9,10,11	14,15,16,18	6,9.3	9,10,12,13	10,11,12	17,20,22	2,13,14,15.	17,18	8,11,12	12,13,14	X,Y	11,12	20,23,24,26
ArmedXpert WG_63 Samples.tx	Z13_63_Ex1C	8,10,13	,29,31.2,32	8,10,11,13	9,10,11	14,15,16,18	6,9.3	9,10,12,13	10,11,12	17,20,22	2,13,14,15.	17,18	8,11,12	12,13,14	X,Y	11,12	20,23,24,26
GMID WG_63 Samples.txt	Z13_63_Ex1A	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
ArmedXpert WG_63 Samples.tx	Z13_63_Ex1A	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
GMID WG_63 Samples.txt	Z13_63_Ex1B	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert WG_63 Samples.tx	Z13_63_Ex1B	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	95	98.96%
	1-Diffs	1	1.04%

<sup>a</sup> GeneMapper®ID designated allele call that analyst manually labeled as "pull-up" or "minus A".

# TABLE LXXXVII KH\_Z13\_63 GENEMAPPER®ID AND ARMEDXPERT ™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_63 QC.txt	KH_URB1_10213																
ArmedXpert KH_63 QC.txt	KH_URB1_10213																
GMID KH_63 QC.txt	KH_Pos_control	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert KH_63 QC.txt	KH_Pos_control	13	30	10,11	10,12	14,15	8,9.3	- 11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
GMID KH_63 QC.txt	KH_SRB1_10713																
ArmedXpert KH_63 QC.txt	KH_SRB1_10713																
GMID KH_63 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert KH_63 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10,	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,19	8,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
			-		-			-		-							
GMID KH_63 QC.txt	KH_Neg_control																
ArmedXpert KH_63 QC.txt	KH_Neg_control																
			-		-												
GMID KH_63 QC.txt	KH_URB1_10313																
ArmedXpert KH_63 QC.txt	KH_URB1_10313																

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	96	100.00%

# TABLE LXXXVIII KH\_Z13\_63 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID KH_63 Samples.txt	KH_Z13-63-1A																
ArmedXpert KH_63 Samples.txt	KH_Z13-63-1A						6										
GMID KH_63 Samples.txt	KH_Z13-63-1B	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert KH_63 Samples.txt	KH_Z13-63-1B	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID KH_63 Samples.txt	KH_Z13-63-3	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
ArmedXpert KH_63 Samples.txt	KH_Z13-63-3	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
GMID KH_63 Samples.txt	KH_Z13-63-2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert KH_63 Samples.txt	KH_Z13-63-2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID KH_63 Samples.txt	KH_Z13-63-4	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
ArmedXpert KH_63 Samples.txt	KH_Z13-63-4	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
GMID KH_63 Samples.txt	KH_Z13-63-1C	8,10,13	28,29,31.2,32.2	8,10,11,13	9,10,11	14,15,16,18	6,9.3	9,10,12,13	10,11,12	17,20,22	12,13,14,15.2	17,18	8,11,12	12,13,14	X,Y	11,12	20,23,24,26
ArmedXpert KH 63 Samples.txt	KH Z13-63-1C	8,10,13	28.29.31.2.32.2	8,10,11,13	9,10,11	14.15.16.18	6.9.3	9.10.12.13	10.11.12	17.20.22	12.13.14.15.2	17.18	8.11.12	12.13.14	X.Y	11.12	20.23.24.26

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	95	98.96%
	1-Diffs	1	1.04%

# TABLE LXXXIX JAC\_Z13\_63 GENEMAPPER®ID AND ARMEDXPERT™ QUALITY CONTROL COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	TH01	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_63 QC.txt	JAC_Neg_control																
ArmedXpert JAC_63 QC.txt	JAC_Neg_control																
GMID JAC_63 QC.txt	JAC_SRB1_1007																
ArmedXpert JAC_63 QC.txt	JAC_SRB1_1007																
GMID JAC_63 QC.txt	JAC_URB1_1003																
ArmedXpert JAC_63 QC.txt	JAC_URB1_1003																
GMID JAC_63 QC.txt	JAC_URB1_1002																
ArmedXpert JAC_63 QC.txt	JAC_URB1_1002																
GMID JAC_63 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	4,15,16,17	8,9,9.3,10	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	6,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
ArmedXpert JAC_63 QC.txt	Ladder	2,13,14,15,	2,31,31.2,3	10,11,12,1	10,11,12,1	14,15,16,17	8,9,9.3,10	0,11,12,13,	0,11,12,13	20,21,22,23	2,14,14.2,1	16,17,18,1	\$,9,10,11,1	.2,15,16,17	X,Y	,11,12,13,1	.2,31.2,32.
GMID JAC_63 QC.txt	JAC_Pos_control	13	30	10,11	10,12	14,15	8,9.3	11	11,12	19,23	14,15	17,18	8	15,19	Х	11	23,24
ArmedXpert JAC 63 OC.txt	JAC Pos control	13	30	10.11	10.12	14.15	8.9.3	11	11.12	19.23	14.15	17.18	8	15.19	X	11	23,24

Locus Matching Stats	Diffs	Freq	Prec (%)
	0-Diffs	96	100.00%

## TABLE XC JAC\_Z13\_63 GENEMAPPER®ID AND ARMEDXPERT™ SAMPLES COMPARISON

Input File	Sample Name	D8S1179	D21S11	D7S820	CSF1PO	D3S1358	<b>TH01</b>	D13S317	D16S539	D2S1338	D19S433	VWA	TPOX	D18S51	AMEL	D5S818	FGA
GMID JAC_63 Samples.txt	JAC_63-2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert JAC_63 Samples.txt	JAC_63-2	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID JAC_63 Samples.txt	JAC_63-4	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
ArmedXpert JAC_63 Samples.txt	JAC_63-4	8,13	28,32.2	8,10	10,11	14,16	9.3	12,13	11,12	20	12,15.2	17	8,11	12,14	Х	11,12	20,26
GMID JAC_63 Samples.txt	JAC_63-1C	8,10,13	28,29,31.2,32.2	8,10,11,13	9,10,11	14,15,16,18	6,9.3	9,10,12,13	10,11,12	17,20,22	12,13,14,15.2	17,18	8,11,12	12,13,14	X,Y	11,12	20,23,24,26
ArmedXpert JAC_63 Samples.txt	JAC_63-1C	8,10,13	28,29,31.2,32.2	8,10,11,13	9,10,11	14,15,16,18	6,9.3	9,10,12,13	10,11,12	17,20,22	12,13,14,15.2	17,18	8,11,12	12,13,14	X,Y	11,12	20,23,24,26
GMID JAC_63 Samples.txt	JAC_63-1B	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
ArmedXpert JAC_63 Samples.txt	JAC_63-1B	8,10	29,31.2	11,13	9,11	15,18	6	9,10	10,12	17,22	13,14	17,18	12	12,13	X,Y	11	23,24
GMID JAC_63 Samples.txt	JAC_63-1A	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
ArmedXpert JAC_63 Samples.txt	JAC_63-1A	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	10,13	22,24
GMID JAC_63 Samples.txt	JAC_63-3	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	X	10,13	22,24
ArmedXpert JAC_63 Samples.txt	JAC_63-3	14,15	29,32.2	9,11	12	15,19	6,9.3	8,11	12,13	20,25	15	14,16	8,9	14,16	Х	9 <sup>b</sup> ,10,12 <sup>b</sup> ,13	22,24

Locus Matching Stats	Diffs	Freq	Prec (%)	
	0-Diffs	95	98.96%	
	1-Diffs	1	1.04%	

<sup>&</sup>lt;sup>b</sup> ArmedXpert<sup>TM</sup> designated allele call that GeneMapper®ID did not.

#### **APPENDIX C**

# TABLE XCI DETAILED CATEGORIZATION OF ANAMOLIES

ANALYST	CASE NUMBER	a	b	c	OL	Other	
DLK	Z13_49	5	0	0	11		
WG	Z13_49	2	0	0	5		
KH	Z13_49	4	0	0	11		
JAC	Z13_49	1	1	0	8		
DLK	Z13_50	0	3	0	1		
KH	Z13_50	3	0	0	11		
JAC	Z13_50	1	0	0	4		
DLK	Z13_51	0	0	0	6		
WG	Z13_51	0	0	0	0		
KH	Z13_51	1	0	0	8		
JAC	Z13_51	0	0	0	3	1	
DLK	Z13_52	1	6	0	2		
WG	Z13_52	0	2	0	0		
KH	Z13_52	4	0	0	11		
JAC	Z13_52	1	2	0	5		
DLK	Z13_55	0	0	0	0		
WG	Z13_55	1	0	0	3		
KH	Z13_55	0	2	0	0	1	
JAC	Z13_55	0	0	0	0	1	
DLK	Z13_56	0	2	0	0		
WG	Z13_56	2	6	0	3		
KH	Z13_56	0	1	0	0		
JAC	Z13_56	0	5	0	0	4	
ANALYST	CASE NUMBER	a	b	b c		Other	
---------	----------------	----	-------	-----	-----	-------	--
DLK	Z13_57	0	6	0	0		
WG	Z13_57	1	0	0	3		
KH	Z13_57	0	2	0	0		
JAC	Z13_57	0	0	1	0		
DLK	Z13_60	0	0	0	0	4	
WG	Z13_60	0	4	0	3	7	
KH	Z13_60	1	6	0	7	4	
JAC	Z13_60	1	5	0	1	4	
WG	Z13_61	0	6	0	0	3	
KH	Z13_61	0	3	0	0		
JAC	Z13_61	0	2	0	0	1	
DLK	Z13_63	0	0	0	0		
WG	Z13_63	1	1 0 0		0		
KH	Z13_63	0	0	0	0	1	
JAC	Z13_63	0	2	0	0		
	Total	30	66	1	106	31	

 TABLE XCI

 DETAILED CATEGORIZATION OF ANAMOLIES (CONTINUED)

## **Column Headings**

 $^{\rm a}$  GeneMapper®ID designated allele call that analyst manually labeled as "pull-up" or "minus A" .

<sup>b</sup> ArmedXpert<sup>TM</sup> designated allele call that GeneMapper®ID did not.

<sup>c</sup> ArmedXpert<sup>™</sup> is missing allele call, not manually labeled as "pull-up" or "minus A" by analyst.

OL refers to alleles labeled as Off Ladder

Other includes alleles not detected by one software, when the other software labeled the peak.

#### **APPENDIX D**

Figure 9. ArmedXpert Mixture Interpretation Detailed Report

#### Mixture Interpretation Details for 'KH\_55\_1BF2\_B'

All combinations have: PHr >= 0.5, MPh >= 75, mP >= 0

D8S1179:					
10 (1376),12 (988),13 (2205)					
For a 2-contributor 3-allele mixture of types AB & CC: 2/3-combination(s):					
10, 12(phr = 0.72; p = 0.52); 13(p = 0.48); [1.1 : 1]					
10, 13(phr = 0.62; p = 0.78); 12(p = 0.22); [3.5 : 1]					
For a 2-contributor 3-allele mixture of types AC & BC: 1/3-combination(s):					
10, 13(phr = 0.93; p = 0.58); 12, 13(phr = 0.93; p = 0.42); [1.4 : 1]					

#### D21S11:

28 (865),29 (1924),31 (1100)				
For a 2-contributor 3-allele mixture of types AA & BC: 2/3-combination(s):				
29, 31(phr = 0.57; p = 0.78); 28(p = 0.22); [3.5 : 1]				
28, 31(phr = 0.79; p = 0.51); 29(p = 0.49); [1.0 : 1]				
For a 2-contributor 3-allele mixture of types AB & BC: 1/3-combination(s):				
29, 31(phr = 0.98; p = 0.56); 28, 29(phr = 0.98; p = 0.44); [1.3 : 1]				

#### D7S820:

7 (435),8 (744),10 (369),12 (521)For a 2-contributor 4-allele mixture of types AB & CD: 3/3-combination(s): 7, 8(phr = 0.58; p = 0.57); 10, 12(phr = 0.71; p = 0.43); [1.3 : 1] 8, 12(phr = 0.70; p = 0.61); 7, 10(phr = 0.85; p = 0.39); [1.6 : 1] 8, 10(phr = 0.50; p = 0.54); 7, 12(phr = 0.83; p = 0.46); [1.2 : 1]

#### CSF1PO:

11 (2335),12 (940)					
For a 2-contributor 2-allele mixture of types AA & AB: 1/2-combination(s):					
11, 12(phr = 1.00; p = 0.57); 11(p = 0.43); [1.3 : 1]					
For a 2-contributor 2-allele mixture of types AA & BB: 1/1-combination(s):					
11(p = 0.71); 12(p = 0.29); [2.4 : 1]					

Figure 9. ArmedXpert Mixture Interpretation Detailed Report (continued)

## D3S1358:

14 (2607),16 (2652)					
For a 2-contributor 2-allele mixture of types AA & AB: 2/2-combination(s):					
14, 16(phr = 0.95; p = 0.99); 14(p = 0.01); [99 : 1]					
14, 16(phr = 0.99; p = 0.99); 16(p = 0.01); [99 : 1]					
For a 2-contributor 2-allele mixture of types AA & BB: 1/1-combination(s):					
16(p = 0.50); 14(p = 0.50); [1 : 1]					
For a 2-contributor 2-allele mixture of types AB & AB: 1/1-combination(s):					
<u>1</u> 4, 16(phr = 0.98); 14, 16(phr = 0.98);					

#### TH01:

6 (1060),8 (1076),9.3 (3474) For a 2-contributor 3-allele mixture of types AB & CC: 1/3-combination(s): 9.3(p = 0.62); 6, 8(phr = 0.99; p = 0.38); [1.6 : 1] For a 2-contributor 3-allele mixture of types AC & BC: 1/3-combination(s): 8, 9.3(phr = 0.61; p = 0.50); 6, 9.3(phr = 0.61; p = 0.50); [1 : 1]

#### D13S317:

10 (678), 11 (1765), 13 (952)For a 2-contributor 3-allele mixture of types AA & BC: 2/3-combination(s): 11, 13(phr = 0.54; p = 0.80); 10(p = 0.20); [4 : 1] 11(p = 0.52); 10, 13(phr = 0.71; p = 0.48); [1.1 : 1] For a 2-contributor 3-allele mixture of types AB & BC: 1/3-combination(s): 11, 13(phr = 0.92; p = 0.58); 10, 11(phr = 0.92; p = 0.42); [1.4 : 1]

#### D16S539:

11 (212),12 (3134),13 (1500)

For a 2-contributor 3-allele mixture of types AB & BC: 1/3-combination(s): 12, 13(phr = 0.55; p = 0.88); 11, 12(phr = 0.55; p = 0.12); [7.3 : 1] Figure 9. ArmedXpert Mixture Interpretation Detailed Report (continued)

#### D18S51:

12 (725), 14 (354), 16 (1001)For a 2-contributor 3-allele mixture of types AB & AC: 2/3-combination(s): 12, 16(phr = 0.54; p = 0.74); 12, 14(phr = 0.54; p = 0.26); [2.8 : 1] 12, 16(phr = 0.93; p = 0.67); 14, 16(phr = 0.93; p = 0.33); [2.0 : 1] For a 2-contributor 3-allele mixture of types AC & BB: 1/3-combination(s): 12, 16(phr = 0.72; p = 0.83); 14(p = 0.17); [4.9 : 1]

#### Amel:

X (1858),Y (1885)					
For a 2-contributor 2-allele mixture of types AA & AB: 2/2-combination(s):					
X, Y(phr = 0.95; p = 0.98); X(p = 0.02); [49 : 1]					
X, Y(phr = 0.97; p = 0.98); Y(p = 0.02); [49.0 : 1]					
For a 2-contributor 2-allele mixture of types AA & BB: 1/1-combination(s):					
Y(p = 0.50); X(p = 0.50); [1:1]					
For a 2-contributor 2-allele mixture of types AB & AB: 1/1-combination(s):					
<u>X, Y(phr = 0.99); X, Y(phr = 0.99);</u>					

#### D5S818:

11 (675), 12 (1528), 13 (895)For a 2-contributor 3-allele mixture of types AA & BC: 2/3-combination(s): 12, 13(phr = 0.59; p = 0.78); 11(p = 0.22); [3.5 : 1] 11, 13(phr = 0.75; p = 0.51); 12(p = 0.49); [1.0 : 1] For a 2-contributor 3-allele mixture of types AB & BC: 1/3-combination(s): 12, 13(phr = 0.97; p = 0.57); 11, 12(phr = 0.97; p = 0.43); [1.3 : 1]

#### FGA:

	21 (510),22 (1225),25 (683)					
	For a 2-contributor 3-allele mixture of types AA & BC: 3/3-combination(s):					
	22, 25(phr = 0.56; p = 0.79); 21(p = 0.21); [3.8 : 1]					
	21, 22(phr = 0.42; p = 0.72); 25(p = 0.28); [2.6 : 1]					
	22(p = 0.51); 21, 25(phr = 0.75; p = 0.49); [1.0 : 1]					
For a 2-contributor 3-allele mixture of types AB & BC: 1/3-combination(s):						
	22, 25(phr = 0.97; p = 0.57); 21, 22(phr = 0.97; p = 0.43); [1.3 : 1]					

# **APPENDIX E**

# TABLE XCIIARMEDXPERT LR FOR KH\_Z13-55, 1BF2

KH\_55\_1BF2\_B

Locus	Locus Profile	Allele 1 (a)	Allele 2 (b)	Allele 3 (c)	Allele 4 (d)	Likelihood	C1		C2
					1				
D8S1179	10, 12, 13	10	12	13					
		10	12	13		$P0(\emptyset 10,12,13) \div P1(10 10,12,13)$			
		0.102	0.1454	0.3393		9.15	1	0.	.1092828
		0.025	0.1083	0.2222		58.31	1		0.01715
		0.0936	0.1207	0.3251		10.84	1	0.0	09221472
D21S11	28, 29, 31	28	29	31					
221011	20, 27, 01	28	29	31		$P0(\emptyset 28,29,31) \div P1(31 28,29,31)$			
		0.1658	0.1811	0.0714		18.30	1	0.0	05463528
		0.2151	0.1899	0.0922		12.02	1	0.0	08318284
		0.069	0.2044	0.069		23.53	1	0.	.0424902
						-			
D7S820	7, 8, 10, 12	7	8	10	12				
		7	8	10	12	$P0(\emptyset 7,8,10,12) \div P1(8,12 7,8,10,12)$			
		0.0172	0.1626	0.2906	0.1404	21.90	1	0.0	04565808
		0.0119	0.1738	0.3238	0.0905	31.79	1	0.	.0314578
		0.0215	0.0981	0.3062	0.1914	26.63	1	0.0	03755268
CCEIDO			10	٦					
CSFIPO	11, 12		12			$D0(\sim   11, 12) + D1(12  11, 12)$			
			0.2251	<b>-</b>		$\frac{FO(\emptyset 11,12) + FI(12 11,12)}{2.22}$	1		20107511
		0.3003	0.3251	-		<u> </u>	1	$\frac{10.}{1}$	0.21288
		0.2048	0.3	-		4.70	1		36228005
		0.2050	0.3923			2.70	1	10	30228903
D3S1358	14, 16	14	16						
		14	16			$P0(\emptyset 14,16) \div P1(\emptyset 14,16)$			
		0.1404	0.2315	Ĩ		7.23	1	0.	13830961
		0.1214	0.3071	1		5.45	1	0.	18361225
		0.079	0.2656	]		8.42	1	0.	11874916

## **APPENDIX E (CONTINUED)**

# TABLE XCII ARMEDXPERT LR FOR KH\_Z13-55, 1BF2 (CONTINUED)

Locus	Locus Profile	Allele 1 (a)	Allele 2 (b)	Allele 3 (c)	Allele 4 (d)	Likelihood	C1	C2
TH01	6, 8, 9.3	6	8	9.3				
		6	8	9.3		$P0(\emptyset 6,8,9.3) \div P1(9.3 6,8,9.3)$		
		0.2266	0.1256	0.3054	ĺ	3.24	1	0.30839292
		0.1095	0.1857	0.1048		13.73	1	0.07285696
		0.2321	0.0813	0.2416		4.77	1	0.20980544
					-			
D13S317	10, 11, 13	10	11	13				
		10	11	13		$P0(\emptyset 10,1\overline{1,13}) \div P1(13 10,11,13)$		
		0.051	0.3189	0.1097	ſ	10.73	1	0.09319015
		0.0503	0.2374	0.1257		11.35	1	0.08812827
		0.101	0.202	0.1379		9.75	1	0.10258381
				-				
D16S539	12, 13	12	13					
		12	13			$P0(\emptyset 12,13) \div P1(13 12,13)$		
		0.3391	0.1634	Ī		7.27	1	0.13751744
		0.1866	0.1651	]		11.25	1	0.08887333
		0.2861	0.1034	]		14.31	1	0.06985704
						1		
D2S1338	16, 17, 20, 21	16	17	20	21			
		16	17	20	21	$0(\emptyset 16,17,20,\overline{21}) \div P1(17,20 16,17,20,2)$	21)	
		0.02961	0.19408	0.15461	0.01974	16.66	1	0.06001342

0.15269

0.01761

D19S433 14, 15

	4 7
14	15
14	15
0.33553	0.13487
0.1976	0.03892
0.32042	0.11972

0.1018

0.22183

0.06287

0.14085

0.04491

0.01761

16.66	
78.12	
16.00	

/	
1	0.06001342
1	0.01280033
1	0.06248951

P0(ø 1	$(4,15) \div P1(\emptyset)$	(4,15)
	1.50	

4.52	
17.88	
5.16	

1	0.22127616
1	0.05594171
1	0.19372322

## **APPENDIX E (CONTINUED)**

# TABLE XCII ARMEDXPERT LR FOR KH\_Z13-55, 1BF2 (CONTINUED)

T :11:11	
Likelinood	
Differincood	

C2

Locus	Locus Profile
vWA	15, 16

ļ	Allele 1 (a)	Allele 2 (b)	Allele 3 (c)	Allele 4 (d)
	15	16		
	15	16		
1	0.1122	0.2015	ĺ	
	0.2361	0.2694		
	0.0764	0.3596		

**TPOX** 8, 10, 11

8	10	11
8	10	11
0.5443	0.037	0.2537
0.3684	0.0933	0.2249
0.555	0.0335	0.2727

D18S51 12, 14, 16

12	14	16
12	14	16
0.1276	0.1735	0.1071
0.0583	0.0639	0.1889
0.1059	0.17	0.1158

1111111 11, 1
---------------

|--|

11	12	13
11	12	13
0.4103	0.3539	0.1462
0.2611	0.3556	0.2444
0.4212	0.2906	0.0961

 $P0(\emptyset|15,16) \div P1(15|15,16)$ 

•	,10) 11(10	,
	17.30	
	5.47	
	16.45	

1	0.05780544
1	0.18295389
1	0.06078384

P0(ø 8,1	0,11)	÷P	1(8	8,1	0,11	)
				1		

1.63	
2.70	
1.54	

1	0.61271851
1	0.37016832
1	0.647907

 $P0(\emptyset|12,1\overline{4,16}) \div P1(12|12,14,16)$ 

11.38	
30.42	
13.94	

1	0.08789088
1	0.03287537
1	0.07174725



# $P0(\emptyset|11,12,13) \div P1(13|11,12,13)$

4.08	
2.77	
6.85	

1	0.24482652
1	0.36117432
1	0.14604317

#### **APPENDIX E (CONTINUED)**

# TABLE XCII ARMEDXPERT LR FOR KH\_Z13-55, 1BF2 (CONTINUED) Allele 1 (a) Allele 2 (b) Allele 3 (c) Allele 4 (d) Likelihood

LocusLocus ProfileFGA21, 22, 25

	$1 \operatorname{mele} 2 (0)$	There $J(\mathbf{c})$
21	22	25
21	22	25
0.1735	0.1888	0.0689
0.125	0.225	0.1
0.1305	0.1773	0.1379

4.0282E+13 (40.2 Trillion)

2.0242E+14 (202 Trillion)

2.1687E+16 1.6 Quadrillion)

 $P0(\emptyset|21,22,25) \div P1(25|21,22,25)$ 

, 2,	$(2,23) \times 11(23)$
	18.29
	12.50
	9.62

1	0.05467215
1	0.08
1	0.10390765

C1

Caucasian Black

Hispanic 1 Px = 02 Px = 1

Known Unknown

Sources: FBI C2

### **APPENDIX F**

# TABLE XCIIIARMEDXPERT CPI FOR KH\_Z13-55, 1BF2

# KH\_55\_1BF2\_B

Locus	Locus Profile	Allele 1	Allele 2	Allele 3	Allele 4	PE PI
D851170	10 12 12	10	12	13	]	
D0511/9	10, 12, 15	10	12	13		
		0.102	0.1454	0.3393		0.6558 0.3442
		0.025	0.1083	0.2222		0.8736 0.1264
		0.0936	0.1207	0.3251		0.7090 0.2910
					_	
D21S11	28, 29, 31	28	29	31		
		0.1658	0.1811	0.0714		0.8250 0.1750
		0.2151	0.1899	0.0922		0.7528 0.2472
		0.069	0.2044	0.069		0.8828 0.1172
D7S820	7, 8, 10, 12	7	8	10	12	
		0.0172	0.1626	0.2906	0.1404	0.6269 0.3731
		0.0119	0.1738	0.3238	0.0905	0.6400 0.3600
		0.0215	0.0981	0.3062	0.1914	0.6191 0.3809
CSF1PO	11, 12	11	12			
		0.3005	0.3251			0.6086 0.3914
		0.2048	0.3			0.7452 0.2548
		0.2656	0.3923			0.5672 0.4328
D3S1358	14, 16	14	16			
		0.1404	0.2315			0.8617 0.1383
		0.1214	0.3071			0.8164 0.1836
		0.079	0.2656			0.8813 0.1187

# **APPENDIX F (CONTINUED)**

 TABLE XCIII

 ARMEDXPERT CPI FOR KH\_Z13-55, 1BF2 (CONTINUED)

PE	PI
0.5676	0.4324
0.8400	0.1600
0.6920	0.3080

0.7700	0.2300
0.8291	0.1709
0.8056	0.1944

0.7475	0.2525
0.8763	0.1237
0.8483	0.1517

0.8416	0.1584
0.8688	0.1312
0.8417	0.1583

0.7787	0.2213
0.9441	0.0559
0.8063	0.1937

Locus	Locus Profile
TH01	6, 8, 9.3

Allele 1	Allele 2	Allele 3	Allele 4
6	8	9.3	
0.2266	0.1256	0.3054	
0.1095	0.1857	0.1048	
0.2321	0.0813	0.2416	

|--|

10	11	13
0.051	0.3189	0.1097
0.0503	0.2374	0.1257
0.101	0.202	0.1379

D16S539	12, 13

12	13
0.3391	0.1634
0.1866	0.1651
0.2861	0.1034

D2S1338 16, 17, 20, 21
------------------------

16	17	17 20	
0.02961	0.19408	0.15461	0.01974
0.04491	0.1018	0.06287	0.15269
0.01761	0.22183	0.14085	0.01761

D19S433 14, 15

14	15
0.33553	0.13487
0.1976	0.03892
0.32042	0.11972

# **APPENDIX F (CONTINUED)**

 TABLE XCIII

 ARMEDXPERT CPI FOR KH\_Z13-55, 1BF2 (CONTINUED)

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Locus	Locus Profile	Allele 1	Allele 2	Allele 3	Allele 4	PE	PI
vWA	15, 16	15	16				
		0.1122	0.2015			0.9016	0.0984
		0.2361	0.2694			0.7445	0.2555
		0.0764	0.3596			0.8099	0.1901
				-			
TPOX	8, 10, 11	8	10	11			
		0.5443	0.037	0.2537		0.3028	0.6972
		0.3684	0.0933	0.2249		0.5286	0.4714
		0.555	0.0335	0.2727		0.2583	0.7417
					-		
D18S51	12, 14, 16	12	14	16			
		0.1276	0.1735	0.1071		0.8334	0.1666
		0.0583	0.0639	0.1889		0.9032	0.0968
		0.1059	0.17	0.1158		0.8466	0.1534
			·	·	-		
Amel	Χ, Υ			]			
	<u></u>						
			1	J		L	

13

0.1462

0.2444

0.0961

12

0.3539

0.3556

0.2906

11

0.4103

0.2611

0.4212

11, 12, 13

D5S818

0.1712	0.8288
0.2585	0.7415
0.3473	0.6527

1	0	6	
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# **APPENDIX F (CONTINUED)**

 TABLE XCIII

 ARMEDXPERT CPI FOR KH\_Z13-55, 1BF2 (CONTINUED)

Locus	Locus Profile		Allele 1	Allele 2	Allele 3	Allele 4	PE
FGA	21, 22, 25		21	22	25		
			0.1735	0.1888	0.0689		0.8141
			0.125	0.225	0.1		0.7975
			0.1305	0.1773	0.1379		0.8014
	Caucasian Black Hispanic Sources: FBI	1 in 1 in 1 in	5.2995E+8 4.3714E+10 1.916E+9	(529 Million) (43.7 Billion) (1.91 Billion)			



ΡI

0.1859 0.2025 0.1986

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