

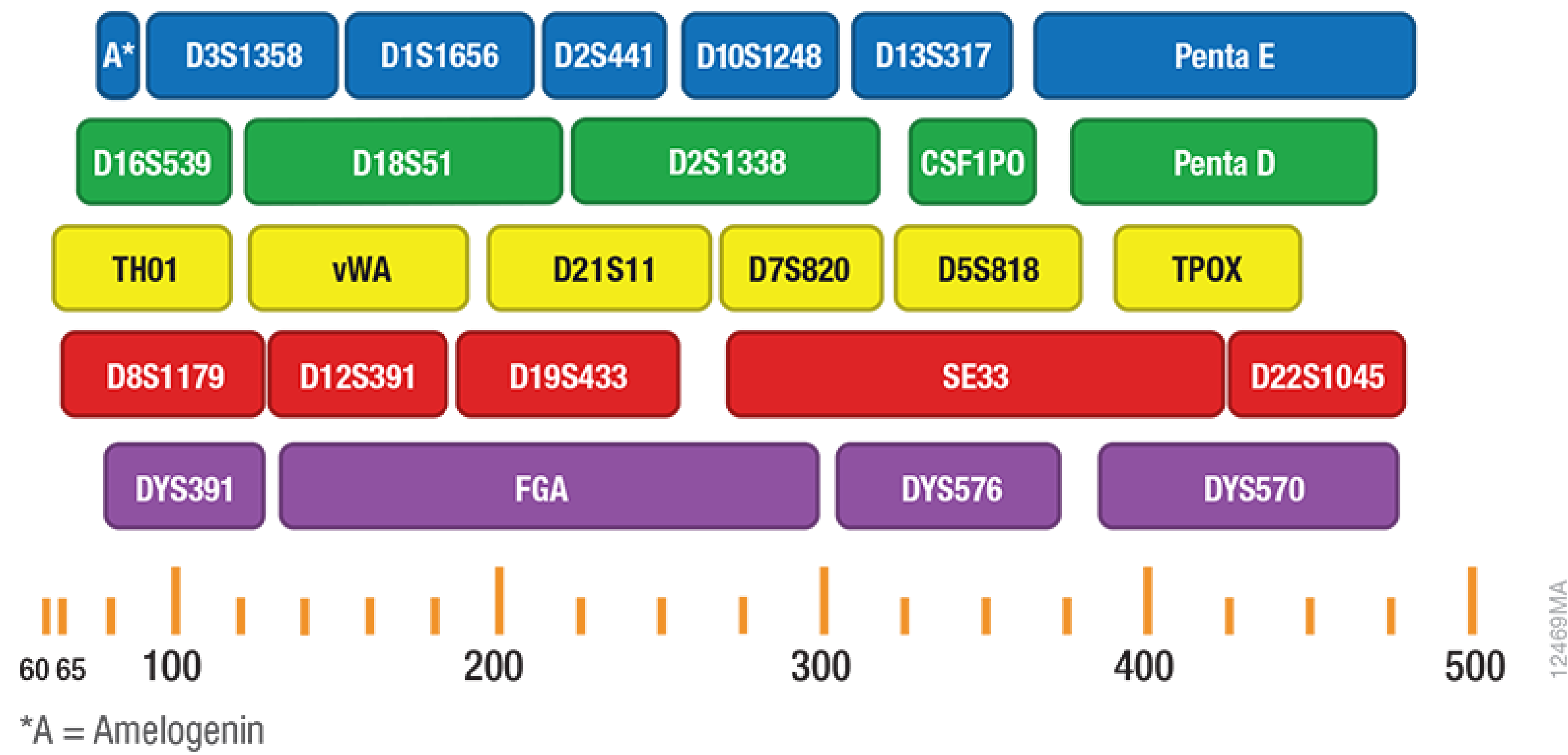
Maximize Information from Your Mixture Samples Using a Combined Autosomal STR and Y-STR Multiplex System

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Abstract #B7



PowerPlex® Fusion 6C System

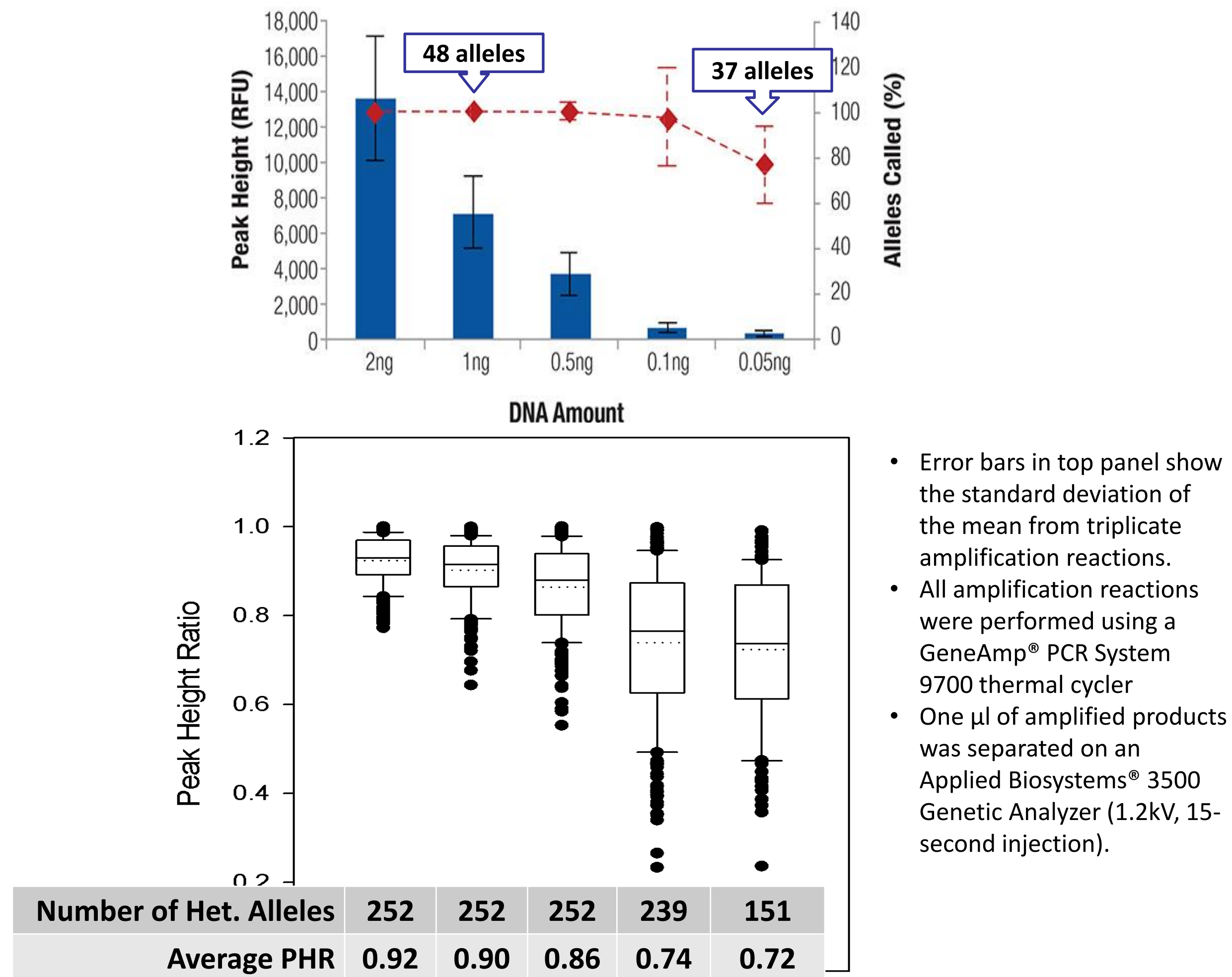


- 6-dye STR amplification system designed to meet expanded CODIS core loci guidelines¹
 - Contains 23 autosomal STR markers, including SE33
 - Contains 3 Y-STR loci (DYS391, DYS570, DYS576)
- 2 Rapidly Mutating (RM) Y-STR markers improve determination of contributors in mixtures
- One kit for both casework and database use streamlines QC process
- Capable of direct-amplification of FTA® punch, nonFTA punch, and swab in 25µl or 12.5µl reaction volumes
- Short PCR cycling time of about 1 hour
- Compatible with the GeneAmp® 9700 and Veriti® thermal cyclers
- Compatible with OSIRIS and GeneMarker® HID fragment analysis software
- PCR setup methods available on the Hamilton MicroLab STAR, Beckman Biomek®, and Tecan Freedom EVO® workstations.

23 Autosomal STR's + 3 Y-STR's + Amelogenin = High Discriminatory Power

STR Kit	Number of Loci	PI ² (N = 1036)	How Much Better than CODIS 20
CODIS 13	13	5.02 x 10 ⁻¹⁶	-
CODIS 20	20	9.35 x 10 ⁻²⁴	-
CODIS 20 + TPOX + D22S1045 + SE33	23	7.73 x 10 ⁻²⁸	10 ⁴
CODIS 20 + TPOX + D22S1045 + Penta D + Penta E	24	6.58 x 10 ⁻²⁹	10 ⁵
PowerPlex® Fusion 6C System	27	2.30 x 10 ⁻³²	10 ⁸

High Sensitivity = More Information at Low DNA Input

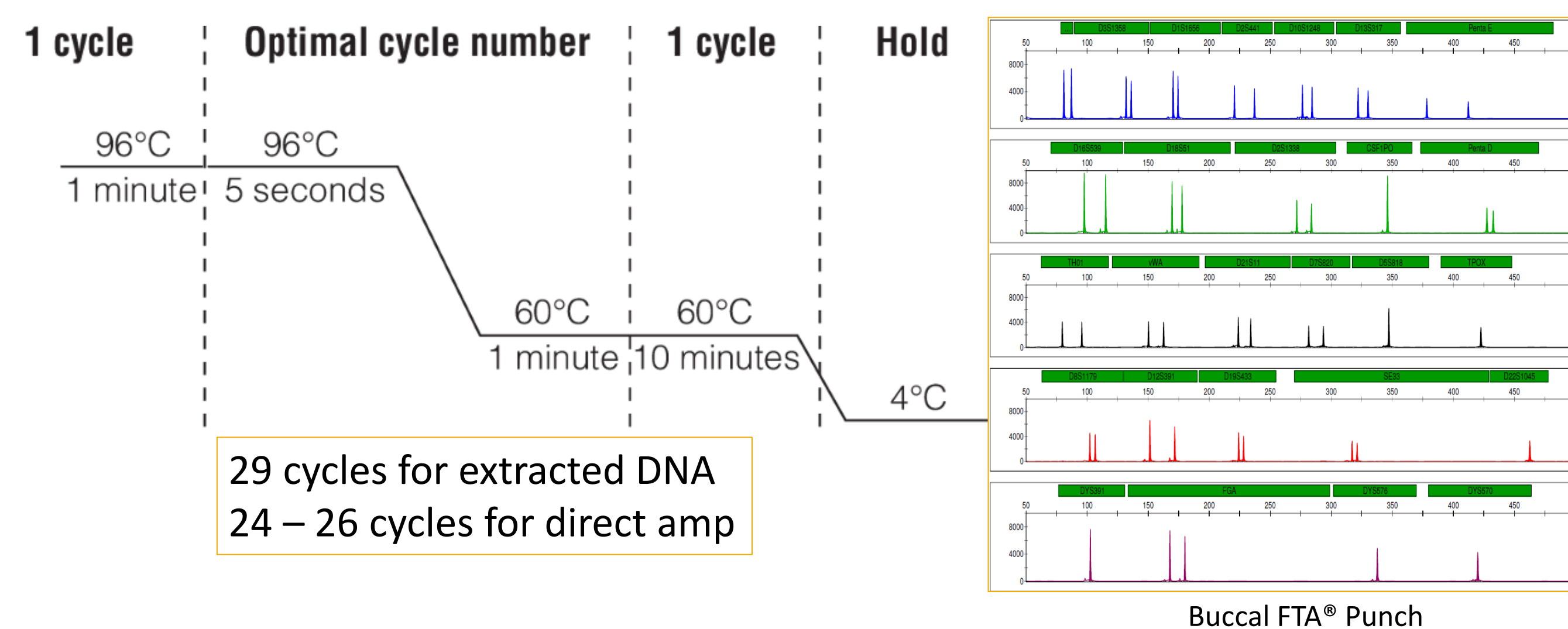


- Error bars in top panel show the standard deviation of the mean from triplicate amplification reactions.
- All amplification reactions were performed using a GeneAmp® PCR System 9700 thermal cycler
- One µl of amplified products was separated on an Applied Biosystems® 3500 Genetic Analyzer (1.2kV, 15-second injection).

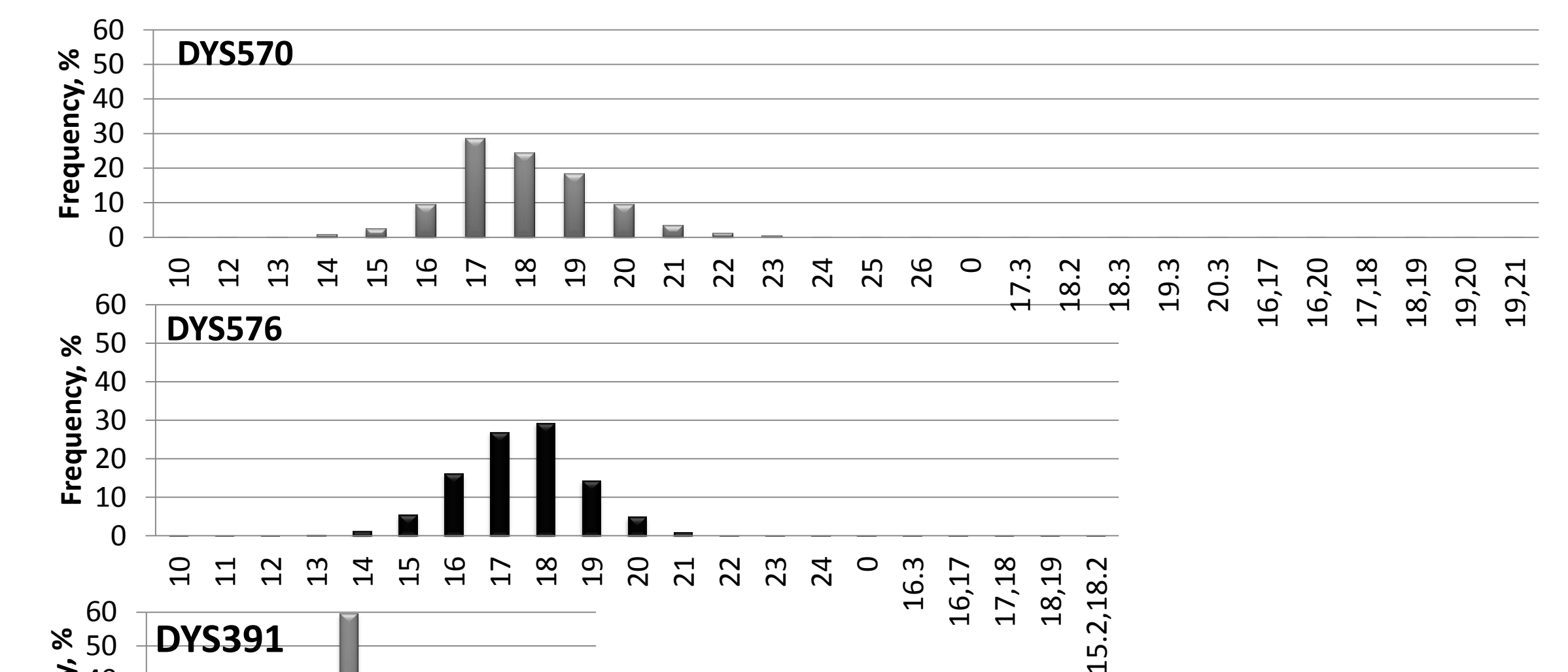
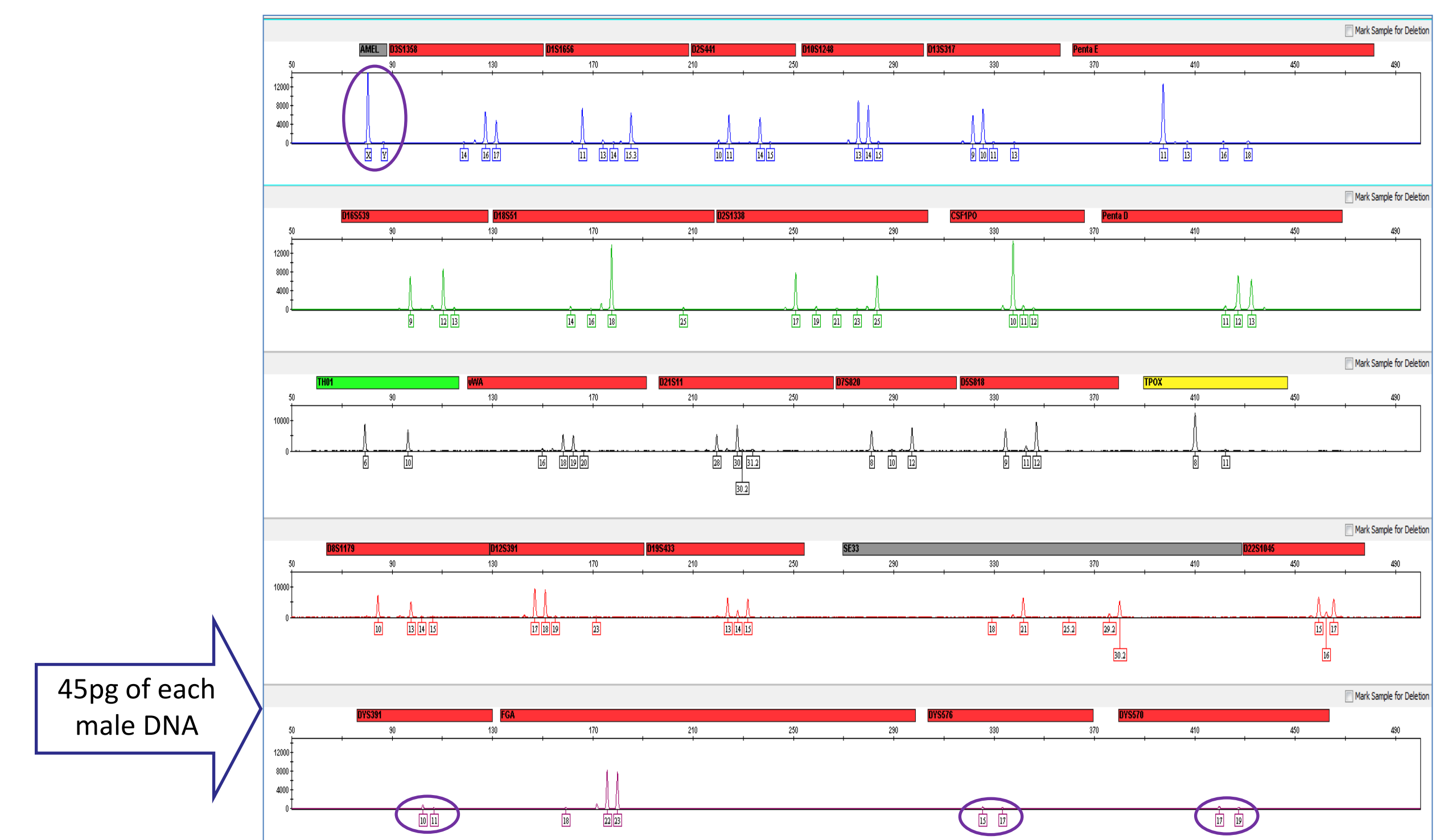
Direct Amp + Fast Cycling + 12.5µl Reaction Volume = Improved Lab Efficiency

Sample Type	Pre-treatment	5X AmpSolution™ Reagent	Number of Cycles*	Amplification Time (min)*
Blood FTA® Punch	None	✓	25	58
Buccal FTA® Punch				
Blood nonFTA Punch	PunchSolution™ Reagent	✓	24	56
Buccal nonFTA Punch				
Buccal Swab	SwabSolution™ Reagent	×	25	58

* 12.5µl PCR reaction volume



3 Y-STR's = Better Determination of Male Contributors (1 Male : 1 Male : 20 Female Mixture; 1ng Total; 29 cycles)



Y-STR	Number of Alleles ³	Gene Diversity ³	Mutation Rate ⁴
DYS570	28	0.803	17 / 1429 1.24 x 10 ⁻²
DYS576	21	0.789	24 / 1727 1.43 x 10 ⁻²
DYS391	10	0.521	5 / 1759 3.23 x 10 ⁻³

References

1. D. Hares (2012) Expanding the CODIS core loci in the United States; Forensic Science International: Genetics; 6: e52
2. J. Butler et al. (2012) Variability of New STR Loci and Kits in US Population Groups; Profiles in DNA
3. J. Purps et al. (2014) A global analysis of Y-chromosomal haplotype diversity for 23 STR loci; Forensic Science International: Genetics; 12: 12
4. K. Ballantyne et al. (2010) Mutability of Y-Chromosomal Microsatellites: Rates, Characteristics, Molecular Bases, and Forensic Implications; The American Journal of Human Genetics; 87: 341