Precision ID Ancestry Panel

Investigative leads

Get more information from your sample

The Applied Biosystems™ Precision ID Ancestry Panel can provide you with biogeographic ancestry information to guide your investigation process. Utilizing Ion AmpliSeq™ technology, the Precision ID Ancestry Panel enables simple and fast target selection of hundreds of single-nucleotide polymorphisms (SNPs) using multiplex PCR. In addition to the ancestry panel, the Precision ID portfolio also offers STR, mitochondrial, and identity SNP panels to meet all of your forensic NGS needs.

Obtain ancestry information

This ready-to-use panel consists of 165 autosomal markers* that provide biogeographic ancestry information. A total of 55 of these markers were selected based on a poster presented by Dr. Kenneth Kidd [1], and 123 markers were selected based on a publication by Dr. Michael Seldin [2]. Ion AmpliSeq technology makes it possible to multiplex 165 PCR reactions in one tube with as little as 125 pg of input DNA [3]. With small amplicon sizes, as shown in Table 1, the panel is optimized for degraded DNA samples.

Table 1. Precision ID Ancestry Panel specifications.

Precision ID Ancestry Panel	
Target	165 SNPs*
Amplicon length range	Average 130 bp for the 55 SNPs from Dr. Kenneth Kidd
	Average 120 bp for the 123 SNPs from Dr. Michael Seldin
Primer pool size	165 primer pairs in 1 primer pool
Sample multiplexing**	Ion 510 Chip: 48 samples
	Ion 520 Chip: 72 samples
	Ion 530 Chip: 362 samples

* There are 13 overlapping SNPs between the two sets.

** Based on 100x coverage at 97% of total markers using a manual library preparation. Individual lab results may vary depending on workflow used and customer requirements.

Simplicity

- Accurate biogeographic predictions using as little as 125 pg of input DNA
- Suitable for degraded samples
- Simple multiplex PCR–based library amplification

Scalability

- Multiple Ion Torrent™ semiconductor chip formats, designed for low, medium, or high throughput
- Ability to multiplex up to 362 samples per run and decrease your sequencing costs

Speed

- Sample-to-result time is typically less than 2 days when using the Ion Chef™ Instrument

ThermoFisher SCIENTIFIC

Verifying the Precision ID Ancestry Panel

A total of 24 samples of known genotype were analyzed after one run using the Applied Biosystems™ Precision ID NGS system for human identification. Results from the study demonstrated a concordance rate of 99.77% to Applied Biosystems™ TaqMan® SNP genotyping methodology for the 55 SNPs from Dr. Kenneth Kidd at an average read depth of ~1,250x per SNP. 98% of all amplicons had depth of coverage within 2 standard deviations of the mean, and heterozygosity balance of 37–50%. The Precision ID Ancestry Panel has been evaluated using multiple populations and forensic cases [4-8].

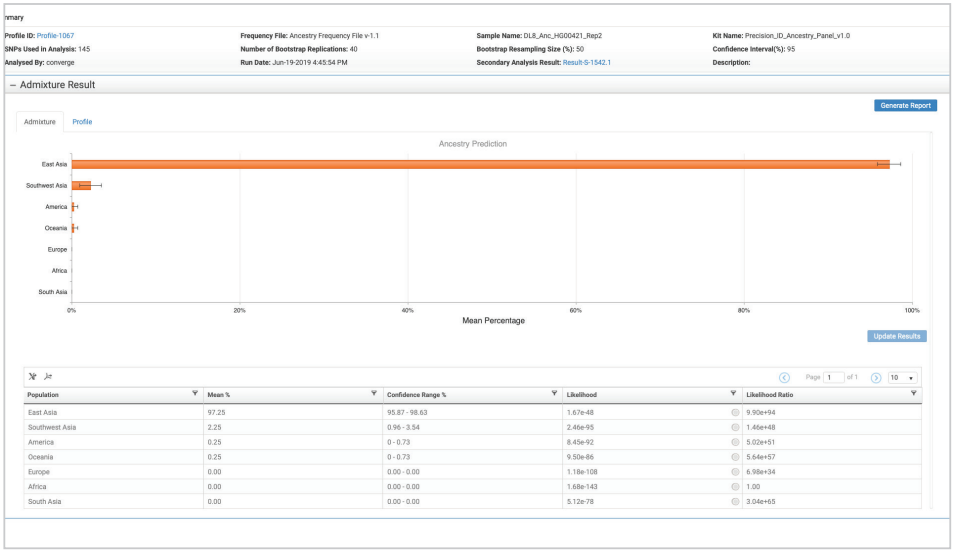

Figure 1. Graphical representation of ancestry analysis. Admixture prediction is shown with confidence range and population likelihoods, including variability estimates based on bootstrapping analysis.

Converge Software for SNP analysis

Applied Biosystems™ Converge™ Software, an all-in-one modular enterprise platform, integrates forensic DNA data management and analysis into a single software package designed to increase the efficiency of forensic and relationship DNA testing laboratories. With recent advances in NGS, crime laboratories are now able to analyze targeted and forensically relevant SNPs to generate investigative leads, STR markers to help determine the number of contributors in a mixture analysis, and the mitochondrial genome to identify remains when there is poor-quality or no autosomal DNA available for analysis. The Converge NGS Data Analysis module contains parameters for analyzing the Precision ID Ancestry Panel, generating an estimation of admixture prediction and population likelihoods with variability estimates based on bootstrapping analysis [9] (Figure 1) from 151 ancestry-informative markers that cover 7 continental populations. In addition to performing ancestry analysis based on frequencies from the 1000 Genomes Project, Converge Software also allows input of custom population and frequency data for refined ancestry analysis.

References

1. Kidd K et al. (2012) Better SNPs for Better forensics: ancestry, phenotype, and family identification. Poster presented at the National Institute of Justice (NIJ) annual meeting (June), Arlington, VA.
2. Kosoy R, Nassir R, Tian C et al. (2009) Ancestry informative marker sets for determining continental origin and admixture proportions in common populations in America. *Hum Mutat* 30: 69–78.
3. Al-Asfi M, McNevin D, Mehta B et al. (2018) Assessment of the Precision ID Ancestry Panel. *Int J Legal Med* doi: 10.1007/s00414-018-1785-9.
4. Espregueira Themudo G et al. (2016) Frequencies of HID-Ion AmpliSeq ancestry panel markers among Greenlanders. *Forensic Sci Int Genet* 24:60–64.
5. Pereira V et al. (2017) Evaluation of the Precision ID Ancestry Panel for crime case work: A SNP typing assay developed for typing of 165 ancestral informative markers. *Forensic Sci Int Genet* 28:138–145.
6. García O et al. (2017) Allele frequencies and other forensic parameters of the HID-Ion AmpliSeq™ Identity Panel markers in Basques using the Ion Torrent PGM™ platform. *Forensic Sci Int Genet* 28:e8–e10.
7. Hollard C, Keyser C, Delabarde T et al. (2017) Case report: on the use of the HID-Ion AmpliSeq™ Ancestry Panel in a real forensic case. *Int J Legal Med* 131:351–358.
8. Tasker E et al. (2017) Analysis of DNA from post-blast pipe bomb fragments for identification and determination of ancestry. *Forensic Sci Int Genet* 28:195–202.
9. Alexander DH et al. (2009) Fast model-based estimation of ancestry in unrelated individuals. *Genome Res.* 19:1655-1664.

applied
biosystems

Ordering information

Product	Quantity	Cat. No.
Precision ID Ancestry Panel*	96 reactions (manual)	A25642
	32 reactions (automated with Ion Chef System)	
Precision ID Library Kit	96 reactions	A26435
Precision ID Ancestry and Library Kit Bundle	96 reactions	A26807
Precision ID DL8 Kit	32 reactions	A33212
Precision ID Library Kit	384 reactions	A30941
IonCode Barcode Adapters 1-384 Kit	3,840 reactions	A29751
Ion S5 Precision ID Chef & Sequencing Kit (1 run per initialization)	8 reactions	A35850
Ion S5 Precision ID Chef & Sequencing Kit (2 runs per initialization)	8 reactions	A33208
Ion 530 Chip Kit	8 chips	A27764
Ion 520 Chip Kit	8 chips	A27762
Ion 510 Chip Kit	8 chips	A34292
Converge Software and Server	1 each	A35131
Case Management and NGS Data Analysis License, 1 user	3-year license	A35987
Case Management and NGS Data Analysis License, 5 users	3-year license	A36237
HID Ion Chef System	1 each	A30070
HID Ion GeneStudio S5 System	1 each	A41431
HID Ion GeneStudio S5 Plus System	1 each	A41432
HID Ion GeneStudio S5 Prime System	1 each	A41433

* The Precision ID Ancestry Panel has been internally tested but has not been verified under the Scientific Working Group on DNA Analysis Methods (SWGDAM) guidelines.

Find out more at **thermofisher.com/hid-ngs**

ThermoFisher SCIENTIFIC