



Figure 2: OvineSNP50 BeadChip Probe Spacing – The OvineSNP50 BeadChip provides uniform coverage across the entire ovine genome.

High-Quality Data

The 54,241 SNPs on the OvineSNP50 BeadChip were subjected to rigorous functional testing on multiple breeds to ensure strong performance using the Infinium HD assay. High call rates and accurate genotype calls are required for successful whole-genome association studies. Because complex traits often have relatively small gene effects, potential associations can be missed if the assayed SNP in linkage disequilibrium with the SNP of interest has a low call rate or incorrect genotype call. Illumina ensures that every OvineSNP50 BeadChip offers > 99% average call rate across common breeds.

Table 1 shows the results from internal validation testing of the OvineSNP50 BeadChip content using samples provided by collaborators and the Ovine HapMap Consortium.³ Illumina scientists and collaborators identified and retained 3,079 loci that appear to have an adjacent polymorphism or deletion among the breeds sampled. Although these loci yielded lower call rates when compared to most loci on the panel, they were retained because they might provide biologically relevant information for traits of interest and future improvements in the genome build. These performance and content validation results clearly demonstrate the high data quality delivered by the product. With such high data quality, the OvineSNP50 BeadChip provides researchers the highest accuracy and reliability for interrogating ovine genotypes in *Ovis aries* breeds.

Table 1: Performance and Specifications

Parameter	Results ^a	Product Specification
Average call rate	> 99.9%	> 99%
Reproducibility	> 99.9%	> 99.9%
Mendelian inconsistencies	< 0.01%	< 0.1%

a. Based on genotypes from reference samples.

Illumina Solutions for Genotyping

The OvineSNP50 BeadChip is compatible with the iScan® and HiScan® Systems. These array scanners feature high-performance lasers and powerful optical systems that enable rapid scan times and precise assay detection.

The convenient modular design enables researchers to build out the system easily for evolving research needs. An optional Laboratory Information Management System (LIMS) is available to accurately and efficiently track samples. Robotic automation capabilities can be added to improve throughput for labs processing large numbers of samples. With the Infinium Assay workflow, data are processed directly into Illumina GenomeStudio® software to provide streamlined genotype calling, analysis, and reporting. Researchers can also choose to use the convenient FastTrack™ Genotyping service to have samples genotyped and data delivered in a format suitable for GWAS or QTL analysis.

Summary

Developed through a collaboration between Illumina scientists and leading ovine thought leaders, the OvineSNP50 BeadChip features more than 54,000 evenly spaced SNPs that provide comprehensive coverage of the ovine genome. As the first high-density whole-genome genotyping array for sheep, the 12-sample OvineSNP50 BeadChip presents a powerful, efficient, and cost-effective tool for a wide variety of genome-wide genetic analysis applications across most sheep breeds worldwide.

Table 4: BeadChip Content Sources

Source	OvineSNP50 Probes
Validated SNPs (Sanger) ^{4,a}	557
Illumina RRS	17,042
mtDNA	8
Other	36,634
Total	54,241

a. Validated SNPs from a 1536-plex that the consortium did before the release of the OvineSNP50 BeadChip.

References

- Gunderson KL, Steemers FJ, Lee G, Mendoza LG, Chee MS. A genome-wide scalable SNP genotyping assay using microarray technology. *Nat Genet.* 2005;37:549-554.
- Steemers FJ, Chang W, Lee G, Barker DL, Shen R, Gunderson KL. Whole-genome genotyping with the single-base extension assay. *Nat Methods.* 2006;3:31-33.
- International Sheep Genomics Consortium (www.sheepmap.org) Accessed 03 April 2015.
- Kijas JW, Townley D, Dalrymple BP, et al. A genome wide survey of SNP variation reveals the genetic structure of sheep breeds. *PLoS One.* 2009;4:e4668.

Ordering Information

Catalog No.	Product	Description
WG-420-1001	OvineSNP50 Whole-Genome Genotyping Kit (48 samples)	Kit contains 4 BeadChips and reagents for processing 48 samples.
WG-420-1002	OvineSNP50 Whole-Genome Genotyping Kit (288 samples)	Kit contains 24 BeadChips and reagents for processing 288 samples.
WG-420-1003	OvineSNP50 Whole-Genome Genotyping Kit (1152 samples)	Kit contains 96 BeadChips and reagents for processing 1152 samples.

Each OvineSNP50 DNA Analysis BeadChip can process 12 samples and analyze 54,241 loci.

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