

Infinium® ImmunoArray-24 v2.0 BeadChip

Evaluate immune function-associated genetic variants on a single array.

Overview

The Infinium ImmunoArray-24 v2.0 BeadChip (Figure 1) is a next-generation genotyping array for detecting genetic variation associated with human immune system phenotypes. The Infinium ImmunoArray-24 v2.0 BeadChip updates and improves the HumanImmuno v1.0 BeadChip, which has been cited in over 180 publications.¹ Like its predecessor, the Infinium ImmunoArray-24 v2.0 BeadChip is designed for deep replication of genome-wide association studies (GWAS) and fine mapping of susceptibility loci in multiple immune-mediated disorders.²

The Infinium ImmunoArray-24 v2.0 BeadChip supplements the most valuable content from the HumanImmuno v1.0 BeadChip with newly selected markers from the immunology research community. This new content includes loci currently published in the GWAS catalog for major autoimmune and inflammatory disorders³ and published ancestry informative markers.⁴

The Infinium ImmunoArray-24 v2.0 BeadChip uses the Infinium 24-sample high-throughput screening (HTS) format, enabling maximum throughput, productivity, and genotyping accuracy (Table 1). When combined with the iScan® or HiScan® System, the Infinium ImmunoArray-24 v2.0 BeadChip delivers affordability with high-density content (Table 2), allowing researchers to explore the relationship between gene variants and disease association in major autoimmune disorders (Table 3 and Table 4).

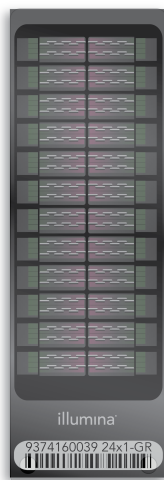


Figure 1: Infinium ImmunoArray-24 v2.0 BeadChip—The Infinium ImmunoArray-24 v2.0 BeadChip provides excellent coverage of expert-selected markers plus variant markers for the most common autoimmune diseases.

Table 1: Product Information

| Feature | Description | | |
|--------------------------------|------------------------|-----------------------|--------------------|
| Species | Human | | |
| Total Number of Markers | 253,702 | | |
| Capacity for Custom Bead Types | 390,000 | | |
| Number of Samples per BeadChip | 24 | | |
| DNA Input Requirement | 200 ng | | |
| Assay | Infinium HTS | | |
| Instrument Support | iScan or HiScan System | | |
| Sample Throughput ^a | ~3456 samples/week | | |
| Scan Time per Sample | iScan System | HiScan System | |
| | 2.5 min | 3.5 min | |
| Data Performance | Value ^b | Product Specification | |
| Call Rate | 99.8% | >99% avg. | |
| Reproducibility | 99.99% | >99.9% | |
| Log R Deviation | 0.12 | <0.30 ^c | |
| Spacing | Mean | Median | 90th% ^b |
| Spacing (kb) | 11.4 | 1.28 | 29.9 |

- a. Estimate assumes 2 iScan Systems, 1 Autoloader 2.x, 3 Tecan robots, and a 5-day work week.
 b. Values are derived from genotyping 275 HapMap reference samples.
 c. Value expected for typical projects using standard Illumina protocols. Tumor samples and samples prepared by methods other than standard Illumina protocols are excluded.

The Infinium ImmunoArray v2.0 BeadChip is compatible with the Illumina FFPE QC Kit and Infinium HD FFPE DNA Restore Kit enabling interrogation of formalin-fixed, paraffin-embedded (FFPE) samples⁵. The Infinium ImmunoArray v2.0 BeadChip Kit includes BeadChips and necessary reagents for amplifying, fragmenting, hybridizing, labeling, and detecting alleles from DNA samples using the Infinium streamlined PCR-free protocol.

Flexible Format

The Infinium ImmunoArray-24 v2.0 BeadChip can be tailored to incorporate up to 390,000 custom bead types. It is available in a stand-alone version, and as an add-on to the following Infinium BeadChips:

- Infinium Multi-Ethnic Global-8 BeadChip
- Infinium Multi-Ethnic AMR/AFR-8 BeadChip
- Infinium Multi-Ethnic EUR/EAS/SAS BeadChip
- Infinium Core-24 BeadChip

Table 2: Marker Information

| Marker Categories | Number of Markers ^a | | |
|--|---------------------------------|------|----------|
| In RefSeq ^b Genes | 128,808 (160,146 ^c) | | |
| In RefSeq Exons | 13,414 | | |
| In RefSeq Promoter Regions | 7756 | | |
| In ADME Genes | 1894 (2547 ^c) | | |
| In ADME Exons | 282 | | |
| MHC (Extended MHC ^d) | 8131 (9534) | | |
| Overlap with Genes in COSMIC ^e | 300,733 | | |
| Overlap with Genes in Gene Ontology ^f | 90,628 | | |
| Nonsense Markers | 519 | | |
| Missense Markers | 3430 | | |
| Synonymous Markers | 2879 | | |
| Silent Markers | 6542 | | |
| Mitochondrial Markers | 1 | | |
| Indels | 1287 | | |
| Sex | X | Y | PAR Loci |
| Chromosomes | 1455 | 1203 | 662 |

- a. Compared against the June 2011 1KGP data release. www.1000genomes.org.
b. RefSeq - NCBI Reference Sequence Database. www.ncbi.nlm.nih.gov/refseq.
c. Within 10 Kb.
d. MHC is a ~4 Mb region; extended MHC is a ~8 Mb region.
e. Catalog of somatic mutations in cancer. <http://cancer.sanger.uk/cosmic>.
f. Gene Ontology Consortium. www.geneontology.org.

Abbreviations: ADME, absorption, distribution, metabolism, and excretion; MHC, major histocompatibility complex; PAR, pseudoautosomal region.

Table 3: Diseases Represented on the Infinium ImmunoArray-24 v2.0 BeadChip

| Disease/Disorder | Number of Markers |
|----------------------------------|-------------------|
| Allergy | 32 |
| Alopecia Areata | 8 |
| Ankylosing Spondylitis | 64 |
| Antinuclear Antibody | 1047 |
| Asthma | 198 |
| Celiac Disease | 120 |
| Grave's Disease | 22 |
| Hodgkin's Lymphoma | 75,149 |
| Inflammatory Bowel Disease | 878 |
| Multiple Sclerosis | 329 |
| Psoriasis | 383 |
| Rheumatoid Arthritis | 540 |
| Solid Tumor Cancer | 1727 |
| Systemic Lupus Erythematosus | 6158 |
| Systemic Sclerosis | 107 |
| Type 1 Diabetes | 158 |
| Vitiligo | 38 |
| Other Autoimmune Diseases | 371 |
| Other Nonautoimmune Diseases | 4135 |
| Other Hematological Malignancies | 176 |

Table 4: Infinium ImmunoArray-24 v2.0 BeadChip Content Source Summary

| Source | Number of Unique Disease Associations |
|---|---------------------------------------|
| ClinVar ^a | 172 |
| Expert Content ^b | 87,856 |
| BaseSpace Correlation Engine ^c | 1196 |
| NHGRI GWAS Catalog ^d | 2419 |

a. ClinVar Public Archive of Clinically Relevant Variants. www.ncbi.nlm.nih.gov/clinvar.
b. Expert content refers to markers that are provided by Immunology researchers.
c. BaseSpace Correlation Engine. www.illumina.com/informatics/research/biological-data-interpretation/nextbio.html.
d. National Human Genome Research Institute (NHGRI) GWAS Catalog. www.ebi.ac.uk/gwas/docs/downloads.

Learn More

To learn more about the Infinium ImmunoArray-24 v2.0 BeadChip and other Illumina genotyping products and services, visit www.illumina.com/applications/genotyping.html.

Ordering Information

| Infinium ImmunoArray-24 v2.0 Kit | Catalog No. |
|------------------------------------|-------------|
| 48 Samples | WG-357-1001 |
| 288 Samples | WG-357-1002 |
| 1152 Samples | WG-357-1003 |
| Infinium ImmunoArray-24+ v2.0 Kit* | Catalog No. |
| 48 Samples | WG-357-1011 |
| 288 Samples | WG-357-1012 |
| 1152 Samples | WG-357-1013 |

*Enabled for additional custom content.

References

- Search Results for "ImmunoChip"[Title/Abstract]. PubMed Web site. <http://www.ncbi.nlm.nih.gov/pubmed?term=ImmunoChip%5BTitle%2FAbstract%5D>. Accessed August 10, 2016.
- Cortes A, Brown MA. Promise and pitfalls of the immunochip. *Arthritis Res Ther*. 2011;13(1):101.
- National Human Genome Research Institute (NHGRI) GWAS Catalog. www.ebi.ac.uk/gwas/docs/downloads. Accessed August 10, 2016.
- Exome Chip Design. Center for Statistical Genetics Web site. genome.sph.umich.edu/wiki/Exome_Chip_Design. Accessed August 10, 2016.
- Infinium FFPE QC and DNA Restoration Kits. www.illumina.com/products/infinium_ffpe_dna_restoration_solution.html. Accessed August 10, 2016.