Illumina Microarray Solutions.

A complete range of microarrays for every need.

illumina®

It just keeps getting

A history of progress. A future of promise.

For all applications. For all needs. Illumina has the microarray to help you discover more. Publish faster. Remain at the forefront of your industry.

Through collaboration and an unrelenting drive to help you do more, Illumina continues to invest in microarrays, regularly introducing new offerings with fresh content and ever-higher capacity. Plus, we're the only company that can successfully guide you along the entire genomics continuum, next-generation sequencing to microarrays and qPCR.

The Infinium® platform is at the core of our many offerings. These industry-leading microarrays are known for their ease of use, robustness, and reproducibility. Call rates are > 99% and reproducibility is > 99.9%, but we're not satisfied with past success. Our new 24-sample microarrays support content of up to 750k markers and have 2 – 3 times the scanning capacity compared to the previous generation of BeadChips—maximizing content flexibility and throughput.

Then there's our range of gene expression arrays. A perfect complement to RNA sequencing, they'll ensure you capture all the changes, in any species, in real time.

Whatever the scale of your work, you'll find tools to suit your needs. Illumina's comprehensive suite has been designed and priced to power discovery in labs of all sizes.

better.

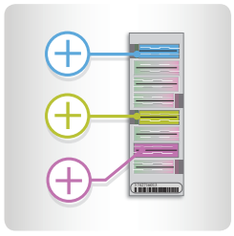
The right microarray.

There is simply no other company that selects content as carefully as Illumina. We work closely with industry leaders, taking advantage of the latest discoveries and actively participating in a variety of consortia.

But sometimes you want the flexibility to select your own content. Illumina gives you that. We offer automated tools to help you intelligently select markers and add-on content to already-customized or ready-to-use microarrays.

What do you need your microarray to do?

Illumina is ready.



Custom arrays.

With Illumina, you're never limited by choice. Combining high multiplexing with multi-sample array formats, our iSelect HD Custom BeadChips open up new opportunities for human and agricultural studies. Allowing you to create your own panel and interrogate virtually any SNP, for any species.

- Panels span from 3,072 up to 1,000,000 markers
- Tailor assays for targeted-region genotyping or fine mapping
- Add content from public databases or your own discoveries

FastTrack Services contract screening surpasses one million samples.

If the time has come for you to outsource genotyping, there's no better place. Illumina gives you the technology, the expertise and the project management to feel comfortable with your decision.

Contract sizes vary from 384 SNPs to five million and 94 samples to thousands. Whatever the scale of your job, the accuracy remains the same. Having genotyped over one million samples from a variety of species and project types, Illumina has a tremendous documented track record of achievements such as an average DNA success rate of 98%, average assay success rate of 99%, and an average call rate of 99.7%.

Genome Wide Association Studies (GWAS).

Carefully selected content. Maximized throughput. Unprecedented price. Illumina has the right microarray for your study.

Core

The Core BeadChip array family makes cost-effective, large-scale human genotyping studies possible. Developed in collaboration with several leading research institutions, microarrays such as HumanCore and HumanCoreExome BeadChips contain:

- Core common variant tag SNPs
- Additional markers for sample tracking and quality control
- Extended coverage of exonic regions (HumanCoreExome BeadChip only)
- Room for custom content to tailor studies to specific populations or research goals

Based upon the trusted Infinium platform, these customizable microarrays support downstream applications important for disease research, including:

- Common variant GWAS
- Large-scale CNV (copy number variant) detection
- mtDNA studies and ancestry tracking
- Sex confirmation and general sample quality control (QC)
- Loss of function and indel variant analysis

Omni

The Omni microarray family brings you the speed, ease of use, and cost effectiveness needed for true statistical power. You'll be able to study the widest range of human genetic variation—no matter your study size, sample population, research focus, or budget. Dive right into the most comprehensive coverage of common and rare variants with the Omni5's 5 million variants per sample. Or, start with common variants on the OmniExpress, and then dig deeper into the minor allele frequency (MAF) range with additional Omni arrays as your study progresses.

Whichever microarray you choose, it's important to know that we take content selection very seriously. SNPs are chosen to maximize the number of imputable SNPs using the 1000 Genomes Project as a reference. You'll always find the most powerful, highly correlated tag SNPs to maximize genomic coverage across all populations. RefSeq genes. SNPs in X, Y and PAR loci. Ancestry-informative SNPs. Mito SNPs. Indels, Whatever it is you'll need, it's likely to be found.

Plus, as your needs expand, Illumina microarrays can expand right along with you, allowing you to add content, or even create your own custom iSelect array.

Scanning.

When it comes to throughput, we've got you covered. Our scanners bring you the best mix of efficiency and precision.

Weekly throughput of selected BeadChips with a single HiScan or iScan system.

BeadChip	Approximate scan time per sample (minutes)		Manual loading* (samples per week)		With automation** (samples per week)	
	HiScan	iScan	HiScan	iScan	HiScan	iScan
HumanOmni5	15	26	128	128	480	272
HumanOmni2.5-8	6.5	11.4	256	256	1,088	608
HumanOmniExpress+	2.5	2.5	1,152	1,152	2,880	2,880
Methylation450K	5.0	5.0	576	576	1,440	1,440
HumanCytoSNP-12	1.8	2.9	576	576	1,728	1,728
InfiniumHD iSelect (12x1)	2.9	2.9	576	576	1,728	1,728
InfiniumHD iSelect (24x1)	1.0	1.0	1,152	1,152	3,456	3,456
BovineLD	0.3	0.3	1,152	1,152	3,456	3,456
Universal-32 BeadChip for GoldenGate Genotyping	0.3	0.3	1,440	1,440	1,440	1,440

*Manual: 1FTE, 1 HiScan or iScan system, 16 BeadChips/batch, 2 batches/FTE/Tecan per week

**Automated: 1FTE, 1 HiScan or iScan system, 2 Tecans, 1 Autoloader 2.x, 24 BeadChips/batch, 2 batches?FTE/Tecan per week

HiScan gives you the fastest scan times on high-multiplex BeadChips, for whole-genome genotyping, gene expression analysis, methylation analysis, and more.

iScan empowers your research with revolutionary, high-precision scanning that supports an extensive range of array applications, unlocking the potential for limitless discovery.

Innovative imaging systems.

Both the HiScan and iScan systems use high-performance lasers, optics, and detection systems to offer sub-micron resolution and unmatched throughput rates. The result is dramatically reduced scan times without sacrificing data quality and reproducibility. With high signal-to-noise rations, high sensitivities, low limits of detection, and broad dynamic ranges, these systems produce exceptional data quality for use in any biomarker screening or any validation study.

Consortia.

Collaboration is at the center of everything we do. By sharing our collective knowledge, each of us benefits. Costs are reduced. Science moves forward.

Illumina coordinates dozens of consortia, and adds more every year, with the aim of adapting our technology to the widest range of applications. It's why we've been able to produce so many field-tested tools and specialty content to fast track your discoveries. Our BeadChips are now the foundation of more than 25 consortia products, including:

- MetaboChip (> 200K SNPs) was developed in collaboration with University of Michigan, Oxford, Broad/ Massachusetts General Hospital/Harvard, and the University of Pennsylvania
- ImmunoChip (> 200K SNPs) with Sanger
- CancerChip (iCOGS) (> 200K SNPs) with the University of Cambridge
- ExomeChip (> 245K SNPs) with the University of Michigan, the Broad/Massachusetts General Hospital, and Oxford University
- OncoChip (600K SNPs; 200K tag SNPs based on HumanCoreExome and 400K markers associated with cancer risk) with the GAME-ON consortium
- More than two dozen species-specific chips have been developed through various consortia

Biobanks.

Collaboration. Project management. Custom content. High throughput. Illumina helps make processing a very large number of samples easier. From one end of the world to the other, you can rely on us for affordable, high-throughput genomic solutions and an eagerness to work with you on projects.

To maximize your biobank specimen value, Illumina has a portfolio of tools designed to connect comprehensive medical history with essential underlying genetics. Standard arrays. Methylation arrays. Customizable arrays. We have the content flexibility to match any application with unprecedented call rates of > 99% and reproducibility of > 99.9%.

Illumina has solutions to help you with:

- Translational and pharmacogenomics research
- Clinical trials and investigator-initiated research
- Epidemiology and population research
- Tissue and cellular engineering
- Biospecimen science research

Agrigenomics.

Extensive toolset. Proven technology. Collaborative approach. Illumina microarrays are designed to help increase crop yields, enhance desirable characteristics in breeding stock, advance aquaculture, and improve the health of companion animals. Evolve your research rapidly, with the ability to add new markers as they're discovered, so you always have the latest content.

For livestock, Illumina has the tools and resources to help:

- Increase the efficiency of animal breeding
- Provide insight into reproduction, growth, nutrition, health, and animal welfare
- Increase the quality and security of animal products

For crops, you can rely on Illumina tools and resources to:

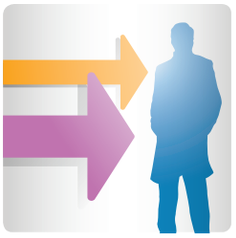
- Perform high-resolution genetic mapping
- Identify markers in plant breeding
- Enable genome wide association studies
- Enhance genomic selection

Illumina has worked with agricultural consortia on a wide range of plants and animals to develop more than two-dozen cost-effective microarrays.

In addition to consortia- and custom-design options, you can choose from a leading selection of catalog products. As always, they are designed with flexibility in mind, allowing you to add your own unique content.

- BovineHD: Developed by Illumina scientists and global bovine thought leaders at USDA-ARS, Pfizer Animal Genetics, UNCEIA-INRA, and the University of Missouri
- BovineSNP50: Developed by Illumina scientists in collaboration with USDA-ARS, the University of Missouri, and the University of Alberta
- BovineLD: Developed as part of BovineLD Consortium with the Department of Primary Industries (DPIViC), the French National Institute for Agricultural Research (INRA), the National Association of Livestock and Artificial Insemination Cooperatives (UNCEIA), and the USDA
- CanineHD: A collaborative effort between Illumina and multiple canine genetics laboratories in the academic community
- OvineSNP50: Developed in collaboration with the International Sheep Genomics Consortium, AgResearch, Baylor, UCSC, and Australia's CSIRO
- MaizeSNP50: Developed in collaboration with the USDA, Syngenta, INRA, and Traitgenetics

Check the latest on our agrigenomic partnerships and products at
www.illumina.com/agrigenomics

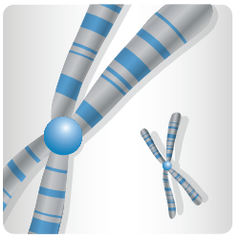


Direct-to-consumer.

Genomics is having a huge impact in the medical community, advancing healthcare and improving the quality of human lives.

Illumina has been a part of this transformation from the beginning, supplying far more than just the genetic tools. We have been deeply involved as many of the world's leading direct-to-consumer companies have developed and improved their genetic tests. We can do the same for you.

Together, we can carefully select the most focused content using our Infinium platform. Because we are experienced in this area—and are willing to share this experience—we can help connect you with leading bioinformatic scientists and project managers. As a result, you'll get the reliable, scalable, and reproducible solution you need to produce accurate, cost-effective, and profitable genotyping services



Cytogenetics.

If you're a cytogenomic researcher, you know how important it is to have the right tools. Unbiased. High resolution. Consistently informative.

Illumina is committed to giving you all that and more. Our portfolio doesn't just help you visualize relevant genes and identify chromosomal aberrations—it gives you a fast, standardized workflow. Meaningful insight is now more accessible than ever.

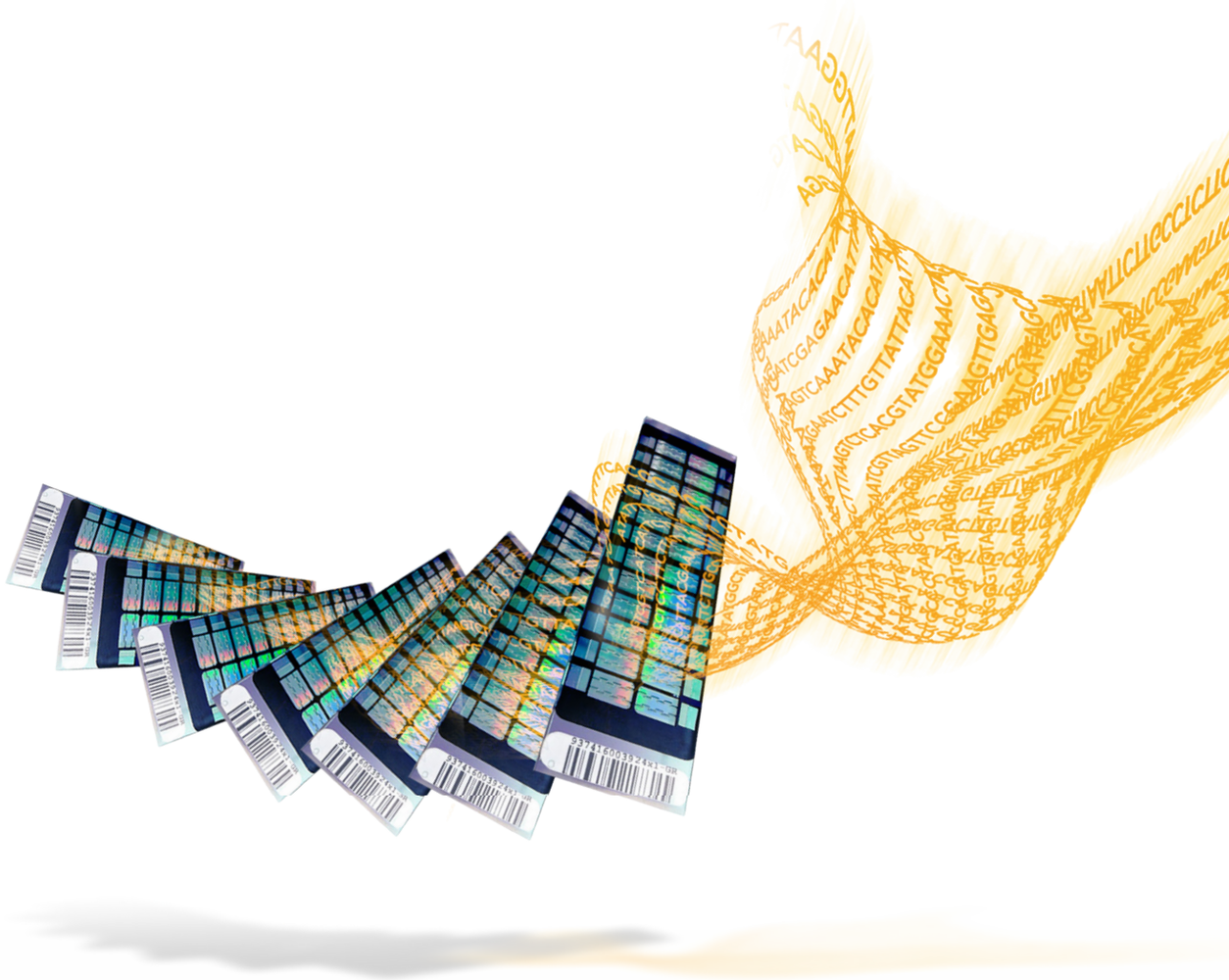
But our vision doesn't stop there. Illumina continues exploring the intersection of array and next-generation sequencing. And we recently acquired BlueGnome, a leading provider of cytogenetic and *in vitro* fertilization screening.

Structural variation. Biological relevance. Practical workflow. It's waiting for you at www.illumina.com/applications/cytogenomics.ilmn

Many microarrays. One source.

Flexibility. Quality. Productivity. Illumina has the right microarray for you. To get started, contact your Illumina Representative or visit

www.illumina.com



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