CytoScan HD Suite

Optimized for cytogenetics research

The Applied Biosystems™ CytoScan™ HD Suite is a complete cytogenetics microarray solution that includes an Applied Biosystems™ CytoScan™ HD Array, reagent kit, and the simple, user-friendly software, Chromosome Analysis Suite (ChAS). The CytoScan HD Suite was designed to provide the most comprehensive coverage and highest performance for detecting chromosomal aberrations in a broad range of sample types for constitutional, cancer, stem cell, and neurodevelopmental applications.

Highlights

- High specificity, sensitivity [1], dynamic range [2], and resolution [3] across the genome
- Superior coverage across RefSeq, OMIM™, ClinGen, DECIPHER/DDD constitutional regions, and Sanger cancer genes
- Forward-looking design by covering not only the regions relevant today, but also the ones that may become relevant in the future
- A hybrid, dual design including not only the best of copy number probes, but also the power of high-density SNPs for confident breakpoint determination [4], allelic confirmation of copy number changes [5], high-resolution loss/absence of heterozygosity (LOH/AOH) [6], gene-level homozygosity mapping [7], parent-of-origin analysis [8], enhanced detection of low-level mosaics [9], clonality [10], genomic contamination, and ploidy adjustments and detection [11]
- 2.67 million markers for copy number analysis, including 750,000 SNP and 1.9 million nonpolymorphic probes
- Robust, proprietary manufacturing technology that produces highly reproducible arrays between batches, with no risk of probe dropout that occurs with bead array technology
- Proven technology, extensively cited, with more than 250 publications per year not only in constitutional and cancer applications, but also in neurodevelopmental and stem cell research
- A robust and flexible manual or automated assay, designed to save you time and money, reduce error, and deliver performance, results, and quality consistent with your laboratory requirements
- State-of-the-art software tailored for cytogenetics and copy number analysis, ChAS allows simple data analysis and generation of customized exports based on your specific requirements; the software adapts to the needs of any cytogenetics laboratory, from single data analysis to database generation, and from constitutional tools to cancer algorithms
- World-class support, from training and instrument maintenance to consulting and compliance, led by our world-class team of multilingual technical experts

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CytoScan HD Array specifications

Markers for copy number analysis	
Total number of probes	6,876,796
Number of nonpolymorphic markers	1,953,246
Number of SNP markers	743,304
Total number of SNP markers suitable for genotyping	749,157
Genome build	hg19
Autosomal markers	2,491,915
Pseudoautosomal markers	4,624
Intragenic markers	1,410,535
Intergenic markers	1,286,015

Average marker spacing (base pairs)	
Intragenic (within all the genes below)	880
Intergenic (nongene backbone)	1,737
Overall (gene and nongene backbone)	1,148
Percentage of genes covered (25 markers/100 kb)	
ClinGen (formerly ICCG and ISCA) (3,483)	100%
Cancer genes (526)	100%
OMIM Morbid genes (3,561)	100%
X chromosome OMIM Morbid genes (177)	100%
RefSeq genes (36,121)	98%
DDD [12] (1,309)	98%

References

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2. Ambros I, et al. (2014) Ultra-high density SNParray in neuroblastoma molecular diagnostics. *Frontiers in Oncology* 4:202.
3. Zimmerman E, Maron JL (2016) *FOXP2* gene deletion and infant feeding difficulties: a case report. *Cold Spring Harbor Molecular Case Studies* 2:a000547.
4. Rodriguez-Pascau L, et al. (2012) Characterization of two deletions involving *NPC1* and flanking genes in Niemman-Pick type C disease patients. *Molecular Genetics and Metabolism* 107(4):716–720.
5. Chen W, et al. (2013) Identification of chromosomal copy number variations and novel candidate loci in hereditary nonpolyposis colorectal cancer with mismatch repair proficiency. *Genomics* 102(1):27–34.
6. Mason-Suares H (2013) Density matters: comparison of array platforms for detection of copy number variation and copy-neutral abnormalities. *Genetics in Medicine* 15(9):706–712.
7. Mayer A, et al. (2016) Homozygosity mapping and whole-genome sequencing reveals a deep intronic *PROM1* mutation causing cone-rod dystrophy by pseudoexon activation. *European Journal of Human Genetics* 24(3):459–462.
8. Darcy D, et al. (2015) Mosaic paternal genome-wide uniparental isodisomy with Down syndrome. *American Journal of Medical Genetics Part A* 167(10):2463–2469.
9. Oneda B, et al. (2014) High-resolution chromosomal microarrays in prenatal diagnosis significantly increase diagnostic power. *Prenatal Diagnosis* 34(6):525–533.
10. Jiangchuan T, et al. (2014) Concurrence of B-lymphoblastic leukemia and myeloproliferative neoplasm with copy neutral loss of heterozygosity at chromosome 1p harboring a *MPL* W515S mutation. *Cancer Genetics* 207(10–12):489–494.
11. Choi S, et al. (2014) Near-haploid B lymphoblastic leukemia with an apparent hyperdiploid karyotype: the critical role of SNP analysis in establishing proper diagnosis. *Journal of Hematopathology* 7(1):27–32.
12. Fitzgerald TW, et al. (2015) Large-scale discovery of novel genetic causes of developmental disorders. *Nature* 519(7542):223–228.

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Ordering information

Product	Description	Cat. No.
CytoScan HD Suite consumables		
CytoScan HD Array and Reagent Kit Bundle	Arrays and reagents sufficient for 24 reactions	901835
Chromosome Analysis Suite (ChAS)	Available as free download from **thermofisher.com/chas**	NA
CytoScan training products		
CytoScan HD Training Kit	Arrays and reagents sufficient for 24 reactions plus training materials	901834
CytoScan FAS On-Site Training	FAS-led on-site preparation and first week of training	000802
CytoScan FAS Assisted Training	FAS-led on-site preparation; customer completes training using self-paced tools	000803
Supporting products		
GeneChip 3000 7G with Workstation and AutoLoader	Includes: • GeneChip Scanner 3000 7G with AutoLoader • n2D Handheld Barcode Reader • GeneChip Fluidics Station 450 • GeneChip Hybridization Oven 645 • Computer workstation with instrument control software	00-0218
GeneChip System 3000Dx v.2*	Includes: • GeneChip Scanner 3000Dx v.2 with AutoLoaderDx • GeneChip Fluidics Station 450Dx v.2 • Workstation with Affymetrix Molecular Diagnostics Software * Recommended: GeneChip Hybridization Oven 645	00-0334
GeneChip Hybridization Oven 645		00-0331
NIMBUS Target Preparation Instrument	Robotics workstation and laptop	00-0401

For additional instrument system configurations or individual system components to meet your needs, please contact your account manager.

Find out more at **thermofisher.com/microarrays**

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