CytoChip™ Oligo SNP Pack

Reagents for arrayCGH experiments.

Description

The CytoChip Oligo SNP Pack provides the reagents that are required to perform 16 array comparative genomic hybridization (arrayCGH) experiments combined with single-nucleotide polymorphism (SNP) calling. A pack includes CytoChip Oligo SNP microarray slides including gaskets (x4), SureLabel32SNP [dUTP] Fluorescent Labeling System (32 reactions) including fully genotyped reference DNA, and COT Human DNA. This product information sheet provides details of the CytoChip Oligo SNP microarrays. For detailed product descriptions of other pack components, see www.cambridgebluegnome.com.

CytoChip Oligo SNP microarrays are for use in arrayCGH where fluorescently labeled test and reference DNAs are competitively hybridized to immobilized probes on glass slides to identify regions of copy-number imbalance. Regions of copy-number neutral loss of heterozygosity/uniparental isodisomy (LOH/UPD) can be identified in the same assay.

CytoChip Oligo SNP microarrays are created using an *in situ*, highdensity, inkjet printing process that synthesizes oligonucleotides of 45–60 bases directly on glass slides. The active side of the slide is labeled "Agilent." Each array probe is designed to avoid repetitive sequences in the human genome.

Supply

All the reagents that are required to perform arrayCGH experiments with CytoChip Oligo SNP microarrays are available in packs. For detailed information on each pack, see the *Contents* section.

CytoChip Oligo SNP microarrays are supplied in a box of four slides vacuum-packaged inside a foil bag. Each slide is labeled with a unique barcode. The foil bag is labeled with product name and version, expiration date, product number, lot number, and barcodes for each slide and the pack. The pack includes gaskets required for hybridization.

The SureLabel32SNP [dUTP] Fluorescent Labeling System is supplied in three parts. Part 1 contains reagents for restriction digestion, reagents for DNA labeling, and fully genotyped reference DNA for hybridization. Part 1 is supplied and stored at -20°C. Part 2 contains Hybridization Buffer and blocking agent, and is supplied at room temperature. Part 3 contains the purification columns and is supplied at room temperature.

COT Human DNA is supplied in a single, 1.5 ml, screw-capped tube labeled with quantity (0.2 mg), order reference number, production lot number, storage conditions, and expiration date.

Storage

CytoChip Oligo SNP microarrays are supplied desiccated, at room temperature, and protected from light. They should be stored desiccated, at room temperature, and protected from light until required.

Part 1 of the SureLabel32SNP [dUTP] Fluorescent Labeling System should be stored at -20°C in a non–frost-free freezer. Part 2 should be stored at room temperature. After it is prepared, 10X blocking agent should be stored at -20°C. Part 3 should be stored at room temperature.

COT Human DNA should be stored at -20°C until required.

CytoChip Oligo SNP microarrays and all reagents should be used before their expiration date.

Technical Specifications

CytoChip Oligo SNP microarrays enable the detection of copynumber imbalance at a high resolution, in addition to the detection of copy-number neutral UPD in the same assay. CytoChip Oligo SNP 4×180K is a disease-focused microarray designed to investigate constitutional disorders.

The CytoChip Oligo SNP 4×180K design includes 150K oligo probes for detecting copy-number imbalance; these probes are the ISCA 4×180K v2 targeted design that includes coverage of 500 constitutional disease regions (www.iscaconsortium.org). In addition, Illumina has added 27,000 SNP probes distributed as evenly as possible across the genome. This design provides the power to detect LOH/UPD across the genome at approximately 10 Mb resolution.

The SNP probes on the CytoChip Oligo SNP microarray are designed to include restriction digestion sites (4 bp sequence) for restriction enzymes (Alu1/Rsa1) that overlap known SNP sites. If both alleles (two alleles for each SNP—one maternal, one paternal) in the target DNA are cut, the signal for that probe will be low. For a heterozygous SNP, one allele will be cut, resulting in an intermediate signal strength. If neither allele is cut, the signal strength will be high. In this way, the copy number for each SNP covered by the probe is assessed. Regions of LOH/UPD are located by finding regions with few heterozygous calls, i.e., regions of homozygosity, where both alleles are the same or contain the same SNPs, either cut or uncut.

The key elements of each design are summarized in Table 1.

Table 1: Technical Specifications

Catalog No.	Description	Design (Design ID)	Unique Probes	Targeted Regions [*]	Average Spacing/ Replication	Spike-in Controls
PR-23-438006-00	CytoChip Oligo	ISCA [†] v2.0	147,790 CGH	500 plus	20 Kb/×1	Yes
	SNP 4×180K v1.0	plus SNP (33485)	plus	10 Mb		
			26,551 SNP	LOH/UPD		

†All ISCA design targets were provided by the ISCA consortium on genome build 36.

Software Specifications

The earliest version of BlueFuse[®] Multi software that supports the identification of CytoChip Oligo Spike-in Controls is v3.1. Subsequent versions of the software will support CytoChip Oligo Spike-in Controls.

The annotation databases used by BlueFuse Multi software during microarray analysis are regularly updated with new array types and annotation information, and can be downloaded from the customer area of the Illumina website.

Quality Control

CytoChip Oligo SNP arrays undergo a quality control procedure at the site of manufacture.

A slide is taken from either the first lot of slides ordered or from every lot ordered (see Table 2) and hybridized with labeled male versus female control DNA using standard CytoChip Oligo protocols. Hybridized images are then visually checked for printing artifacts and the processed data are assessed for signal, noise, dynamic range, and X and Y chromosome log₂ ratio.

Each lot of the SureLabel32SNP [dUTP] Fluorescent Labeling System and COT Human DNA are checked for performance in hybridizations.

Metrics, including signal-to-noise ratio, the spread of data points on the autosomal chromosomes, and the shift from 0 (\log_2 scale) of data points on the sex chromosomes are used as measures of quality. They have to exceed a threshold set from historical data.

To make sure that components of the SureLabel32SNP [dUTP] Fluorescent Labeling System are supplied with the correct quantities, three kits from each lot are checked for reagent fill volumes.

Stock Control, Delivery Dates, and Expiration

Illumina operates a sophisticated stock control procedure to ensure reliable supplies of critical components while maximizing useful life. To achieve this, each microarray model number is classified as a volume, high-volume, or special product. For each product, Illumina commits to a target delivery date and a guaranteed delivery date as summarized in Table 2. The information in this table is relevant to the microarray slides. All pack components are shipped at the same time.

Contents

See Table 3 for a complete list of kit contents and part numbers.

Table 2: Stock Control, Delivery, and Expiration

Catalog No.	Description	Classification	Target Delivery	Guaranteed Delivery	Minimum Expiration	QC Process
PR-23-438006-00	CytoChip Oligo SNP 4×180K v1.0	Volume	14 days	45 days	3 months	1 slide from first lot

Table 3: CytoChip Pack Contents

Catalog No.	Description	No. Samples	Part No.	Description
PR-11-448006-PK	CytoChip Oligo SNP	16	15043054	CytoChip Oligo SNP 4×180K v1.0 inc. gaskets (4 slides)
	4×180K v1.0 SNP DNA		15043144	SureLabel32SNP [dUTP] FLS (32 rxns) part 1
	Pack		15043142 Fluorescent Labeling System [dUTP]	Fluorescent Labeling System [dUTP] (32 rxns) part 2
			15043146	SureLabel32SNP [dUTP] FLS (32 rxns) part 3
			15043063	COT Human DNA (0.2 mg)

Safety Information

Safety data sheets are available for download from www.cambridgebluegnome.com.

PR-4080/4081/4381/4380: CytoChip Oligo PR-30-413437-00: SureLabel32SNP [dUTP] Fluorescent Labeling System part 1 PR-30-413401-00: Fluorescent Labeling System (dUTP) part 2 PR-40-413503/413510: COT Human DNA

Additional Documents

Additional documents available for download include:

- CytoChip Oligo Reference Manual
- CytoChip Oligo Summary Protocol
- Annotation database for BlueFuse Multi (for all microarray formats)
- A GAL file for each of the CytoChip Oligo array designs
- Quality control documents for each microarray design

Ordering Information

Product	Catalog No.	No. Samples
CytoChip Oligo SNP 4x180K v1.0 SNP DNA Pack	PR-11-448006-PK	16

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