

CytoChip™ Oligo Pack

Reagents for array CGH experiments.

Description

CytoChip Oligo Packs provide the reagents to perform array comparative genomic hybridization (array CGH) experiments. Each pack includes CytoChip Oligo microarray slides, gaskets, Fluorescent Labeling System, and COT Human DNA. This product information sheet provides details of the CytoChip Oligo microarrays. For detailed product descriptions of other pack components, please see www.cambridgebluegnome.com.

fluorescently labeled test and reference DNAs are competitively hybridized to immobilized probes on glass slides in order to identify regions of copy-number imbalance.

density, inkjet printing process that synthesizes oligonucleotides of 45–60 bases directly on glass slides. The active side of the slide is labeled “Agilent.”

human genome. Models differ primarily in their design and number of hybridization areas.

All the read

with CyChip Oligo microarrays are available in packs. For detailed information on each pack, see the *Contents* section.

Each pack includes 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.

and stored at -20°C. Part 2 contains blocking agent and hybridization buffer, and is supplied at room temperature.

All reagents in packs are supplied with a minimum expiration date of 2 months.

Storage

desiccated,

protected from light, and at room temperature until required.

Part 1 of the Fluorescent Labelling System should be stored at -20°C in a non-frost-free freezer. Part 2 should be stored at room temperature. Once prepared, 10X blocking agent should be stored at -20°C.

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their expiration date.

Technical specifications

disorders through a combination of two factors. First, the arrays provide increased density of probes in regions or genes associated with known constitutional disorders. Second, the arrays feature regular spacing of probes on the genomic backbone, with no known association to relevant diseases.

/SCA—a standardized international design

investigations from the International Standards for Cytogenetic Arrays (ISCA), now known as the International Collaboration for Clinical Genomics (ICCG; www.iccg.org)¹.

Focus—a constitutional design for the investigation of challenging

samples, such as those with low amounts of poor quality DNA extracted from chorionic villus sampling (CVS) and amniocentesis samples. This design aims to include genes associated with early developmental disorders and specifically exclude regions associated with late-onset diseases. The Focus designs use a strategy that replicates backbone clones to provide more robust results, while minimizing the reporting of Variants Of Unknown Significance (VOUS). The Focus 60K design, used in the 8x60K format, includes a duplicated backbone. The Focus 180K design, used in the 4x180K format, arose out of further consultation with the cytogenetics community and includes a modified list of targeted regions and a triplicated backbone.

The key elements of each design, on each model number, are summarized in Table 1.

Product Information Sheet: Reproductive and Genetic Health

- Table 1: Technical Specifications

Catalog No.	Description	Design (Design ID)	Unique Probes	Targeted Regions ^a	Average Spacing/Replication	Spike-in Controls
PR-21-408001-00	CytoChip Oligo 2×105K v1.0	Oligo Constitutional (21856)	101,024	142	30 Kb/x1	No
PR-21-408003-00	CytoChip ISCA 4×44K v1.0	ISCA* v1.0 (23097)	43,079	232	70 Kb/x1	No
PR-21-408005-00	CytoChip ISCA 8×60K v2.0	ISCA* v2.0 (26370)	59,055	498	51 Kb/x1	Yes
PR-21-408006-00	CytoChip ISCA 4×180K v1.0b	ISCA* v1.0 (24585)	174,200	500	18 Kb/x1	No
PR-21-408010-00	CytoChip ISCA 4×44K v2.0	ISCA* v2.0 (28739)	43,085	232	70 Kb/x1	Yes
PR-21-408011-00	CytoChip ISCA 2×105K v2.0	ISCA* v2.0 (28740)	100,401	498	30 Kb/x1	Yes
PR-21-408013-00	CytoChip ISCA 4×180K v2.0	ISCA* v2.0 (30078)	147,693	500	21 Kb/x1	Yes
PR-21-408024-00	CytoChip Focus 8×60K v1.0	Focus 60K v1.0 (40942)	31,198	162	97 Kb/x1 disease, x2 backbone	Yes
PR-21-408026-00	CytoChip Focus 4×180K v1.0	Focus 180K v1.0 (45830)	63,526	179	44 Kb/x1 disease, x3 backbone	Yes

b. The CytoChip ISCA 4x180K v1.0 design was produced using the ISCA v2.0 design but with a filled-out bad

²All ISCA design targets were provided by the ISCA consortium on genome build 36.

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Catalog No.	Description	Characterization	Delivery	Delivery	Expiration	Comments
PR-21-408001-00	CytoChip Oligo 2x105K v1.0	Volume	14 days	45 days	3 months	1 slide from first lot
PR-21-408003-00	CytoChip ISCA 4x44K v1.0	Volume	14 days	45 days	3 months	1 slide from first lot
PR-21-408005-00	CytoChip ISCA 8x60K v2.0	High volume	7 days	30 days	3 months	1 slide from every lot*
PR-21-408006-00	CytoChip ISCA 4x180K v1.0	High volume	7 days	30 days	3 months	1 slide from every lot*
PR-21-408010-00	CytoChip ISCA 4x44K v2.0	Special	35 days	60 days	3 months	1 slide from first lot
PR-21-408011-00	CytoChip ISCA 2x105K v2.0	Special	35 days	60 days	3 months	1 slide from first lot
PR-21-408013-00	CytoChip ISCA 4x180K v2.0	Special	35 days	60 days	3 months	1 slide from first lot
PR-21-408024-00	CytoChip Focus 8x60K v1.0	Volume	14 days	45 days	3 months	1 slide from first lot
PR-21-408026-00	CytoChip Focus 4x180K v1.0	Volume	14 days	45 days	3 months	1 slide from first lot

CytoChip Focus Arrays

Two publications^{2,3} have described the use of "research use only" microarray devices to investigate cytogenetic abnormalities in fetal DNA obtained from CVS and amniocentesis. These are analytically challenging samples that yield small amounts of DNA of variable quality. The CytoChip Focus 4×180K microarray was designed for the analysis of similar analytically challenging samples and is also a "research use only" device. **All findings must always be verified using additional analytical techniques.**

Software Specifications

This earliest version of Biochip™ Main 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 website.

Quality Control

CytoChip Oligo 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 artefacts and the processed data is assessed for signal, noise, dynamic range and X and Y chromosome \log_2 ratio.

PR-10-408001-PK	CytoChip Oligo 2×105K v1.0 Pack	16	2x 15043024 15043143 15043142 2x 15043063	CytoChip Oligo 2×105K v1.0 inc. gaskets (2 × 4 slides) Fluorescent Labeling System [dUTP] (32 rxns) part 1 Fluorescent Labeling System [dUTP] (32 rxns) part 2 COT Human DNA (2 × 0.2 mg)
PR-10-408003-PK	CytoChip ISCA 4×44K v1.0 Pack	16	15043025 15043143 15043142 15043063	CytoChip ISCA 4×44K v1.0 inc. gaskets (4 slides) Fluorescent Labeling System [dUTP] (32 rxns) part 1 Fluorescent Labeling System [dUTP] (32 rxns) part 2 COT Human DNA (0.2 mg)
PR-10-408005-PK	CytoChip ISCA 8×60K v2.0 Pack	32	15043026 15043143 15043142 15043063	CytoChip ISCA 8×60K v2.0 inc. gaskets (4 slides) Fluorescent Labeling System [dUTP] (32 rxns) part 1 Fluorescent Labeling System [dUTP] (32 rxns) part 2 COT Human DNA (0.2 mg)
PR-10-408006-PK	CytoChip ISCA 4×180K v1.0 Pack	16	15043027 15043143 15043142 15043063	CytoChip ISCA 4×180K v1.0 inc. gaskets (4 slides) Fluorescent Labeling System [dUTP] (32 rxns) part 1 Fluorescent Labeling System [dUTP] (32 rxns) part 2 COT Human DNA (0.2 mg)
PR-10-408010-PK	CytoChip ISCA 4×44K v2.0 Pack	16	15043031 15043143 15043142 15043063	CytoChip ISCA 4×44K v2.0 inc. gaskets (4 slides) Fluorescent Labeling System [dUTP] (32 rxns) part 1 Fluorescent Labeling System [dUTP] (32 rxns) part 2 COT Human DNA (0.2 mg)
PR-10-408011-PK	CytoChip ISCA 2×105K v2.0 Pack	16	2x 15043032 15043143 15043142 2x 15043063	CytoChip Oligo 2×105K v2.0 inc. gaskets (2 × 4 slides) Fluorescent Labeling System [dUTP] (32 rxns) part 1 Fluorescent Labeling System [dUTP] (32 rxns) part 2 COT Human DNA (2 × 0.2 mg)
PR-10-408013-PK	CytoChip ISCA 4×180K v2.0 Pack	16	15043034 15043143 15043142 15043063	CytoChip ISCA 4×180K v2.0 inc. gaskets (4 slides) Fluorescent Labeling System [dUTP] (32 rxns) part 1 Fluorescent Labeling System [dUTP] (32 rxns) part 2 COT Human DNA (0.2 mg)
PR-10-408024-PK	CytoChip Focus 8×60K v1.0 Pack	32	15043043 15043143 15043142 15043063	CytoChip Focus 8×60K v1.0 inc. gaskets (4 slides) Fluorescent Labeling System [dUTP] (32 rxns) part 1 Fluorescent Labeling System [dUTP] (32 rxns) part 2 COT Human DNA (0.2 mg)
PR-10-408026-PK	CytoChip Focus 4×180K v1.0 Pack	16	15043044 15043143 15043142 15043063	CytoChip Focus 4×180K v1.0 inc. gaskets (4 slides) Fluorescent Labeling System [dUTP] (32 rxns) part 1 Fluorescent Labeling System [dUTP] (32 rxns) part 2 COT Human DNA (0.2 mg)

Each lot of Fluorescent Labeling System and COT Human DNA are checked for performance in hybridizations. Quality control metrics, such as 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 and have to exceed a threshold set from historical data.

To ensure that components of the 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 in order to ensure reliable supplies of critical components while maximizing useful life. In order 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; for information on other pack components, please see individual product descriptions. All pack components are shipped at the same time.

Contents

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

Safety Information

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

PR-4080/4081/4381/4380: CytoChip Oligo

PR-30-413431-00: Fluorescent Labeling System (dUTP) 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
- CytoChip ISCA regions
- CytoChip Focus regions
- Quality control documents for each microarray design
- BED files for each array design

References

1. Baldwin EL, Lee JY, Blake DM, Bunke BP, Alexander CR, et al. (2008) Enhanced detection of clinically relevant genomic imbalances using a targeted plus whole genome oligonucleotide microarray. *Genet Med* 10: 415-429.
2. Wapner RJ, Martin CL, Levy B, Ballif BC, Eng CM, et al. (2012) Chromosomal microarray versus karyotyping for prenatal diagnosis. *NEJM* 367: 2175-2184.
3. Fiorentino F, Napoletano S, Caiazzo F, Sessa M, Bono S, et al. (2013) Chromosomal microarray analysis as a first-line test in pregnancies with a priori low risk for the detection of submicroscopic chromosomal abnormalities. *Eur J Hum Genet* 21: 725-730.

Ordering Information

Product	Catalog No.	No. Samples
CytoChip Oligo 2x105K v1.0 Pack	PR-10-408001-PK	16
CytoChip ISCA 4x44K v1.0 Pack	PR-10-408003-PK	16
CytoChip ISCA 8x60K v2.0 Pack	PR-10-408005-PK	32
CytoChip ISCA 4x180K v1.0 Pack	PR-10-408006-PK	16
CytoChip ISCA 4x44K v2.0 Pack	PR-10-408010-PK	16
CytoChip ISCA 2x105K v2.0 Pack	PR-10-408011-PK	16
CytoChip ISCA 4x180K v2.0 Pack	PR-10-408013-PK	16
CytoChip Focus 8x60K v1.0 Pack	PR-10-408024-PK	32
CytoChip Focus 4x180K v1.0 Pack	PR-10-408026-PK	16