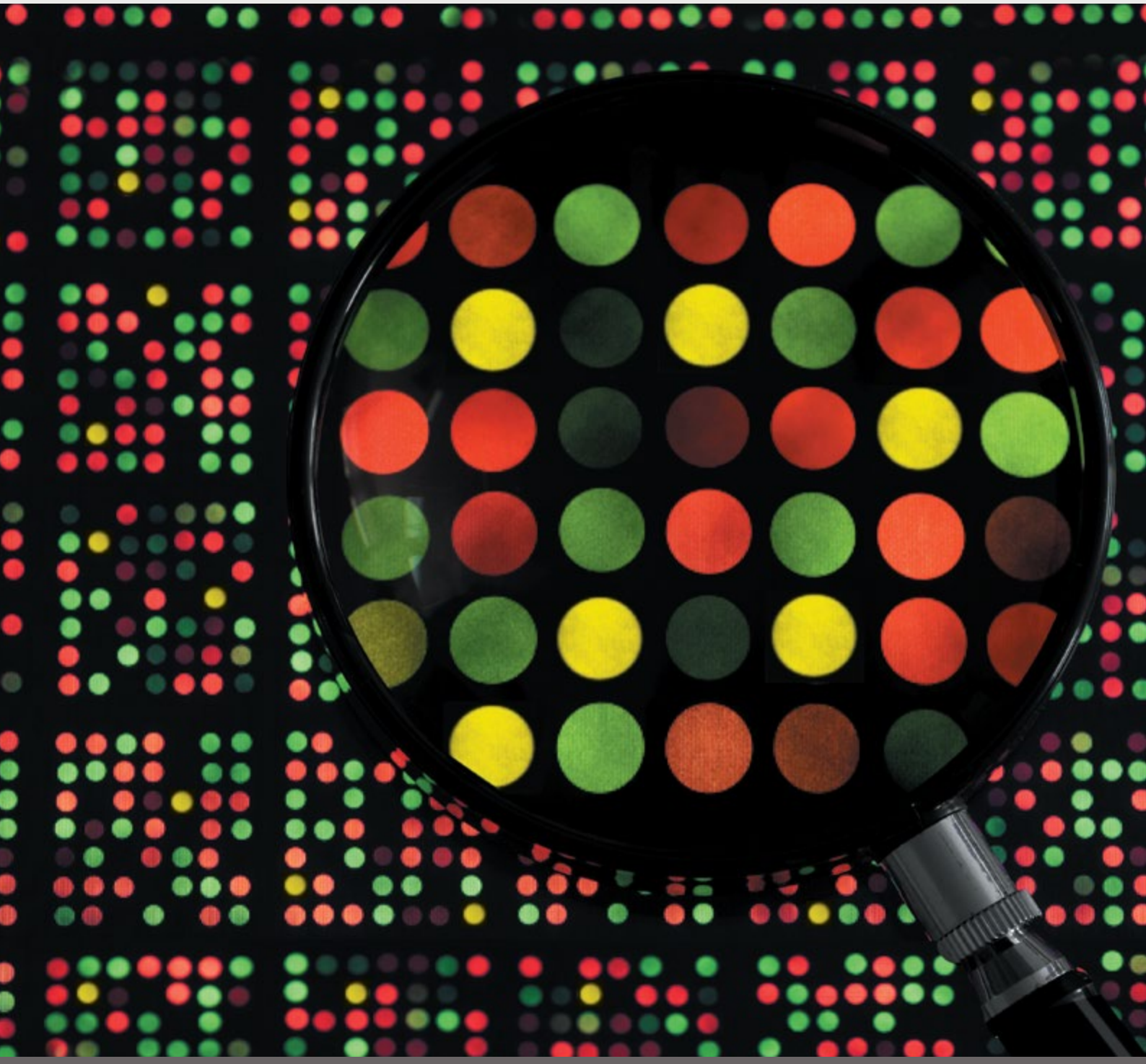
CYTAG® CGH Labeling Kits

Optimized Labeling for Microarrays



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Delivering Superior Results for Better Understanding of Genetic Disorders, Cancers, and Other Diseases Caused By Genomic DNA Copy Number Variations

Enzo is a unique company with assay development know-how, backed by intellectual property, production, distribution, validation, and service capabilities. All of these skills combined in one company allow for the presentation to the market of open assay solutions that enable scientists to accurately and efficiently perform their cutting-edge research. Our extensive intellectual property portfolio allows us the freedom to operate, and our technical expertise enables us to provide optimized solutions to a multitude of platforms.

Included in our extensive IP portfolio are nucleic acid labeling chemistries that support Enzo's position as a recognized pioneer in labeling and detection in genomics. A pillar of our molecular biology portfolio is our array-based comparative genomic hybridization (array CGH) labeling kit.

Array CGH is a powerful tool for detecting gene copy number gains and losses associated with chromosome abnormalities. Detecting chromosomal aberrations by array CGH is faster, more robust, and provides superior results over other technologies such as FISH and G-banding karyotyping, thus providing a greater understanding of the role of chromosomal changes in genetic diseases and cancers.

Complete Solutions for CYTAG® CGH Analysis and CGH+SNP Analysis

- CYTAG CGH Labeling Kits for labeling DNA for CGH microarray analysis.
  Available in 20 and 200 reactions format.
- CYTAG TotalCGH Labeling Kits for CGH or CGH+SNP microarray analysis.
  Available in 20 and 200 reactions format.
- CYTAG SuperCGH Labeling Kits for for detecting DNA copy number gains and losses associated with chromosomal abnormalities in genetic diseases and cancers.
  Available in 20 and 200 reactions format.

	CYTAG CGH Labeling Kit		CYTAG TotalCGH Labeling Kit		CYTAG SuperCGH Labeling Kit	
KIT COMPONENTS	**ENZ-42671-K010 (2 x 10)**	**ENZ-42671-K100 (2 x 100)**	**ENZ-42674-0010 (2 x 10)**	**ENZ-42674-0100 (2 x 100)**	**ENZ-GEN120-0010 (2 x 10)**	**ENZ-GEN120-0100 (2 x 100)**
Primers/Reaction Buffer	1 x 400 µL	4 mL	1 x 400 µL	4 mL	1 x 400 µL	4 mL
Cyanine 3-dUTP Nucleotide Mix	2 x 50 µL	1 mL	2 x 50 µL	1 mL	100 µL	1 mL
Cyanine 5-dUTP Nucleotide Mix	2 x 50 µL	1 mL	2 x 50 µL	1 mL	100 µL	1 mL
Klenow DNA Polymerase	1 x 20 µL	0.2 mL	1 x 20 µL	0.2 mL	1 x 20 µL	200 µL
Stop Buffer	1 x 100 µL	1 mL	1 x 100 µL	1 mL	1 x 100 µL	1 mL
Nuclease-free Water	1 x 1 mL	10 mL	1 x 1 mL	10 mL	1 x 1 mL	10 mL
***Alu*I**	–	–	1000 units	1000 units	–	–
***Rsa*I**	–	–	1000 units	1000 units	–	–
PCR & Gel Clean-up Columns	–	–	20 tests	200 tests	20 tests	200 tests

ARRAY CGH WORKFLOW

DNA Sample

Reference gDNA (ENZ-GEN117,118) and Test Sample DNA

Will You Be Doing SNP Analysis?

NO | MAYBE | YES

Are Your Test Samples Low Input?

YES | NO | NO

Labeling Kit

SuperCGH | CGH | TotalCGH

Sample Labeling

Labeling of the DNA samples

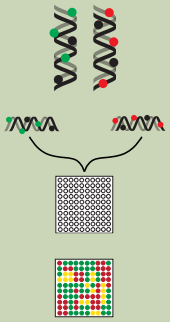
Purification of labeled DNA

Microarray Processing

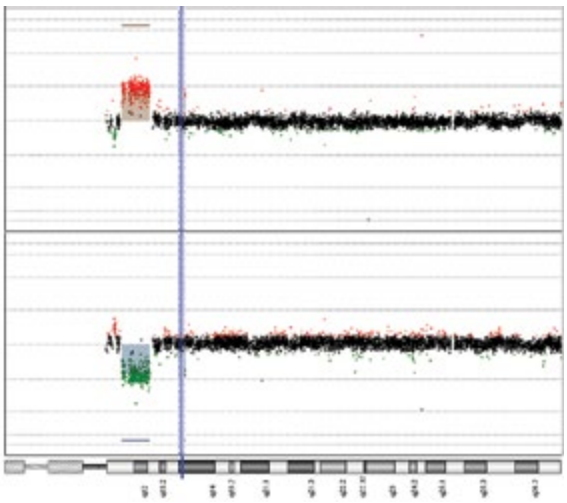
Preparation for hybridization

Hybridization

Oligo array scanning and analysis



Superior Results



Superior labeling delivers clear and accurate data analysis

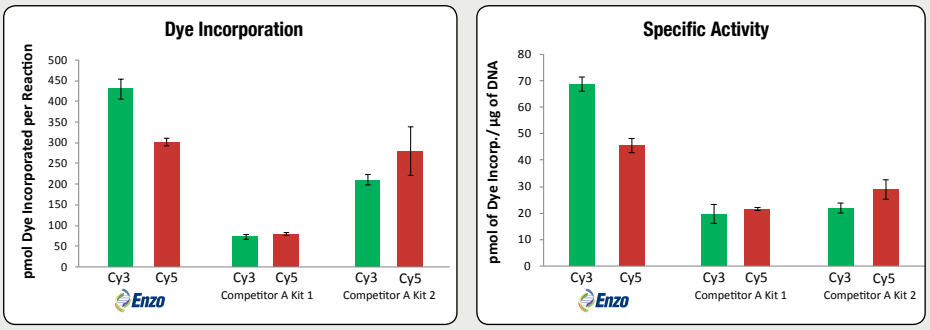
CYTAG® CGH Labeling Kits using an oligonucleotide microarray (Agilent® 4x180K) for analysis of syndromic DNA demonstrated the characteristic deletion in 15q11.2-q13 (chromosome 15) found in patients with Prader-Willi syndrome.

TOTAL SOLUTION FOR CGH+SNP ARRAYS

CYTAG® CGH Labeling Kits (ENZ-42671)

Superior Labeling Assures Confident Aberrant Calls and Reduces the Number of Failed Runs

- Lowest DLR scores (0.09 - 0.12) assure confident aberrant calls and reduces the number of failed runs
- Superior dye incorporation and high specific activity deliver better hybridization results
- Suitable for challenging samples including formalin-fixed paraffin embedded (FFPE) tissue
- Extensively tested on all commonly used array scanner platforms (including Agilent, Nimblegen, and Innopsys)
- Validated by customers on common microarrays (including Agilent and OGT)
- Wide range of input DNA (0.25 - 2.5 µg)



Enzo's proprietary labeling technology with superior dye incorporation leads to the highest specific activity.

Figure 1: Four replicate 500 ng DNA samples were labeled with Enzo's CYTAG CGH Labeling Kit for Oligo Arrays or a leading competitor's kits. Enzo's proprietary labeling technology generates the highest specific activity of labeling.

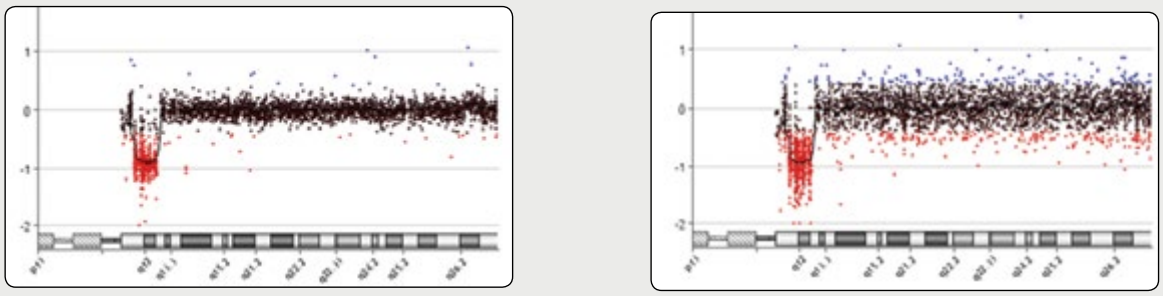
CYTAG® TotalCGH Labeling Kits (ENZ-42674)

More Confident Calls for CGH+SNP Arrays

All-inclusive kit containing optimized CGH labeling reagents and ancillary products for CGH+SNP arrays.

Kit includes:
CYTAG® CGH Labeling Kit
Restriction enzymes *Alu*I & *Rsa*I
PCR & Gel Clean-up Columns

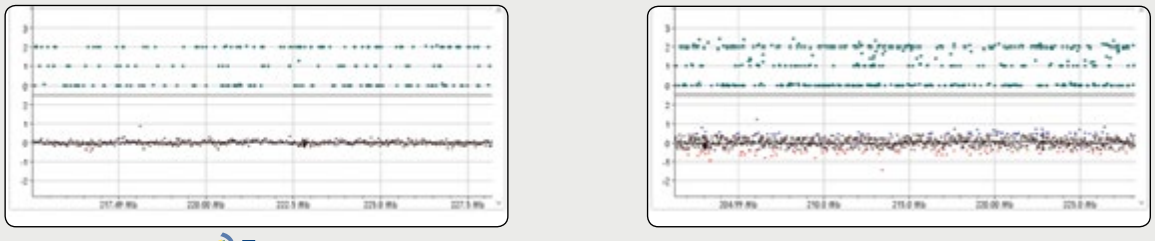
Comparative Analysis of Chromosome 15



Enzo **Competitor A**

Upon scanning, the quality of the labeling in DNA samples was visually inspected to demonstrate detection of known deletion in the Prader-Willi DNA. Enzo's CYTAG TotalCGH Labeling Kit when compared with Competitor A, demonstrates superior labeling with less background.

SNP Analysis of a Segment of Chromosome 2



Enzo **Competitor A**

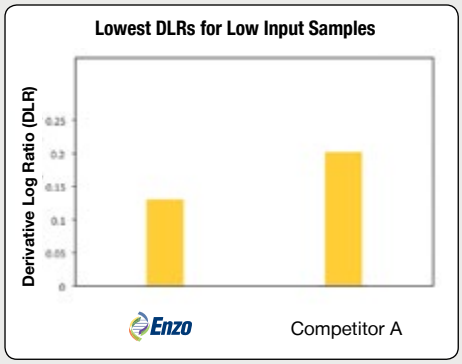
Enzo's CYTAG TotalCGH Labeling Kit cleanly identifies the sequence at single nucleotide polymorphisms (SNPs). compaired to SNP analysis of DNA labeled with Competitor A's labeling system which is not as clean.

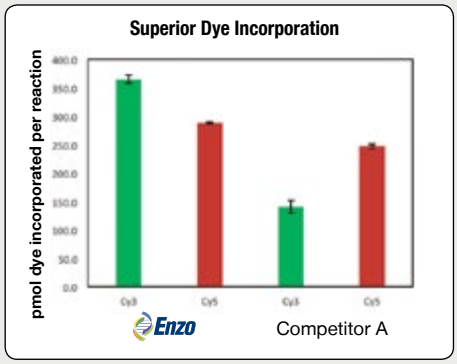
PROPRIETARY LABELING TECHNOLOGY

CYTAG® SuperCGH Labeling Kits (ENZ-GEN120)

For Low Input Samples

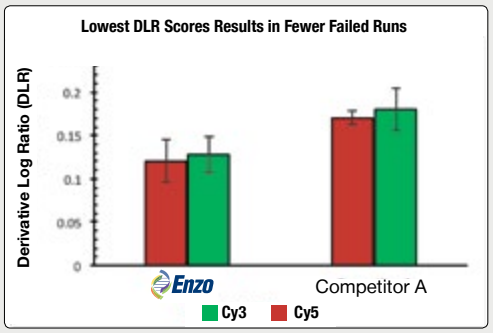
- Provides excellent dynamic analytical range down to 50 ng
- Suitable for precious low input samples, including small volume and concentration prenatal, postnatal, and oncological samples
- Superior DLR scores
- QC benchmarked and validated using high-resolution arrays
- High signal-to-noise ratio





Optimized, Trusted, and Highly Cited

Learn how the CYTAG CGH Labeling Kits can be used to label small volume samples (300 ng in 20 µL labeling volume).



Application Notes:

[Sensitivity of Comparative Genomic Hybridization Using Artificial Mosaicism and Small DNA Quantities]

[CGH Labeling Protocol for Prenatal Small Volumes of DNA]

[Labeling of Small DNA Quantities with CYTAG® SuperCGH Labeling Kit for Prenatal, Postnatal, and Oncological Diagnostics]

[Compatibility of CYTAG® CGH Labeling Kit from Enzo Life Sciences with SurePrint® G3 human CGH 1x1M microarrays from Agilent]

[Compatibility of CYTAG CGH Labeling Kit with Illumina 24sure Microarrays]

Widely Trusted. Highly Cited.

Adenoid Cystic Carcinoma
Costa, AF *et. al.* Analysis of MYB oncogene in transformed adenoid cystic carcinomas reveals distinct pathways of tumor progression. A.F. Lab. Invest. (2014) 94, 692.

Bladder Exstrophy
Evaluation of the ISL1 gene in the pathogenesis of bladder exstrophy in a Swedish cohort: S. Arkani, *et al.*; Hum. Genome Var. 5, 18009 (2018).

Breast Cancer
Schouten, PC *et. al.* Breast cancers with a BRCA1-like DNA copy number profile recur less often than expected after high-dose alkylating chemotherapy: P.C. Schouten, *et al.*; Clin. Cancer Res. 21, 763 (2015).

Copy number profiling by array comparative genomic hybridization identifies frequently occurring BRCA2-like male breast cancer: H.D. Biesma, *et al.*; Genes Chromosomes Cancer 54, 734 (2015).

Discovery of Tumor Suppressor Genes and Oncogenes
Protopopov, A *et. al.* Full Complexity Genomic Hybridization on 60-mer Oligonucleotide Microarrays for Array Comparative Genomic. Methods in Molecular Biology, (2008) 439, 87.

Human Genomic DNA
Derivative chromosomes involving 5p large rearranged segments went unnoticed with the use of conventional cytogenetics: E. Yokoyama, *et al.*; Mol. Cytogenet. 11, 30 (2018).

Metastatic Melanoma
Moore, S *et. al.* Detection of Copy Number Alterations in Metastatic Melanoma by a DNA Fluorescence *in situ* Hybridization Probe Panel and Array Comparative Genomic Hybridization: A Southwest Oncology Group Study (S9431). Clin Cancer Res 2927 (2008) 14, 2927.

Postnatal Testing for Genome Imbalance
Ahn *et. al.* Validation and implementation of array comparative genomic hybridization as a first line test in place of postnatal karyotyping for genome imbalance. Molecular Cytogenetics (2010), 3:9.

Prenatal Testing for Chromosome Imbalance
Ahn, JW *et. al.* A new direction for prenatal chromosome microarray testing: software-targeting for detection of clinically significant chromosome imbalance without equivocal findings. Peer J. (2014) 2, e354.

A.L. Mosca-Boidron, *et. al.* (2013) An improved method to extract DNA from 1mL of uncultured amniotic fluid from patients at less than 16 weeks' gestation. PLoS One 8, e59956.

Salivary Gland Carcinosarcoma
Vékony, H *et. al.* Salivary gland carcinosarcoma: Oligonucleotide array CGH reveals similar genomic profiles in epithelial and mesenchymal components. Oral Oncology (2009) 45, 259.

Solitary Median Maxillary Central Incisor Syndrome
Szakszon, K *et. al.* Endocrine and anatomical findings in a case of Solitary Median Maxillary Central Incisor Syndrome. (2012) 55, 109.

Stem Cells
M. Juhl, *et. al.* Comparison of clinical grade human platelet lysates for cultivation of mesenchymal stromal cells from bone marrow and adipose tissue: Scand. J. Clin. Lab. Invest. 76, 93 (2016).

A. Petrova, *et. al.* Induced pluripotent stem cell differentiation and three-dimensional tissue formation attenuate clonal epigenetic differences in trichohyalin. Stem. Cells. Dev. 25, 1366 (2016).

Uveal Melanoma
Worley, LA *et. al.* Transcriptomic versus Chromosomal Prognostic Markers and Clinical Outcome in Uveal Melanoma. Clin Cancer Res. (2007) 13, 1466.

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RELATED PRODUCTS	PRODUCT #	SIZE
BIOSCORE® Screening & Amplification Kit	ENZ-42440	20 reactions
PCR & Gel Clean-up Kit	ENZ-GEN100-0020, -0050, -0200	20, 50, 200 tests
Genomic DNA (human), male	ENZ-GEN106-0100	100 µg
Genomic DNA (human), female	ENZ-GEN107-0100	100 µg
Human Cot DNA	ENZ-GEN116-0500	500 µg
***Alu*I**	ENZ-GEN108-1000	1000 units
***Rsa*I**	ENZ-GEN109-1000	1000 units

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Put our experience to work for you!

Our broad range of scientific expertise and manufacturing capabilities enables us to provide innovative tools for CGH analysis to save you time and money!

MB21-080618