



GENOMICS & MOLECULAR BIOLOGY

Copy Number & SNP Detection

CYTAG® CGH Labeling Kit
CYTAG® TotalCGH Labeling Kit for CGH+SNP Array
BIOSCORE® Screening & Amplification Kit
BIOARRAY™ 3'-OH Terminal Labeling Kit

Gene Expression & Transcript Analysis

BIOARRAY™ RNA Amplification & Labeling Systems

DNA Amplification & Detection

AMPIGENE® PCR Solutions & qPCR Solutions
AMPIGENE® DNA Ladders
BIOPANEL® DNA Methylation Detection Kit
CYGREEN® Nucleic Acid Dye

RNA Reverse Transcription, Amplification & Detection

AMPIPROBE® HCV Assay Kit
cDNA Synthesis & Purification Kits
AMPIGENE® 1-Step RT-PCR Kit
AMPIGENE® 1-Step RT-qPCR Kit

In situ Hybridization

Labeling & Detection Systems
PATHO-GENE® & BIO-PROBE® Virus
Detection Assays and Probes
FLOWSCRIPT® HPV E6/E7 Assay

Nucleic Acid Labeling & FISH

Nick Translation Kit
Labeled & Modified Nucleotides
EQ Quencher Dyes

DNA Damage, Repair & Content Analysis

DNA Damage ELISA Kit
Comet SCGE Assay Kit



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CLEAR RESULTS WITH INNOVATIVE NUCLEIC ACID LABELING

Enabling Solutions for Genomics Analysis

With a passion for genomics, we were the first to develop non-radioactive labeling of nucleic acids. This technique was instrumental in the development of today's genomic analysis market, including nucleic acid-based diagnostic systems, sequencing the human genome, identification of genetic diseases, and detection of chromosomal abnormalities. Our innovations in the detection and labeling of nucleic acids in solutions and solid matrices led to the development of technology platforms such as hybrid capture, as well as fluorescent and chromogenic *in situ* hybridization. In addition, our IP portfolio contains key patents that describe real-time nucleic acid tests. Our work in the genomic space has resulted in technologies in gene expression and immune regulation, which opened the door for the well-known molecular diagnostics assays used today. Enzo remains at the forefront of target amplification technologies critical in the detection of infectious agents, cancer markers, and genotyping.

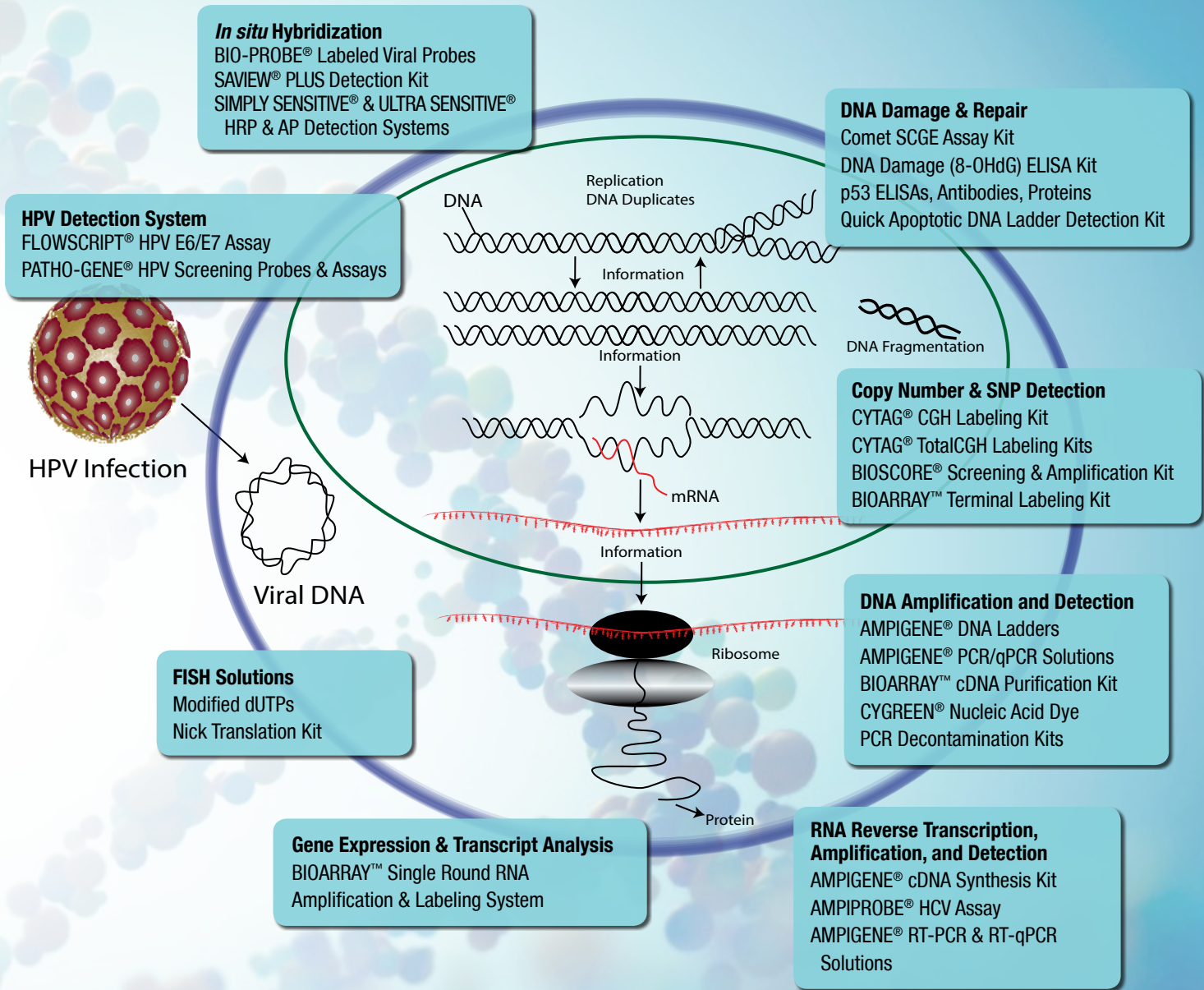
A pillar of our molecular biology portfolio is CYTAG[®], an array-based comparative genomic hybridization (aCGH) kit, a powerful platform for detecting DNA copy number gains and losses associated with chromosome abnormalities. Array CGH provides a greater understanding and characterization of genetic disorders, cancers, and other genomic aberrations.

Supporting our CYTAG[®] kits are a variety of everyday-use molecular biology products designed to maximize the quantity and quality of data generated from your valuable samples. These include RNA and DNA amplification kits, as well as labeling systems and modified nucleotides designed for creating biotin- or fluorophore-labeled nucleic acid probes for a variety of applications and detection platforms. These products have been specifically designed to provide optimal performance in Nick Translation reactions or with microarrays.

AMPIGENE[®] PCR and qPCR products enhance the speed, yield and specificity of your PCR. Available in a wide variety of formats and compatible with many platforms, AMPIGENE[®] PCR and qPCR kits have optimized enhancers and stabilizers to improve sensitivity and specificity of amplification.

Our AMPIPROBE[®] technology incorporates probe detection technology in primer design. It employs a combination of fluorescent reporter-labeled primers and quencher-labeled primers to amplify DNA. Our AMPIPROBE[®] assay kits are compatible with open qPCR platforms, allowing for smaller sample input, and offers smaller reaction volume, which consumes less reagent per test.

As a global leader in HPV detection, we specialize in developing high-quality assays to improve your gene expression analysis. Our panel of PATHO-GENE[®] kits provides high-specificity probes used to classify human papillomavirus (HPV) genotypes in tissue sections by *in situ* hybridization. The FLOWSCRIPT[®] HPV E6/E7 Assay is a flow cytometry-based assay for the detection of mRNA transcripts which code for the expression of the oncogenic proteins, E6 and E7, produced during infection by high-risk human papillomavirus. The assay employs a novel *in situ* hybridization technique utilizing a cocktail of oligonucleotide probes specific to multiple targets within the E6 and E7 genes to ensure the detection of these transcripts from most known variants of high-risk HPV. The FLOWSCRIPT[®] platform is anticipated to be further utilized for applications related to cancer, immune-mediated disorders, patient monitoring and drug development.



*Molecular biologists needed reliable
 fluorescent nucleic acid labeling systems
 ... we invented them.*

COPY NUMBER & SNP DETECTION

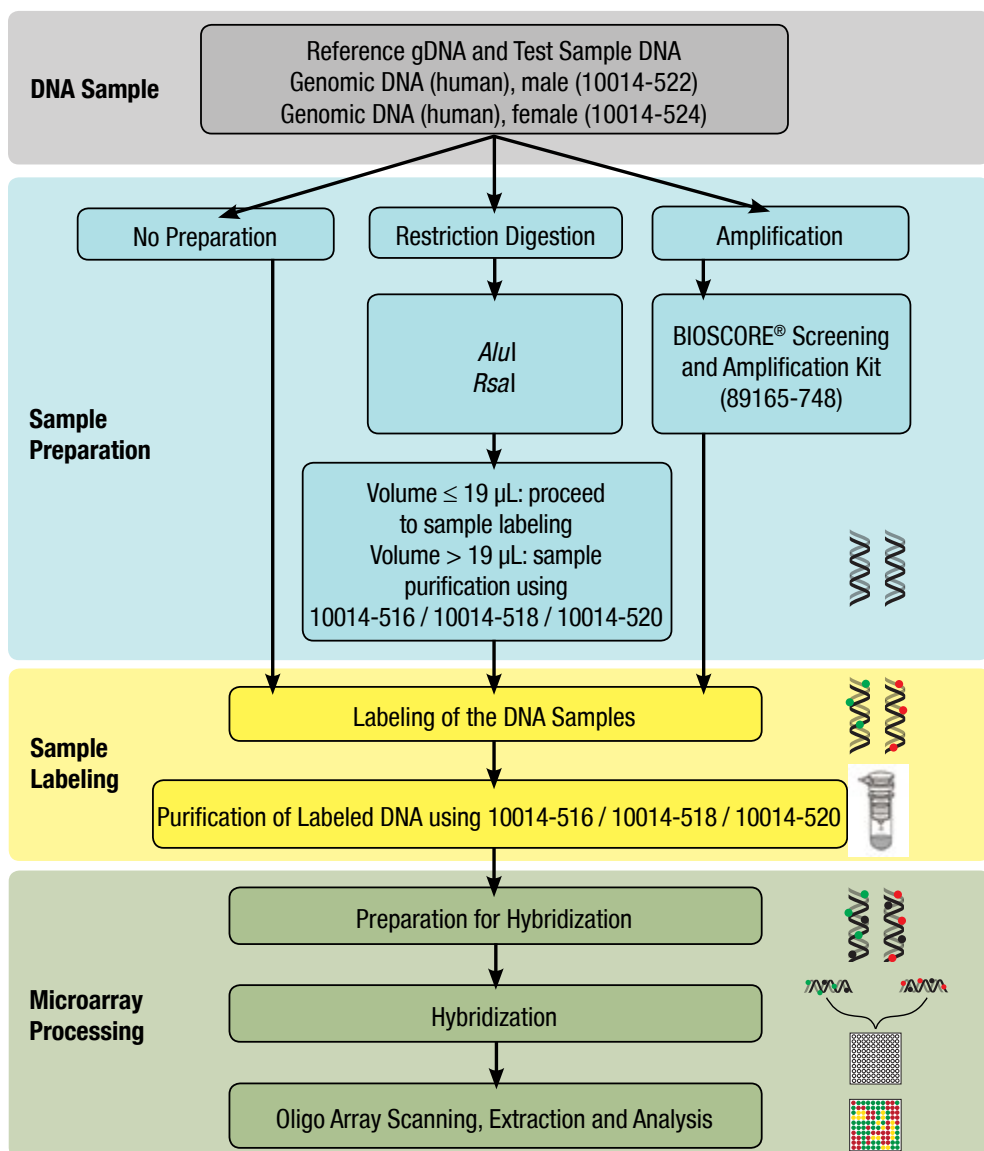
CYTAG® CGH LABELING KIT

Exceptional CGH labeling kit deliver superior results and fewer errors for better understanding of genetic disorders, cancers, and other diseases caused by genomic DNA copy number variations

Array-based comparative genomic hybridization (aCGH) is a powerful tool for detecting gene copy number gains and losses associated with chromosome abnormalities. Detecting chromosomal aberrations by aCGH 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.

The proprietary labeling technology and high-performance dyes incorporated into our array CGH kits enhance performance with commonly implemented microarray platforms (e.g., Agilent® arrays). Superior labeling technology results in more uniform dye incorporation so that comparisons between genomes is done at higher resolution and with improved signal-to-noise ratios. High quality data provides fewer errors (false positive or false negative) and less time with manual analysis of the data, thereby increasing efficiencies.

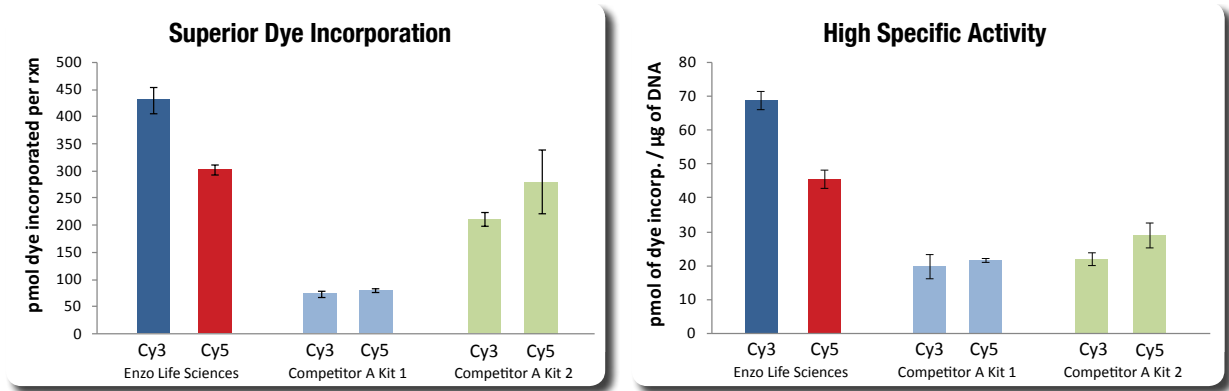
- Proprietary labeling technology increases dye incorporation to reduce reaction failure rates, and deliver the most consistent and reliable results
- Increased resolution for comprehensive, unbiased analysis of DNA copy number changes
- Generates the lowest DLR scores, exceeding industry standards
- Suitable for challenging samples (including formalin-fixed paraffin-embedded tissue)



PROTOCOL OVERVIEW	
Input DNA	0.25 - 2.5 µg
Digest DNA	Optional
Denature DNA and Anneal Random Primers	Mix DNA (19 µL), Primers/Reaction Buffer (20 µL) Add water to 39 µL Heat 99°C, 20 min Ice 5 min, Centrifuge, Ice
Extend Primers with Klenow Exo-DNA Polymerase	Add Cy Nucleotide Mix (10 µL) and Klenow (1 µL) Incubate 2-4 h, 37°C Add Stop Buffer (5 µL) Heat 10 min 65°C
Purify Labeled DNA	PCR & Gel Clean-up Columns
Block Repetitive Sequences with Cot-1	Combine Labeled DNA Block with Cot-1 DNA

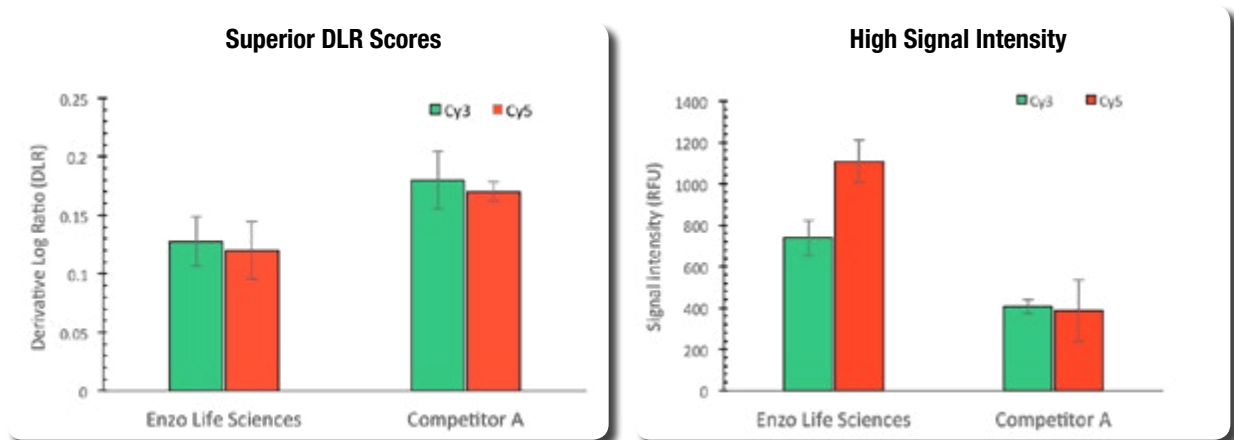
CYTAG® CGH Labeling Kit provides superior labeling efficiency and better dye incorporation resulting in fewer failed runs.

Enzo's proprietary labeling technology delivers excellent DNA yields with superior dye incorporation leading to the highest specific activity of labeling.



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

Our labeling protocol can be altered for small volumes of precious sample, still resulting in superior DLR scores and signal intensity compared to the leading competitor.



Small volume labeling protocol used to label prenatal DNA (300 ng in 20 µL). Significantly improved DLR (left) and higher signal intensity (right) after labeling with Enzo's CYTAG® CGH Labeling Kit when compared with the competitor's DNA labeling kit.

Description	Cat. No.	Description	Cat. No.
BIOSCREEN® Screening & Amplification Kit	89165-748	PCR & Gel Clean-up Column	10014-516 10014-518 10014-520
CYTAG® CGH Labeling Kit	10014-576 10014-578	Genomic DNA (h), male	10014-522
CYTAG® TotalCGH Labeling Kit	75802-910	Genomic DNA (h), female	10014-524

CYTAG® TOTALCGH LABELING KIT

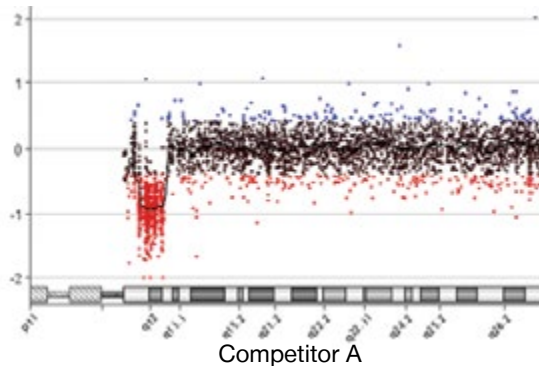
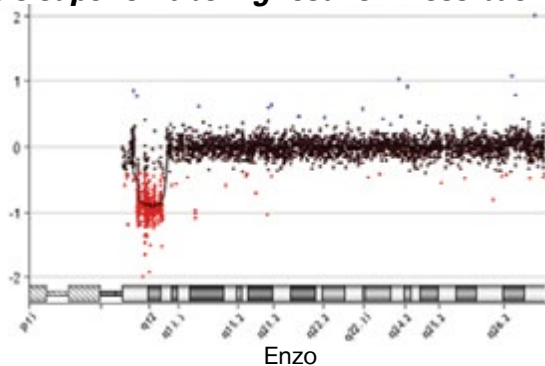
Superior labeling efficiency and better dye incorporation results in less failed runs

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

CYTAG® TotalCGH Labeling Kit includes:

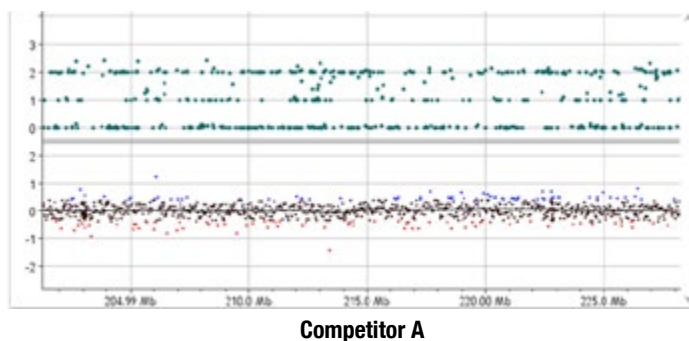
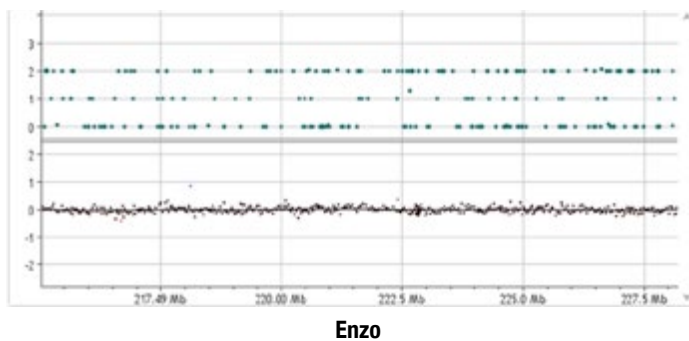
- CYTAG® CGH Labeling Kit
- Restriction enzymes *AluI* and *RsaI*
- PCR Gel and Clean-up Columns

Enzo's superior labeling results in less background



Comparative analysis of chromosome 15. Upon scanning, the quality of the labeling in DNA samples was visually inspected to demonstrate detection of known deletion in the Prader-Willi DNA. This demonstrates the superior labeling obtained with Enzo's CYTAG® TotalCGH Labeling Kit when compared with leading competitor.

Higher signal-to-noise ratios and lower DLR scores enable the clear identification of SNPs



Enzo's CYTAG® TotalCGH Labeling kit and a competitor's labeling kit were used to label digested DNA and hybridized to an Agilent CGH+SNP array.

	CYTAG® CGH Labeling Kit (10014-576 / 10014-578)		CYTAG® TotalCGH Labeling Kit (75802-910)	
KIT COMPONENTS	(2 x 10)	(2 x 100)	(2 x 10)	(2 x 100)
Primers/Reaction Buffer	2 x 10 reactions	2 x 100 reactions	2 x 10 reactions	2 x 100 reactions
Cyanine 3-dUTP Nucleotide Mix	2 x 50 µL	1 mL	2 x 50 µL	1 mL
Cyanine 5-dUTP Nucleotide Mix	2 x 50 µL	1 mL	2 x 50 µL	1 mL
Klenow DNA Polymerase	1 x 20 µL	0.2 mL	1 x 20 µL	0.2 mL
Stop Buffer	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
<i>AluI</i>	–	–	1000 Units	1000 Units
<i>RsaI</i>	–	–	1000 Units	1000 Units
PCR & Gel Clean-up Columns	–	–	20 Tests	200 Tests

BIOSCORE® SCREENING & AMPLIFICATION KIT

Avoid wasting expensive microarrays and labeling kits on low quality DNA with the BIOSCORE® Screening and Amplification Kit

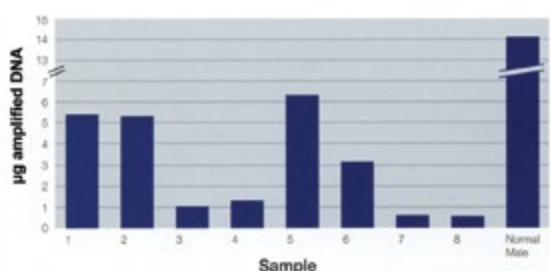
The dual-purpose BIOSCORE® Screening and Amplification kit utilizes a novel whole genome amplification (WGA) method to identify genomic DNA samples that are suitable for microarray analysis prior to labeling and to predict sample performance with virtually 100% predictability. The kit discriminates FFPE DNA quality based on the yield of amplification product produced in one hour via an isothermal WGA reaction that is capable of generating more than 10 µg of DNA from 100 ng high-quality template DNA (isolated starting material). Genomic DNA isolated from any source can serve as the template in an amplification reaction.

- DNA quality is scored as Poor, Intermediate, Good, or Excellent. Samples that amplify in the Poor range are not suitable for microarray analysis. Intermediate or Good FFPE samples can be directly labeled using our CYTAG® CGH or TotalCGH Labeling Kits.
- Direct, unbiased and uniform whole genome DNA amplification from FFPE samples for microarray analysis
- Predicts FFPE sample performance on microarrays with virtually 100% concordance
- Generate higher DNA yields and improved signal-to-background ratios on arrays for more accurate data interpretation
- Rapid, semi-quantitative results in 1 hour

Predict FFPE Sample DNA Quality with Confidence

Results from BIOSCORE® Screening and Amplification Kit (FFPE-isolated tissue)

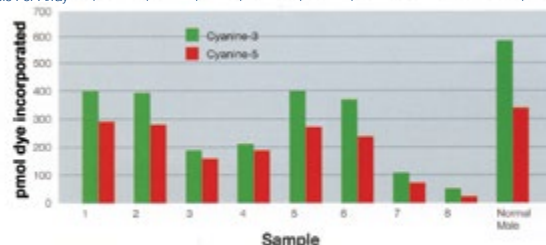
BIOSCORE® Prediction Good Good Int Int Good Good Poor Poor Excellent



Yields of amplified genomic DNA from several different FFPE breast tumor samples.

Results from CYTAG® CGH Labeling Kit for Oligo Arrays (FFPE-isolated tissue)

BIOSCORE® Prediction Good Good Int Int Good Good Poor Poor Excellent
Labeling Result Suitable For Array + + + + + + - - +



Incorporation of cyanine-modified nucleotides into genomic DNA from several different FFPE breast tumor tissue samples.

References:

1. M.A. Vollebergh, *et al.* Genomic patterns resembling BRCA1- and BRCA2-mutated breast cancers predict benefit of intensified carboplatin-based chemotherapy. *Breast Cancer Res.* 16, R47 (2014).
2. M. Bierkens, *et al.* Focal aberrations indicate EYA2 and hsa-miR-375 as oncogene and tumor suppressor in cervical carcinogenesis. *Genes Chromosomes Cancer* 52, 56 (2013).
3. J.Y. Chung, *et al.* A pressure cooking-based DNA extraction from archival formalin-fixed, paraffin-embedded tissue. *Anal. Biochem.* 425, 128 (2012).
4. L.J. Mekenkamp, *et al.* Beyond KRAS mutation status: influence of KRAS copy number status and microRNAs on clinical outcome to cetuximab in metastatic colorectal cancer. *BMC Cancer* 12, 292 (2012).
5. S. Liao, *et al.* Differential copy number aberrations in novel candidate genes associated with progression from in situ to invasive ductal carcinoma of the breast. *Genes Chromosomes Cancer* 51, 1067 (2012).

BIOARRAY™ 3'-OH TERMINAL LABELING KIT

BIOARRAY™ 3'-OH Terminal Labeling is the recognized benchmark standard for biotin labeling of DNA

The kit is considered the gold standard end-labeling system for use with Affymetrix® DNA SNP (single nucleotide polymorphism), resequencing and prokaryotic microarrays. This method uses Bio-ddUTP and terminal deoxynucleotide transferase to catalyze the addition of a single biotin-ddUMP (2',3'-dideoxyuridine 5'-monophosphate) to the 3'-OH terminus of an amplified and fragmented target DNA molecule.

- Gold standard end-labeling system
- Label up to 100 picomoles (equivalent to 1 µg of a 30-nucleotide sequence)
- Compatible with Affymetrix® DNA SNP, Resequencing and Prokaryotic microarrays
- Eliminates sequence bias that occurs with Nick Translation or random priming

Description	Cat. No.	Size
BIOARRAY™ 3'-OH Terminal Labeling	89165-766	25 Reactions

GENE EXPRESSION & TRANSCRIPT ANALYSIS

BIOARRAY™ RNA AMPLIFICATION & LABELING SYSTEMS

Improved data quality and analysis results through greater biotin incorporation with the Single Round RNA Amplification and Biotin Labeling System for transcriptional analysis

Biotin-labeled antisense RNA (aRNA) is generated from total cellular RNA samples in less than 24 hours. Incorporation of two biotin nucleotides yields brighter signal, improving data from microarray experiments.

- Convenient workflow with a flexible 4-16 hour transcription time and reagents supplied in a ready-to-use format
- Decrease experimental variation, and standardize data derived from microarrays
- Maintain the value of legacy data by the continued use of the gold standard for GeneChip® visualization
- Enables correlation of results from experiment-to-experiment, project-to-project and lab-to-lab
- Production of large amounts of biotin-labeled RNA targets by *in vitro* transcription from bacteriophage T7 RNA polymerase promoters is available separately with our BIOARRAY HIGHYIELD® RNA Transcript Labeling Kits

References:

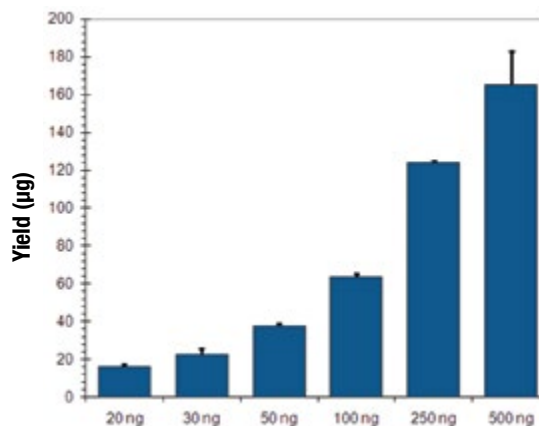
1. Rosen, MB *et al.* Gene Expression Profiling in Wild-Type and PPAR α -Null Mice Exposed to Perfluorooctane Sulfonate Reveals PPAR α -Independent Effects. PPAR Research Volume 2010, Article ID 794739, doi:10.1155/2010/794739.
2. Grosheva, I *et al.* Caldesmon effects on the actin cytoskeleton and cell adhesion in cultures HTM cells. Experimental Eye Research. Volume 82, issue 6, June 2006, 945-958.

BIOARRAY™ Low Input RNA Amplification and Biotin Labeling System for transcript analysis

Analyze limiting quantities of total RNA with high-quality biotin labeling.

- Generates sufficient aRNA for standard microarray analysis from as little as 20 ng of total input RNA
- Entire amplification reaction can be performed in a single tube
- Superior 3'/5' transcript ratios demonstrating efficient *in vitro* transcription
- Biotin-labeled aRNA can be purified using either magnetic beads or purification columns and reagents

As little as 20 ng total RNA input produces sufficient amounts of aRNA for microarrays



Universal Human Reference RNA ranging from 20 ng to 500 ng was amplified in triplicate using BIOARRAY™ Low Input RNA Amplification and Biotin Labeling System. The lowest amount of input (20 ng) generated enough labeled aRNA for microarray analysis.

Description	Cat. No.	Size
BIOARRAY™ Single Round RNA Amplification and Biotin Labeling System	89165-744	10 Reactions
	89165-746	100 Reactions
BIOARRAY™ Low Input RNA Amplification and Biotin Labeling System	10014-574	10 Reactions
BIOARRAY™ Eukaryotic Hybridization Controls	89165-778 / 89165-780	30, 50 Reactions
BIOARRAY HIGHYIELD® RNA Transcript Labeling Kit	89165-768 / 89165-770 89165-776	10, 20, 40, 100 Reactions

DNA AMPLIFICATION & DETECTION

AMPIGENE® PCR SOLUTIONS

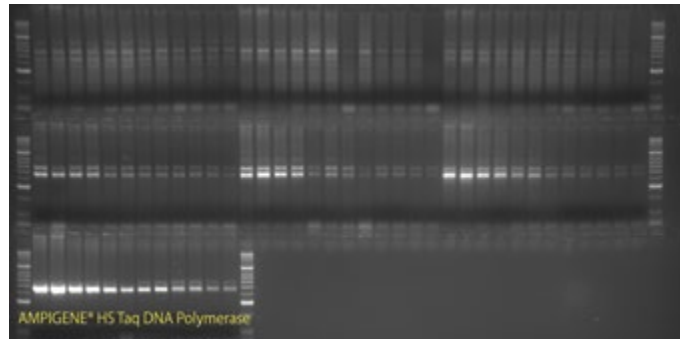
PCR with enhanced speed, yield, and specificity

AMPIGENE® PCR products use the latest developments in polymerase technology and buffer chemistry to optimize PCR. AMPIGENE® Taq Mixes and DNA Polymerases all include stabilizers, enhancers, buffers, polymerases, dNTPs, and magnesium to enable efficient standard PCR.

- Advanced hot-start DNA polymerase
- Optimized buffer system for efficient amplification
- Resistant to PCR inhibitors and suitable for unprocessed samples

Higher yield and sensitivity. 450bp fragment of the human myc gene was amplified with AMPIGENE® Taq and compared with Taq Polymerases from other suppliers. AMPIGENE® Taq delivers higher yield and sensitivity as compared with all six competing products.

AMPIGENE® HS Taq Mixes and HS DNA Polymerase utilize hot-start technology to allow for more sample types and increased PCR sensitivity

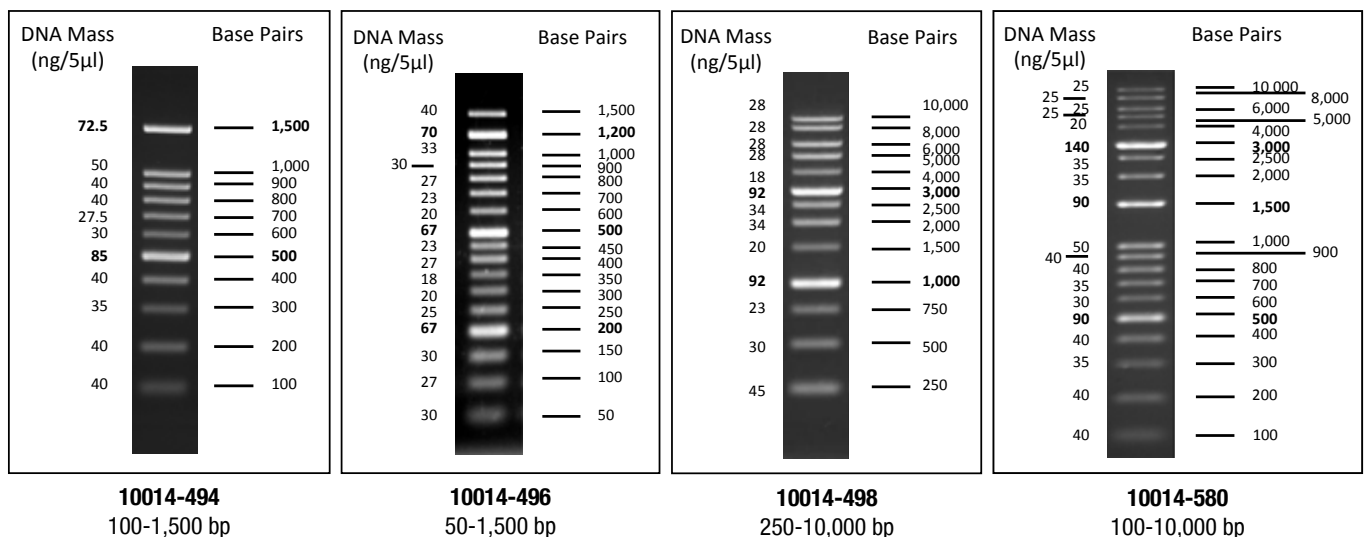


Description	Cat. No.	Size	Information
AMPIGENE® Taq Polymerase	10014-680	500 Units	For standard PCR. Contains: AMPIGENE® Taq DNA Polymerase (5U/μL), 5x AMPIGENE® Reaction buffer (with dNTPs)
AMPIGENE® HS Taq DNA Polymerase	10014-682	500 Units	Increased sensitivity PCR. Contains: AMPIGENE® HS Taq DNA Polymerase (5U/μL), 5x AMPIGENE® rxn buffer (with dNTPs)
AMPIGENE® Taq Mix	10014-616 / 10014-618 10014-620	40, 200, 1000 Reactions	For standard PCR. Contains: 2x AMPIGENE® Taq Mix
AMPIGENE® HS Taq Mix	10014-622 / 10014-624 10014-626	40, 200, 1000 Reactions	Increased sensitivity PCR. Contains: 2x AMPIGENE® HS Taq Mix
AMPIGENE® dNTP Mix	10014-628	500 μL (10 mM)	Ultra-pure, stable, and suitable for a variety of PCR applications

AMPIGENE® DNA LADDERS

AMPIGENE® DNA Ladders contain DNA fragments in a wide range that can be used as molecular weight standards for agarose gel electrophoresis. The bands are evenly spaced and have easily identifiable reference bands. The approximate mass of DNA in each of the bands is provided, assuming 5 μL load, for determining the approximate mass of DNA in samples with comparable intensity and size.

- Ready-to-use format can be loaded straight onto a gel
- Evenly spaced bands with intensified reference bands
- Room temperature stable

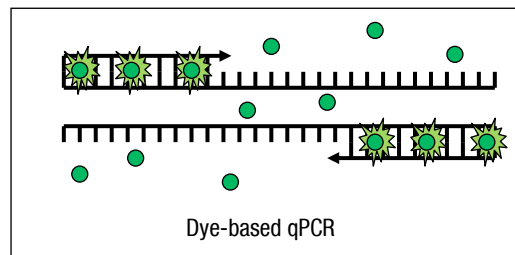


AMPIGENE® qPCR SOLUTIONS

AMPIGENE® qPCR mixes use the latest developments in polymerase technology and buffer chemistry to deliver high-performing, dye- and probe-based real-time PCR with minimal optimization

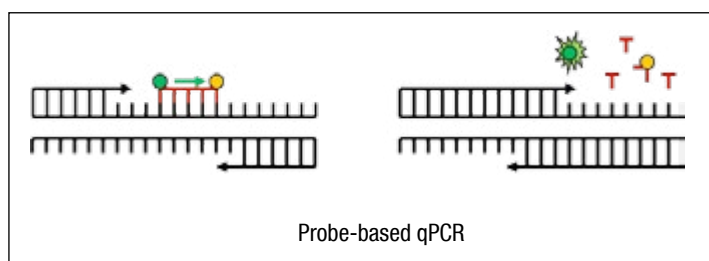
AMPIGENE® qPCR Green Mixes use an intercalating dye that does not interfere with PCR

- For dye-based qPCR applications
- Enhancers and stabilizers improve reaction sensitivity and specificity
- Available with different ROX reference dye concentrations, compatible with many platforms



AMPIGENE® qPCR Probe Mixes are designed for use on a wide range of probe technologies

- For probe-based qPCR applications
- Can be used with Taqman®, Molecular Beacons®, and Scorpion® probes
- For dye-based qPCR applications
- Enhancers and stabilizers improve reaction sensitivity and specificity
- Available with different ROX reference dye concentrations, compatible with many platforms



Description	Cat. No.	Size	Information
AMPIGENE® qPCR Green Mix	Lo-ROX Hi-ROX	10014-630 / 10014-632 10014-634 / 10014-506	200, 1000 Reactions
AMPIGENE® qPCR Probe Mix	Lo-ROX Hi-ROX No-ROX	10014-508 / 10014-510 10014-652 / 10014-654 10014-656 / 10014-658	200, 1000 Reactions

Choose the appropriate ROX concentration for your platform

Manufacturer	Instrument	Lo-ROX	Hi-ROX	No-ROX
Analytica Jena	qTower	✓	✓	✓
Applied Biosystems	7500, 7500 FAST, ViiA7™	✓		✓
Applied Biosystems	7000, 7300, 7700, 7900, 7900HT, 7900HT FAST, StepOne™, StepOne™ Plus		✓	
Bio-Rad®	iCycler®, MyiQ®, iQ™5, Opticon™, Opticon™2, Chromo4™, MiniOpticon™, CFX96™, CFX384™	✓		✓
Cepheid®	Smartcycler®	✓	✓	✓
Eppendorf	Mastercycler® ep realplex, Mastercycler® realplex 2S	✓	✓	✓
Illumina®	Eco™	✓	✓	✓
Qiagen/Corbett	Rotor-Gene™ 3000, 6000, Q	✓	✓	✓
Qiagen/Corbett	Lightcycler®480, Lightcycler®Nano	✓	✓	✓
Stratagene (Agilent)	MX 4000P®, MX 3000P®, MX 3005P®	✓		✓
Takara	Cycler Dice®	✓	✓	✓
Techne	Quanta®	✓	✓	✓

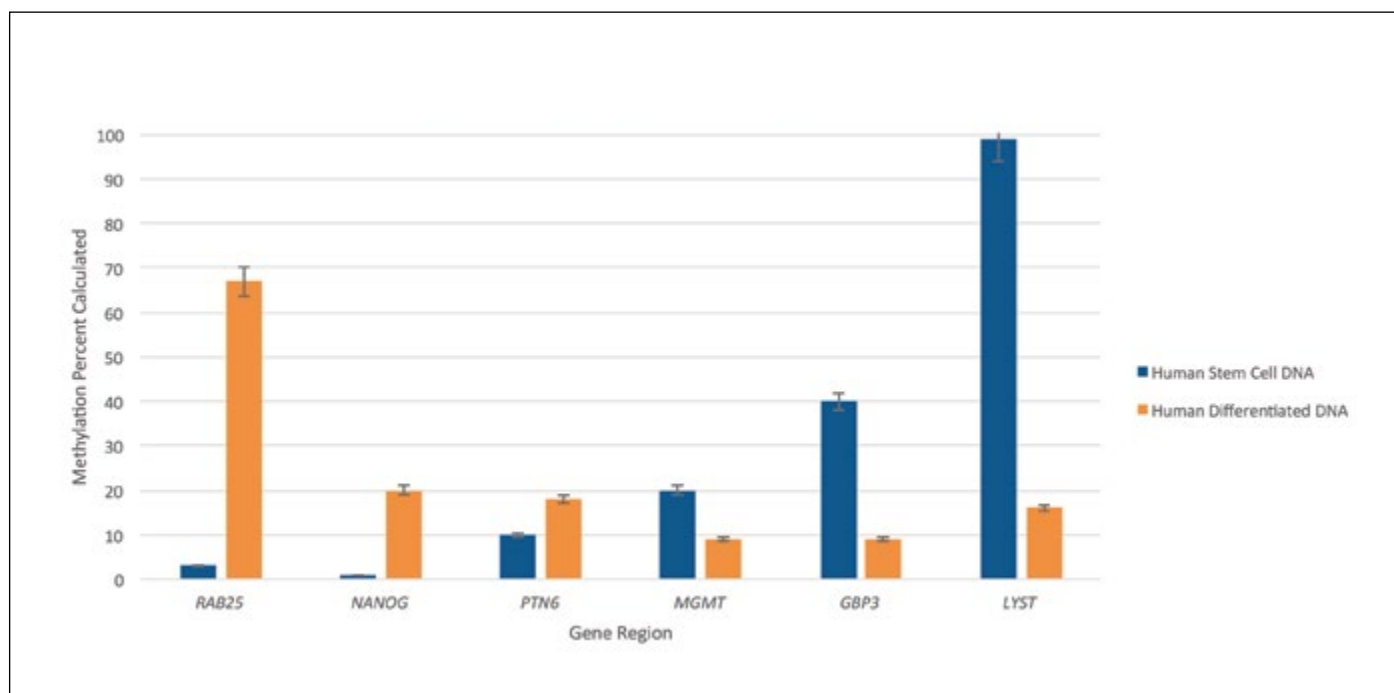
BIOPANEL® DNA METHYLATION DETECTION KIT

Real-time PCR-Based DNA Methylation Detection

The BIOPANEL® methylation detection kit for pluripotent human stem cells provides a simple and bisulfite-free procedure for rapid, DNA methylation assessment in any cell type.

- Eliminate the need for bisulfite conversion
- Determine % methylation of specific regions in less than 5 hours
- Identifies region-specific DNA methylation in RAB25, NANOG, PTPN6, MGMT, GBP3, and LYST gene promoters

Quantifying Methylation to Determine Pluripotency State of Cells



This graph shows an example of difference in methylation percentages for RAB25, NANOG, PTPN6, NGNT, GBP3 and LYST. Human differentiation DNA (orange bars) and human stem cell DNA (blue bars) percentages were calculated following Ct calculations.

Description	Cat. No.	Size
BIOPANEL® Methylation Detection Kit for Human Pluripotent Stem Cells (Light Cycler™ 480 RT PCR)	10136-024	96 Wells
BIOPANEL® Methylation Detection Kit for Human Pluripotent Stem Cells (CFX Touch™ RT PCR)	10136-026	96 Wells
BIOPANEL® Methylation Detection Kit for Human Pluripotent Stem Cells (7500™ or 7900™ RT PCR)	10136-028	96 Wells
BIOPANEL® Methylation Detection Kit for Human Pluripotent Stem Cells (custom format)	10136-030	48 Wells

CYGREEN® NUCLEIC ACID DYE

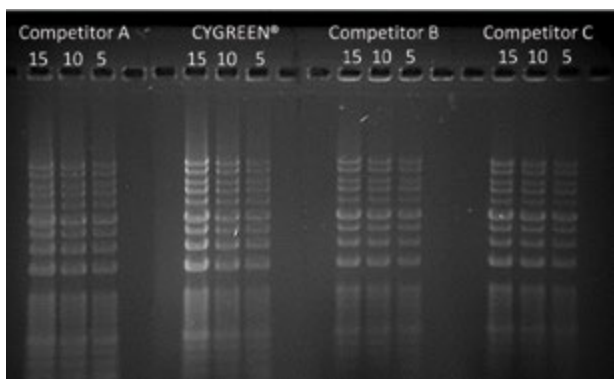
Nucleic Acid Dye for Gel Staining and Higher Sensitivity qPCR

CYGREEN® Nucleic Acid Dye is a DNA intercalating agent that is used to stain DNA. The DNA-dye complex emits a fluorescence spectra that makes it suitable for qPCR and gel staining applications. CYGREEN® Nucleic Acid Dye has excitation/emission spectra similar to commonly used qPCR dyes and can be substituted in to increase sensitivity and reduce cost.

Key Features

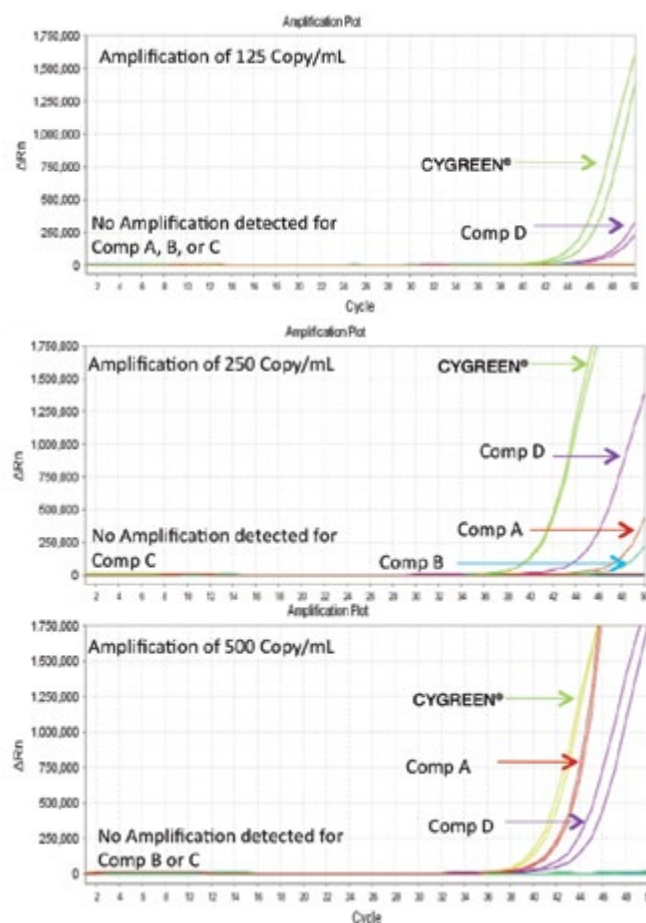
- Higher sensitivity allows detection of low target concentration
- Greater PCR efficiency for accurate and reproducible results
- Soluble in water for higher stability
- Compatible with various enzyme systems
- Suitable for commonly used rotor-type and plate-type qPCR platforms
- Validated for qPCR applications and gel staining
- Lower cost per assay compared to commonly used dyes

CYGREEN® Dye shows bright gel staining equivalent to or better than competitors



5, 10 and 15 µL of AMPIGENE® DNA Ladder 100-10,000 bp (Cat. No. 10014-580) were loaded onto a 1% Agarose gel in TAE buffer and run for 1h at 100 v. Gel was sectioned and stained for 1h with CYGREEN® Dye or with 3 other competitors.

CYGREEN® Nucleic Acid Dye has higher sensitivity than competitor dyes



CYGREEN® Nucleic Acid Dye and 4 other competitor dyes were used in qPCR reactions with varying target concentrations.

RNA REVERSE TRANSCRIPTION, AMPLIFICATION & DETECTION

AMPIPROBE® HCV ASSAY KIT

Sensitive and Unique qPCR Assay for Quantifying HCV Viral Load

The AMPIPROBE® HCV Assay Kit is a quantitative reverse transcription polymerase chain reaction (RT-qPCR) assay for the quantitative detection of human Hepatitis C Virus (HCV) RNA in plasma or serum. The proprietary primer mix included in the kit is specific for HCV genotypes 1 through 6.

AMPIPROBE® technology incorporates probe detection technology in primer design. It employs a combination of fluorescent reporter-labeled primers and quencher-labeled primers to amplify DNA, akin to traditional PCR. When free in solution, fluorescent primers generate a signal. However, as the primers are incorporated into amplified DNA, the quencher and the fluorophore are brought within close proximity and exhibit Förster resonance energy transfer (FRET). This causes a logarithmic decay of signal with respect to the number of amplification cycles of DNA. Once the signal decays to a defined threshold, a value is generated with respect to the corresponding cycle. The threshold cycle is indicative of the amount of target RNA or DNA in the sample.

*AMPIPROBE® HCV assay offers
50% greater sensitivity over leading
commercially available tests.*

Quantifying HCV RNA is a well-established method for measuring baseline viral loads and response to treatment. HCV RNA can be detected in plasma or serum by extraction and amplification of nucleic acids. Enzo Life Sciences' new AMPIPROBE® HCV Assay Kit uses a novel probe system to accurately quantify HCV RNA.

Key Benefits

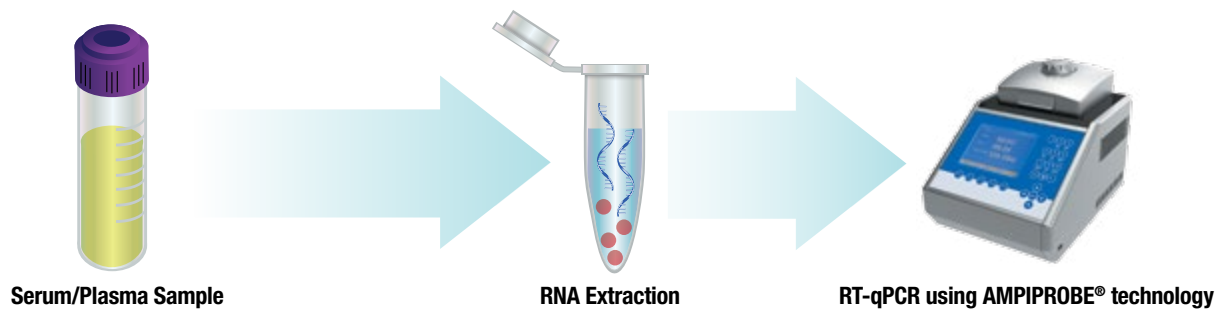
- Sensitive quantitation of HCV viral load
 - LOD Serum = 5.5 IU/mL*
 - LOD Plasma = 7.9 IU/mL*
- Low-cost alternative to other methods of viral load detection
- Compatible with most open qPCR platforms
- Complete set of controls including:
 - High, medium, and low quantification controls
 - Internal sample extraction control
 - Negative control
- Smaller sample input allows remaining extracted samples to be used in other tests

The AMPIPROBE® HCV was tested side-by-side and exceeded the specifications of the current market leader

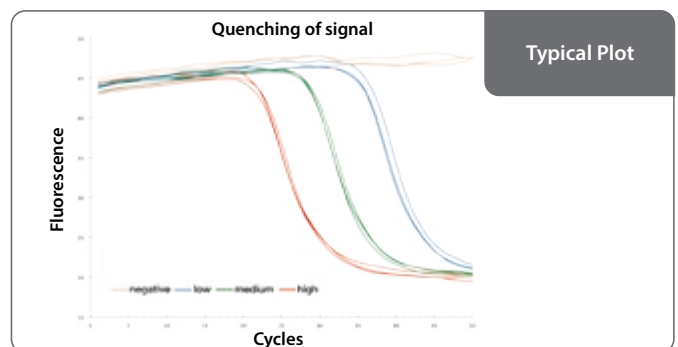
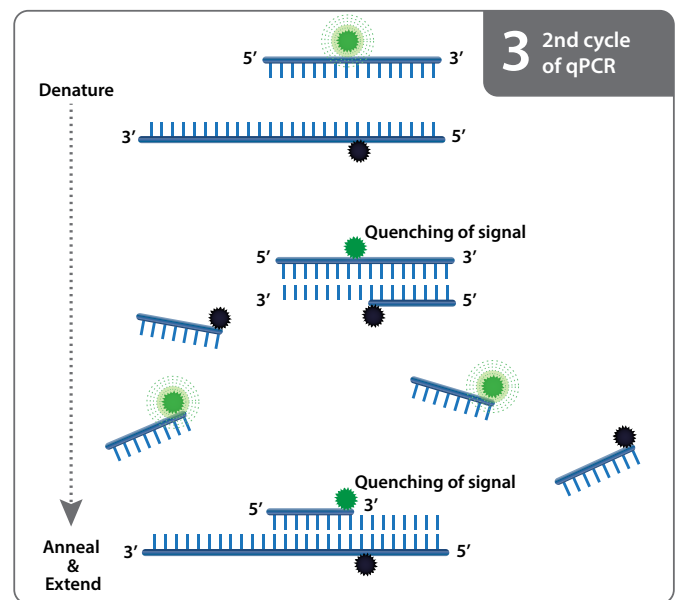
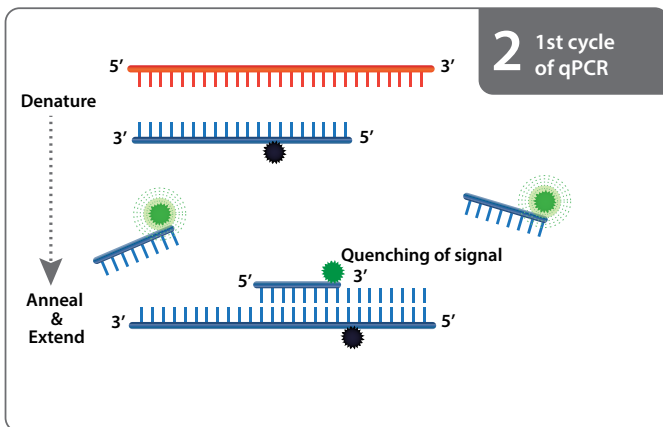
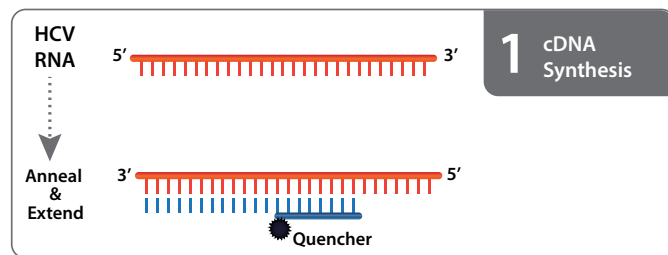
	ENZO	EXISTING
Reported Sensitivity	10 IU/mL	15 IU/mL
Sample Volume	600 µL	650 µL
LOD* Plasma	7.9 IU/mL	11 IU/mL
LOD* Serum	5.5 IU/mL	12 IU/mL

*Limit of detection via 95% hit rate Probit analysis determined in a validation study approved by the New York State Department of Health.

AMPIPROBE® HCV: Sensitive Quantification of Viral Load



Principles of HCV assay



cDNA SYNTHESIS AND PURIFICATION KIT

AMPIGENE® cDNA Synthesis Kit provides efficient and sensitive cDNA synthesis for downstream qPCR

AMPIGENE® cDNA Synthesis Kit uses the latest developments in reverse transcriptase (RTase) technology and buffer chemistry for efficient and accurate cDNA synthesis.

- Thermostable and extremely active MMLV RTase
- Blended with RNase inhibitor to prevent degradation of RNA by contaminating RNase
- Enhanced buffer system for efficient synthesis
- Optimized random hexamer and anchored oligo(dT) concentrations for generation of cDNA for qPCR

Description	Cat. No.	Size
AMPIGENE® cDNA Synthesis Kit	10014-590 / 10014-592	50, 200 Reactions

AMPIGENE® 1-STEP RT-PCR KIT

Optimized and efficient cDNA synthesis and PCR in a single tube

AMPIGENE® 1-Step RT-PCR Kit uses the latest developments in reverse transcriptase (RTase) technology and buffer chemistry for efficient cDNA synthesis and PCR in a single tube. An optimized buffer system allows efficient amplification and proprietary enhancers prevent the formation of primers/dimers to increase sensitivity and specificity.

- Convenient one-tube reaction
- Thermostable and extremely active MMLV RTase
- Blended with RNase inhibitor to prevent degradation of RNA by contaminating RNase
- Optimized buffer system for efficient amplification
- Enhancers and stabilizers improve reaction sensitivity and specificity

Description	Cat. No.	Size
AMPIGENE® 1-Step RT-PCR Kit	10014-584 / 10014-586 / 10014-588	50, 200, 1000 Reactions

AMPIGENE® PCR solutions provide enhanced speed, yield, and specificity.

AMPIGENE® 1-STEP RT-qPCR KITS

AMPIGENE® qPCR 1-Step Green Kits and 1-Step Probe Kits use an optimized buffer system which allows efficient amplification and provides proprietary enhancers to prevent the formation of primers/dimers to increase sensitivity and specificity

AMPIGENE® qPCR 1-Step Green Kits provide optimized and efficient cDNA synthesis and dye-based qPCR in a single tube.

- Thermostable and extremely active MMLV RTase
- For dye-based qPCR applications: Green dye does not interfere with PCR
- Enhancers and stabilizers improve reaction sensitivity and specificity

AMPIGENE® qPCR 1-Step Probe Kits provide optimized and efficient cDNA synthesis and probe-based qPCR in a single tube.

- Thermostable and extremely active MMLV RTase
- For probe-based qPCR applications: Designed for use on a wide range of probe technologies
- Enhancers and stabilizers improve reaction sensitivity and specificity

Description	Cat. No.	Size
AMPIGENE® qPCR 1-Step Green Kit Lo-ROX	10014-660 / 10014-662	200, 1000 Reactions
AMPIGENE® qPCR 1-Step Green Kit Hi-ROX	10014-664 / 10014-666	200, 1000 Reactions
AMPIGENE® qPCR 1-Step Probe Kit Lo-ROX	10014-668 / 10014-670	200, 1000 Reactions
AMPIGENE® qPCR 1-Step Probe Kit Hi-ROX	10014-672 / 10014-674	200, 1000 Reactions
AMPIGENE® qPCR 1-Step Probe Kit No-ROX	10014-676 / 10014-678	200, 1000 Reactions

Choose the appropriate ROX concentration for your platform

Manufacturer	Instrument	Lo-ROX	Hi-ROX	No-ROX
Analytica Jena	qTower	✓	✓	✓
Applied Biosystems	7500, 7500 FAST, ViiA7™	✓		✓
Applied Biosystems	7000, 7300, 7700, 7900, 7900HT, 7900HT FAST, StepOne™, StepOne™ Plus		✓	
Bio-Rad®	iCycler®, MyiQ®, iQ™5, Opticon™, Opticon™2, Chromo4™, MiniOpticon™, CFX96™, CFX384™	✓		✓
Cepheid®	Smartcycler®	✓	✓	✓
Eppendorf	Mastercycler® ep realplex, Mastercycler® realplex 2S	✓	✓	✓
Illumina®	Eco™	✓	✓	✓
Qiagen/Corbett	Rotor-Gene™ 3000, 6000, Q	✓	✓	✓
Qiagen/Corbett	Lightcycler®480, Lightcycler®Nano	✓	✓	✓
Stratagene (Agilent)	MX 4000P®, MX 3000P®, MX 3005P®	✓		✓
Takara	Cycler Dice®	✓	✓	✓
Techne	Quantica®	✓	✓	✓

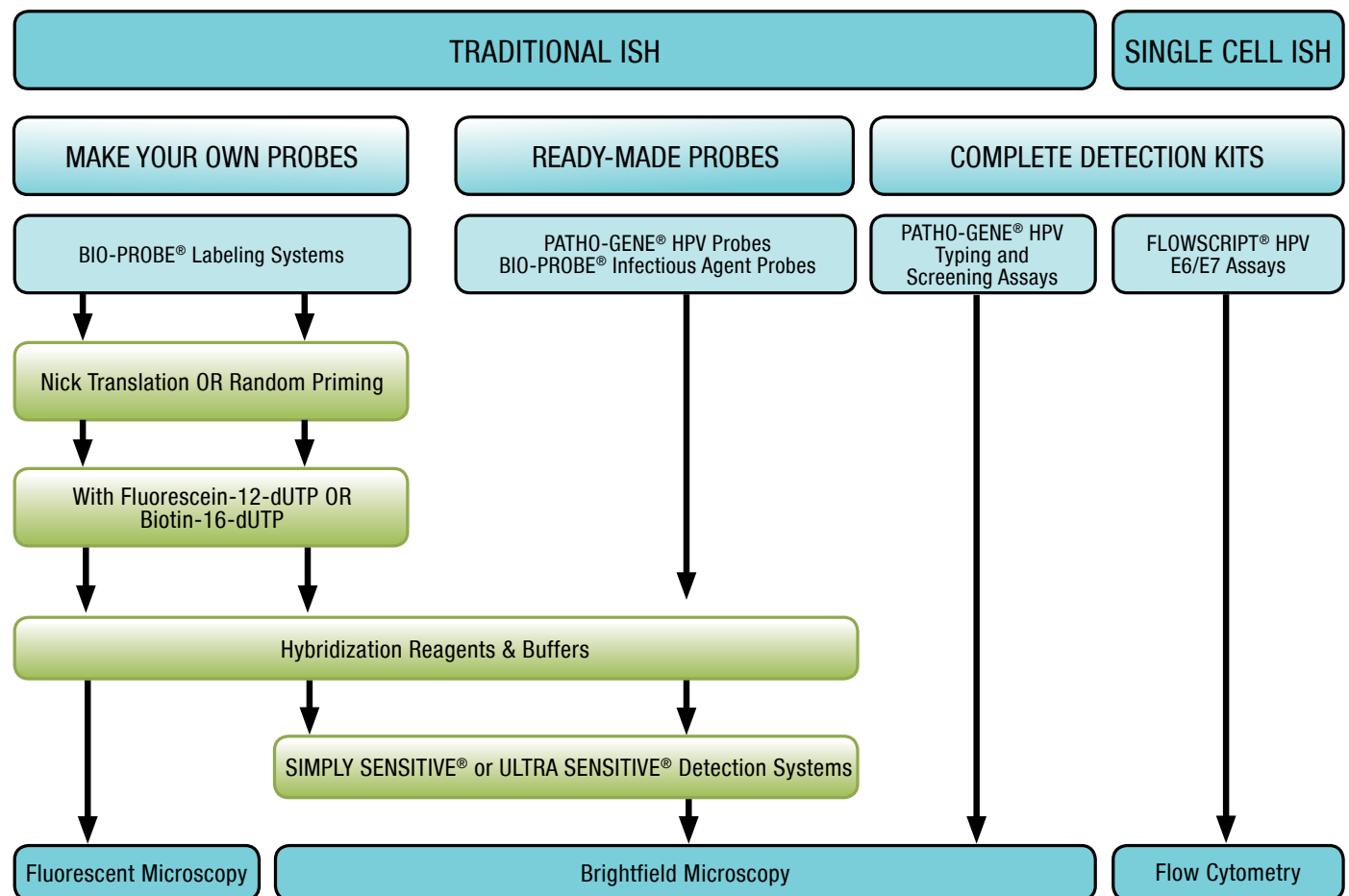
IN SITU HYBRIDIZATION

LABELING, PROBES & DETECTION SYSTEMS

A complete BIO-PROBE® Random Primed or Nick Translation DNA Labeling System consists of the combination of two separate components: a Reagent Pack (labeling system) and a choice of deoxynucleotide packs for Bio-16-dUTP. Once labeling of choice is completed, hybridization is performed with a complete set of reagents, followed by detection with SIMPLY SENSITIVE® or ULTRA SENSITIVE® Detection Systems.

No time to make your own viral detection probes? Choose from a selection of ready-made, high-sensitivity probes for HPV or infectious agents, hybridize with reagents, and detect with SIMPLY SENSITIVE® or ULTRA SENSITIVE® Detection systems.

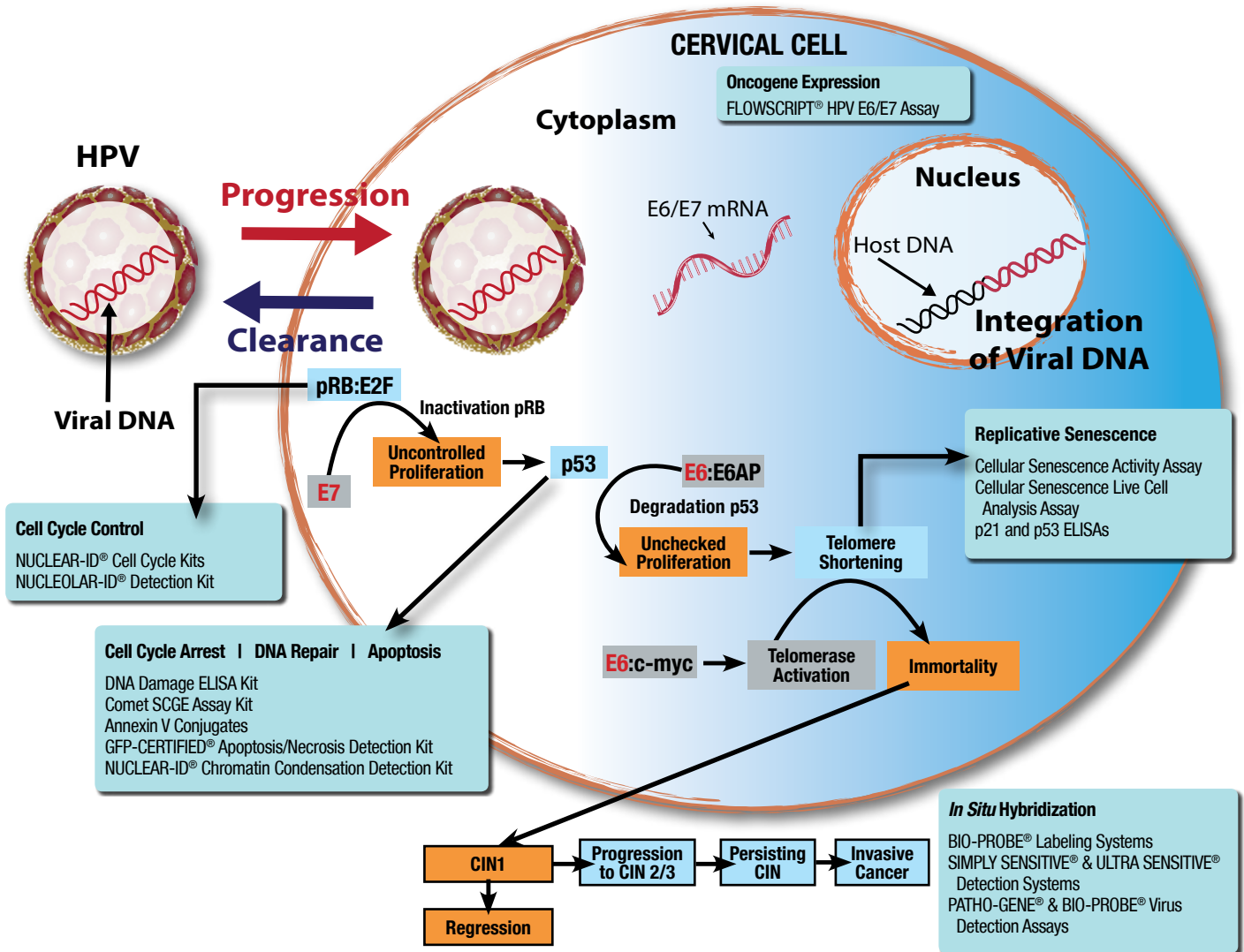
Complete ISH Workflow



BIO-PROBE® LABELING SYSTEMS

Description		Cat. No.	Size
BIO-PROBE® Nick Translation Systems	Nick Translation Reagent Pack	89165-790	25 Reactions
	Bio-16-dUTP for Nick Translation (Deoxynucleotide pack)	89165-796	25 Reactions
	Fluorescein-12-dUTP for Nick Translation (Deoxynucleotide pack)	89165-798	25 Reactions
	Nick Translation Kit with Biotin-16-dUTP (as a set)	89165-792	25 Reactions
	Nick Translation Kit with Fluorescein-12-dUTP (as a set)	89165-794	25 Reactions
BIO-PROBE® Random Primed Labeling Systems	Random Primed Reagent Pack	89165-800	25 Reactions
	Bio-16-dUTP for Random Priming (Deoxynucleotide pack)	89165-806	25 Reactions
	Fluorescein-12-dUTP for Random Priming (Deoxynucleotide pack)	89165-808	25 Reactions
	Random Primed Labeling Kit with Bio-16-dUTP (as a set)	89165-802	25 Reactions
	Random Primed Labeling Kit with Fluorescein-12-dUTP (as a set)	89165-804	25 Reactions
Hybridization Reagents and Buffers	Proteinase K	89165-712	2 x 5 mg
	Wash Buffer Salts	89165-714	3 Packs
	SIGNASURE® Wash Buffer	89165-716	3 Packs
	<i>In Situ</i> Hybridization Buffer (1.25X concentrate)	89165-718	10 mL
	<i>In Situ</i> Hybridization Wash Reagent	89165-720	30 mL
	<i>In Situ</i> Hybridization Buffer for HPV Probes (Ready-to-Use)	10014-368	50 mL
Linkers	Rabbit Anti-biotin Linker (Ready-to-Use)	10135-992	6 mL
	Mouse Anti-biotin Linker (Ready-to-Use)	10135-990	6 mL
Detection Reagents and Systems	SAVIEW® PLUS HRP Reagent	75841-132	150 Assays
	SIMPLY SENSITIVE® HRP-AEC <i>In Situ</i> Detection System	89165-690	20 Assays
	SIMPLY SENSITIVE® HRP-DAB <i>In Situ</i> Detection System	89165-692	20 Assays
	SIMPLY SENSITIVE® AP-NBT/BCIP <i>In Situ</i> Detection System	89165-694	20 Assays
	ULTRA SENSITIVE® Enhanced HRP-AEC <i>In Situ</i> Detection System	89165-684	30 Assays
	ULTRA SENSITIVE® Enhanced HRP-DAB <i>In Situ</i> Detection System	89165-686	30 Assays
	ULTRA SENSITIVE® Enhanced AP-NBT/BCIP <i>In Situ</i> Detection System	89165-688	30 Assays

PATHO-GENE® & BIO-PROBE® VIRUS DETECTION ASSAYS

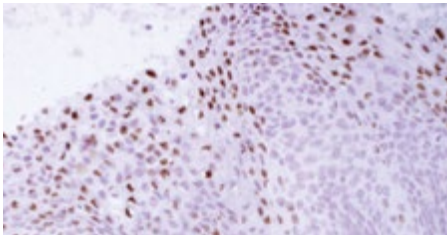


PATHO-GENE® Human Papillomavirus in situ typing assays for sensitive detection of pathogen-expressed genes from fresh or FFPE tissue sections

The assays employ separate mixtures of biotin-labeled Human Papillomavirus (HPV)-specific probes to detect and identify HPV/DNA-infected biopsy tissue sections. The identifying probes are HPV types 6/11 (benign lesions), 16/18 (cervical intraepithelial neoplasia [CIN] and carcinoma *in situ* [CIS]), or 31/33/51 (condyloma or cervical intraepithelial neoplasia [CIN] and carcinoma *in situ* [CIS]).

- Provides all reagents and materials for preparation and pretreatment as well as hybridization/detection and typing of HPV DNA
- Suitable for processing paraffin-embedded tissue manually or on automated slides-stainers
- HPV 16 Probe Control Slide is available separately to serve as a positive control for HPV 16 DNA detection

Detect and Identify HPV Infection *In Situ*



High-risk HPV Type 16/18/31/33/51 Probe (10014-566 / 10014-568) was hybridized to cervical tissue. Tissue sections were developed with HRP-DAB and counterstained with hematoxylin.

References:

1. Brown DR, *et al.* Neutralization of human papillomavirus type 11 (HPV-11) by serum from women vaccinated with yeast-derived HPV-11 L1 virus-like particles: correlation with competitive radioimmunoassay titer. *J Infect Dis.* 2001 Nov 1;184(9):1183-6.
2. Lajer CB, *et al.* Different miRNA signatures of oral and pharyngeal squamous cell carcinomas: a prospective translational study. *Br J Cancer.* 2011 Mar 1;104(5) 830-40.
3. Nuovo GJ, *et al.* Strong inverse correlation between microRNA-125b and human papillomavirus DNA in productive infection. *Diagn Mol Pathol.* 2010 Sep;19(3):135-43.
4. Cohen C, *et al.* Automated *in situ* hybridization for human papilloma virus. *Immunohistochem. Mol. Morphol.* 2014 Sep;22(8):619-22.

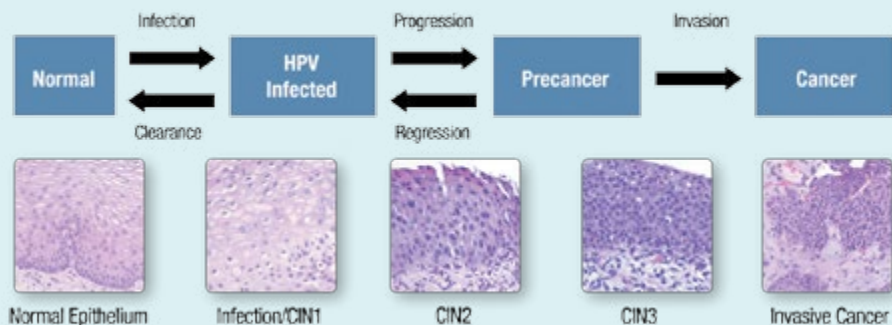
Description		Cat. No.	Size
PATHO-GENE® HPV Probes & Detection Assays	PATHO-GENE® Aik Phos-NBT/BCIP Human Papillomavirus <i>In Situ</i> Typing Assay	89165-710	10 Assays
	PATHO-GENE® HRP-AEC Human Papillomavirus <i>In Situ</i> Typing Assay	89165-698	20 Assays
	PATHO-GENE® HRP-DAB Human Papillomavirus <i>In Situ</i> Typing Assay	89165-696	20 Assays
	PATHO-GENE® Human Papillomavirus <i>In Situ</i> Screening Assay	89165-700	20 Assays
	HPV 16 Control Slide	89165-682	1 Slide
PATHO-GENE® Probes	HPV Screening Probe in hybridization buffer (6/11, 16/18, 31/33/51)	89165-702 10014-570	1 mL 6 mL
	HPV Type 6/11 Probe	89165-704 10014-572	1 mL 6 mL
	HPV Type 16/18 Probe	89165-706 10014-364	1 mL 6 mL
	HPV Type 31/33/51 Probe	89165-708 10014-366	1 mL 6 mL
	HPV Type 16/18/31/33/51 Probe	10014-566 10014-568	1 mL 6 mL
BIO-PROBE® Probes	Adenovirus	89165-722	2 µg
	BK Virus	89165-734	2 µg
	Blur 8	89165-736	2 µg
	Cytomegalovirus	89165-724	2 µg
	Herpes Simplex	89165-726	2 µg
	JC Virus	89165-732	2 µg
	SV 40	89165-730	2 µg

FLOWSCRIPT® HPV E6/E7 ASSAY

Detecting Overexpression of HPV E6 and E7 Oncogenes and Those at Greatest Risk for Developing Cervical Cancer

Data have shown that overexpression of HPV E6 and E7 oncoproteins is a critical and necessary step to the progression of cervical disease through their ability to disrupt cell proliferation. Early detection of mRNA transcripts of E6/E7 in individual infected cells identifies not only the presence of the virus but also its integration into the patient. This integration promotes the growth of malignant cells through the inhibition of tumor suppressors and has been linked with increased likelihood of cervical cancer progression.

Natural History of HPV Infection

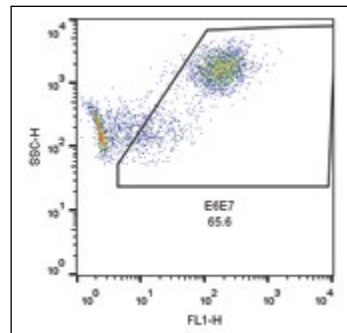


FLOWSCRIPT® HPV E6/E7 Assay: mRNA Transcript Expression Analysis at a Single Cell Level

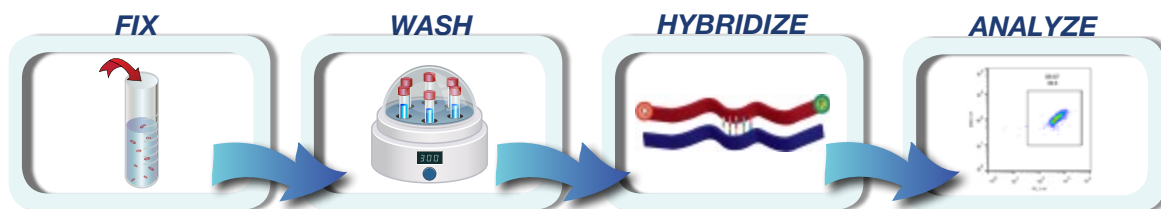
The FLOWSCRIPT® HPV E6/E7 Assay contains high quality, well-designed controls resulting in fail-safe functionality.

- High specificity assay for the most prevalent high and moderate risk HPV subtypes provides useful information for labs and physicians
 - Detects overexpression of E6/E7 HPV oncogenes, a trigger for transforming normal cells to cervical cancer
 - Over-expression of E6/E7 precedes development of cancer in HPV infected cells
- Homogeneous assay provides gene expression information at a single cell level using a cocktail of probes for high and moderate risk HPV
 - The probes are specific to multiple sites within the E6 and E7 genes for detection of these mRNA transcripts
- Simplified workflow
 - The mix-and-read assay eliminates post-hybridization wash steps, minimizing leakage and signal degradation
 - The assay is run on any standard flow cytometry systems and has been optimized to work with ThinPrep® and SurePath® specimens

Postive E6/E7 Expression



High-risk HPV positive cervical cells analyzed with FLOWSCRIPT® HPV E6/E7 Assay demonstrate positive staining for E6/E7.



Description	Cat. No.	Size
FLOWSCRIPT® HPV E6/E7 Assay Kit	10014-526	100 Tests

NUCLEIC ACID LABELING & FISH

NICK TRANSLATION DNA LABELING SYSTEM

Fluorescent-labeled dUTPs and Nick Translation System for Preparing FISH Probes

Fluorescent dye-dUTPs are well recognized as superior to analogous methods using cumbersome indirect two-step labeling methods. When coupled with the Nick Translation DNA Labeling System, this direct approach provides a simple and efficient method to label DNA for FISH.

- Eight distinct colors to choose from, spanning the visible light spectrum
- High signal intensity and good photostability
- Suitable for a wide range of molecular biology and cytogenetics applications

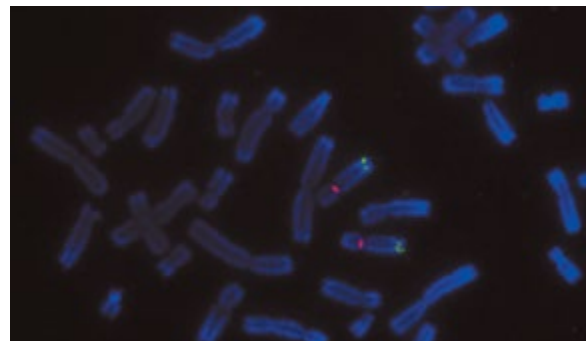
Nick Translation DNA Labeling System (89165-860)

- Simple and efficient method for generating labeled DNA
- Allows the user to optimize incorporation and product size by adjusting the ratio of components
- Compatible with both biotin-labeled and fluorophore-labeled nucleotides

Fluorescent dye-dUTPs

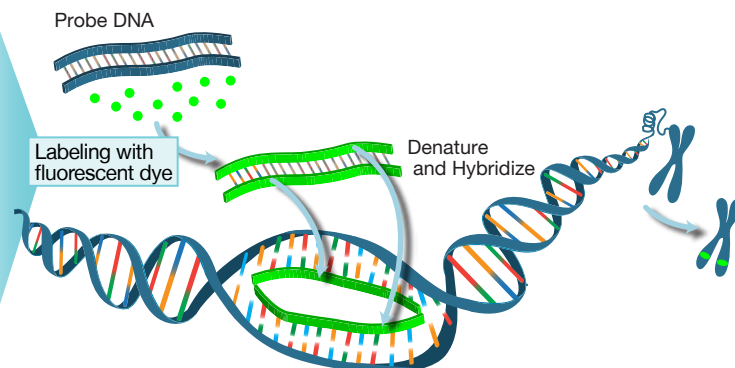
- Eight distinct colors to choose from, spanning the visible light spectrum
- High signal intensity and good photostability
- Available in aqueous format or new lyophilized sizes

Total FISH Solution: Nick Translation Kit + Fluorescent dye-dUTPs



Composite fluorescent image using the Nick Translation Kit and BAC Target DNA labeled with Enzo's Green 496 dUTP (89165-842) and Centromere BAC Probe labeled with Enzo's Orange 552 dUTP (89165-848). Metaphase chromosome spreads were counterstained with DAPI.

Labeling Probes for FISH Analysis



Description		Cat. No.	Size
Nick Translation DNA Labeling System for FISH Probes		89165-860	50 Reactions
Description		Cat. No.	Size
Fluorescent Nucleotides	Gold 550 dUTP	89165-758	25 nmol
	Red 650 dUTP	89165-760	25 nmol
	Green 496 dUTP	89165-842	25 nmol
	Orange 552 dUTP	89165-848	25 nmol
	Gold 525 dUTP	89165-850	25 nmol
	Red 580 dUTP	89165-852	25 nmol
	Green 500 dUTP	89165-854	25 nmol
	Aqua 431 dUTP	89165-856	25 nmol

LABELED & MODIFIED NUCLEOTIDES

Modified Nucleotides

Description		Cat. No.	Size
Deoxynucleotides	Allylamine-dUTP	89165-858	2.5 μ mol
	Bio-16-dUTP	89165-828	50 nmol
	Bio-7-dATP	89165-840	50 nmol
	Cyanine-3-dUTP	89165-750	25 nmol
	Cyanine-5-dUTP	89165-752	25 nmol
	Digoxigenin-dUTP, alkali-stable	10842-814	25 nmol
Dideoxynucleotides	Bio-N ⁶ -ddATP	89165-826	25 nmol
	Bio-16-ddUTP	89165-830	25 nmol
	Fluorescein-12-ddUTP	89165-844	25 nmol
Ribonucleotides	Bio-11-CTP	89165-838	250 nmol
	Bio-16-UTP	89165-832	250 nmol
	Cyanine-3-UTP (enhanced)	89165-754	250 nmol
	Cyanine-5-UTP (enhanced)	89165-756	250 nmol
	Digoxigenin-UTP, alkali-stable	10842-816	250 nmol
	Fluorescein-12-UTP	89165-846	250 nmol

Enzo's complete FISH probe solutions ensure peak labeling performance.

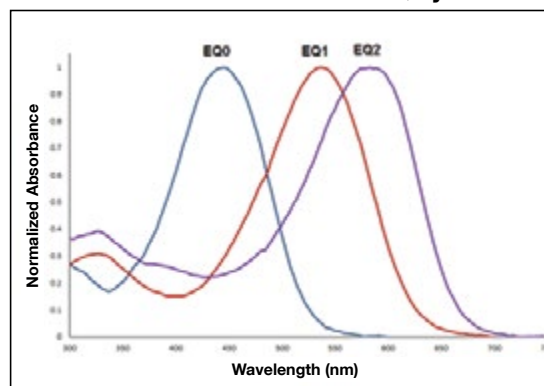
EQ QUENCHER DYES

EQ Quencher Dyes are Compatible With a Wide Range of Fluorescent Dyes

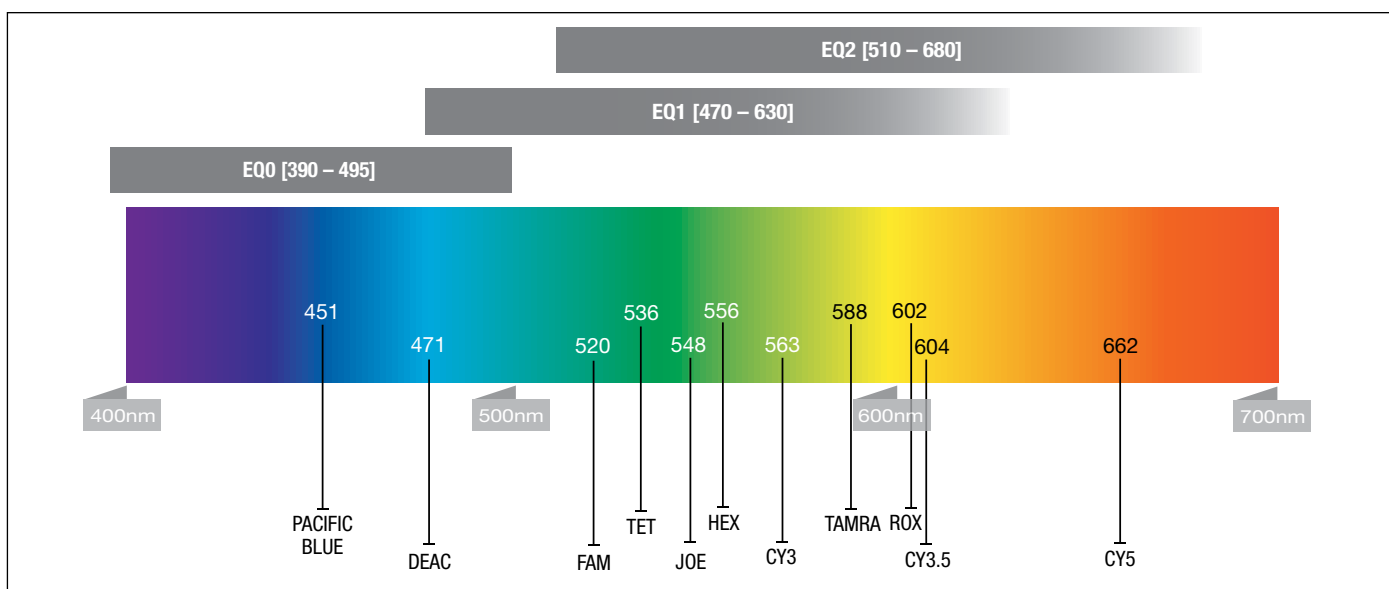
EQ quencher dyes are suitable as acceptors in fluorescence resonance energy transfer (FRET) applications due to their broad visible absorption but lack of detectable fluorescence emission.

- Commonly used in molecular biology FRET applications to quench fluorophores
- NHS ester quencher dye can be conjugated to amine-labeled probes
- Enable multiplexing of probes with the use of different reporter-quencher dye pairs
- Compatible with most common commercially available fluorophores including Alexa Fluor®, ATTO, DyLight®, and BD Horizon® dyes

Normalized Absorbance of EQ Dyes



Normalized absorbance of EQ dyes showing their range of quenching through FRET.



Range of absorption of EQ quencher dyes and common dyes that can be quenched.

Description	Cat. No.
EQ1 NHS ester	10810-050
EQ2 NHS ester	10810-048

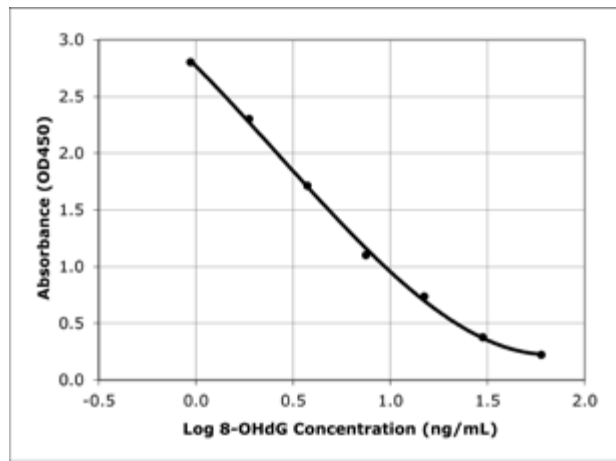
DNA DAMAGE ELISA KIT

Rapidly monitor DNA destruction arising from cancer, apoptosis and oxidative stress using the DNA Damage ELISA kit

The DNA Damage ELISA (enzyme-linked immunosorbent assay) is a fast and sensitive immunoassay providing results in less than 2.5 hours. Quantitation of 8-hydroxy-2'-deoxyguanosine (8-OHdG) in urine, serum, and saliva samples is performed in a convenient 96-well plate format using a colorimetric substrate. 8-OHdG is a frequently-used critical biomarker of oxidative stress and carcinogenesis.

- Quantify levels < 1 ng/mL
- Validated in-house in a variety of sample matrices
- Tested in a variety of biofluids (urine, serum, and saliva)
- Convenient colorimetric 96-well plate format

Typical 8-OHdG Standard Curve



The standard curve has a range of 0.94 – 60 ng/mL.

Description	Cat. No.	Size
DNA Damage ELISA Kit	89141-832	1 x 96-Well Plate

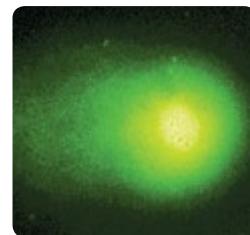
COMET SCGE ASSAY KIT

Sensitive and versatile method for measuring single- and double-strand DNA breaks in individual cells

Exposure of cells to oxidative and environmental stresses frequently results in the breakdown or oxidation of genomic DNA. Assays to evaluate the integrity of genomic DNA, or to assess the presence of oxidized DNA, are frequently used as a means of verifying the onset of apoptosis or DNA damage. The Comet SCGE Assay measures DNA damage by fluorescently detecting the integrity of DNA liberated from cells embedded in low melting point agarose. Upon electrophoresis, fragmented DNA produces a characteristic “comet” shaped tail as small DNA fragments migrate in the gel more rapidly than intact genomic DNA.

The Comet SCGE Assay is a fast and simple electrophoresis method to detect and quantitate DNA fragmentation in cells associated with DNA damage and apoptosis. A unique nucleic acid stain provides improved sensitivity for DNA visualization compared to ethidium bromide.

- Ready-to-use Comet Slides allow direct application of sample without pre-treatment
- Shorter assay time allows for higher throughput sample analysis
- Hydrophobic barrier allows sample treatment with DNA repair enzymes
- Unique nucleic acid stain provides improved sensitivity for DNA visualization compared to ethidium bromide



Description	Cat. No.	Size
Comet SCGE Assay Kit	89141-246	50 Tests



1.800.932.5000 | vwr.com

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