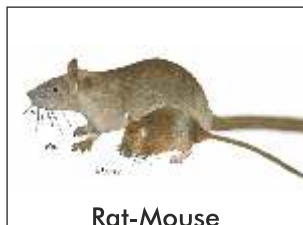


The World's Largest Clone Resource

With over 20 million clones representing nearly every gene for most model organisms, we are your perfect partner for life science and biological research.



With over 20 million clones representing nearly every known gene for most common organisms, we are your perfect partner for life science and biological research

- Sequence verification available
- Rapid turnaround time
- Easy to order, via the intuitive search engine GenomeCube
- Custom project design with in-house expertise
- Plasmid preparation service

Over 20 million clones, including:

- **cDNA** (EST and full ORF collections for various species, like IMAGE, MGC, ORFeome, FANTOM, Xenopus EST collections, RIKEN Honeybee)
- **RNAi** (miRNA, shRNA, C.elegans RNAi)
- **Antibody libraries** (Human Single fold scFv libraries I + J, Human Domain Antibody Library (DAb), ATLAS ScFV)
- **Synthetic genes** (made to order)
- **Expression-Ready ORF cDNA** (ORFeome, Invitrogen, Genecopoeia OmicsLink™, SGC)
- **Genomic libraries**
 - Human (CpG island, TilePath BAC, Minimal Genomic Clone Set, RPCI-11 BAC)
 - Mouse (bMQ BAC, RPCI-23 BAC, PAC, cosmid (strain 129/ola))
 - C.elegans (promoterome and fosmid libraries)
 - Zebrafish (BAC)
 - Chicken (BAC, CpG island)
 - Drosophila (cosmid)
 - Fugu (BAC, cosmid)
 - Pig (CpG Island)

Why e-nnovation Life Sciences?

- Sequence verification from Europe's largest sequencing provider
- State-of-the-art facilities in UK, Germany and Ireland
- Rapid turnaround time
- Dedicated project management
- Advice from our experts
- One-stop shop for life science

We also offer entire clone libraries and the construction of customised libraries

Custom project design Full range of clone services

- Project management
- In-house team of clone experts
- Batch search
- Gene synthesis
- Clone validation (Sanger sequencing, primer walking, next generation sequencing)
- HT cloning service (Gateway, Golden Gate, LIC cloning)
- Bioinformatic analysis
- Protein expression
- Protein arrays
- Sequence verification
- Plasmid preparation
- Shuttling
- Custom project design
- Storage facilities
- Re-arrays
- Large custom picking projects
- Robotic re-arraying



GenomeCube™
powered by
Source e-nnovation Life Sciences

How to order

Find your clone quickly and easily using our intelligent search engine, GenomeCube®. GenomeCube® can search the entire clone and antibody database using an array of search terms and common identifiers to help you find your required clone.

Can't find your clone? Let us help

Contact : 011-6566-2016 | +91 9711-34-7133

Antibodies

Source BioScience has an extensive range of primary and secondary antibodies, in addition to other supporting products such as isotype controls, peptides and proteins.

Why choose our antibodies?

Enhanced and optimised Taq PCR mastermix for standard applications

- Extensive range, over 300,000 covering all applications
- Excellent characterisation with full performance guarantee
- Competitively priced
- Easily accessible and experienced technical support
- Simple ordering process.
- Online using GenomeCUBE®
- Via fax
- On your own in-house e-procurement site such as Science Warehouse or SciQuest
- Via purchase order

Our Suppliers

Enhanced and optimised Taq PCR mastermix for standard applications

- reSource™
- Advanced Biotechnologies
- Alpha Diagnostics
- ATGen
- EnoGene
- Genetex
- LSBio
- Proteintech
- QED Bioscience
- Zytomed Systems

ELISA & assay kits

The enzyme-linked immunosorbent assay (ELISA) is a common laboratory technique which is used to measure the concentration of an analyte (usually antibodies or antigens) in solution.

The basic ELISA, or enzyme immunoassay (EIA), is distinguished from other antibody-based assays because separation of specific and non-specific interactions occurs via serial binding to a solid surface, usually a polystyrene multiwell plate, and because quantitative results can be achieved.

The steps of the ELISA result in a colored end product which correlates to the amount of analyte present in the original sample.

We have wide range of ELISA kits and assay kits with us for your immunoassay.

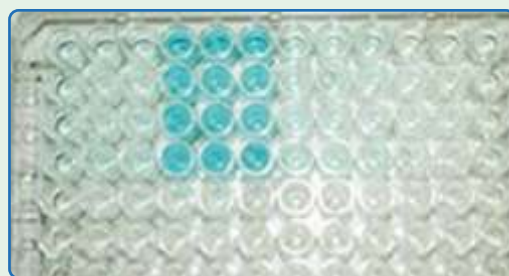
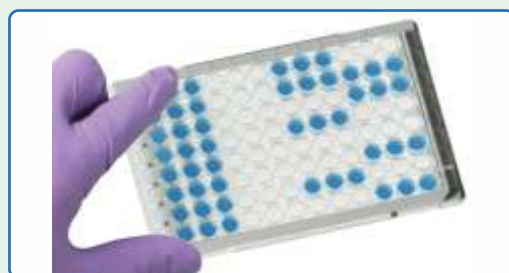
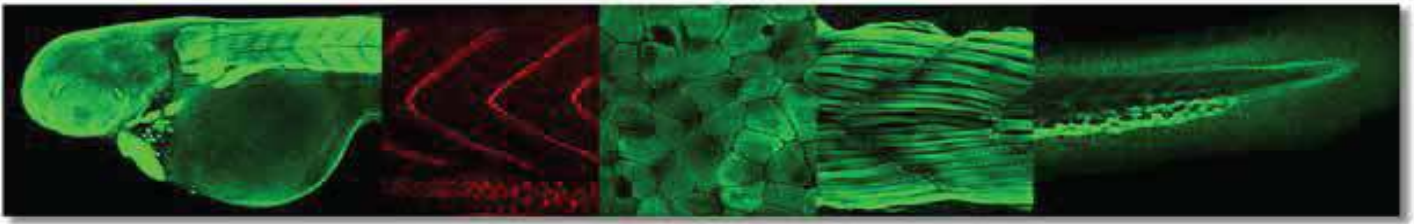


Figure 1. Typical ELISA Output. Darker wells indicate higher levels of analyte in the original sample.





Your partner for zebrafish research.

e-**nnovation Life Sciences** recognises the importance of zebrafish (*Danio rerio*) as a model organism within biological research for studying development and disease, organ function, behaviour, and toxicology.

We have compiled a wide range of products and services from within our own reSource brand to provide researchers with a comprehensive toolbox for use in a key vertebrate model system in today's research.

Our products and services can be used in protein expression studies, gene expression studies, gene discovery and genome mapping.

Also available:

- Lentiviral particle
- shRNA clones
- miRNA target clones
- qPCR primers
- Recombinant proteins



Find out more

about all our zebrafish clones, validated antibodies and other products and services, please don't hesitate to contact us

Product highlights

cDNA clones and ESTs

- **Zebrafish** Gene Collection (ZGC)- >16,000 full-length (open reading frame) sequences and cDNA clones of expressed genes for **zebrafish**
- Zebrafish EST library (ZF_mu)- >114,000 searchable ESTs

Gateway® adapted ORFs

- More than 2,200 fully sequence-validated full-ORF easily transferred into virtually any type of expression vector (ORFeome Collaboration)

Expression ready ORFs

- Selection of available expression vectors
- Various tags available

Genomic DNA clones

- More than 200,000 distinct **zebrafish** BAC clones

Individual clones, libraries and subsets available

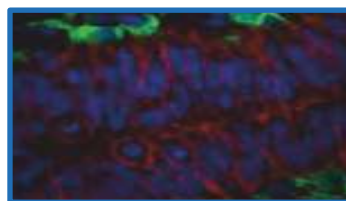
The widest range of zebrafish validated antibodies

We currently offer over 500 antibodies for ennovationlifesciences



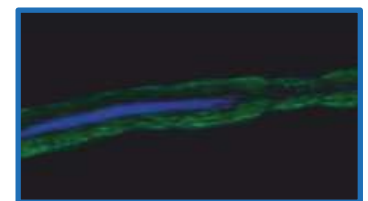
Cct5 antibody

IHC-Fr analysis of zebrafish muscle



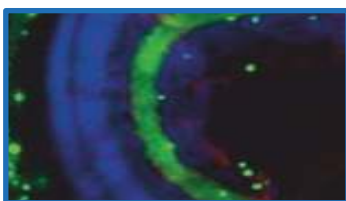
Cdh2 antibody

IHC analysis of agarose-embedded zebrafish embryo (red)



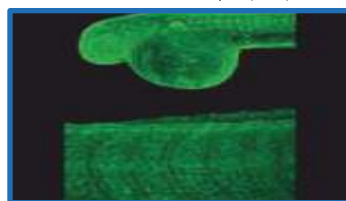
Ckma antibody

IHC analysis of embryonic zebrafish tail



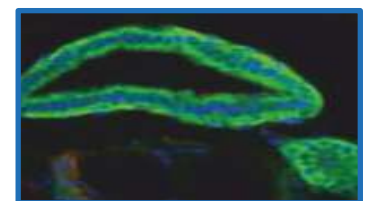
Col2a1a antibody

IHC analysis of zebrafish retina (green)



Cox4i1 antibody

Whole-mount staining of zebrafish, embryo



Cyp26b1 antibody

IHC analysis of agarose-embedded, zebrafish embryo

e-nnovation Life sciences

in association with our global sourcing partners offers
Morpholino antisense oligos.

Morpholino oligos bind to complementary RNA and get in the way of processes; they can knock down gene expression, modify RNA splicing or inhibit miRNA activity and maturation. Morpholinos are the premier knockdown tools used in developmental biology labs, the best RNA-blocking reagents for cells in culture and, as Vivo-Morpholinos, the most specific delivery-enhanced oligos available for other animal models. We are the sole commercial manufacturer selling research quantities of Morpholinos world-wide.

Morpholino oligos are short chains of about 25 Morpholino subunits. Each subunit is comprised of a nucleic acid base, a morpholine ring and a non-ionic phosphorodiamidate intersubunit linkage. Morpholinos do not degrade their RNA targets, but instead act via an RNase H-independent steric blocking mechanism. With their requirement for greater complementarity with their target RNAs, Morpholinos are free of the widespread off-target expression modulation typical of knockdowns which rely on RISC or RNase-H activity. They are completely stable in cells and do not induce immune responses.

With their high mRNA binding affinity and exquisite specificity, Morpholinos yield reliable and predictable results. Depending on the oligo sequence selected, they either can block translation initiation in the cytosol (by targeting the 5' UTR through the first 25 bases of coding sequence), can modify pre-mRNA splicing in the nucleus (by targeting splice junctions or splice regulatory sites) or can inhibit miRNA maturation and activity (by targeting pri-miRNA or mature miRNA), as well as more exotic applications such as ribozyme inhibition, modifying poly-A tailing, blocking RNA translocation sequences or translational frameshifting. Morpholinos have been shown effective in animals, protists, plants and bacteria.

We are continually developing novel cytosolic delivery systems like our 'Endo-Porter' for cultured cells and our Vivo-Morpholinos for both cultures and in vivo delivery. With established delivery technologies it's easy to deliver Morpholinos into cultures, embryos or animals -- making Morpholinos the best tools for genetic studies and drug target validation programs.

What Sets Us Apart?

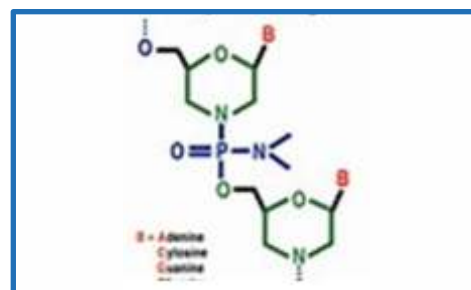
Morpholino oligos have excellent antisense properties compared to other gene knockdown systems. Microinjection or

electroporation of Morpholino oligos into the embryos of frogs, zebrafish, chicks, sea urchins and other organisms successfully and specifically shuts down the expression of targeted genes, making



Morpholinos an indispensable tool of developmental biologists. Morpholinos have also proven their versatility and efficacy in cultures of primary or immortal cells when delivered by Endo-Porter, electroporation or Vivo-Morpholinos. Usually, Vivo-Morpholinos are used to bring the specificity and efficacy of Morpholino oligos to experiments requiring systemic delivery in adult animals. The list of over 7500 publications using Morpholinos is growing daily and is maintained on-line in a browseable database.

Besides providing the best knockdown and splice modification tools, we also provide the best customer support available in the gene silencing industry. Our customer support team includes four scientifically active Ph.D.-level



scientists who are available to: 1) discuss your experiment design, 2) design your oligos for you, and 3) help you troubleshoot your experiments, all at no additional cost.

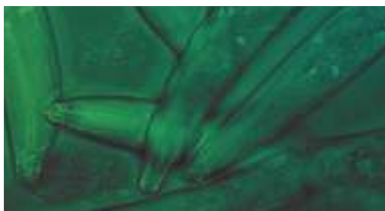
News

e-nnovation Life sciences now offers a blue-emitting fluorescent tag, 3'-Gene Tools Blue, as an available modification for Morpholino oligos.

Morpholino special issue of the Austin Journal of Drug Discovery, Development and Delivery.

C. elegans ORF-RNAi Library

The ORFeome-RNAi v1.1 library was constructed by Dr Marc Vidal and his laboratory. It is an ideal resource for either high throughput screening or individual knockdown experiments.



Library Specifications

The ORFeome-RNAi v1.1 library contains 11,511 RNAi clones, which targets 10,953 genes. 485 of these genes are targeted by 2 or more constructs. The library covers the potential knockdown of 55% of the 19,920 unique protein-coding genes predicted in 'worm sequence' 112. This includes ~1,700 unique genes not previously targeted by existing RNAi feeding libraries (an additional ~9% of the worm genome). In conjunction with the existing RNAi feeding library, the overall predicted coverage of worm genes is ~86%.

Applications

The library has many applications including but not limited to:

- High throughput screening
- Individual knock down experiments

Format

offers:

- Individual clones
- Subsets of your chosen clones from the collection

C. elegans ORFeome

C. elegans ORFeome version 1.1 was constructed in a collaborative effort based at the Dana-Farber Cancer Institute and Harvard Medical School. Dr Marc Vidal and colleagues have cloned a first version (version 1.1) of all predicted protein-coding open reading frames (ORFs), or the 'ORFeome' of *Caenorhabditis elegans*. This resulted in the generation of over 12,000 clones (ORFeome 1.1), of which ~4,000 correspond to genes that have remained untouched by any cDNA or expressed sequence tag (EST).



Library Specifications

C. elegans is an invaluable model system for studies in developmental genetics and neurobiology. The C. elegans ORFeome version 1.1 library has been produced using the InVitrogen Gateway™ recombinational vector system pDONR201. 19,000 primer pairs were designed by computational methods, based on gene predictions from one of the first drafts of the worm genome annotation. Gene-specific primer pairs would amplify all 'splice variants' between the two primers designed for any gene. Pools of ~50-1,000 transformants for each set of amplification products were partially sequenced to produce OSTs (ORF sequence tags). This confirmed gene identity and permitted identification of pools where at least one processed mRNA was represented. All the data from this

project has been made available in WormDB, which integrates with other mapping data.

Applications

The library has many applications including but not limited to:

- Protein production
- RNAi complementation

Format

offers:

- Complete clone set as 114 96-well plates
- Individual pooled clones from a single well
- Subset of pools
- Subsets of your chosen clones from the collection

C. elegans Fosmid Library

The C. elegans Fosmid library was constructed by Don Moerman et al. The availability of genomic clones with 35kb to 40kb inserts has been a critical resource to the C. elegans community. Fingerprinted and ordered cosmid clones harbouring such inserts were the backbone of the sequencing project. Further utility was found, when individual research laboratories were trying to map mutants. However, many of the cosmid libraries are now 20 years old and there are reports of some of them losing viability. With these considerations in mind, Don Moerman et al. chose to construct a fosmid rather than cosmid library.



Library Specifications

The C. elegans fosmid library was constructed using the fosmid vector pCC1FOS (Epicentre) and is maintained at low copy number until induced. The use of fosmids as backbones allows for the maintenance of large pieces of DNA (around 40kb) in limited number (1-5) per bacterial host. Up to this point, such a resource was unavailable for C. elegans. The N2 fosmid clones are mapped to the C. elegans genome by pair-wise alignment of fosmid end-reads. Initial analysis of the library quality shows that the average insert size is ~ 43,284 bp and 86.7% of the clones have paired end-reads with correct relative orientation. The library obtained approximately 5.74X clone coverage of the genome.

Applications

The library has many applications including but not limited to:

- Complementation of RNAi experimentation
- Template for knock out studies

Format

offers:

- Complete clone set as 41 384-well microtitre plates
- Custom subsets
- Individual clones

qPCR & SNP Genotyping

LGC Biosearch Technologies offers a variety of probe and primer types for real-time qPCR, including dual-labeled BHQ® probes, BHQplus® probes, Molecular Beacons, and Scorpions® primers.

With the "Quantitative PCR" module of RealTimeDesign software, probes can be designed for sensitive measurements of copy number.

DNA Quantification & Gene Expression Analysis

RealTimeDesign Software Ensures Robust Amplification and Detection

When designing probes to quantify DNA for copy number studies (gDNA) or gene expression analysis (cDNA), traditional dual-labeled probes quenched with the BHQ dye are more than sufficient. However, many difficult target sites are AT-rich, and so fortified BHQplus probes are required to maintain an elevated melting temperature.

BHQplus probes provide more flexibility in design of assays for DNA quantification: these shorter probes can be accommodated into a greater variety of targets and with a wider range in base composition.

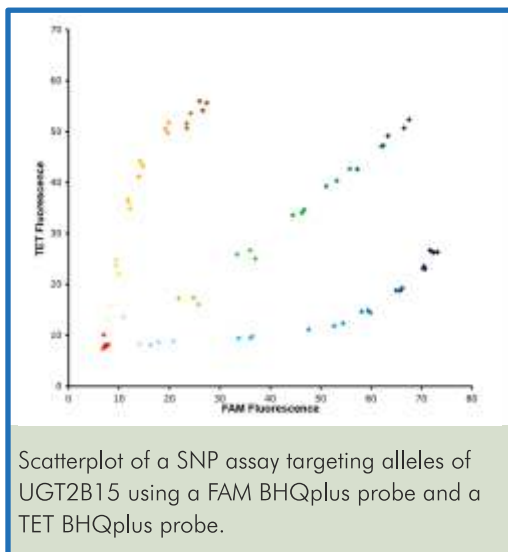
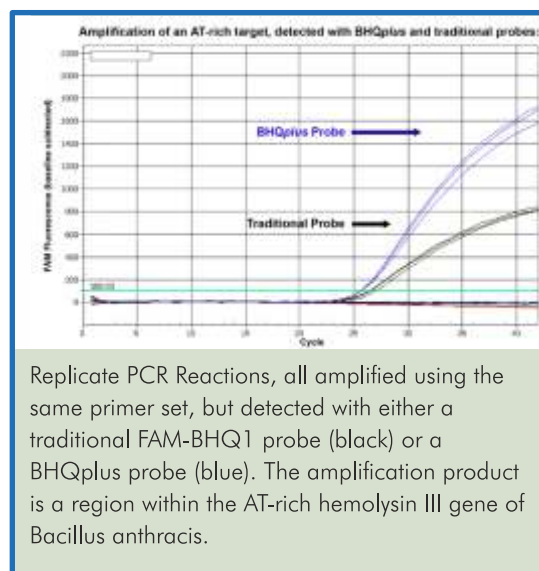
With the "Quantitative PCR" module of RealTimeDesign software, probes can be designed for sensitive measurements of copy number.

- Choose BHQ or BHQ plus probes partnered with the ideal fluorophore for the instrument optics in use
- Use NCBI gene symbols, RefSeq IDs, or GenBank accession numbers, or use your own optimized sequence
- Pick the optimal assays designed by RealTimeDesign software or choose alternate primers and probes using Custom Mode
- Order directly through the Biosearch website



Note :

LGC Biosearch Technologies offers a variety of probe and primer formats for SNP genotyping and gene expression analysis with real-time qPCR. As inventors of the Black Hole Quencher® (BHQ®) dyes, every probe format is available with a BHQ dye for versatile quenching. In addition, each oligo may be labeled with a variety of fluorophores that span the spectrum, such as FAM, TET, HEX, JOE, CAL Fluor®, and Quasar® dyes. View our Dye Selection Chart or Spectral Overlay Tool for Multiplexed qPCR to see a list of dyes offered at LGC Biosearch. Other modifications are also available for advanced probe designs.



Probe-Based SNP Genotyping

RealTimeDesign for Allelic Discrimination

Because the BHQplus technology stabilizes probe hybridization to the template, it allows for the design of shorter probes that offer increased resistance against hybridizing to a mismatch. This makes BHQplus probes ideal for genotyping applications such as screening, linkage associations, or fine-mapping studies. Designing optimal probes is simple with RealTimeDesign's "SNP Genotyping" module (found under qPCR - BHQ Probe > Application > SNP Genotyping).



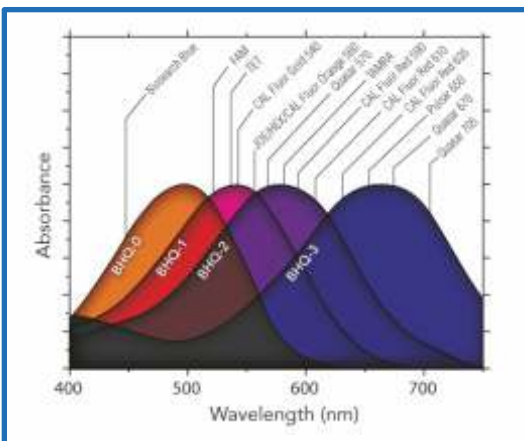
Screenshot from RealTimeDesign software, displaying the oligo sequences of the genotyping assay targeting UGT2B15, a gene involved in the metabolism of certain drugs such as tamoxifen.

- Use NCBI SNP Reference ID (rs#), gene symbols or RefSeq IDs derived from a SNP database such as dbSNP as a starting point for design
- Choose the fluorophore that matches your instrument optics.
- Review the optimal assay proposed by RealTimeDesign software
- Order directly through the Biosearch website

Save Time and Money, Let RealTimeDesign Software do the Prep Work!

True Dark Quenchers

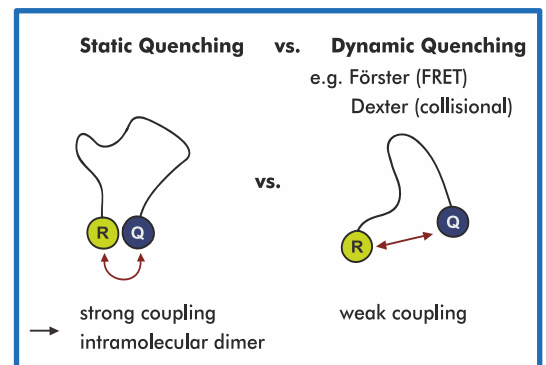
BHQ dyes can be paired with all common reporter dyes emitting between the ultraviolet and infrared wavelengths. Dual-Labeled BHQ probes have replaced earlier reporter-quencher dye pairings, such as FAM-TAMRA or FAM-DABCYL. In such sub-optimal probes, the quencher has inherent limitations including auto-fluorescence or a narrow quenching range which limits the choice of compatible fluorophores. In contrast, the BHQ dyes are highly efficient dark quenchers, have broad absorption spectra, and produce probes with high signal-to-noise ratios. Quenching versatility make BHQ Probes an excellent tool in gene expression and multiplexed qPCR assays.



Black Hole Quencher dyes are stable and highly efficient "dark" quenchers with no native fluorescence and broad absorption spectra. These characteristics lend high versatility to the potential uses for BHQ probes.

FRET and Static Quenching

BHQ dyes quench fluorescent signals through Förster Resonance Energy Transfer (FRET) and in some instances static quenching, resulting in improved performance over other dark quencher dyes, such as DABCYL. For more on FRET and static quenching, see our website at www.biosearchtech.com.



BLACK HOLE QUENCHER AND DYE SELECTION CHART

FLUOROPHORE	DYE-5'-T10 EX EM	BHQ Dye*
• Biosearch Blue™	352 447	BHQ[®] - 0 λ_{max} 495 nm QR=430-520 nm
FAM	495 520	
TET	521 536	
• CAL Fluor® Gold 540	522 544	
JOE	529 555	BHQ - 1 λ_{max} 534 nm QR=480-580 nm
VIC	538 554	
HEX	535 556	
• CAL Fluor Orange 560	538 559	
• Quasar® 570	548 566	BHQ - 2 λ_{max} 579 nm QR=559-670 nm <i>BHQ-2 dye is recommended for Pulsar 650, Quasar 670, and Quasar 705 dyes due to static quenching.</i>
Cy™ 3	549 566	
NED	546 575	
TAMRA	557 583	
• CAL Fluor Red 590	569 591	BHQ - 3 λ_{max} 672 nm QR=620-730 nm
Cy 3.5	581 596	
ROX	586 610	
• CAL Fluor Red 610	590 610	
Texas Red®	597 616	
• CAL Fluor Red 635	618 637	
• Pulsar® 650	460 650	
Cy 5	646 669	
• Quasar 670	647 670	
Cy 5.5	675 694	
• Quasar 705	690 705	

CAL Fluor and Quasar Dyes - Perfect Partners to the Black Hole Quencher Dyes:

To complement the BHQ dyes, Biosearch has since developed the CAL Fluor and Quasar dye series, which are low-cost fluorophores that partner perfectly with the BHQ dyes.

These vibrant fluorophores have emission spectra that span the visible spectrum and near infrared, matching the optics of most popular thermal cyclers, making them ideal for multiplexed real-time qPCR assays. With such an expansive selection, Biosearch's CAL Fluor and Quasar dyes are great alternatives to TET, JOE, VIC, HEX, TAMRA, Texas Red® and CY™ dyes.

Dual-labeled probes incorporating a CAL Fluor or Quasar dye paired with a BHQ dye exhibit large signal-to-noise values, to produce amplification traces with robust V_Rn and early CT values.

MULTIPLEXING RECOMMENDATIONS FOR DUAL-LABELED DARK-QUENCHED PROBES AND PRIMERS

INSTRUMENT	COMPANY	CALIBRATION REQUIRED?	MULTIPLEXING DEGREE	DYE 1	DYE 2	DYE 3	DYE 4	DYE 5
MX3000P™	Agilent	No	4-Plex	FAM	CAL Fluor® Orange 560	CAL Fluor Red 610	Quasar® 670	
MX4000®	Agilent	No	4-Plex	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670	
Prism® 7000	Applied Biosystems	Yes	Duplex	FAM	CAL Fluor Gold 540	SuperROX		
Prism 7300	Applied Biosystems	Yes	Duplex	FAM	CAL Fluor Gold 540	SuperROX		
Prism 7500	Applied Biosystems	Yes	4-Plex	FAM	CAL Fluor Orange 560	TAMRA	SuperROX	Quasar 670
Prism 7700	Applied Biosystems	Yes	Duplex	FAM	CAL Fluor Gold 540	SuperROX®		
Prism 7900	Applied Biosystems	Yes	Duplex	FAM	CAL Fluor Gold 540	SuperROX		
StepOne™	Life Technologies	Yes	Duplex	FAM	CAL Fluor Gold 540			
StepOnePlus™	Life Technologies	Yes	Triplex	FAM	CAL Fluor Gold 540	TAMRA		
CFX96™	Bio-Rad Laboratories	Yes	5-Plex	FAM	CAL Fluor Gold 540	CAL Fluor Red 610	Quasar 670	Quasar 705
Chromo™ 4	Bio-Rad Laboratories	Yes	4-Plex	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670	
iCycler iQ®	Bio-Rad Laboratories	Yes	4-Plex	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670	
iQ™5	Bio-Rad Laboratories	Yes	5-Plex	FAM	CAL Fluor Gold 540	CAL Fluor Red 590	CAL Fluor Red 610	Quasar 670
Opticon® 2	Bio-Rad Laboratories	Yes	Duplex	FAM	CAL Fluor Orange 560			
SmartCycler®	Cepheid	Yes	Triplex	FAM	CAL Fluor Orange 560	CAL Fluor Red 635		
SmartCycler II	Cepheid	Yes	4-Plex	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670	
Mastercycler® ep Realplex	Eppendorf	Yes	Duplex	FAM	CAL Fluor Gold 540			
Eco™	Illumina	Yes	4-Plex	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670	
Rotor-Gene™ Q 2-plex	Qiagen	No	Duplex	FAM	CAL Fluor Orange 560			
Rotor-Gene Q 5-plex	Qiagen	No	5-Plex	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670	Quasar 705
LightCycler® 1.2	Roche	Yes	Duplex	FAM	Pulsar® 650			
LightCycler 2.0	Roche	Yes	Triplex	FAM	CAL Fluor Red 610	Pulsar 650		
LightCycler 480	Roche	Yes	4-Plex	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670	
cobas® z 480	Roche	Yes	4-Plex	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670	

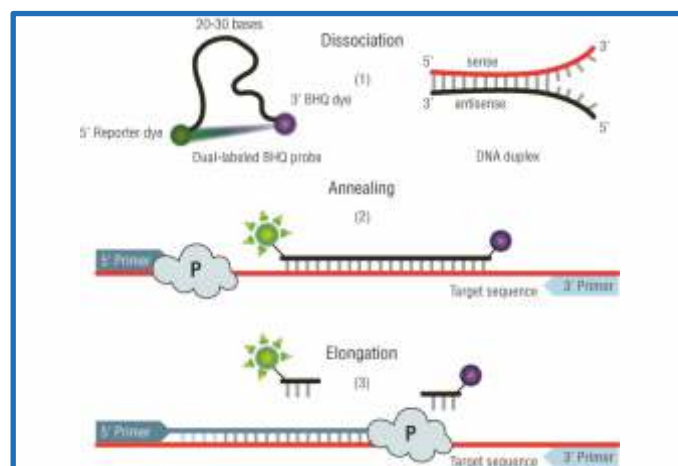
 Determined through research at Biosearch
 Determined through research of a collaborator
 Predicted based on instrument specifications

Dual-labeled BHQ® probes

A BHQ® Probe is a linear, dual-labeled oligonucleotide covalently labeled with a fluorophore and a Black Hole Quencher® (BHQ) dye. BHQ dyes are placed 10 to 30 nucleotides from the reporter dye when used in qPCR hybridization studies. Dyes can be attached either at the 5'-end, 3'-end or at internal thymidine bases, as necessary.

Mechanism of Dual-Labeled BHQ Probes in qPCR

1. Heat denatures the sense and antisense strands of a DNA duplex. As the temperature cools, the BHQ probe and primers anneal to their target sequences. During hybridization, the BHQ probe changes conformation, distancing the fluorophore from the quencher, which disrupts FRET quenching and releases fluorescent signal.
2. During elongation, the DNA polymerase extends the strand in a 5' to 3' direction from the primer. When the polymerase encounters the 5' end of the probe, it cleaves off the reporter-bound nucleotide(s) permanently separating the reporter and quencher dyes.
3. The accumulation of fluorescence signal over repeated cycling allows determination of quantitative and qualitative information from the kinetics of fluorescence-signal amplification.



Mechanism of dual-labeled BHQ probes in qPCR. In solution, the BHQ Probe exists as a random coil when it is in a stoichiometric excess. Hydrophobicity and electrostatics promote dye-dye attractions and enhance fluorescence-quenching.

Knowledge center

- BHQ® dyes, a superior class of high-efficiency dark quenchers – NO native fluorescence
- CAL Fluor®, Quasar® and Pulsar® reporter dyes spectrally paired with BHQ dyes, intended for use in multiplexed assays
- Photostable dyes that stand up to oligonucleotide synthesis and aggressive work-up conditions
- Many other specialty modifiers: biotin, amino, spacers, and more
- Flexible reagents for a wide variety of probe geometries: 5', 3', and internal labeling
- Bulk amidites and CPGs for higher probe purity and yield than ester chemistry
- A variety of column formats to meet your automated synthesis needs
- Personal consultation to support the synthesis and application of modified oligos
- Custom production capabilities available and tailored to your needs!

e-nnovation Life Sciences : Knowledge Center : qPCR & SNP Genotyping, Synthesis Reagents and Immunochemicals

- 1 Introduction to Proprietary Products and Quenching Mechanisms
- 2 An Introduction to Black Hole Quencher® Dyes
- 3 Overview of FRET and Static Quenching Mechanisms
- 4 The Distinction Between FRET and Static Quenching
- 5 Probe/Primer Formats and Dye Selection Guides for Dual Labeled Probes An Overview of Probe / Primer Formats and a Multiplex Instrument Dye Selection Guide
- 6 Popular Quenching Mechanisms in Dual-Labeled Probes&Multiplexing Recommendations for Dual-Labeled Probes
- 7 Black Hole Quencher Amidite, Column and CPG Ordering Information General Information About Synthesis Columns and CPGs
- 8 Black Hole Quencher Amidites&Black Hole Quencher Synthesis Columns and Bulk CPG
- 9 Other Quencher Amidite, Column and CPG Other Quencher Amidites, Synthesis Columns and Bulk CPG Supports. CAL Fluor, Quasar and Pulsar Reporter Dye Information CAL Fluor® and Quasar® Dye Amidites,CAL Fluor and Quasar Dye Synthesis Columns and Bulk CPGs ,Pulsar® 650 Dye Synthesis Columns and Bulk CPGs ,Generic Reporter dye,FluoresceinAmidites, Synthesis Columns and Bulk CPGs TAMRA Amidites, Synthesis Columns and Bulk CPGs ,TET and HEX Amidites .ROX Synthesis Columns and Bulk CPG, Amino Modifying Synthesis Columns and Bulk CPGs
- 10 Biotinylating Amidites, Synthesis Columns and Bulk CPGs ,PhosphorylatingAmidites, Synthesis Columns and Bulk CPGs . Thiol Modifier Amidites and CPG .Spacer Modifier Amiditesand CPGs .Spacer Modifier Amidites and CPGs .Standard DNA Synthesis Amidite, Column and CPG Products deoxyInosine and deoxyUridineAmidites and CPGs .dA, dC, dG and T Columns and CPGs . Universal Support Columns and CPGs .AminopropylCPGs. Mixed Base Synthesis Columns and CPGs
- 11 DNA Purification Products MicroSync II Solvent Resistant Vacuum Manifold System. Purification Columns .Additional Technical Information for BHQ Dyes BHQ Dye and Probe Spectra .&Analysis of a Common BHQ-LabeledOligo: 5' FAM-3' BHQ-1 ..

Design considerations for BHQ probes

Sequence Design

- Probe sequences should be target specific
- For gene expression measurement, the assay design may cross an exon-exon junction (excised intron) to ensure replication of only the desired splice variant
- Sequence design should be no longer than 30 bases to ensure efficient quenching
- If more than 30 bases are required, use an internal BHQ label for more efficient quenching and a Spacer 3 at the 3' end to block polymerase extension
- The probe T_m should be higher than that of the primers

Amplicon Length – Amplicon length should be between 50 and 200 bases for optimum PCR efficiency. Adding another hold step to the thermal cycling protocol may help produce longer amplicons

Applications – Single and multiplex, quantitative and qualitative, real-time and endpoint PCR analysis; and allelic discrimination.

BHQplus Probe Design for SNP Genotyping

- Both allele-specific probes should target the same strand
- The T_m may be lower than that of the primers to enhance discrimination further
- Does not represent a direct substitute for MGB™ probes

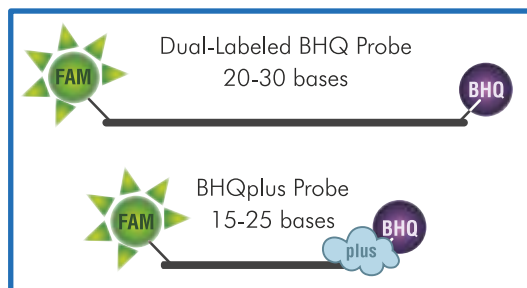


Applications: Single and multiplex, quantitative and qualitative, real-time and endpoint PCR analysis; allelic discrimination and SNP genotyping

BHQplus™ probes

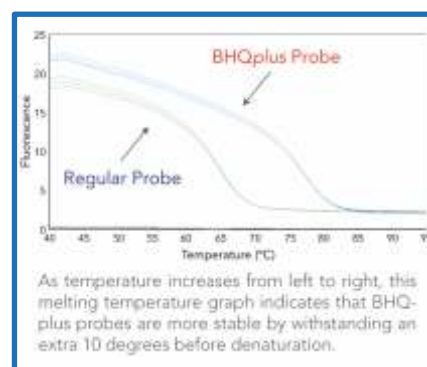
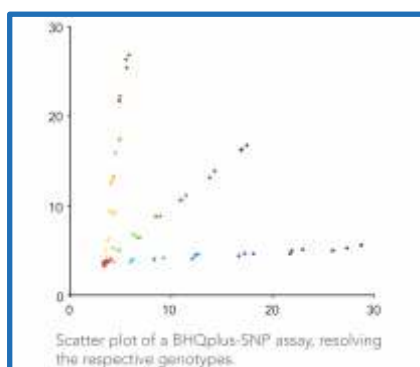
Standard Dual-Labeled BHQ Probes have limited use in SNP analysis and genotyping because such methods require shorter probes for heightened discrimination. Biosearch offers BHQplus probes to address these issues and to provide an alternative to MGB™ probes for qPCR applications.

BHQplus probes form highly stable duplexes with DNA targets to allow shorter probe design while maintaining the proper melting temperature (T_m). Typically, BHQplus probes are 15-25 bases in length, whereas BHQ probes are 20-30 bases long. With compact sequence lengths, BHQplus probes have enhanced target specificity making them ideal for SNP genotyping.



Additionally, BHQplus probe chemistry allows for better interrogation of difficult targets such as AT-rich sequences.

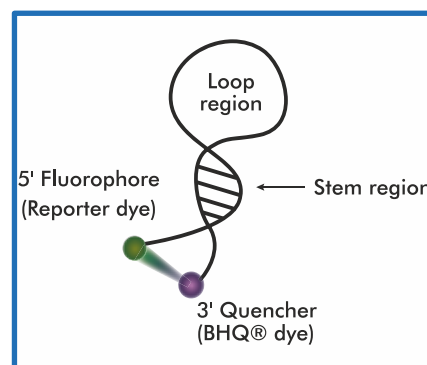
Below are representative results demonstrating the binding characteristics and reporting capacity of BHQplus probes.



Molecular Beacons

Molecular Beacons are a type of dual-labeled oligonucleotide probe that relies on a structured probe conformation to heighten assay specificity. This property allows Beacons to discriminate mismatches as specific as a single nucleotide polymorphism (SNP).

Beacons have a hairpin loop modality with a 5'-fluorophore and a 3'-quencher dye at alternate ends of a short stem sequence, which serves to position the dyes in very close proximity. The loop region contains a sequence complementary to its target. Beacons generate fluorescence through hybridization and under non-hydrolytic conditions allow for post-PCR melt curve analyses.

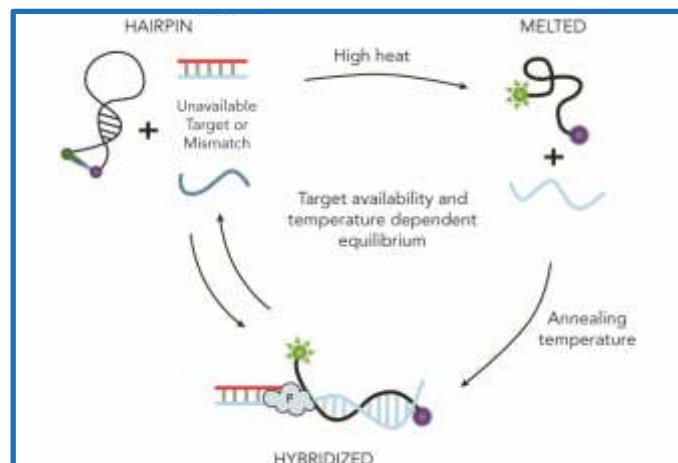


In the absence of target or prior to amplification, the stem anneals to form a closed hairpin conformation which holds the reporter and quencher close together to enable efficient FRET quenching and to promote contact or static quenching.

Mechanism of Molecular Beacons in qPCR

1. Heat denaturation melts the Beacon into a random coil conformation
2. Upon lowering the temperature for primer annealing, the Beacon either hybridizes to the fully complementary target or else refolds into the hairpin conformation
3. Polymerization in a 5' to 3' direction dislodges the Beacon from the target sequence, until the next cycle of amplification

The increase in fluorescence intensity with repeated PCR cycles correlates with the accumulation of product and allows for accurate quantification of template.



Mechanism of Molecular Beacons in qPCR. Molecular Beacons can exist in three conformations depending upon target availability and temperature.

DESIGN CONSIDERATIONS FOR MOLECULAR BEACONS

Loop region:

- Designed sequence length and GC content should ensure that the perfect-match probe-target hybrid is more stable than the hairpin conformation
- Loop sequence should exclude regions of substantial complementarity to the stem region and to either PCR primer



Stem region:

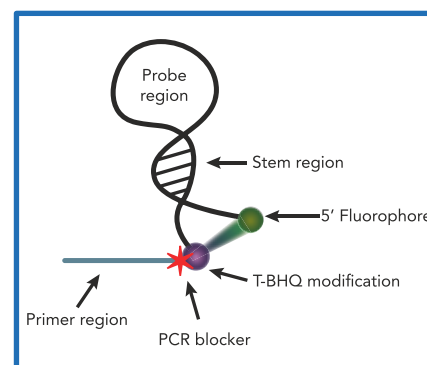
- Stem length should be 5-7 base pairs
- Hairpin stem has a T_m that is 7-10 degrees lower than the probe-target hybrid

Applications: Single and multiplexed, quantitative and qualitative, real-time and end point PCR analysis; allelic discrimination; SNP detection; DNA microarray-immobilized probes and biosensors

SCORPIONS® PRIMERS

Scorpions® primers are dual-labeled probes that combine a Molecular Beacon-like probe structure and a PCR primer element in a single oligonucleotide, allowing for target detection through a unimolecular mechanism. Scorpions primers consist of three distinct features:

- Target-binding sequence representing the primer region at the 3' end
- PCR blocker, often a hexethylene glycol modification linker sequence
- Target-binding region comprising a stem-loop structure, an internal BHQ dye, and a 5'-fluorophore covalently bound to the probe termini.



Design Considerations for Scorpions Primers:

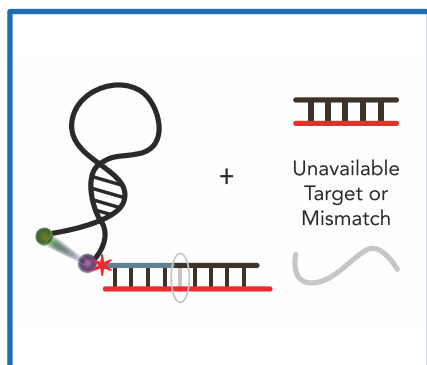
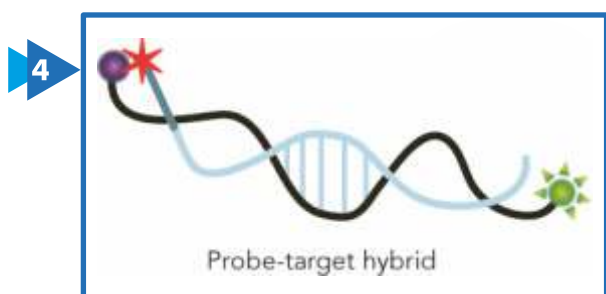
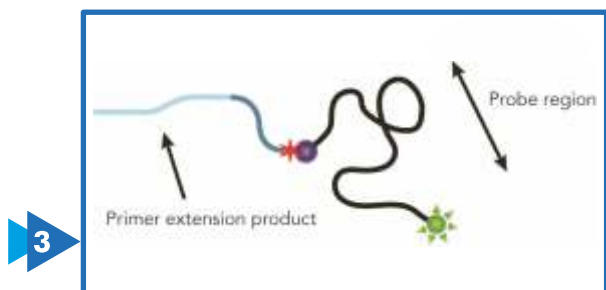
Probe region:

- Design the probe region to be the reverse complement of the primer-extension product
- Design the probe region to bind within 40 bases of the end of the Scorpion Primer region
- Probe region T_m can be lower than that of the primers to enhance discrimination

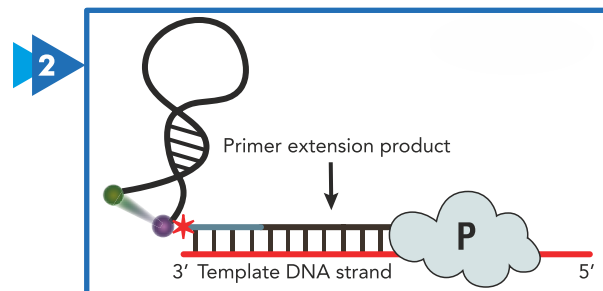
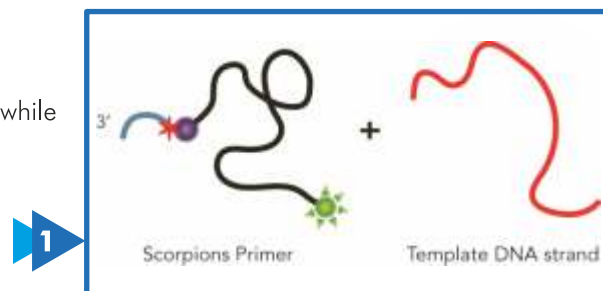
Applications – Single and multiplexed, quantitative and qualitative, real-time and end point PCR analysis; allelic discrimination and SNP genotyping.

Mechanism of Scorpions Primers in qPCR

1. Heat denaturation melts Scorpions Primers into random coils
2. During annealing, the probe region remains in a hairpin conformation while the primer region anneals to its target sequence



Note: Mismatched hybrids are less stable than the reformed stem region. Therefore, the Scorpions Primers only produce signal when the probe region hybridizes to a perfect-match target sequence within the primer extension product.



3. Elongation during polymerization results in a newly synthesized strand, which contains the probe binding site and retains the probe on the 5' end. The binding site is not available while hybridized to the complementary strand
4. After another round of denaturation, the fluorescence-quenched probe attached to the 5' end of this PCR product recognizes the available binding site and unfolds the hairpin to release fluorescence

Purification & Quality Control

PURIFICATION & QUALITY CONTROL

In our ISO 9001:2008 certified facilities, Biosearch purifies all probes using Reverse-Phase HPLC or dual HPLC. Typical purity levels can range from 85% to 90%. All probe formats are processed by HPLC and ESI-TOF mass spectrometry to confirm the identity of the manufactured oligo. Biosearch's production group barcodes all orders to ensure quick and accurate traceability and a quality final product. Certificates of Analysis are available on request.

Custom Oligonucleotides

Whether you require labeled or unlabeled oligos, we can meet your exact needs as we offer more custom modifications than any other oligo supplier at a cost well below the prevailing market rate.

Custom Oligos

Seeking to purchase custom and highly sophisticated oligonucleotides or simple PCR primers? Build Your Oligo is the place to order unlabeled, single labeled or non-standard oligos and primers online. Simply enter your sequence, select from the

industry's largest selection of modifications, and choose a preferred purification option.

Oligos in Plates

LGC Biosearch Technologies offers oligos delivered in plates for those performing high-throughput applications that require large numbers of oligos.

RNA FISH

Stellaris® RNA FISH is a RNA visualization method that allows simultaneous detection, localization, and quantification of individual mRNA molecules at the cellular level in fixed samples. This novel RNA FISH technology represents a fast and easy-to-use method to achieve conclusive results through compelling images of RNA expression.

Custom Probe Sets

Stellaris Custom RNA FISH probe sets can be designed against almost any RNA target to allow for visualization, localization, and quantification of individual mRNA transcripts.

ShipReady Probe Sets

StellarisShipReady RNA FISH probe sets provide convenient, ready-to-ship positive controls for mouse or human reference and long non-coding RNA targets.

DesignReady Probe Sets

StellarisDesignReady probe sets are pre-designed, and have gone through rigorous bioinformatic analysis to ensure specificity. StellarisDesignReady probe sets are made-to-order.

RNA FISH Buffers

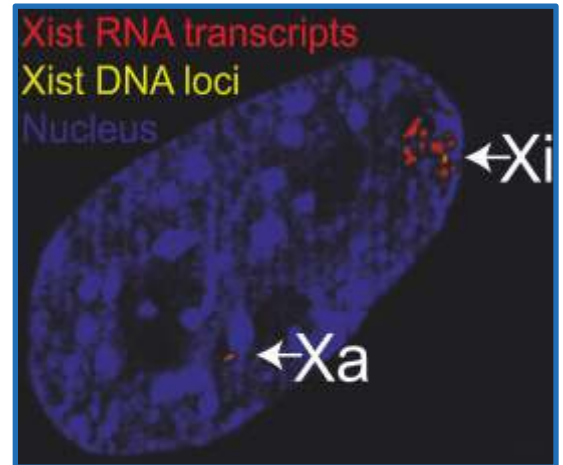
Stellaris Buffers are ideal for performing Stellaris RNA FISH on cells and tissue, as well as other sample types. The buffers contain proprietary additives to enhance signal and reduce background in assays that may typically exhibit more pronounced background fluorescence

Chromatin Isolation via RNA Precipitation (ChIRP)

ChIRP is a rapid technique to discover RNA-associated DNA sequences and map genomic binding sites of chromatin associated long noncoding RNAs (lncRNAs) with high sensitivity and low background.

Stellaris Education

View Stellaris protocols, educational materials, citation center, image gallery, webinars, tech articles, FAQ, and more.

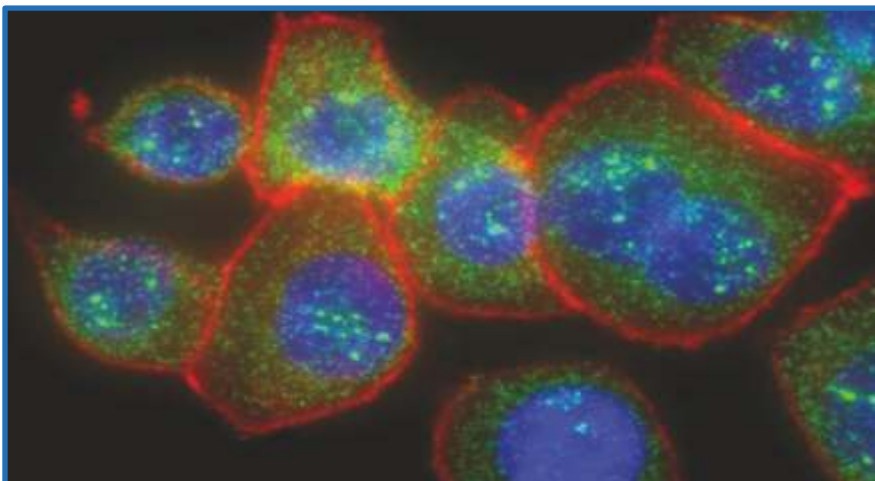


note :

Stellaris FISH (fluorescence in situ hybridization) is a RNA visualization method that allows simultaneous detection, localization, and quantification of individual RNA molecules at the sub-cellular level in fixed samples using widefield fluorescence microscopy. A set of Stellaris FISH Probes comprises multiple oligonucleotides with different sequences each with a fluorescent label that collectively bind along the same target transcript to produce a punctate signal.

The Stellaris FISH technology follows a simple protocol, does not use exotic reagents, is inexpensive and platform-independent, offers same-day results, and is versatile toward many sample types and applications. Scientists may even label Stellaris FISH probes with a number of various dyes to allow for multiplex detection of different RNA targets simultaneously. Finally, scientists can address the stochastic nature of gene expression and visualize RNA through direct detection without isolation, purification, and amplification.

Before getting started with your experiments, please download our Getting Started Guide. You can also learn more about the Stellaris RNA FISH technology by downloading our white paper or by visiting our RNA FISH applications page. Furthermore, The BiosearchTech Blog contains the most up-to-date tips and tricks for running Stellaris experiments.

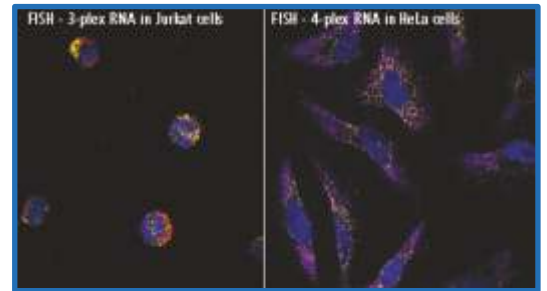


What are Stellaris FISH Probes?

Stellaris FISH Probes enable simultaneous detection, localization, and quantification of individual mRNA molecules at the cellular level. This much improved and simplified FISH technology makes use of multiple single-labeled oligonucleotide probes to provide a high degree of specificity and sensitivity. Stellaris FISH probes are ideal for applications that analyze transcription site activity, protein-RNA interactions and mRNA translocation events, and hold promise for future diagnostic applications. Single molecules can be seen as individual diffraction-limited spots in conventional fluorescence microscopes, evoking stars on a moonless night! For Research Use Only. Not for use in diagnostic procedures.

How to Use Stellaris FISH Probes

The Stellaris RNA FISH Method - Detecting single transcripts in situ using Stellaris FISH Probes is remarkably simple and straightforward. From sample preparation to imaging with wide-field fluorescence microscopy, it takes less than a day to bring light to your queries. An experiment using Stellaris FISH Probes requires no exotic reagents and can detect single mRNA molecules in four easy steps:



Detection of Long Non-coding RNAs by Stellaris™ FISH Probes

References

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Custom Stellaris® FISH Probes

White Paper

Stellaris RNA FISH: Detection, Localization, and Quantification of mRNA at the Cellular Level

Abstract

Presented here is a new method for in situ RNA detection, the Stellaris® FISH technology, which enables simultaneous detection, localization, and quantification of individual RNA molecules at the cellular level. This technique provides a high degree of specificity and sensitivity, is ideal for applications that analyze transcription site activity, protein- RNA interactions and mRNA translocation events, and holds promise for future diagnostic applications.

Introduction

Methods for in situ RNA detection have been in existence for some time, but these techniques have thus far faltered for reasons including specificity, incompatibility with existing research methods, or overly complex preparation methods.

Stellaris FISH technology utilizes a set of simple fluorescent probes which bind along the length of target RNA. The use of multiple probes ensures that positive signal is clearly visible above background without need for amplification, while fluorescence due to stray probes falls below the threshold of detection.

The simple structure and small size of the Stellaris probes makes permeabilization possible without protease treatment. As a result, the procedure is less cumbersome than existing methods and more easily integrates with complementary detection techniques such as fluorescent antibody assays.

Method

The Stellaris FISH protocol is comparatively simple, and consists of four steps, as shown in Figure 1. No exotic reagents are required, and the entire process can be completed in less than a day.

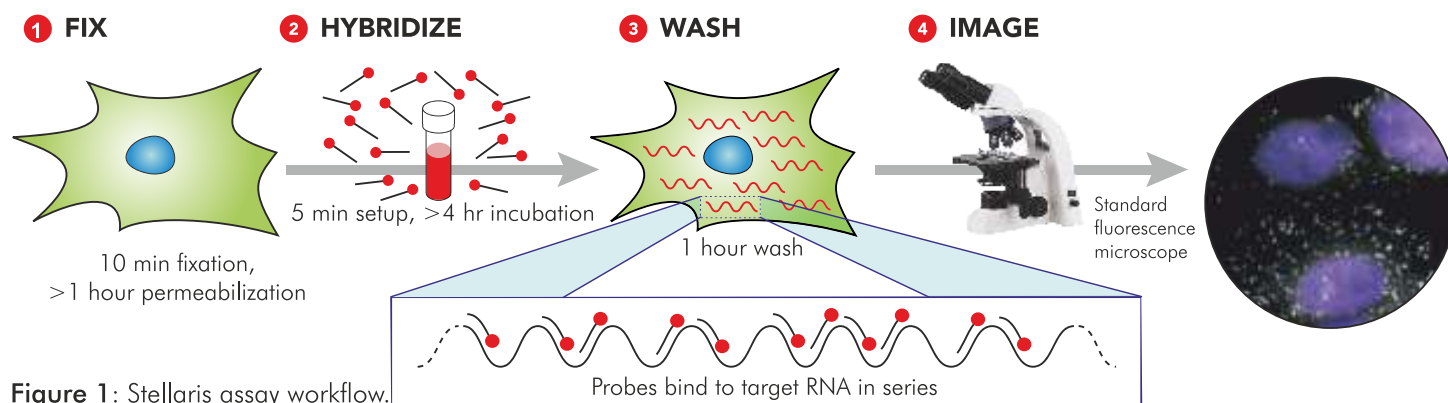


Figure 1: Stellaris assay workflow.

Step 1: Prepare sample

The sample is adhered or sectioned onto a #1 coverglass and permeabilized with 70% EtOH. Slight variations in sample preparation between different organisms and sample types are covered in the online protocols. No protease is required.

Step 2: Hybridize Probes

For most samples, hybridization can be completed in 4 hours at +37 °C in a generic laboratory incubator.

Step 3: Wash Sample

After hybridization, wash buffer with short incubation periods is used to remove excess probes. The total time for this step is 1 – 1.5 hours.

Step 4: Image Sample

At this point, the sample can be imaged using a standard fluorescence microscope.

Sensitivity and Specificity

The large number of probes in a Stellaris FISH assay ensures a high level of sensitivity. While there are various factors such as buffer composition and hybridization temperature that can improve the binding of probes to target RNA, hybridization is, at its root, a stochastic process. As a result, assays which depend on a single probe or a small number of probes will fail to detect a small number of the target RNA. With a larger number of probes, built in redundancy minimizes the risk of a false negative, as enough probes will hybridize to target RNA to allow detection. The effect of the stochastic nature of hybridization can be observed in the small variation in fluorescence among positive spots in a Stellaris FISH assay (figure 2).

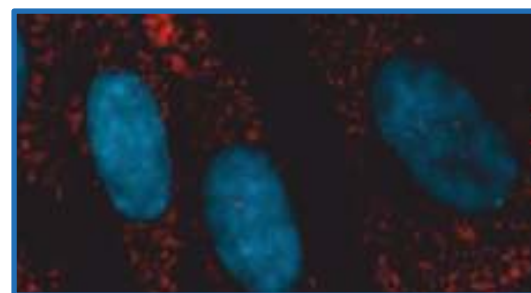


Figure 2: Low levels of variability in fluorescence due to number of hybridized probes.

Stellaris FISH assays are also highly specific due to the large number of probes. Positive signal is only identified from the combined localized fluorescence of multiple probes. Off-target binding of probes generates weak and diffuse fluorescence, well below the threshold for specifically targeted mRNA detection. The punctate spots which indicate positive signal clearly stand out from background, and the distinction can be further improved with background subtraction algorithms (figure 3) common in many imaging software packages. In contrast, detection methods which use multiply labeled probes have the potential for a single stray probe to be detectable above background. The sensitivity and specificity of Stellaris FISH probes has previously been established through comparison with RTqPCR by Raj et al.

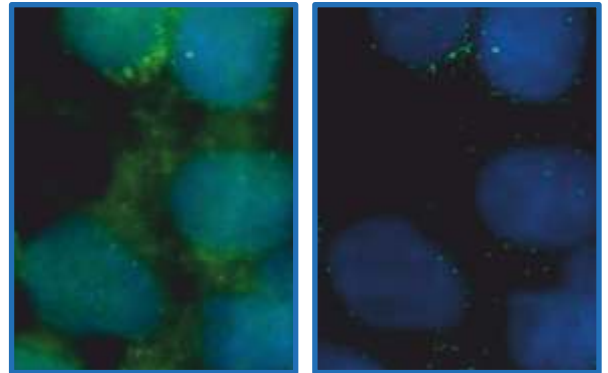


Figure 3: Sample directly after imaging (left), and after background subtraction in ImageJ (right).

Multiplex Capability

Stellaris FISH probes are available with a wide variety of fluorophores, including Biosearch Technologies' CAL Fluor® and Quasar® dyes. Like qPCR, the variety of fluorophores allows the technology to be used in a multiplex assay (figure 4). The dye choices in a multiplex assay are largely determined by the filters available to a researcher, but it is certainly possible to design an assay including a DAPI nuclear stain and three Stellaris FISH probe sets labeled with reporter dyes with minimal spectral overlap. Multiplex assays can be used to identify a correlation in expression levels between multiple genes, run a control probe set of known expression with a target simultaneously, or simply save time over running the assays one at a time.

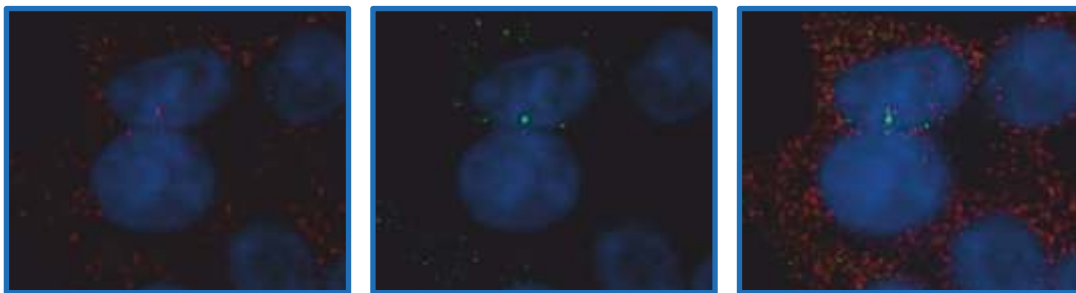


Figure 4: Highly expressed GAPDH (left), Low expression c-myc (middle), Overlay of multiplex (right)

Combination with Antibody Assays

The use of ethanol instead of protease in the permeabilization step prevents additional proteolysis from the fixation process. As a result, it is possible to combine a Stellaris assay with fluorescent antibody assays (figure 5) to simultaneously image a messenger RNA and the protein for which it codes. This can be a useful tool in identifying mechanisms of translational regulation.

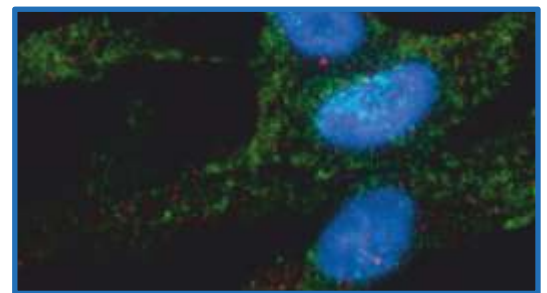
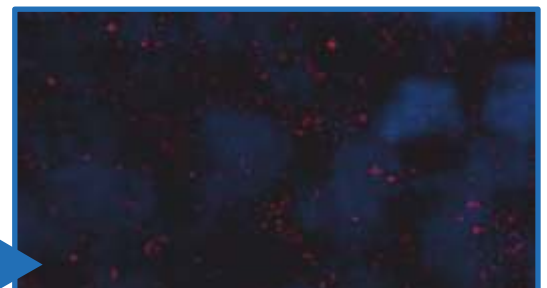


Figure 5: Multiple assay with GAPDH mRNA using Stellaris Probes (green), and Alexa Fluor® 488 antibodies for GAPDH protein (red)

Use in FFPE Samples

Stellaris FISH probes can be used in FFPE samples (figure 6) as well as adherent cells and frozen tissue sections. While freezing is the preferred method of preservation for RNA analysis due to RNA degradation in formalin fixation, in many cases archival FFPE tissue presents the only feasible source of data points. In these cases, Stellaris FISH probes can be used to gain a semi-quantitative analysis of gene expression in archival tissue. Stellaris FISH technology presents an additional advantage over other methods of RNA quantification from archival tissue in that it does not require lysing of the sample and thus keeps tissue morphology intact.

Figure 6: Probes targeting GAPDH mRNA in formalin fixed paraffin embedded (FFPE) tissue.



Synthesis Reagents

We offer an extensive range of products for DNA and RNA synthesis including: synthesis supports, columns for 3' labeling and specialty amidites. These products are available for all of our fluorophores and quenchers as well as for many non-fluorescent labels.

Amidites

We offer a broad range of, fluorophore reporter, non-fluorescing quencher and specialty modification phosphoramidites for 5' and internal modifications of chemically synthesized DNA.

CPG

For synthesizing DNA or RNA we offer an extensive range of controlled pore glass (CPG) including standard nucleoside DNA and RNA supports. For labeling and synthesis of dual labeled probes we offer 3' specialty modifications, fluorescent and BHQ quencher CPG. Our supports are packed in columns which are compatible with most automated DNA/RNA synthesizers, or are offered as bulk CPG's.

Carboxylic Acid, Succinimidyl Esters, & Amines

We offer a variety of quenchers, fluorophores, and non-fluorescent modifications in the form of succinimidyl esters, carboxylic acids, and amines for post-synthesis labeling.

Synthesis & Purification Accessories

We offer Micropure purification columns intended for reverse-phase purification of 5'-dimethoxytrityl protected oligonucleotides and our Microsync II vacuum manifold system for rapid, efficient purification of many samples simultaneously. We also offer empty synthesis columns and standard frits for customers who prefer to pack their own columns.

We offer an extensive range of products for DNA and RNA synthesis including: synthesis supports and columns for 3' labeling and specialty amidites. These products are available for all of our fluorophores as well as for many non-fluorescent labels.

for more product information write us to : info@ennovationlifesciences.com

or visit our webpage : www.ennovationlifesciences.com



Immunochemicals

Immunochemicals

We offer a line of immunochemicals which include hapten reporter groups and protein, FICOLL, and fluorophore conjugates.

Native Proteins and FICOLL

LGC Biosearch offers hapten conjugated proteins; unlabeled proteins (OVAL; BSA ; CGG and KLH) and fluorescent protein conjugates for immunochemistry. We also offer the haptens that can be used as labeling reagents for custom conjugates.

[learn more](#)

Hapten Conjugates

Our line of conjugates include well studied small molecule haptens eg, DNP, TNP, NP, NIP, and PC (Phosphoryl Choline). Various levels of conjugation density are available depending on the antibody response required by the researcher. Such reagents are complete antigens useful for inducing antibody response in animal models.

[learn more](#)

Hapten Reagents

Hapten reagents (such as succinimide esters) allow the customer to synthesize their own custom conjugates.

[learn more](#)

Other

LGC Biosearch offers GC7 a potent inhibitor of deoxyhypusine synthase. Used as cell growth inhibitor and to synchronize the cell cycle of cultured cells.

EPIGENETICS research

Epigenetic regulation refers to biological mechanisms in which DNA, RNA, and proteins are chemically or structurally modified, without changing their primary sequence. These epigenetic modifications play critical roles in the regulation of numerous cellular processes, including gene expression, DNA replication, and recombination. Epigenetic regulatory mechanisms include DNA methylation and hydroxymethylation, histone modification, chromatin remodeling, RNA methylation, and regulation by small and long non-coding RNAs. While epigenetic modifications can be very stable and passed on to multiple generations in some cases, they can also dynamically change in response to specific cellular conditions or environmental stimuli. When epigenetic mechanisms are misregulated, the result can be detrimental to health and can lead to cancer, neurological disorders, and developmental abnormalities. Therefore, epigenetic modifications are emerging as important

Epigenetics Technologies

DNA Methylation

DNA methylation remains one of the most extensively studied areas of epigenetic research, and e-nnovation Life sciences products for investigating DNA methylation are the most cited and trusted in the industry.

DNA Hydroxymethylation

DNA hydroxymethylation is an epigenetic modification that is being increasingly investigated, yet its biological remains unclear.

RNA Methylation

e-nnovation life sciences assists scientists in pioneering the emerging field of RNA epigenetics with the first commercially available products to study methylation in RNA.

NGS Library Prep Kits

e-nnovation Life sciences offers unique library preparation methods that feature easy-to-use, streamlined workflows to generate ready-to-sequence libraries compatible with Illumina®-based sequencing chemistries.

Non-coding RNA

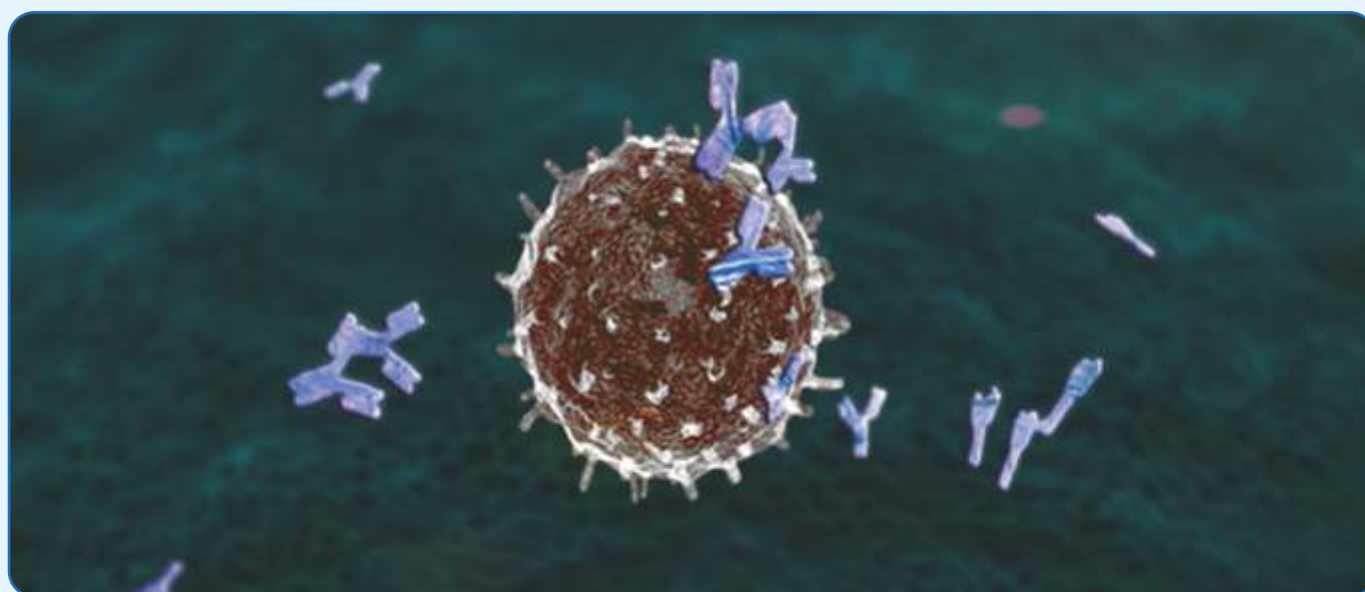
e-nnovation life sciences offers the best purification kits for investigating small (miRNA, siRNA, piRNA) and long non-coding RNAs.

Antibodies for Epigenetics

Antibodies are essential for many epigenetic experiments, and e-nnovation Life sciences offers some of the most specific and sensitive epigenetic antibodies available.

Epigenetic Enzymes & Reagents

e-nnovation Life sciences offers an extensive line of enzymes and reagents for use in epigenetic experiments.



TrueMethyl[®] oxBS technology

Quantify 5hmC and 5mC at single-base resolution



TrueMethyl[®] highlights

The new gold standard

CEGX's TrueMethyl[®] oxidative bisulfite sequencing (oxBS-Seq) kits allow you to accurately quantify 5-methylcytosine (5mC) and 5-hydroxymethylcytosine (5hmC) in parallel at single-base resolution.

Robust and reproducible

The innovative workflow limits bias and yields and reproducible data ($r^2 > 0.98$).

Platform agnostic

oxBS technology is compatible with a variety of techniques including next generation sequencing (NGS), Infinium 450K methylation array, pyrosequencing and additional targeted approaches.

5 major reasons why 5hmC is important*

1. Stable modification positively associated with transcriptional activity.
2. Recruits binding partners distinct from those bound by 5mC.
3. Produced by the TET enzymes which are essential for development and cellular differentiation.
4. Strong prognostic indicator in cancer and other diseases.
5. Implicated in the regulation of neurological plasticity, immunology and other dynamic systems.

* Learn more at cegx.co.uk

Early studies strongly indicate that 5hmC is functionally distinct from 5-methylcytosine (5mC).

TrueMethyl[®] technology enables accurate methylation sequencing



1. Bisulfite (BS) sequencing converts 5hmC to cytosine 5-methylsulfonate (CMS), leaving both 5mC and 5hmC to be detected as C by sequencing. Therefore, oxBS is necessary to resolve the 5mC & 5hmC ambiguity.

2. Oxidative bisulfite (oxBS) sequencing yields the true levels of 5mC at single-base resolution. Efficient chemical oxidation (ox) converts 5hmC into 5-formylcytosine (5fC). Bisulfite (BS) treatment then converts 5fC and C to uracil, leaving only 5mC to be detected by sequencing.

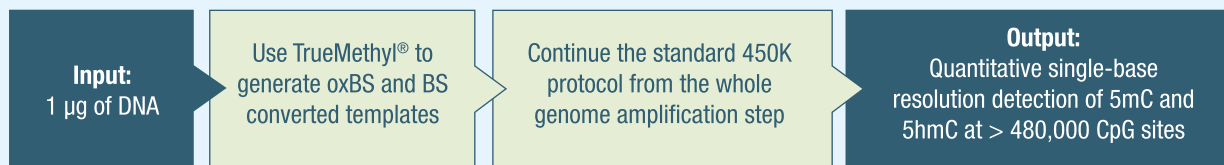
$$\text{BS} - \text{oxBS} = \text{True } 5\text{hmC}$$

3. Subtractive analysis identifies 5hmC bases by quantitative comparison.

Experimental data

Analysis of 5mC and 5hmC using TrueMethyl® and 450K array

Generic human brain genomic DNA was processed through TrueMethyl® in duplicate, and subsequently run on the Illumina Infinium HumanMethylation 450 BeadChip® (450 array).



Results (n=2, r²>0.98)

Figure 1. Traditional BS analysis

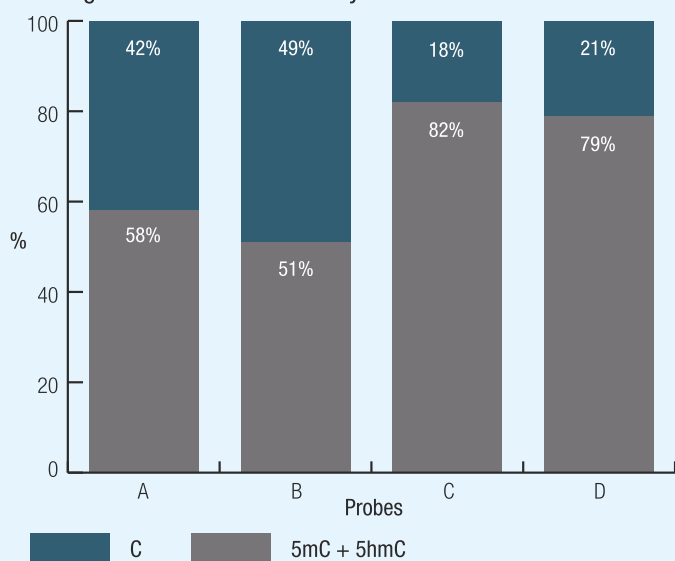


Figure 2. TrueMethyl® analysis

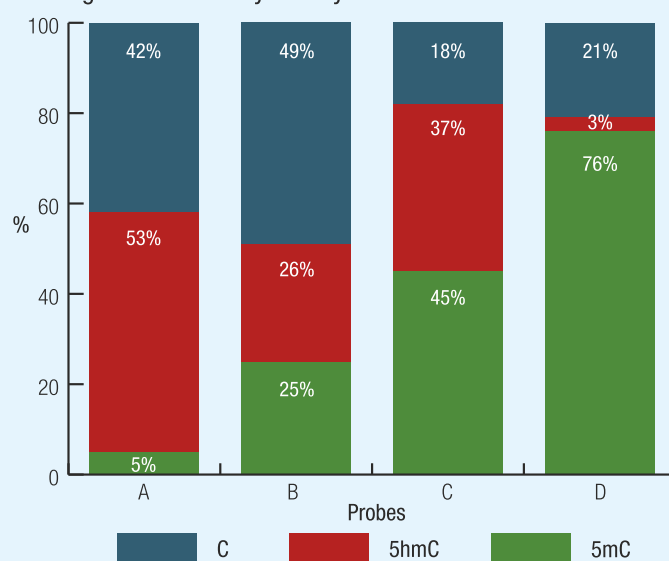


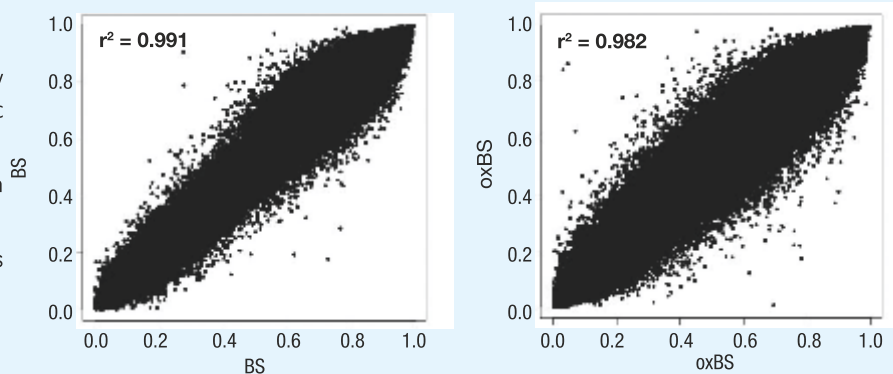
Figure 1 shows the levels of unmethylated cytosines (C), and the confounded measurement of methylated and hydroxymethylated cytosines (5mC + 5hmC) after traditional bisulfite conversion (BS). Results from 4 probes (A, B, C and D) of the 450K array are displayed.

Figure 2 shows the levels of unmethylated (C), methylated (5mC) and hydroxymethylated (5hmC) cytosines after TrueMethyl® conversion. Results from the same 4 probes shown in figure 1 illustrate the true levels of 5mC and 5hmC.

oxBS technology resolves DNA modifications (5mC & 5hmC) for accurate epigenetic interpretation.

High reproducibility

- TrueMethyl® chemicalbased technology does not utilize unreliable enzymatic reactions.
- Unbiased contextindependent conversion (dense/sparse, high/low, CpG & CpH).
- Robust and highly reproducible results (r²>0.98).



Coefficient of determination (r²) from simple linear regression of BS and oxBS replicates.

New improved design

The second generation (Gen2) TrueMethyl® workflow has been enhanced for optimal performance:

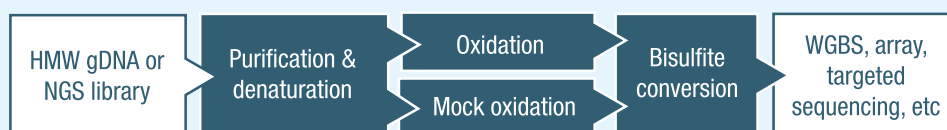
- TEasier-to-use
- Increased sample recovery rates
- Lower input requirements

Furthermore, the Gen2 kits have been designed for high throughput processing and automation.

	Gen1 kits (TM6 & TM24)	Gen2 kits (TM-Seq & TM-Array)
DNA input for WGBS	≥800ng	≥50ng
DNA input for 450K array	4ug	1ug
Automatable	No (uses columns & filters)	Yes (uses magnetic beads)
High throughput	No	Yes

TM-Seq and TM-Array kits

Our Gen2 TrueMethyl® kits contain the necessary controls and reagents to perform oxidation and bisulfite conversion of complex genomic samples. They enable the accurate and robust quantification of both cytosine methylation (5mC) and hydroxymethylation (5hmC) at single-base resolution and are compatible with standard upstream processing and downstream analysis.



To facilitate experimental design and ensure TrueMethyl® integrates seamlessly into your existing protocols, we provide two kits optimized for your chosen analytical platform:

TrueMethyl® Seq is ideal for NGS libraries and for applications including WGBS, RRBS and target enrichment.

TrueMethyl® Array converts high molecular weight genomic DNA for applications including 450K array, pyrosequencing and amplicon sequencing.

Need experimental design advice? Contact us at info@cegx.co.uk

Highlighted publications using oxBS technology

Role of Tet1 and 5-hydroxymethylcytosine in cocaine action.

Feng J. *et al.*, Nature Neuroscience, 2015.

Accurate Measurement of 5-Methylcytosine and 5-Hydroxymethylcytosine in Human cerebellum DNA by Oxidative Bisulfite on an Array (OxBS-Array).

Field S.F *et al.*, Plos One, 2015.

Large conserved domains of low DNA methylation maintained by Dnmt3a.

Jeong M. *et al.*, Natural Genetics, 2013.

Oxidative bisulfite sequencing of 5-methylcytosine and 5-hydroxymethylcytosine.

Booth M.J. *et al.*, Nature Protocols, 2013.

FGF signaling inhibition in ESCs drives rapid genome-wide demethylation to the epigenetic ground state of pluripotency.

Ficz G. *et al.*, Cell Stem Cell, 2013.

Ordering information

	Catalogue #	# Reactions
TrueMethyl® Seq	CEGXTMS	24 oxBS + 24 BS
TrueMethyl® Array	CEGXTMA	96 oxBS + 96 BS

And there is more...

Interested in 5-formylcytosine?

RedBS technology accurately quantifies 5-formylcytosine at single-base resolution and is exclusively available to TrueMethyl® customers.

PCR and qPCR Reagents

PCR and qPCR Reagents

Superior PCR performance for the most straightforward to the most challenging of reactions.

PCR Mastermix

Enhanced and optimised Taq PCR mastermix for standard applications

- Suitable for a broad range of templates up to 6kb
- Specific and efficient amplification of challenging templates including gDNA and GC- & AT-rich sequences
- High yields under standard and fast protocols
- Ready to use premixed, pre optimised, 2x mastermix

HiFi Polymerase

Superior PCR performance on complex templates

- 50x fidelity vs Taq polymerase, 6x fidelity vs standard Pfu
- Advanced buffer chemistry - dNTPs included in buffer
- Enhanced DNA binding-improved processivity, increased yield, shortened cycle time
- Increased efficiency minimises inhibition from impure samples

Hot Start PCR Mastermix

Novel hot start for unrivalled specificity and sensitivity

- Proprietary small molecule hot start technology
- Unrivalled amplification of low copy number templates
- Specific and efficient amplification of challenging templates including gDNA and GC- & AT-rich sequence
- Ready to use pre-mixed, pre optimised, 2x mastermix

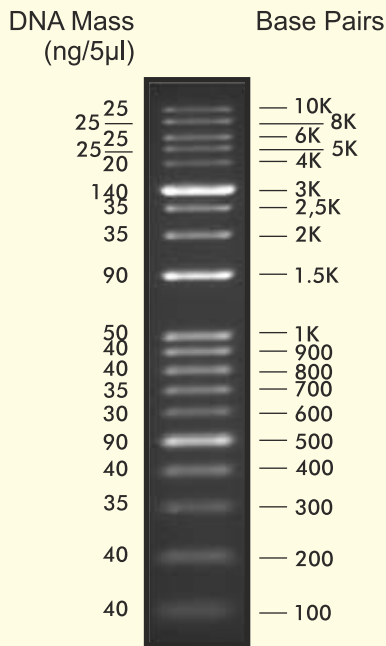
Cat no.	Description	Product code
reSource PCR mastermix	400 x 25µl reactions 2,000 x 25µl reactions	SBS7271 SBS7271-B
reSource HS PCR mastermix	400 x 25µl reactions 2,000 x 25µl reactions	BS7272-B SBS7273
reSource HiFi polymerase	200 units 1,000 units	SBS7273 SBS7273-B



Ready-To-Use DNA Ladders

Kplus DNA Ladder RTU

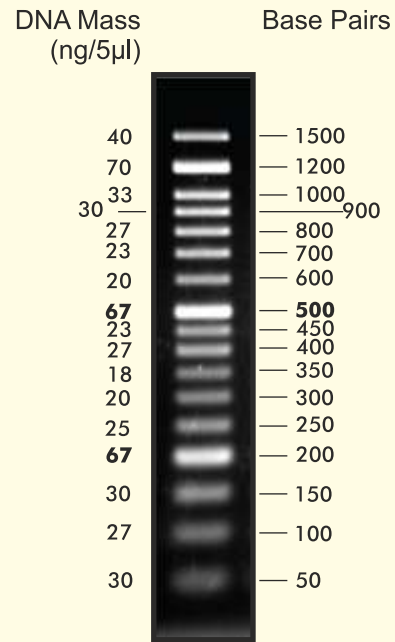
Cat. No. DM011-R500
Size : 86ug/500ul



1.5% TAE agarose gel

50bp DNA Ladder RTU

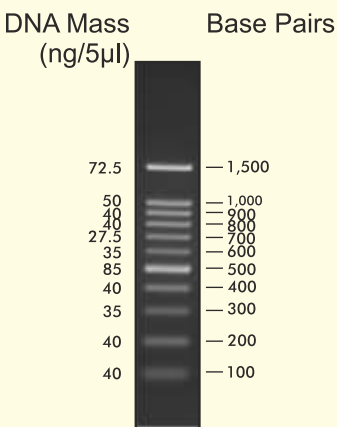
Cat. No. DM012-R500
Size : 56ug/500ul



2% TAE agarose gel

100bp DNA Ladder RTU

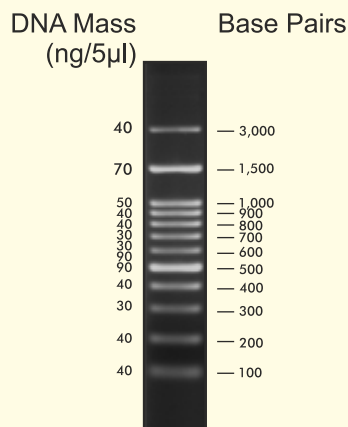
Cat. No. DM001-R500
Size : 50ug/500ul



1.7 % TAE agarose gel

100bp DNA Ladder H3 RTU

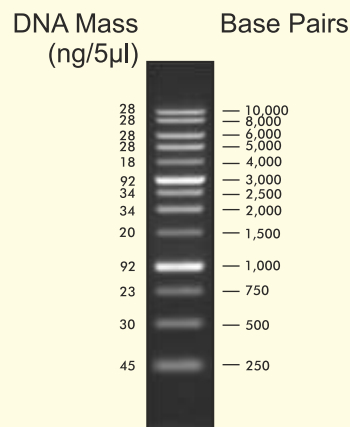
Cat. No. DM003-R500
Size : 54ug/500ul



1.5 % TAE agarose gel

1Kb DNA Ladder RTU

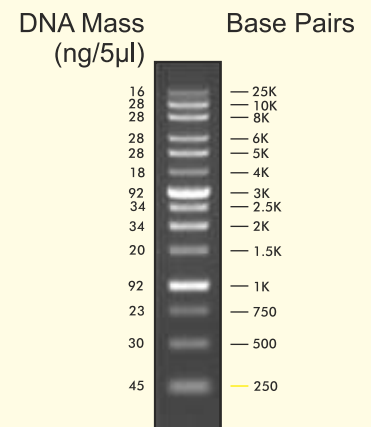
Cat. No. DM010-R500
Size : 50ug/500ul



1 % TAE agarose gel

XLarge DNA Ladder RTU

Cat. No. DM013-R500
Size : 50ug/500ul



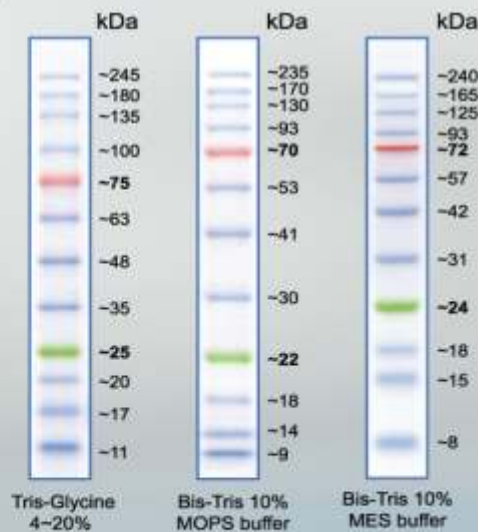
0.7 % TAE agarose gel

Prestained Protein Ladder

BLUeye Prestained Protein Ladder

Cat. No. PM007-0500
Size: 500 µl

- Broad Range: 11 - 245 kDa
- Supplied in a gel loading buffer for ready-to-use convenience
- Easier identification: Green and red reference bands at 25 kDa and 75 kDa, respectively
- Sharp bands



BLUelf Prestained Protein Ladder

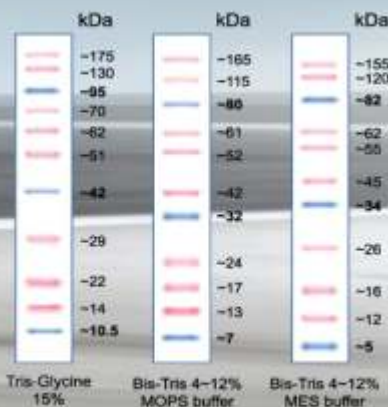
Cat. No. PM008-0500
Size: 500 µl

- Broad Range: 5 - 245 kDa
- Supplied in a gel loading buffer for ready-to-use convenience
- Easier identification: Green and red reference bands at 25 kDa and 75 kDa, respectively
- Sharp bands



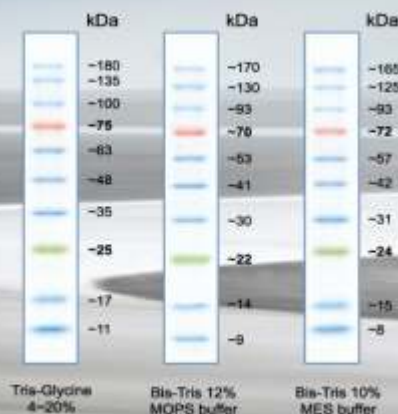
PiNK Plus Prestained Protein Ladder

Cat. No. PM005-0500
Size: 500 µl
Range: 10~175 kDa



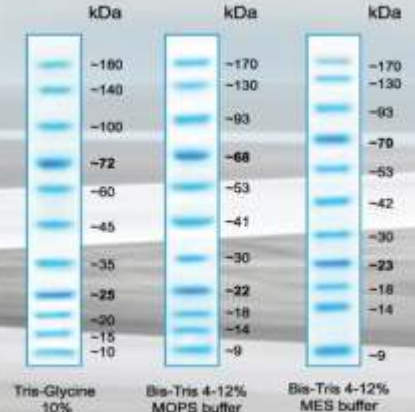
BlueRAY Prestained Protein Ladder

Cat. No. PM006-0500
Size: 500 µl
Range: 10~180 kDa



BlueAQUA Plus Prestained Protein Ladder

Cat. No. PM019-0500
Size: 500 µl
Range: 10~180 kDa



Tubes	Cat #	Description	Unit	Unit	
Sterile Centrifuge Tubes	10-0151	15ml, Plug-seal cap, PP, Conical, rack pack	50 Tubes/Rack, 10 Racks/Case	500	
	10-0152	15ml, Plug-seal cap, PP, Conical, bulk pack	25 Tubes/Bag, 20 Bags/Case	500	
	10-0501	50ml, Plug-seal cap, PP, Conical, rack pack	25 Tubes/Rack, 20 Racks/Case	500	
	10-0502	50ml, Plug-seal cap, PP, Conical, bulk pack	25 Tubes/Bag, 20 Bags/Case	500	
	10-9151	15ml, Flat-top cap, PP, Conical, rack pack	50 Tubes/Rack, 10 Racks/Case	500	
	10-9152	15ml, Flat-top cap, PP, Conical, bulk pack	25 Tubes/Bag, 20 Bags/Case	500	
	10-9501	50ml, Flat-top cap, PP, Conical, rack pack	25 Tubes/Rack, 20 Racks/Case	500	
	10-9502	50ml, Flat-top cap, PP, Conical, bulk pack	25 Tubes/Bag, 20 Bags/Case	500	
Non-Sterile Centrifuge Tubes & Caps	10-9815	Non-sterile 15ml Flat-top cap Centrifuge Tubes, PP, Bulk	500 Tubes/bag, 500 Caps/Bag, 2 Bags/Case	500	
	10-9850	Non-sterile 50ml Flat-top cap Centrifuge Tubes, PP, Bulk		500	
	10-0815	Non-sterile 15ml Plug-seal cap Centrifuge Tubes, PP, Bulk		500	
	10-0850	Non-sterile 50ml Plug-seal cap Centrifuge Tubes, PP, Bulk		500	
Note: For non-sterile centrifuge Tubes, once the stock sold out, there will be MOQ per catalog number.					
Test Tubes	12-1275	12mm x 75mm, Polystyrene, Round Bottom, Non-sterile, Disposable	500 Pieces/bag, 4 Bags/Case	2000	
	12-2275	12mm x 75mm, Polypropylene, Round Bottom, Non-sterile, Disposable	500 Pieces/bag, 4 Bags/Case	2000	
	12-1300	13mm x 100mm, Polystyrene, Round Bottom, Non-sterile, Disposable	250 Pieces/bag, 8 Bags/Case	2000	
	12-1299	12mm Plug Caps, Polyethylene, Blue, Used for #12-1275 tubes only	1000 Pieces/bag, 2 Bags/Case	2000	
	12-1399	13mm Plug Caps, Polyethylene, Red, Used for #12-1300 tubes only	1000 Pieces/bag, 2 Bags/Case	2000	
MicroCentrifuge Tubes	80-0500	0.5ml, Clear, 500 Tubes/bag	500 Tubes/bag, 10 Bags/Case	5000	
	80-1500	1.5ml, Clear, RNase & DNase Free	500 Tubes/bag, 10 Bags/Case	5000	
	80-1500-upgr	1.5ml, Clear, RNase & DNase Free	500 Tubes/box, 10 Boexs/Case	5000	
Screw Cap Microtubes	81-0053	0.5ml Conical Tube, Non-sterile, PP	500 Tubes/pack, 8 Packs/Case	4000	
	81-0054	0.5ml Self-Standing Tube, Non-sterile, PP,	500 Tubes/pack, 8 Packs/Case	4000	
	81-0153	1.5ml Conical Tube, Non-sterile, PP	500 Tubes/pack, 8 Packs/Case	4000	
	81-0154	1.5ml Self-Standing Tube, Non-sterile, PP	500 Tubes/pack, 8 Packs/Case	4000	
	81-0203	2.0ml Conical Tube, Non-sterile, PP	500 Tubes/pack, 8 Packs/Case	4000	
	81-0204	2.0ml Self-Standing Tube, Non-sterile, PP	500 Tubes/pack, 8 Packs/Case	4000	
	81-0000	Screw Cap with O-Ring, Clear, Non-sterile, PP	500 Caps/pack, 8 Packs/Case	4000	
	#81-0001—Pink, #81-0002—Green, #81-0003—Blue, #81-0004—Yellow,		500 Caps/pack, 8 Packs/Case	4000	
	Note: package will change to be 10packs/case once old stock sold out and the price will change to be old price*1.25				
Sterile Cryogenic Vials	81-8204	2.0ml Self-Standing Vials assembled with clear caps, Sterile, RNase & DNase Free, ith Whit P i t i A E d t i F	500/pack, 4 Packs/Case	2000	
	81-7053 (0.5ml), 81-7054(0.5ml self-standing), 81-7153(1.5ml) 81-7154(1.5ml self-standing) 81-7203(2.0ml)		500/Pack, 4 Packs/Case	2000	
	Cryogenic Vial, Sterile, No-Printing, RNase & DNase free, Endotoxin Free, PP.—the lead time will be longer				
CryoKING	X—Cap Color: 0—White, 1—Red, 2—Green, 3—Blue, 4—Yellow, 5—Purple				
CryoKING Cryogenic Vial	88-005X	0.5ml vial, no Barcode, PP, O-ring free cap	25 Pieces/Bag, 20 Bags/Pack, 2 Packs/Case, Two free cryogenic boxes included	1000	
	88-010X	1.0 ml vial, no Barcode, PP, O-ring free cap		1000	
	88-015X	1.5 ml vial, no Barcode, PP, O-ring free cap		1000	
	88-320X	2.0 ml vial, no Barcode, PP, O-ring free cap	25 Pieces/Bag, 10 Bags/Pack, 4 Packs/Case	1000	
	88-350X	5.0 ml vial, no Barcode, PP, O-ring free cap		1000	
CryoKING Cryogenic 2D Vial	88-105X	0.5ml vial, with 2D Barcode, PP, O-ring free cap	25 Pieces/Bag, 20 Bags/Pack, 2 Packs/Case, Two free cryogenic boxes included	1000	
	88-110X	1.0 ml vial, with 2D Barcode, PP, O-ring free cap		1000	
	88-115X	1.5 ml vial, with 2D Barcode, PP, O-ring free cap		1000	
CryoKING Combo	89-305X	0.5ml vial with 2D Barcode, PP, O-ring free cap with one inch Box	100 Vials+1 Box/bag, 6 Bags/Pack, 2 Packs/case	1200	
	89-310X	1.0ml vial with 2D Barcode, PP, O-ring free cap with two inch Box			
	89-315X	1.5ml vial with 2D Barcode, PP, O-ring free cap with two inch Box			
CryoKING Cryogenic Boxes	98-0113	one inch Box, PC, 10x10	3 Pieces/Bag, 2 Bags/Pack, 2 Packs/Case	12	
	98-0213	two inch Box, PC, 10x10			
CryoKING Scanner	CKS-1101	Including 2-Box Scanning Frame with No Extra Charge. Catalog # CKS-8102	1Piece/Case	1	
PCR					
PCR Tubes	60-0082	0.2ml, Flat caps, PP, RNase & DNase Free, Clear	1,000 Tubes/Pack, 10 Packs/Case	10000	
	60-0002	0.2ml, Dome-shaped caps, PP, RNase & DNase Free	1,000 Tubes/Pack, 10 Packs/Case	10000	
	60-0088	0.2ml, 8-strip, Flat caps, PP, RNase & DNase Free	125 Strips/Pack, 10 Packs/Case	1250	
	60-0008	0.2ml, 8-strip, Dome-shaped caps, PP, RNase & DNase Free	125 Strips/Pack, 10 Packs/Case	1250	
PCR Plate	60-0056	96-well PCR Plates, Half-Skirted, RNase & DNase Free, Clear	25 Plates/Pack, 4 Packs/Case	100	
Liquid Handling					
Pipet Tips	20-0010	10µl bulk, Non-sterile, RNase & DNase Free, Clear	1,000 Tips/Bag, 10 Bags/Case	10000	
	20-0200	200µl bulk, Non-sterile, RNase & DNase Free, Yellow	1,000 Tips/Bag, 10 Bags/Case	10000	
	20-1000	1ml bulk, Non-sterile, RNase & DNase Free, Blue	1,000 Tips/Bag, 10 Bags/Case	10000	
	20-1250	1250 ul, bulk, Non-sterile, RNase & DNase Free, Clear	1,000 Tips/Bag, 6 Bags/Case	6000	
	20-1250-upgr	1250 ul, bulk, Non-sterile, RNase & DNase Free, Clear	1,000 Tips/Box, 10 Boxes/Case	10000	
	Note: we upgrade the package of bulk tip and each 1000 pieces packed in a box, 10 boxes/case, once the old products sold out.				
	21-0010	10µl Racked, Sterile, RNase & DNase Free, Clear	10 Racks/Pack, 10 Packs/Case	9600 Tips/Case	
	21-0200	200µl Racked, Sterile, RNase & DNase Free, Yellow	96 Tips/rack, 10 Racks/Pack, 10 Packs/Case	9600 Tips/Case	
	21-1000	1ml Racked, Sterile, RNase & DNase Free, Blue	100 Tips/rack, 10 Racks/Pack, 6 Packs/Case	6000 Tips/Case	
	21-1250	1250 Racked, Sterile, RNase & DNase Free, Clear,	96 tips/rack, 6 Racks/pack, 10 Pack/Case	5760 Tips/Case	

Liquid Handling		Cat #	Description	Unit	Unit
Transfer Pipets	30-0135	1ml, Length 160mm, total capacity 6.2ml, Graduated to 1ml	500/Pack, 10 Packs/Case	5000	
	30-0135A1	1ml, individually packed, sterile, Length 160mm, total capacity 6.2ml, Graduated to 1ml	500/Pack, 10 Packs/Case	5000	
	30-0138	3ml, Length 160mm, total capacity 7.5ml, Graduated to 3ml	500/Pack, 10 Packs/Case	5000	
	30-0138A1	3ml, individually packed, sterile, Length 160mm, total capacity 7.5ml, Graduated to 3ml	500/Pack, 10 Packs/Case	5000	
	Note: once the old stock sold out, the package will be changed to be 4 packs/case, 2000 pieces/case. The price will change accordingly				
	30-0135-upgrade	1ml, Length 160mm, total capacity 6.2ml, Graduated to 1ml	500/Pack, 4 Packs/Case	2000	
	30-0135A1-upgrade	1ml, individually packed, sterile, Length 160mm, total capacity 6.2ml, Graduated to 1ml	500/Pack, 4 Packs/Case	2000	
	30-0138-upgrade	3ml, Length 160mm, total capacity 7.5ml, Graduated to 3ml	500/Pack, 4 Packs/Case	2000	
30-0138A1-upgrade	3ml, individually packed, sterile, Length 160mm, total capacity 7.5ml, Graduated to 3ml	500/Pack, 4 Packs/Case	2000		
30-0238A1	3ml, individually packed, sterile, Length 184mm, total capacity 7.5ml, Graduated to 3ml	500/Pack, 4 Packs/Case	2000		

Solution Basins (Solution Reservoir)	25-0052	PVC, Non-sterile, 55ml Capacity, Clear	100 Pieces/Pack, 8 Packs/Case	800
	25-0051	PS, Sterile, 55ml Capacity, White, Individually Wrapped	1 Piece/Bag, 100 Bags/Case	100
	25-1025	PS, Sterile, 25ml Capacity, White, Individually Wrapped	1 Piece/Bag, 100 Bags/Case	100
	25-1100	PS, Sterile, 100ml Capacity, White, Individually Wrapped	1 Piece/Bag, 50 Bags/Case	50
	25-1202	12-Channel Flip-Side™, PP, Non-sterile, Assorted colors	25 Pieces/Bag, 4 Bags/Case	100

Tri-Cornered Beakers	93-0050	50ml, PP, Three pour spouts, Disposable	25 Pieces/Sleeve, 4 Sleeves/Case	100
	93-0100	100ml, PP, Three pour spouts, Disposable	25 Pieces/Sleeve, 4 Sleeves/Case	100
	93-0250	250ml, PP, Three pour spouts, Disposable	25 Pieces/Sleeve, 4 Sleeves/Case	100
	93-0400	400ml, PP, Three pour spouts, Disposable	25 Pieces/Sleeve, 4 Sleeves/Case	100
	93-1000	1,000ml, PP, Three pour spouts, Disposable	25 Pieces/Sleeve, 4 Sleeves/Case	100

Racks & Boxes

Microtube Racks	90-8009	PP, 80-wells, 5 Assorted Colors	5 Racks/Pack, 4 Packs/Case	20
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Cryogenic Storage Boxes	90-9250	Polycarbonate, 25-wells, -196°C to 121°C, 4 Assorted Colors	24 Boxes/Case	24
	90-9009	Polycarbonate, 81-wells, -196°C to 121°C, 4 Assorted Colors	24 Boxes/Case	24
	90-9210	Polycarbonate, 100-wells, -196°C to 121°C, 4 Assorted Colors	24 Boxes/Case	24
	90-9250-upgrade	Polycarbonate, 25-wells, -196°C to 121°C, 5 Assorted Colors	20 Boxes/Case	20
	90-9009-upgrade	Polycarbonate, 81-wells, -196°C to 121°C, 5 Assorted Colors	20 Boxes/Case	20
	90-9210-upgrade	Polycarbonate, 100-wells, -196°C to 121°C, 5 Assorted Colors	20 Boxes/Case	20
	90-9025	Polypropylene, 25-wells, -90°C to 121°C, 5 Assorted Colors	20 Boxes/Case	20
	90-9081	Polypropylene, 81-wells, -90°C to 121°C, 5 Assorted Colors	20 Boxes/Case	20
	90-9100	Polypropylene, 100-wells, -90°C to 121°C, 5 Assorted Colors	20 Boxes/Case	20
90-9200	Polypropylene, 100-wells, -90°C to 121°C, 5 Assorted Colors, without hinged lid	20 Boxes/Case	20	

Cardboard Freezer Boxes	90-1281	2" Superior White Coated Cryobox with 81-well divider, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-1200	2" Superior White Coated Cryobox with 100-well divider, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-1381	3" Superior White Coated Cryobox with 81-well divider, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-1300	3" Superior White Coated Cryobox with 100-well divider, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-2281	2" Plasti-Coat™ Cryobox with 81-well divider, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-2200	2" Plasti-Coat™ Cryobox with 100-well divider, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-2381	3" Plasti-Coat™ Cryobox with 81-well divider, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-2300	3" Plasti-Coat™ Cryobox with 100-well divider, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-5281	2" Cryo-Color™ Cryobox with 81-well dividers, 5 assorted colors, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-5200	2" Cryo-Color™ Cryobox with 100-well dividers, 5 assorted colors, -196°C to 121°C	5 Pieces/pack, 20 Packs/Case	100	
	90-1536	Superior White Coated Freezer box for 15ml tubes, 36-well divider	5 Pieces/pack, 20 Packs/Case	100	
	90-5016	Superior White Coated Freezer box for 50ml tubes, 16-well divider	5 Pieces/pack, 20 Packs/Case	100	
	90-6281	2" ID-Color™ Cryobox with 81-well plastic dividers, 5 assorted colors	5 Pieces/pack, 4 Packs/Case	20	
	Note: we will update the ID box and will release the new ID box soon,				

Freezer Racks	99-1216	Slide Drawer Freezer Racks, Stainless steel, 4 Drawers, Fits for 2" Standard 16 Boxes	1 Piece/Case	1	
	99-1220	Slide Drawer Freezer Racks, Stainless steel, 5 Drawers, Fits for 2" Standard 20 Boxes	1 Piece/Case	1	
	99-1224	Slide Drawer Freezer Racks, Stainless steel, 6 Drawers, Fits for 2" Standard 24 Boxes	1 Piece/Case	1	
	99-5212	Slide Drawer Freezer Racks, For Side Access, Stainless steel, 4 Drawers, Fits for 2" Standard 12 Boxes	1 Piece/Case	1	
	99-5215	Slide Drawer Freezer Racks, For Side Access, Stainless steel, 5 Drawers, Fits for 2" Standard 15 Boxes	1 Piece/Case	1	
	99-5216	Slide Drawer Freezer Racks, For Side Access, Stainless steel, 4 Drawers, Fits for 2" Standard 16 Boxes	1 Piece/Case	1	
	99-5220	Slide Drawer Freezer Racks, For Side Access, Stainless steel, 5 Drawers, Fits for 2" Standard 20 Boxes	1 Piece/Case	1	
	99-2212	FrameType Freezer Racks, Stainless steel, 3*4, hold 12 boxes with 2" height.	1 Piece/Case	1	
	99-2215	FrameType Freezer Racks, Stainless steel, 3*5, hold 15 boxes with 2" height.	1 Piece/Case	1	
	99-2216	FrameType Freezer Racks, Stainless steel, 4*4, hold 16 boxes with 2" height.	1 Piece/Case	1	
	99-2220	FrameType Freezer Racks, Stainless steel, 4*5, hold 20 boxes with 2" height.	1 Piece/Case	1	
	99-2224	FrameType Freezer Racks, Stainless steel, 4*6, hold 24 boxes with 2" height.	1 Piece/Case	1	
	Vertical Freezer Rack	99-6207	Vertical Type Freezer Rack, Stainless steel, 1*7, Fits for 7 Pieces of 2" Standard Boxes	1 Piece/Case	1
		99-6209	Vertical Type Freezer Rack, Stainless steel, 1*9, Fits for 9 Pieces of 2" Standard Boxes	1 Piece/Case	1
		99-6210	Vertical Type Freezer Rack, Stainless steel, 1*10, Fits for 10 Pieces of 2" Standard Boxes	1 Piece/Case	1
99-6211		Vertical Type Freezer Rack, Stainless steel, 1*11, Fits for 11 Pieces of 2" Standard Boxes	1 Piece/Case	1	
99-6212		Vertical Type Freezer Rack, Stainless steel, 1*12, Fits for 12 Pieces of 2" Standard Boxes	1 Piece/Case	1	
99-6213	Vertical Type Freezer Rack, Stainless steel, 1*13, Fits for 13 Pieces of 2" Standard Boxes	1 Piece/Case	1		

Cell Culture Ware	Cat#	Description	Unit	Unit
Cell Scrapers/Lifters	70-1180	Cell Scrapers, Sterile, Handle Length 18cm, Blade Length 1.8cm	100 Pieces/Case	100
	70-1250-upgrade	Cell Scrapers, Sterile, Handle Length 25cm, Blade Length 1.8cm	200 Pieces/Case	200
	70-2180	Cell Lifters, Sterile, Handle Length 18cm, Blade Length 2.0cm	100 Pieces/Case	100

Cell Strainers	15-1040-upgrade	40um Cell Strainers, Sterile, nylon mesh, PP frame, Purple	100 Pieces/Case	100
	15-1070-upgrade	70um Cell Strainers, Sterile, nylon mesh, PP frame, Orange	100 Pieces/Case	100
	15-1100-upgrade	100um Cell Strainers, Sterile, nylon mesh, PP frame, Green	100 Pieces/Case	100

Histology/Pathology

Slide Storage Boxes	41-5025	25-place foam, Assorted colors, 5.5 x 3.75 x 1.25in	5 /Pack,4 Packs/Case	20
	41-5100-upgrade	100-place foam, Assorted colors, 8.25 x 6.37 x 1.25 in	5 /Pack,6 Packs/Case	30
	41-6025	25-place cork, Assorted colors, 5.5 x 3.75 x 1.25 in	5 /Pack,4 Packs/Case	20
	41-6100	100-place cork, Assorted colors, 8.25 x 6.37 x 1.25 in,	5 /Pack,4 Packs/Case	20
	41-6100-upgrade	100-place cork, Assorted colors, 8.25 x 6.37 x 1.25 in,	5 /Pack,6 Packs/Case	30
Note: the lead time for 25-place slide boxes will be longer. Once the stock stld out, we will not keep stock.				

Microscope slides	7101	1"x3" Glass Slides, Plain, Autoclavable, Ground Edge,	72 Pieces/pack, 50 Packs/Case	3600
	7105	1"x3" Glass Slides, Single Frosted End, Autoclavable, Ground Edge	72 Pieces/pack, 50 Packs/Case	3600
Note: MOQ will be 100 cases per catalog no.				
Slide Mailers	41-4020	20-place cardboard slide mailer w/inventory sheet	10 Pieces/Pack,4 Packs/Case	40
Note: the MOQ will be 100 cases per catalog no.				

Drosophila Products

Drosophila Vials	51-0500	Narrow Polystyrene Vial, 25 x 95mm, Bulk Pack	25 Pieces/Bag, 20Bags/Case	500
	51-0501	Narrow Polystyrene Vial, 25 x 95mm, Tray Pack	100 Pieces/Tray, 5 Trays/Case	500
	51-0800	Wide Polystyrene Vial, 28.5 x 95mm, Bulk Pack	25 Pieces/Bag, 20Bags/Case	500
	51-0801	Wide Polystyrene Vial, 28.5 x 95mm, Tray Pack	100 Pieces/Tray, 5 Trays/Case	500
Drosophila Bottles	51-17720	6oz (177ml) bottle, Polypropylene, Autoclavable, Bulk Pack	200 Pieces/Case	200

Drosophila Plugs	51-0505	Drosophila Plugs, fit for narrow plastic vials with dimension 25x95mm: 51-0500/0501	100 Pieces/Bag,10 Bags/Case	1000
	51-0805	Drosophila Plugs, fit for wide plastic vials with dimension 28.5x95mm: 51-0800/0801	100 Pieces/Bag,10 Bags/Case	1000
	51-17725	Drosophila Plugs, fit for 6oz plastic bottles :51-17720/51-17721	100 Pieces/Bag,10 Bags/Case	1000

Microbiology

Petri Dishes	66-1501	90 x 15mm Petri Dish with vented lid, Sterile	10/Bag,50 Bags/Case	50
	66-1515	150 x 15mm Petri Dish with vented lid, Sterile	10/Bag,20 Bags/Case	200
	66-1560	60mm x 15mm Petri Dish with vented lid, Sterile	10/Bag,50 Bags/Case	500

Inoculating Loops and Needles	65-0001	1µl Inoculating Loop, Sterile, Blue	25 Pieces/Pack,40 Bags/Case	1000
	65-0010	10µl Inoculating Loop, Sterile, Orange	25 Pieces/Pack,40 Bags/Case	1000
	65-0002	Inoculating needles, Sterile, Yellow	25 Pieces/Pack,40 Bags/Case	1000

Cell Spreaders	65-1001	L-shaped Spreader, Polystyrene, Sterile, Individually wrapped, Orange	1 Pieces/Bag, 500 Bags/Case	500 Pieces/Case
	65-1010	L-shaped Spreader, Polystyrene, Sterile, 10 Pieces/Pack, Orange	10 Pieces/Pack,50 Packs/Case	500 Pieces/Case

Gloves

Powder Free Latex Disposable Gloves	97-1111	Non-sterile, Natural to light yellow color, size: XS	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
	97-1112	Non-sterile, Natural to light yellow color, size: S	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
	97-1113	Non-sterile, Natural to light yellow color, size: M	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
	97-1114	Non-sterile, Natural to light yellow color, size: L	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
	97-1115	Non-sterile, Natural to light yellow color, size: XL	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
Powder Free Nitrile Disposable Gloves	97-6111	Non-sterile, dark blue, size: XS	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
	97-6112	Non-sterile, dark blue, size: S	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
	97-6113	Non-sterile, dark blue, size: M	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
	97-6114	Non-sterile, dark blue, size: L	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
	97-6115	Non-sterile, dark blue, size: XL	100Pieces/Pack, 10 Packs/Case	1000 Pieces/Case
note: once the stock sold out, we will only accept container load order				








Deep Well Plate

96 Square Deep Well Plate	02-1016	1.6ml, Without Cap, PP, non-sterile, Clear,	24Pieces/Pack, 4 Packs/Case	96 Pieces/Case
96 Square Deep Well Plate	02-1022	2.2ml, Without Cap, PP, non-sterile, Clear,	24Pieces/Pack, 4 Packs/Case	96 Pieces/Case
96 Round Deep Well Plate	02-2010	1.0ml, Without Cap, PP, non-sterile, Clear,	24Pieces/Pack, 4 Packs/Case	96 Pieces/Case

Name	Pictures	Cat#	Description	Unit
MicroPette Pipettes		01-2101	MicroPette Plus Single-channel Adjustable Volume 0.5-10µl	1 Piece/Case
		01-2104	MicroPette Plus Single-channel Adjustable Volume 10-100µl	1 Piece/Case
		01-2102	MicroPette Plus Single-channel Adjustable Volume 20-200µl	1 Piece/Case
		01-2110	MicroPette Plus Single-channel Adjustable Volume 100-1000µl	1 Piece/Case
8-Channel Pipettes		01-2801	MicroPette Plus ,8-Channel Adjustable Volume 0.5-10µl	1 Piece/Case
		01-2805	MicroPette Plus ,8-Channel Adjustable Volume 5-50µl	1 Piece/Case
		01-2830	MicroPette Plus ,8-Channel Adjustable Volume 50-300µl	1 Piece/Case
dPette Digital Pipette		NEW 01-241X	dPette Digital Pipette,Single-channel Adjustable Volume 0.5-10µl	1 Piece/Case
		01-242X	dPette Digital Pipette,Single-channel Adjustable Volume 5-50µl	1 Piece/Case
		01-243X	dPette Digital Pipette,Single-channel Adjustable Volume 30-300µl	1 Piece/Case
		01-244X	dPette Digital Pipette,Single-channel Adjustable Volume100-1000µl	1 Piece/Case
Pipette Filler		01-2204	Levo Plus with AC adapter, Euro plug	1 Piece/Case
		01-2202	Levo Plus with AC adapter, North-America plug	1 Piece/Case
		01-2205	Levo Plus with AC adapter, UK plug	1 Piece/Case
		NEW 01-221X	Levo Me with AC adapter, Euro plug/UK plug/North-America plug	1 Piece/Case
Pipette Stand		01-2306	Linear Stand, holds up to 6 pipettors	1 Piece/Case
Vacuum Aspiration System		NEW 01-270X	SAFEVAC,Vacuum Aspiration System, AC100V-240V/50Hz/60Hz, USA plug/CN plug/Euro plug/UK plug	1 Piece/Case
Magnetic Hotplate Stirrers		01-3101	MS-H280-Pro, USA plug,100V-120V/50Hz/60Hz	1 Piece/Case
		01-3103	MS-H280-Pro, Cn plug, 200V-240V/50Hz/60Hz	1 Piece/Case
		01-3104	MS-H280-Pro, EURO plug, 200V-240V/50Hz/60Hz	1 Piece/Case
		01-3105	MS-H280-Pro, UK plug, 200V-240V/50Hz/60Hz	1 Piece/Case
Flatspin		01-3201	Flatspin,USA plug,100V-240V/50Hz/60Hz	1 Piece/Case
		01-3203	Flatspin,CN plug,100V-240V/50Hz/60Hz	1 Piece/Case
		01-3204	Flatspin,euro plug,100V-240V/50Hz/60Hz	1 Piece/Case
		01-3205	Flatspin,UK plug,100V-240V/50Hz/60Hz	1 Piece/Case
Mini EcoStir Stirrers		NEW 01-330X	Mini EcoStir Magnetic Stirrers, 100V-240V/50Hz/60Hz, USA plug/CN plug/Euro plug/UK plug	1 Piece/Case

Name	Pictures	Cat#	Description	Unit	
Shakers		01-6101	SK-L180-E,USA plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6103	SK-L180-E,CN plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6104	SK-L180-E,EURO plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6105	SK-L180-E,UK plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6201	SK-O180-E,USA plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6203	SK-O180-E,CN plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6204	SK-O180-E,EURO plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6205	SK-O180-E,UK plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6301	SK-R1807-E,USA plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6303	SK-R1807-E,CN plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6304	SK-R1807-E,EURO plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6305	SK-R1807-E,UK plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6401	SK-D1807-E,USA plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-6403	SK-D1807-E,CN plug,100V-220V/50Hz/60Hz	1 Piece/Case	
01-6404	SK-D1807-E,EURO plug,100V-220V/50Hz/60Hz	1 Piece/Case			
01-6404	SK-D1807-E,UK plug,100V-220V/50Hz/60Hz	1 Piece/Case			
Mixers		01-1103	MX-S,Vortex Mixer (adjustable speed),Cn plug, 220/50Hz	1 Piece/Case	
		01-1101	MX-S,Vortex Mixer (adjustable speed)USA pug, 110/60Hz	1 Piece/Case	
		01-1104	MX-S,Vortex Mixer (adjustable speed),Euro plug, 220/50Hz	1 Piece/Case	
		01-1105	MX-S,Vortex Mixer (adjustable speed),UKplug, 220/50Hz	1 Piece/Case	
Rotators		01-1201	MX-RD-E,Rotator(including accessory-18200961/2/3), USA plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-1203	MX-RD-E,Rotator(including accessory-18200961/2/3), CN plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-1204	MX-RD-E,Rotator(including accessory-18200961/2/3), EURO plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-1205	MX-RD-E,Rotator(including accessory-18200961/2/3), UKplug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-1301	MX-RL-E,Rotator(including accessory-18200961/2/3), USA plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-1303	MX-RL-E,Rotator(including accessory-18200961/2/3), CN plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-1304	MX-RL-E,Rotator(including accessory-18200961/2/3), EURO plug,100V-220V/50Hz/60Hz	1 Piece/Case	
		01-1305	MX-RL-E,Rotator(including accessory-18200961/2/3), UK plug,100V-220V/50Hz/60Hz	1 Piece/Case	
Centrifuges		01-8001	D1008 ,Mini Centrifuge with green lid, including two rotors of A08-2 & A02-PCR8,US plug, 100-240V/50Hz/60Hz	1 Piece/Case	
		01-8003	D1008 ,Mini Centrifuge with green lid, including two rotors of A08-2 & A02-PCR8,CN plug, 100-240V/50Hz/60Hz	1 Piece/Case	
		01-8004	D1008 ,Mini Centrifuge with green lid, including two rotors of A08-2 & A02-PCR8,Euro plug, 100-240V/50Hz/60Hz	1 Piece/Case	
		01-8005	D1008 ,Mini Centrifuge with green lid, including two rotors of A08-2 & A02-PCR8,UK plug, 100-240V/50Hz/60Hz	1 Piece/Case	
		NEW	01-820X	D2012&D2012 plus High Speed Mini Centrifuge, with A12-2P plastic rotor kit, AC100V-240V/50Hz/60Hz, USA plug/CN plug/Euro plug/UK plug	1 Piece/Case
			NEW	01-830X	D3024 High Speed Micro-Centrifuge, with AS24-2 aluminum alloy rotor kit, 110V-120V/220V-240V, 50Hz/60Hz, USA plug/CN plug/Euro plug/UK plug
	NEW		01-831X	D3024R High Speed Refrigerated Micro-Centrifuge, with AS24-2 aluminum alloy rotor kit, 110V-120V/220V-240V, 50Hz/60Hz, USA plug/CN plug/Euro plug/UK plug	1 Piece/Case
	Gradient Thermocycler		01-700X	TC1000-G, Gradient Thermocycler for PCR applications, Precise temperature control system, fast heating and cooling, touch-screen interface, CN plug,Euro plug,UK plug 200-240V/50/60Hz	1 Piece/Case
Thermocycler	01-710X		TC1000-G, Thermocycler for PCR applications, Precise temperature control system, fast heating and cooling, touch-screen interface, UK plug/CN/Euro Plug, 200-240V/50/60Hz,USA Plug 110V-120V/ 50Hz/60Hz	1 Piece/Case	

Name	Pictures	Cat#	Description	Unit
Power Supply		03-1300	Mini 300V Power Supply	1 Piece/Pack
		03-2300	300V Power Supply	1 Piece/Pack
Electrophoresis Tank		03-3070	Electrophoresis Tank, Gel Dimension:70x70mm&70x100mm	1 Piece/Pack
		03-3100	Electrophoresis Tank, Gel Dimension:100x70mm&100x100mm	1 Piece/Pack
Thermo Mixers	 NEW	01-920X	HC110-PRO, LCD digital Thermo Mix with heating, cooling, with Block,100-120V/220-240V, 50Hz/60Hz, USA plug/CN plug/Euro plug/UK plug	1 Piece/Pack
	 NEW	01-930X	HCM100-PRO, LCD digital Thermo Mix with heating, cooling, mixing, with Block, 100-120V/2W0-240V, 50Hz/60Hz, USA plug/CN plug/Euro plug/UK plug	1 Piece/Pack
	 NEW	01-910X	HB120-S, LED digital dry bath, with Block, 100-120V/200-240V, 50Hz/60Hz, USA plug/CN plug/Euro plug/UK plug	1 Piece/Pack
		03-4221	Elite Dry Bath Incubator (One Block Unit) without Block	1 Piece/Pack
		03-4222	Elite Dry Bath Incubator (Dual Block Unit) without Block	1 Piece/Pack
Dry Bath Block		03-5015	1.5ml Block for Dry Bath Incubator	1 Piece/Pack
		03-5005	0.5ml Block for Dry Bath Incubator	1 Piece/Pack
		03-5002	0.2ml Block for Dry Bath Incubator	1 Piece/Pack
		03-5029	29mm Block for Dry Bath Incubator	1 Piece/Pack
		03-5017	17mm Block for Dry Bath Incubator	1 Piece/Pack
BluView		03-6200	BluView Transilluminator, 470nm	1 Piece/Pack
Dry Bath Incubator with Block		03-4221&03-50XX	Elite Dry Bath Incubator (One Block Unit) with One Block	1 Piece/Pack
		03-4221&03-50XX	Elite Dry Bath Incubator (Two Block Unit) with Two blocks	1 Piece/Pack

Name	Match with	Pictures	Cat#	Description	Unit
Heating Blocks	01-910X		01-9191	Heating block, used for 0.2mL tubes, 54 holes	1 Piece/Pack
			01-9192	Heating block, used for 0.5mL tubes, 40 holes	1 Piece/Pack
			01-9193	Heating block, used for 1.5/2mL tubes, 40 holes	1 Piece/Pack
			01-9194	Heating block, used for 5/15mL tubes, 28 holes	1 Piece/Pack
			01-9195	Heating block, used for 50mL tubes, 8 holes	1 Piece/Pack
			01-9196	Heating block, used for 0.2mL, 0.5mL and 1.5/2mL tubes , 18 holes each volume	1 Piece/Pack
			01-9197	Heating block, used for 96/384 microplate	1 Piece/Pack
	01-920X 01-930X		01-9291	Heating block, used for 0.5mL tubes, 24 holes	1 Piece/Pack
			01-9292	Heating block, used for 1.5mL tubes, 24 holes	1 Piece/Pack
			01-9293	Heating block, used for 2mL tubes, 24 holes	1 Piece/Pack
			01-9294	Heating block, used for 5mL tubes, 8 holes	1 Piece/Pack
			01-9295	Heating block, used for 15mL tubes, 8 holes	1 Piece/Pack
			01-9296	Heating block, used for 50mL tubes, 4 holes	1 Piece/Pack
			01-9297	Heating block, used for 0.2ml/96 well PCR plate	1 Piece/Pack
			01-9298	Heating block, used for 96/384 microplate	1 Piece/Pack
Collection Bottle	01-270X		01-2791	PPCO Vacuum Bottles, 4L, 83B	1 Piece/Pack
Standard top cup	01-110X		01-1191	Standard top cup, for \varnothing30mm tubes and small vessels	1 Piece/Pack
Tube holding rod			01-1192	Tube holding rod, used with 01-1131 to 01-1135	1 Piece/Pack
Universal top plate			01-1193	Universal top plate, 100mm plate attachment , free of Rubber vacuum suction foot (01-1137, 4pcs)	1 Piece/Pack
Tube adapter			01-1131	Tube adapter, for 48 holes test tubes, \varnothing 6mm, used with 01-1192/ 01-1193	1 Piece/Pack
			01-1132	Tube adapter, for 15 holes test tubes, \varnothing 10mm, used with 01-1192/ 01-1193	1 Piece/Pack
			01-1133	Tube adapter, for 12 holes test tubes, \varnothing 12mm , used with 01-1192/ 01-1193	1 Piece/Pack
			01-1134	Tube adapter, for 8 holes test tubes, \varnothing 16mm, used with 01-1192/ 01-1193	1 Piece/Pack
			01-1135	Tube adapter, for 8 holes test tubes, \varnothing 20mm, used with 01-1192/ 01-1193	1 Piece/Pack
			01-1136	Platform pad, for \varnothing99mm tubes and small vessels	1 Piece/Pack
Suction foot			01-1137	Rubber vacuum suction foot with screw, 1pc	1 Piece/Pack
Rotor Kit	01-800X		01-8091	Plastic rotor (blank LOGO), 7000rpm, 2ml/1.5ml*8, used with 01-800X	1 Piece/Pack
			01-8092	Plastic rotor (blank LOGO), 7000rpm, PCR8*2, used with 01-800X	2 Piece/Pack
Rotor Adapter			01-8093	2ml to 0.2ml rotor adapter, used with 01-800X rotor, 8pcs/pk	8 Piece/Pack
			01-8094	2ml to 0.5ml rotor adapter, used with 01-800X rotor, 8pcs/pk	8 Piece/Pack
Rotor Kit	01-820X 01-821X		01-8291	Plastic rotor kit with lid (blank LOGO), fixing clips and O'ring, 15000rpm, 2ml*12, used with 01-821X	1 Piece/Pack
			01-8292	Aluminum alloy rotor kit with lid (blank LOGO), fixing clips and O'ring, 15000rpm, 2ml*12, used with 01-820X	1 Piece/Pack
Rotor Adapter			01-8293	2ml to 0.2ml rotor adapter, used with 01-8292, 01-8291 and 01-8393 rotors, 24pcs/pk	24 Piece/Pack
			01-8294	2ml to 0.5ml rotor adapter, used with 01-8292, 01-8291 and 01-8393 rotors, 24pcs/pk	24 Piece/Pack
Rotor Kit	01-830X 01-831X		01-8391	Aluminum alloy rotor kit with lid (blank LOGO), fixing clips and O'ring, 15000rpm, 5ml*18, used with 01-830X & 01-831X	1 Piece/Pack
			01-8392	Aluminum alloy rotor kit with lid (blank LOGO), fixing clips and O'ring, 15000rpm, 5ml*12, used with 01-830X & 01-831X	1 Piece/Pack
			01-8393	Aluminum alloy rotor kit with lid (blank LOGO), fixing clips and O'ring, 15000rpm, 2ml/1.5ml*24, used with 01-830X & 01-831X	1 Piece/Pack
			01-8394	Aluminum alloy rotor kit with lid (blank LOGO), fixing clips and O'ring, 15000rpm, 0.5ml*36, used with 01-830X & 01-831X	1 Piece/Pack
			01-8395	Aluminum alloy rotor kit with lid (blank LOGO), fixing clips and O'ring, 15000rpm, 4*PCR8, used with 01-830X & 01-831X	1 Piece/Pack
Rotor Adapter			01-8293	2ml to 0.2ml rotor adapter, used with 01-8292, 01-8291 and 01-8393 rotors, 24pcs/pk	24 Piece/Pack
			01-8294	2ml to 0.5ml rotor adapter, used with 01-8292, 01-8291 and 01-8393 rotors, 24pcs/pk	24 Piece/Pack
	01-8396	0.5ml to 0.2ml rotor adapter, used with 01-8394 rotor, 36pcs/pk	36 Piece/Pack		
Temperature sensor	01-310X		01-3191	Temperature sensor for digital hotplate models,length of 230mm, used for 01-310X	1 Piece/Pack
Support clamp			01-3192	Support clamp of 01-3191, use with 01-310X	1 Piece/Pack

New arrival Instrument

High Speed Mini Centrifuge Thermo cyclers Shaker incubator Dry Bath Incubator

Levo ME Pipette Filler SAFEVAC Vacuum Aspiration System dPette Digital Pipette

CRYO KING

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NEW! 2ml and 5ml CryoKING cryogenic vials

Six colored screw threads caps for easy sample separation

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Big volume, Great Application

Hexagonal base design for easy single-handed open and close

NEW ARRIVAL INSTRUMENT

MicroPette Pipettes Levo Plus Magnetic Hotplate Stirrer Ultra-flat Compact Magnetic Stirrer

Vortex Mixers Classic Rotator Shaker Plan Micro Centrifuges