Product Manual

Sickle Cell Genemer™ Kit

Genotyping of HbS Mutation Site

Catalog No.: 40-2001-11K **Size: 100 Reactions Store at –20°C**

For research use only. Not for use in diagnostic procedures for clinical purposes

20 years
results you can rely on
Gene Link™

Material Supplied

Sickle Cell Genemer™ Kit

Catalog No.: 40-2001-11K
Size: 100 Reactions

Genotyping Kit for HbS mutation site

Storage Instructions:
Store at –20°C upon receipt

	Product	Catalog No.	Unit Size
	Sickle Cell Genemer™ Kit	**40-2001-11K**	**100 Reactions**
	Kit Components		
❑	Sickle Cell Genemer™ 10 µM Primer Mix	40-2001-11	200 µL
❑	GeneAssays™ Genotyping PCR 2X Master Mix; 1 mL, 100 rxns.	41-1031-01	1 mL
❑	Nuclease Free Water (DEPC Free) 1.6 mL	40-3001-16	1.6 mL
❑	Sickle Cell Genemer™ HbS Control DNA (~10ng/µL)	40-2001-02C	50 µL

Certificate of Analysis & Product Specifications

The Sickle Cell Genemer™ kit components supplied have been validated to amplify the fragment spanning the HbS mutation site. This is a ready to use PCR premix, add sterile water and DNA template.

All component reagents have been manufactured using molecular biology grade water and certified to be DNase & RNase Free. Taq Polymerase is antibody bound for activation after hot start PCR cycle. The 2X Master Mix components include buffer, dNTP, $MgCl_2$ and other proprietary reaction components that enhance steady consistent amplification from less than 10 pg DNA. Each lot is tested for human male genomic DNA dilution curve qQPCR with RNase P and PGR (progesterone receptor) probes.

Appropriate nuclease free handling, dispensing and storage conditions required.

Manufacturing lot numbers are stated on the label of each product and accompanying packing slip.

Product Label Information

Sickle Cell Genemer™ Kit

Genotyping of the HbS mutation
Catalog No.: 40-2001-11K
Size: 100 Reactions

	Catalog No.	Component Description	Size
REF	40-2001-11	Sickle Cell Genemer™ 10 µM Primer Mix	200 µL
	41-1031-01	GeneAssays™ Genotyping PCR 2X Master Mix; 1 mL, 100 rxns.	1 mL
	40-3001-16	Nuclease Free Water (DEPC Free) 1.6 mL	1.6 mL
	40-2001-02C	Sickle Cell Genemer™ HbS Control DNA (~10ng/µL)	50 µL

RUO Research Use Only	-10°C -20°C	LOT
Research Use Only	**Storage** Store at -20°C to -10°C	**Lot Number** Stated on product tube and packing slip

Expiry One year from Date of Shipment	**Instructions** Consult product manual	**QR Code** Visit Gene Link website for product details

Sickle Cell

Background

Sickle cell anemia is an autosomal recessive disease. A single base change (A to T) in the β globin chain causes the substitution of amino acid glutamine to valine; the cause of the disorder sickle cell anemia. The resulting mutant globin chain is termed as the Hb S. Hemoglobin S is freely soluble when fully oxygenated, under conditions of low oxygen tension the red cells become grossly abnormal assuming a sickle shape leading to aggregation and hemolysis. Homozygous Hb S is a serious hemoglobinopathy found almost exclusively in the Black population. About 8% of American Blacks are carriers and about 0.2% are affected. Heterozygotes (sickle cell trait) are clinically normal, although their red cells will sickle when subjected to very low oxygen pressure in vitro.

Sequence change in HbA, HbS and HbC is given below
Hb-A: ...TCCTGAGGAG.....; Hb-S: ...TCCTGTGGAG...; Hb-C: ...TCCTAAGGAG...

DNA analysis for the sickle cell mutation is done by specific amplification of the DNA region spanning the mutation using polymerase chain reaction followed by enzymatic cleavage of the amplified product. Sickle cell mutation abolishes the *Dde* I (C/TNAG) restriction endonuclease site (and other isoschizomers recognizing the same sequence e.g MstII (CC/TNAGG), AocI (CC/TNAGG), HpyF31 (C/TNAG)) and the amplified fragment will not be digested by *Dde* I for the allele containing the mutation. A homozygous genotype will have both alleles not cleaved and thus upon electrophoretic resolution of the fragment pattern reveals the presence or absence of the mutation. Clear genotyping of normal, carrier and homozygous DNA is achieved.

b) β-chain	Amino acid position									
	1	2	3	6	7	26	63	67	121	146
Normal	Val	His	Leu	Glu	Glu	Glu	His	Val	Glu	His
Hb variants:										
Hb-S	Val	His	Leu	Val	Glu	Glu	His	Val	Glu	His
Hb-C	Val	His	Leu	Lys	Glu	Glu	His	Val	Glu	His
Hb-G San Jose	Val	His	Leu	Glu	Gly	Glu	His	Val	Glu	His
Hb-E	Val	His	Leu	Glu	Glu	Lys	His	Val	Glu	His
Hb-M Saskatoon	Val	His	Leu	Glu	Glu	Glu	Tyr	Val	Glu	His
Hb Zurich	Val	His	Leu	Glu	Glu	Glu	Arg	Val	Glu	His
Hb-M Milwaukee-1	Val	His	Leu	Glu	Glu	Glu	His	Glu	Glu	His
Hb-D β Punjab	Val	His	Leu	Glu	Glu	Glu	His	Val	Gln	His

Material Supplied

See page 2 for material supplied and the components of the kit.

Protocol

A. Advance Preparation

1. The sample DNA concentration should be predetermined before starting the PCR setup. The ideal concentration of template DNA is 50-100 ng. Determine volume to be added based on the DNA concentration. A maximum volume of 8 µL can be used substituting the addition of sterile water in the worksheet below. Each sample can have different volume and thus different volume of water to equal a total of 8 µL.
2. Calculate the number of reactions you plan to perform and add 10% more for the preparation of reaction premixture to account for pipetting volume loss.
3. Always add positive controls and no template controls (NTC) on each setup and session.
4. Thaw the all the components of the kit and keep on ice.
5. All components should be vortexed after thawing and centrifuged briefly.
6. Program thermal cycler/real time PCR thermal cycler for the file/program to be used. See Section C.

B. **Reaction Premix Preparation Worksheet** (prepare 10% more than required)
DO NOT ADD TEMPLATE DNA TO THE PREMIX. The template DNA row is only for calculation of the total volume to be added and thus the volume of nuclease free water to be added to arrive at the final volume of the reaction**.**

Component	**/ 20 µLrxn**	**worksheet**	**worksheet**
GeneAssays™ Genotyping PCR 2X Master Mix	10 µL		
Sickle Cell Genemer™ 10 µM Primer Mix	2 µL		
*Nuclease Free Water			
**Template DNA 50 ng. (max of ~100 ng) Do not add. Only for calculation.	Add DNA to each tube		
Final Total Volume	20 µL	20 µL	20 µL
Place tubes in thermal cycler and START thermal cycler file as in Section C			

*Volume of nuclease free water will be determined by the volume of template DNA or the method of DNA delivery method. Add sufficient nuclease free water to arrive at the final total volume of the reaction.
** Determine volume to be added based on the DNA concentration. A maximum volume of 8 µL can be used substituting the addition of sterile water.

C. Thermal Cycler Files for Fragment Amplification

Program the following thermal cycler files.

Amplification File (2 step, 40 Cycles)			
Step	**Temperature**	**Time**	**Cycles**
Denaturation	92°C	15 sec.	40
Annealing & Extension	55°C	1 minute	
Hold	12°C	Infinity	Hold

E. Restriction Digestion & Agarose Gel Electrophoresis

Process amplified PCR product for *Dde I* digestion as described below. The left over PCR volume of 3 µL will be electrophoresed next to the *Dde I* digested sample lane.

Dde I Digestion of Amplified Fragments	
Component	**/ 20 µL Rxn**
PCR amplified fragment	17 µL
10 X Buffer	2 µL
Dde I (5 unit/ µL)	1 µL
Incubate overnight at 37°C	

Sequence change in HbA, HbS and HbC is given below
Hb-A: …TCCTGAGGAG…..; Hb-S: …TCCTGTGGAG…; Hb-C: …TCCTAAGGAG…

Gene Link has tested the restriction enzyme DdeI for digestion of HbA, HbS and HbC amplified DNA and recommends using DdeI. According to literature other restriction enzymes and isoschizomers can be used to digest the amplified fragments. Some of these are listed below.

MstII (CC/TNAGG)
AocI (CC/TNAGG)
HpyF31 (C/TNAG)

F. Agarose Electrophoresis

Load 3 µL of undigested and 20 µL of Dde I digested samples to a 1.6% agarose gel. Run at 60 mAmps till bromophenol dye is at bottom of gel.

Results and Interpretation

Mutation abolishes restriction site.

PCR Product Fragment Size 233 bp		
Fragment Sizes After *Dde* I Digestion		
A/A	A/S	S/S
178+55 bp	233+178+55 bp	233 bp

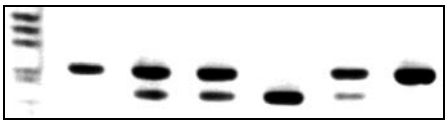

Figure 1. Typical Sickle cell genotype analysis of PCR product digested with *Dde* I. Lane 1 is molecular weight markers. Lane 2 is undigested PCR product. Lanes 3, 4 and 6 is DNA with A/S geneotype. Lane 5 is A/A genotype DNA and Lane 7 represents DNA with S/S genotype.

References:

1. Saiki et al. (1985) Science 230:1350-1354
2. Wu et al. (1989) PNAS 86:2757-2760
3. Conner et al. (1983) PNAS 80:278-282

References

1. Bennet, P.R., et al. (1993) Prenatal determination of fetal RhD type by DNA amplification. NEJM 329:607-610.
2. Mouro, I., et al. (1993) Molecular genetic basis of the human Rhesus blood group system. Nature Genetics 5:62-65.
3. Simsek, S., Bleeker, P.M., Borne, A.. E.G. (1994) Prenatal determination of fetal RhD type. NEJM 330:795.
4. Bennet, P., Warwick,R. and Carton, J-P. (1994) Prenatal determination of fetal RhD type. NEJM 330:795-796.
Westhoff,C.M. and Wylie, D.E. (1994) Identification of a new RhD-specific mRNA from K562 cells. Blood 84:3098-3100

Appendix

Genomic DNA Purification

Genomic DNA is usually extracted from blood. A simple procedure is given below that purifies ~10 µg DNA from 300 µl blood using a 30 minute procedure.

Omni-Pure™ Genomic DNA Purification System Catalog Number: 40-4010-01
Rapid DNA Purification Protocol for 300 µl Whole Blood

A. Initial Preparation

1. Label two sets of eppendorf tubes per sample.
2. Add 900 µl GD-1 solution (RBC Lysis Solution) to one tube for each sample.
3. Add 300 µl Isopropanol (2-propanol) to one tube for each sample. Cap the tubes.

B. Cell Lysis

1. To the tube containing 900 µl GD-1 solution (RBC Lysis Solution) using a filter tip pipet transfer 300 µl whole blood. Cap and gently mix by inversion. Incubate for 1-3 minutes at room temperature. Mix by inversion a few times during this incubation period. Incubate longer for fresh blood cells as they are intact and not lysed already.
2. Centrifuge at 3 K rpm for 20 seconds to pellet the white blood cells. A reddish white pellet should be clearly visible. Decant and discard supernatant leaving behind the last few droplets. Do not totally remove the supernatant.
3. Completely resuspend the white blood cell pellet by vigorously vortexing the tube. Ensure that the pellet is completely resuspended.
4. To the resuspended cells add 300 µl GD-2 solution (Cell Lysis Solution). Mix by gentle vortexing. You will notice release of DNA by the thickening of the liquid in the sample. Samples may be stored at this stage for processing later. It has been shown that the samples are stable in Cell Lysis Solution for at least 2 years at room temperature.

C. Protein Precipitation

1. Add 100 µl GD-3 solution (Protein Precipitation Solution) to the sample in cell lysis solution.
2. Vortex vigorously at for 20 seconds. Small particles of brown color will be appear and be visible at this stage.
3. Centrifuge at 5 K rpm for 1 minute to pellet the precipitated proteins. A clearly visible brown pellet containing proteins should be collected at the bottom of the tube.

D. DNA Precipitation

1. Decant the supernatant containing the DNA to a new appropriately labeled tube (see initial preparation above) containing 300 µl 100% Isopropanol (2-propanol).
2. Mix the sample by inversion till a visible white floating DNA strand-particle is identified. 30-40 mixing by inversion is usually sufficient.
3. Centrifuge at 6 K rpm for 1 minute to collect the DNA as a pellet. A white DNA pellet should be clearly visible.
4. Decant supernatant and place tube inverted on a clean Kimwipe™ tissue paper to drain the remaining supernatant.
5. To remove residual salts, add 300 µl of 70% ethanol. Vortex gently.
6. Centrifuge at 6 K rpm for 1 minute to collect the DNA as a pellet. Gently take out the tubes so that the pellet is not dislodged. While holding the tube, rotate tube so that you can watch the pellet. Now carefully decant the ethanol, keeping an eye on the pellet so that it does not flow away.
7. Place tube inverted on a clean Kimwipe™ tissue paper to drain the remaining ethanol.
8. Air dry the DNA pellet. Do not use vacuum.

E. DNA Reconstitution & Use

1. Add 100 µl of GD-4 solution (DNA Reconstitution Solution). Vortex gently. Incubate at 60°C for 5 minutes to facilitate dissolution or keep overnight at room temperature.
2. Store DNA at 4°C. For long-term storage, place sample at -20°C or -80°C.
3. Average yield of 10 µg is expected from 300 µl blood DNA. The range is between 5 µg to 15 µg.
4. The 100 µl of purified DNA obtained will have an average concentration of ~ 100 ng/µl.
5. For PCR amplification use 1-2µl.
6. Use 100 µl for restriction digestion followed by Southern blot analysis.
7. It is convenient to perform multiple 300 µl blood DNA purification instead of scaling up the procedure.

Appendix: Genomic DNA Purification

Genomic DNA is usually extracted from blood. A simple procedure is given below that purifies ~10 µg DNA from 300 µl blood using a 30 minute procedure.

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2. Centrifuge at 3 K rpm for 20 seconds to pellet the white blood cells. A reddish white pellet should be clearly visible. Decant and discard supernatant leaving behind the last few droplets. Do not totally remove the supernatant.
3. Completely resuspend the white blood cell pellet by vigorously vortexing the tube. Ensure that the pellet is completely resuspended.
4. To the resuspended cells add 300 µl GD-2 solution (Cell Lysis Solution). Mix by gentle vortexing. You will notice release of DNA by the thickening of the liquid in the sample. Samples may be stored at this stage for processing later. It has been shown that the samples are stable in Cell Lysis Solution for at least 2 years at room temperature.

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1. Add 100 µl GD-3 solution (Protein Precipitation Solution) to the sample in cell lysis solution.
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2. Mix the sample by inversion till a visible white floating DNA strand-particle is identified. 30-40 mixing by inversion is usually sufficient.
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5. To remove residual salts, add 300 µl of 70% ethanol. Vortex gently.
6. Centrifuge at 6 K rpm for 1 minute to collect the DNA as a pellet. Gently take out the tubes so that the pellet is not dislodged. While holding the tube, rotate tube so that you can watch the pellet. Now carefully decant the ethanol, keeping an eye on the pellet so that it does not flow away.
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8. Air dry the DNA pellet. Do not use vacuum.

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1. Add 100 µl of GD-4 solution (DNA Reconstitution Solution). Vortex gently. Incubate at 60°C for 5 minutes to facilitate dissolution or keep overnight at room temperature.
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3. Average yield of 10 µg is expected from 300 µl blood DNA. The range is between 5 µg to 15 µg.
4. The 100 µl of purified DNA obtained will have an average concentration of ~ 100 ng/µl.
5. For PCR amplification use 1-2µl.
6. Use 100 µl for restriction digestion followed by Southern blot analysis.
7. It is convenient to perform multiple 300 µl blood DNA purification instead of scaling up the procedure.

Genemer™ Product Ordering Information

Genemer™ Primer pair for gene or mutation specific amplification. Special optimized conditions may be required for certain amplifications

Product	Size	Catalog No.
Fragile X (spanning CGG triple repeat region) Genemer™; 10 nmols	10 nmols	40-2004-10
Huntington Disease (spanning CAG triple repeat region) Genemer™; 10 nmols	10 nmols	40-2025-10
Myotonic Dystrophy (spanning CTG triple repeat region) Genemer™; 10 nmols	10 nmols	40-2026-10
Friedreich's Ataxia (spanning GAA triple repeat region) Genemer™; 10 nmols	10 nmols	40-2027-10
Factor V Genemer™; 10 nmols	10 nmols	40-2035-10
Factor VIII (Hemophilia) Genemer™ Pack Genemer™; 10 nmols	10 nmols	40-2036-10
STS (Steroid Sulfatase) Genemer™; 10 nmols	10 nmols	40-2023-10
HGH (Human Growth Hormone) Genemer™; 10 nmols	10 nmols	40-2024-10
Sickle Cell Genemer™; 10 nmols	10 nmols	40-2001-10
RhD (Rh D gene exon 10 specific) Genemer™; 10 nmols	10 nmols	40-2002-10
Rh EeCc (Rh Ee and Cc exon 7 specific) Genemer™; 10 nmols	10 nmols	40-2003-10
Gaucher (various mutations) Genemer™; 10 nmols	10 nmols	40-2047-XX
Cystic Fibrosis (various mutations) Genemer™; 10 nmols	10 nmols	40-2029-XX
SRY (sex determining region on Y) Genemer™; 10 nmols	10 nmols	40-2020-10
X alphoid repeat Genemer™; 10 nmols	10 nmols	40-2021-10
Y alphoid repeat Genemer™; 10 nmols	10 nmols	40-2022-10

Genemer™ Control DNA Product Ordering Information

Genemer™ control DNA is a cloned fragment of the mutation region of a particular gene. These control DNA are an ideal genotyping template for optimizing and performing control amplification with unknown DNA.

Product	Size	Catalog No.
Sickle Cell Genemer control DNA (HbA, S and C available)	500 ng	40-2001-0X
GLFX CGG Genemer Control DNA; Fragile X (16, 29, 40, 60 & 90 CGG repeats available)	500 ng	40-2004-0X
GLHD CAG Genemer Control DNA; Huntington Disease (18, 34, 44, 89 & 134 CAG repeats available)	500 ng	40-2025-0X
GLDM CTG Genemer Control DNA; Myotonic Dystrophy (12, 45, 93, 129 & 194 CTG repeats available)	500 ng	40-2026-0X

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GeneProber™ Product Ordering Information

The GeneProber™ product line is based on the chemiluminescent Southern blot detection method. Gene Link's non-radioactive detection systems for genotyping of triple repeat disorders are rapid, reliable and as sensitive as the ^{32}P labeled southern blots. No more decayed probes and radioactive exposure. Kits are available for reliable genotyping of the fragile X, myotonic dystrophy and other triple repeat mutation group disorders. **Unlabeled GeneProber™ probes are also available for radio labeling and radioactive based detection.** Gene Link strongly recommends the use of non-radioactive gene detection systems. Consider switching to Gene Link's product line of non-radioactive detection systems

Product	Size	Catalog No.
Fragile X GeneProber™ GLFX1 Probe unlabeled	500 ng	40-2004-40
Fragile X GeneProber™ GLFXDig1 Probe Digoxigenin labeled	110 µL	40-2004-41
Huntington's Disease GeneProber™ GLHD14 Probe unlabeled	500 ng	40-2025-40
Huntington's Disease GeneProber™ GLHDDig2X Probe Digoxigenin labeled	110 µL	40-2025-41
Myotonic Dystrophy GeneProber™ GLDM1 Probe unlabeled	500 ng	40-2026-40
Myotonic Dystrophy GeneProber™ GLDMDig2 Probe Digoxigenin labeled	110 µL	40-2026-41
Friedreich's Ataxia GeneProber™ GLFRDA21 Probe unlabeled	500 ng	40-2027-40
Friedreich's Ataxia GeneProber™ GLFRDADig21 Probe Digoxigenin labeled	110 µL	40-2027-41

GScan™ Products Product Ordering Information

Gene Link's GScan™ gene detection products are safe, convenient and sensitive, and afford automated compilation of data. The kits contain optimized PCR amplification reagents and a wide array of fluorescent-labeled primers for genotyping after PCR using fluorescent genetic analyzer instrument(s). Included in these kits are ready-to-run control samples of various repeats of the triple repeat disorder kit. These control samples are for calibration with the molecular weight markers for accurate size determination of the amplified fragments.
The GScan™ kits are simple and robust for routine triple-repeat detection of greater than 100 repeats of all triple repeat disorders listed, except Fragile X. The CGG repeat in Fragile X can be detected up to ~50 repeats.

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Product	Size	Catalog No.
Fragile X GScan™ Kit for fluorescent detection; 100 reactions kit	1 kit	40-2004-15XX
Fragile X GScan™ Kit for fluorescent detection; 20 reactions kit	1 kit	40-2004-15FMS
Huntington's Disease GScan™ Kit for fluorescent detection; 100 reactions kit	1 kit	40-2025-15XX
Huntington's Disease GScan™ Kit for fluorescent detection; 20 reactions kit	1 kit	40-2025-15FMS
Myotonic Dystrophy GScan™ Kit for fluorescent detection; 100 reactions kit	1 kit	40-2026-15XX
Myotonic Dystrophy GScan™ Kit for fluorescent detection; 20 reactions kit	1 kit	40-2026-15FMS
Friedreich's Ataxia GScan™ Kit for fluorescent detection; 100 reactions kit	1 kit	40-2027-15XX
Friedreich's Ataxia GScan™ Kit for fluorescent detection; 20 reactions kit	1 kit	40-2027-15FMS

All Gene Link products are for research use only Current pricing are posted at http://www.genelink.com/

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Related Products Ordering Information

Omni-Pure™ DNA & RNA Purification Systems

Product	Catalog No.	Size* (Purifications)
Omni-Pure™ Blood DNA Purification System	40-4010-01	100
Omni-Pure™ Blood DNA Purification System	40-4010-05	500
Omni-Pure™ Blood DNA Purification System	40-4010-10	1000
Omni-Pure™ Tissue DNA Purification System	40-4050-01	100
Omni-Pure™ Tissue DNA Purification System	40-4050-05	500
Omni-Pure™ Tissue DNA Purification System	40-4050-10	1000

*Sample volume for each purification system varies. Each purification yields sufficient quantity for desired applications.

Omni-Clean™ Gel DNA Purification and Concentration Systems

Product	Catalog No.	Size* (Purifications)
Omni-Clean™ Gel DNA Beads Purification System	40-4110-10	100
Omni-Clean™ Gel DNA Beads Purification System	40-4110-50	500
Omni-Clean™ Gel DNA Spin Column Purification System	40-4120-10	100
Omni-Clean™ Gel DNA Spin Column Purification System	40-4120-50	500
Omni-Clean™ DNA Beads Concentration System	40-4130-10	100
Omni-Clean™ DNA Beads Concentration System	40-4130-50	500
Omni-Clean™ DNA Spin Column Concentration System	40-4140-10	100
Omni-Clean™ DNA Spin Column Concentration System	40-4140-50	500

*Sample volume for each purification system varies. Each purification yields sufficient quantity for desired applications.

Omni-Pure™ Plasmid DNA Purification Systems

Product	Catalog No.	Size* (Purifications)
Omni-Pure™ Plasmid DNA Purification System	40-4020-01	100
Omni-Pure™ Plasmid DNA Purification System	40-4020-05	500

*Sample volume for each purification system varies. Each purification yields sufficient quantity for desired applications.

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Related Products Ordering Information

Taq Polymerase & Master Mix

Product	Catalog No.	Unit Size
Taq DNA Polymerase; 400 units; 5 µ/µL; 80 µL	40-5200-40	400 units
Taq PCR Kit; 200 x 50 µL reactions	40-5211-01	200 reactions
Taq PCR Kit with controls; 200 reactions	40-5212-01	200 reactions
PCR Master Mix (2X); 100 x 50 µL reactions (2 tubes x 1.3 mL)	40-5213-01	100 reactions
PCR Master Mix (2X); 200 x 50 µL reactions (4 tubes x 1.3 mL)	40-5213-02	200 reactions

Related Products Ordering Information

PCR Additives & Reagents

Product	Catalog No.	Unit Size
Taq DNA Polymerase 300 units; 5 µ/µL; 60 µL	40-5200-30	300 units
PCR Buffer Standard (10 X); 1.6 mL	40-3060-16	1.6 mL
PCR Buffer Mg Free (10 X) ; 1.6 mL	40-3061-16	1.6 mL
Taq Polymerase Dilution Buffer; 1 mL	40-3070-10	1 mL
dNTP 2mM (10X) ; 1.1 mL	40-3021-11	1.1 mL
$MgCl_2$; 25 mM; 1.6 mL	40-3022-16	1.6 mL
Omni-Marker™ Universal Unlabeled; 100 µL	40-3005-01	100 µL
Primer and Template Mix; 500 bp; 40 reactions; 100 µL	40-2026-60PT	100 µL
Nuclease Free Water; 1.6 mL	40-3001-16	1.6 mL
DMSO; 1 mL	40-3031-10	1 mL
TMAC (Tetramethyl ammonium chloride) 100 mM; ; 1 mL	40-3053-10	1 mL
KCl 300 mM; 1 mL	40-3059-10	1 mL
Betaine; 5M; 1 mL	40-3032-10	1 mL

Omni-Marker™

Product	Catalog No.	Unit Size*
Omni-Marker™ Universal unlabeled; 100 µL	40-3005-01	100 µL
Omni- Marker™ Universal unlabeled; 500 µL	40-3005-05	500 µL
Omni-Marker™ Universal unlabeled; 1 mL	40-3005-10	1 mL
Omni- Marker™ Low unlabeled;100 µL	40-3006-01	100 µL
Omni-Marker™ Low unlabeled; 500 µL	40-3006-05	500 µL
Omni- Marker™ Low unlabeled; 1 mL	40-3006-10	1 mL
Omni-Marker™ GScan-2 Tamra labeled 50 bp - 600 bp; 100 µL	40-3062-01	100 µL
Omni-Marker™ GScan-2 Tamra labeled 50 bp - 600 bp; 500 µL	40-3062-05	500 µL

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Southern Blot Buffers& Reagents

Product	Catalog No.	Unit Size
Agarose Tablets, 0.5 gm each 100 Tablets	40-3011-10	100 tablets
Agarose LE Molecular Biology Grade; 100 g	40-3010-10	100 g
Agarose LE Molecular Biology Grade; 500 g	40-3010-50	500 g
Hybwash A, Hybridization Wash Solution; 200 mL	40-5020-20	200 mL
Hybwash B, Hybridization Wash Solution; 100 mL	40-5021-10	100 mL
TAE Buffer; 50X Concentrate; 100 mL	40-3007-01	100 mL
TAE Buffer; 50X Concentrate; 1 L	40-3007-10	1 L
TBE Buffer; 5X Concentrate; 1 L	40-3008-10	1 L
10x Washing buffer; 200 mL	40-5025-20	200 mL
10% Blocking solution; 100 mL	40-5026-10	100 mL
Seq. Loading buffer; 1 mL	40-5027-00	1 mL
10x AP Detection buffer; 100 mL	40-5031-10	100 mL
Lumisol™ I Hybridization Solution; contains formamide; 200 mL	40-5022-20	200 mL
Lumisol™ II Hybridization Solution; for non-toxic hybridizations; 200 mL	40-5023-20	200 mL
Lumisol™ III Hybridization Solution; for oligo probes; 200 mL	40-5024-20	200 mL

Loading Buffers

Product	Catalog No.	Size
Gel Loading Buffer 5X BPB/XC non-denaturing; 1 mL	40-3002-10	1 mL
Gel Loading Buffer 5X BPB/XC non-denaturing; 15 mL	40-3002-15	15 mL
Gel Loading Buffer 10X BPB/XC non-denaturing; 1 mL	40-3003-10	1 mL
Gel Loading Buffer 10X BPB/XC non-denaturing; 15 mL	40-3003-15	15 mL
Gel Loading Buffer 5X Orange G/XC non-denaturing; 1 mL	40-3004-10	1 mL
Gel Loading Buffer 5X Orange G/XC non-denaturing; 15 mL	40-3004-15	15 mL
Gel Loading Buffer 2X BPB/XC Denaturing for Sequencing; 1 mL	40-5027-10	1 mL
Gel Loading Buffer 2X BPB/XC Denaturing for Sequencing; 15 mL	40-5027-15	15 mL
DNA SDS Gel Loading Buffer 5X BPB/XC DNA binding protein denaturing buffer; 1 mL	40-5028-10	1 mL
DNA SDS Gel Loading Buffer 5X BPB/XC DNA binding protein denaturing buffer; 15 mL	40-5028-15	15 mL
RNA Gel Loading Buffer 2X BPB/XC with ethidium bromide; 1 mL	40-5029-10	1 mL
RNA Gel Loading Buffer 2X BPB/XC with ethidium bromide; 15 mL	40-5029-15	15 mL
RNA Gel Loading Buffer 2X BPB/XC without ethidium bromide; 1 mL	40-5030-10	1 mL
RNA Gel Loading Buffer 2X BPB/XC without ethidium bromide; 15 mL	40-5030-15	15 mL

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