Promega

Genomic Essentials Products 2025/26

The key to your *success*

GENOMIC ESSENTIALS

GENOMIC ESSENTIALS

The Key to Successful Research

Curiosity, a good idea, and courage are often the keys to success. In 1978, biochemist William A. Linton recognized scientists' need to work with DNA fragments and offered self-produced restriction enzymes for sale. With the same vision of supporting scientists in their daily work in the lab, Promega expanded its genomics portfolio. Single products, such as RNasin® and Taq DNA Polymerase in the 1980s, were quickly followed by the first "kits" such as the Wizard® Mini-DNA or the SV Total RNA System. These products laid the foundation for a comprehensive range of essential tools for molecular biology. Today, more than 40 years later, Promega offers over 4,000 products for basic research, pharmacology, forensics, and molecular diagnostics, always keeping its core tenet in mind: to provide GENOMIC ESSENTIALS.

Why do we tell you this?

Scientists need simple, good, and reliable genomics products to quickly get answers to their scientific questions. As one of the largest manufacturers of biological reagents world-wide, Promega develops its Genomic Essentials products in close dialogue with users. Our proven and coordinated Genomic Essentials give you more time to focus on your research. Rely on Promega's many years of experience in all areas. With Genomic Essentials, you have the key to your success.

With this extract of the genomics products from Promega's overall program, you have everything you need for the basis of your research – the Genomic Essentials. A clear presentation of the products with all product benefits, notes on tools and apps and all information you need to order.

GENOMIC ESSENTIALS

CONTENTS

Helix

All products marked with this sign can be placed in your Helix® Freezer, Refrigerator or Room Temperature Cabinet.

www.promega.com/helix

Learn more about Helix®

PURIFICATION

Nucleic acid purification is the cornerstone of success. Build a strong foundation for your experiments with Genomic Essentials purification products from Promega.

Choosing the appropriate purification product is critical to the continued success of your experiment. Promega has the right product for a variety of starting materials and applications – whether it is for DNA or RNA, fragments or plasmid, manual or automated workflows! Not only do the products work well and are easy to use, but also clear and fast application protocols make your lab routine easier and more efficient.

*** Want to automate your high-throughput purification?**

More on page 20

Character legend

- min — **Processing Time**
- mg — **Yield** *V=Variable
- A/M — **Format** Automated/Manual
- **Recommended for this application**
- **Application Note or Customer protocol available**
- **Membrane**
- **Magnetic**
- **Solution**

All Purification Products at a Glance

Plasmid DNA purification	PureYield™ Minipreps	Wizard® *Plus* SV Minipreps	Wizard® SV 96 Plasmid	Wizard® MagneSil® Plasmid	Wizard MagneSil Tfx™	PureYield™ Midipreps	PureYield™ Maxipreps
	Small-Scale (< 20 µg)					Large-Scale	
SPECIFICATIONS							
Typical output (µg)	15	20	5	9	20	200	1,000
Culture volume (ml)	0.6 – 3	1 – 10	1 – 1.5	0.5 – 1.5	0.5 – 1.5	50 – 250	250
Time effort (min)	10	45	40 – 60	45	45	30	60
Technology	▼	▼	▼	🧲	🧲	▼	▼
Manual/Automated	M	M	M / A*	A*	A*	M	M
APPLICATIONS							
Transfection	●				●	●	●
Transcription	●	●	●	●	●	●	●
Cloning	●	●	●	●	●	●	●
Sequencing	●	●	●	●	●	●	●
PCR	●	●	●	●	●	●	●
Restriction digestion	●	●	●	●	●	●	●
Transformation	●	●	●	●	●	●	●
Further information	📖8	📖9	📖9	📖21	📖21	📖8	📖8

DNA and RNA fragment purification	ReliaPrep™ DNA Clean-Up and Concentration	Wizard® SV Gel and PCR Clean-Up	ReliaPrep™ RNA Clean-Up and Concentration	Wizard® MagneSil® Sequencing Reaction Clean-Up[1]
SPECIFICATIONS				
Recovery	96 %	95 %	varies	Phred 20 Quality > 650 bases
Time effort (min)	10	15	10	35 – 90
Technology	▼	▼	▼	🧲
Manual/Automated	M	M / A*	M	A*
96-well format available		●		
APPLICATIONS				
PCR purification	●	●	●	
Gel extraction	●	●	●	
Purification of enzymatic reactions	●	●	●	
Removal of nucleotides	●	●	●	●
Further information	📖11	📖11	📖15	📖12

Viral RNA and DNA purification	ReliaPrep™ Viral TNA Miniprep	Maxwell® HT Viral TNA Kit	Wizard® Enviro TNA Kit
SPECIFICATIONS			
Typical output	varies	varies	varies
Time effort (min)	30	90 – 180	120
Technology	▼	🧲	▼
Manual/Automated	M	A*	M
Further information	📖15	📖21	📖15

[1] for purification and Sanger sequencing

Genomic DNA purification	Wizard® Genomic DNA	Wizard® SV Genomic DNA	Wizard® HMW DNA Extraction Kit	ReliaPrep™ Blood gDNA Minipreps	ReliaPrep™ gDNA Tissue Minipreps	ReliaPrep™ FFPE gDNA Minipreps	Wizard® Magnetic System for Food	Wizard® Magnetic 96 DNA Plant	Maxwell® HT 96 gDNA Blood	Maxwell® HT DNA FFPE Isolation	Maxwell® CSC System*	Maxwell® RSC System
SPECIFICATIONS												
Typical output (µg)	varies[1]	20 – 30	varies[1]	4 – 10	varies[1]	varies[1]	varies[1]	varies[1]	14	0.7	varies[1]	varies[1]
Time effort	60 min	20 min	60 min	30 min	30 min	2.5 h[2]	1 h	15 min	2 h	3 – 6 h	varies	< 40 min
Technology												
Manual/Automated	M	M A*	M	M	M	M	M	M A*	A*	A*	A*	A*
96-well format available		●										
SAMPLE TYPE												
Blood	●	◐	●	●					●		●	●
Swab		◐		●	●				●		●	●
Blood spots												●
Ear punch/Mouse tail	●	●			●							●
Stool	◐						◐				●[3]	●
Plasma											●[3]	●
Serum												●
Urine				●							●[3]	◐
Tissue	●	●	●		●						●	●
Bacteria	●		●									●
Cells	●	●	●		◐						●	●
FFPE Tissue						●				●	●	●
Food							●					●
Fungi	●											◐
Insects	●											◐
Plant tissue	●	●	●					●				●
Yeast	●											◐
Further information	9	10	10	10	9	11	10	22	21	21	19	19

* Maxwell® CSC is not available in all countries. Please contact your local representative for more information.
[1] depending on sample type and quantity
[2] including deparaffinization
[3] extraction of pathogen TNA

min Processing Time
mg Yield *V=Variable
A/M Format (Automated/Manual)
● Recommended for this application
◐ Application Note or Customer protocol available
Membrane
Magnetic
Solution

RNA purification

	ReliaPrep™ RNA Cell Minipreps	ReliaPrep™ RNA Tissue Minipreps	ReliaPrep™ FFPE Total RNA Minipreps	SV Total RNA	Maxwell® CSC System*	Maxwell® RSC System	MagneSil® Total RNA	Maxwell® HT simplyRNA Kit	ReliaPrep™ miRNA Cell and Tissue Minipreps	Maxwell® RSC System
	Total RNA								miRNA	
SPECIFICATIONS										
Typical output	varies	varies	varies	0.27–5.3 µg/mg tissue	varies[1]	varies[1]	2 mg or 10^5 cells	varies[1]	varies[1]	varies[1]
Time effort	30 min[2]	30 min[2]	1.5 h[3]	60 min	varies	< 40 min	30 min	< 90 min	40 min	40 min
Technology	▼	▼	▼	▼	🧲	🧲	🧲	🧲	▼	🧲
Manual/Automated	M	M	M	M A*	A*	A*	M A*	A*	M	A*
96-well format available				●						
SAMPLE TYPE										
Tissue		●		●		●[3]	●	●	●	●
Cells				●		●[3]	●	●	●	●
Whole blood				●+	●	●+3		●		
Buffy coat		◐				●				
Bacteria				●		◐				
Fixed tissue			●		●	●				
Cell culture (100–10^6)	●					●				
Yeast				●		●				
Plants				●		●	●	●		
RNA purification and concentration				●		●				
miRNA						●			●	●
Further information	13	13	15	14	19	19	21	22	14	19

* Maxwell® CSC is not available in all countries. Please contact your local representative for more information.
[1] depending on sample type and quantity
[2] DNase step included
[3] miRNA
\+ lymphocytes must be isolated first

DNA Purification

Plasmid Purification – from Miniprep to Maxiprep

PureYield™ Plasmid System

- ✓ Rapid purification of transfection-grade plasmid DNA
- ✓ Vacuum protocol reduces the time required for isolation compared to silica gels or membrane column methods
- ✓ Special wash buffer removes proteins, RNA and endotoxin contamination, thereby improving performance in applications such as transfection, *in vitro* transcription and coupled *in vitro* transcription/translation
- ✓ Alcohol precipitation or centrifugation is not required

PureYield™ Plasmid Miniprep System

- ✓ Fast: six preps can be processed in 12 minutes, including the wash step to remove endotoxins
- ✓ For 600 µl–3 ml of bacterial culture

10 min | 15 µg | M

QUANTITY		CAT.#
100 preps	Helix	A1223
250 preps	Helix	A1222

PureYield™ Plasmid Midiprep System

- ✓ For 25–100 ml of bacterial culture
- ✓ Rapid: requires only 30 minutes
- ✓ Special protocol: for up to 250 ml starting volume and yield maximization of up to 1 mg
- ✓ Direct elution from the column without ethanol carryover

30 min | 200 µg | M

QUANTITY		CAT.#
25 preps	Helix	A2492
100 preps	Helix	A2495
300 preps		A2496

www.promega.com/pureyield-midipreps-fast-video

PureYield™ Midipreps vs. Leading Competitor (Video)

Convince yourself of the fast and simple application.

PureYield™ Plasmid Maxiprep System

- ✓ For up to 250 ml of bacterial culture
- ✓ Particularly high yield – suitable for use in megapreps

60 min | 1 mg | M

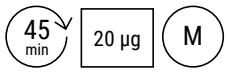
QUANTITY		CAT.#
10 preps	Helix	A2392
25 preps	Helix	A2393

Separately available buffer

	QUANTITY		CAT.#
Cell Resuspension Solution (CRA)	315 ml	Helix	A7115
Cell Lysis Solution (CLA)	315 ml	Helix	A7125
Neutralization Solution (NSB)	500 ml	Helix	A1485

Wizard® *Plus* SV Miniprep DNA Purification System

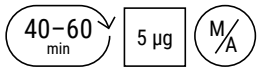
- ✓ For 1–10 ml of bacterial culture
- ✓ Silica membrane-based system
- ✓ The purified DNA can be used directly for automated fluorescent sequencing or other standard molecular biology applications
- ✓ No phenol extraction and no precipitation steps necessary
- ✓ For use with microcentrifuge (spin) or vacuum protocol e.g., Vac-Man® Laboratory Vacuum Manifold (p. 16)



QUANTITY		CAT.#
50 preps	Helix	A1330
250 preps	Helix	A1460
1,000 preps		A1465

Wizard® SV 96 Plasmid DNA Purification System

- ✓ Silica membrane-based system in a 96-well format
- ✓ The purified plasmid DNA can be used directly for automated fluorescent sequencing or other standard molecular biology applications
- ✓ Manual or automated purification on laboratory liquid handlers
- ✓ Time-saving Vacuum protocol (e.g. with the Vac-Man® 96 Vacuum Manifold p. 16)

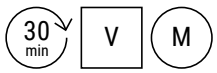


QUANTITY		CAT.#
1 × 96 preps	Helix	A2250
5 × 96 preps	Helix	A2255
100 × 96 preps		A2258

DNA from Blood, Cells, Tissues, Plants or Foods

ReliaPrep™ gDNA Tissue Miniprep System

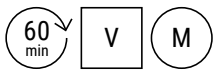
- ✓ Pure, intact genomic DNA without alcohol precipitation from 25 mg of tissue, a buccal swab or 1 cm mouse tail
- ✓ Ready-to-use reagents
- ✓ High yield and purity in a 50 µl elution volume
- ✓ Improved A_{260}/A_{230} ratios vs. conventional DNA purification systems



QUANTITY		CAT.#
100 preps	Helix	A2051
250 preps	Helix	A2052

Wizard® Genomic DNA Purification Kit

- ✓ Simple, solution-based DNA purification from white blood cells, cell culture, animal and plant tissues, yeast, gram-positive and gram-negative bacteria
- ✓ 1×10^5 to 8×10^5 cultured cells
- ✓ 11 mg of mouse liver, 0.5–1 cm mouse tail or 40 mg of tomato leaf
- ✓ The reagent volumes can be adapted to the amount of starting material



QUANTITY		CAT.#
100 isolations × 300 µl	Helix	A1120
500 isolations × 300 µl	Helix	A1125
100 isolations × 10 ml		A1620

Wizard® SV Genomic DNA Purification System

- ✓ Fast, simple membrane-based system for isolating pure DNA with high yields
- ✓ For cells, mouse tail or up to 20 mg of plant tissue
- ✓ For use with microcentrifuge (spin) or vacuum protocol e.g., Vac-Man® Laboratory Vacuum Manifold (p. 16)

20 min | 20–30 µg | M/A

QUANTITY		CAT.#
50 preps	Helix	A2360
250 preps	Helix	A2361
1 × 96 preps | 96-well format	Helix	A2370
4 × 96 preps | 96-well format	Helix	A2371

Wizard® Magnetic DNA Purification System for Food

- ✓ DNA purification from a variety of food samples such as corn, corn flour, wheat flour, soybean, soy flour or soy milk
- ✓ Protocols for processed foods like chips, chocolate, lecithin, soy and soy products and vegetable oils
- ✓ Purified DNA can be used for PCR-based tests, such as GMO sequencing

60 min | V | M

QUANTITY		CAT.#
200 preps	Helix	FF3750
400 preps	Helix	FF3751

Wizard® HMW DNA Extraction Kit

- ✓ Isolation of high-molecular-weight DNA (HMW DNA) for long-read sequencing
- ✓ Simple and fast protocol for HMW DNA extraction with the highest percentage of large fragments up to 500 kb
- ✓ High yield and purity from numerous sample types: Whole blood, plants, cells, tissues or bacteria
- ✓ Ideally suited for sequencing technologies such as PacBio®, 10 × Genomics or Oxford Nanopore Technologies

60 min | V | M

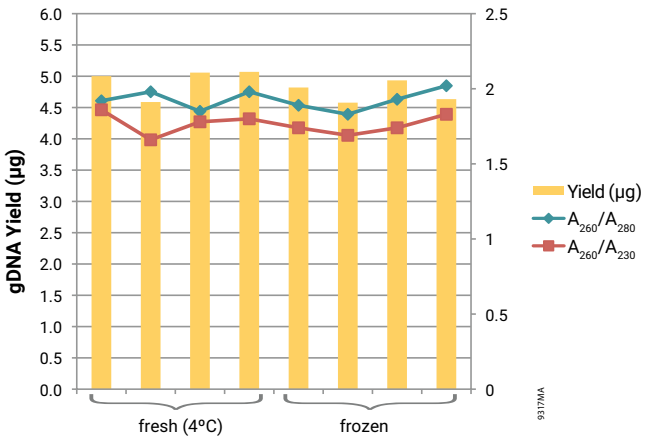
QUANTITY		CAT.#
50 preps	Helix	A2920

ReliaPrep™ Blood gDNA Miniprep System

- ✓ Very good yield even with little starting material
- ✓ No hidden costs: DNase is included
- ✓ Purification of pure, intact genomic DNA without ethanol precipitation from fresh or frozen blood samples, other body fluids or swabs in approximately 30 minutes
- ✓ Complete kit with ready-to-use reagents
- ✓ Good yield and high purity in 50 µl elution volume
- ✓ Improved A_{260}/A_{230} ratios vs. conventional purification systems
- ✓ DNA purification from ≤ 200 µl of blood

<30 min | 4–10 µg | M

QUANTITY		CAT.#
100 preps	Helix	A5081
250 preps	Helix	A5082

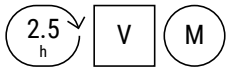


Consistent yield and purity of genomic DNA isolated using the ReliaPrep™ Blood gDNA Miniprep System: DNA was purified from fresh blood or blood that was frozen and thawed three times.

DNA Purification from FFPE Samples

ReliaPrep™ FFPE gDNA Miniprep System

- ✓ Complete system for formalin-fixed, paraffin-embedded tissue
- ✓ No harmful solvents or overnight digestion necessary
- ✓ Minimum time required for purification (reduced hands-on time due to fewer manual steps)
- ✓ Optimized lysis reverses modifications caused by tissue fixation
- ✓ The result is intact DNA suitable for amplification

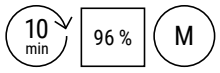


QUANTITY		CAT.#
10 preps	Helix	A2351
100 preps	Helix	A2352

DNA Purification and Concentration from Gels and PCR Reactions

ReliaPrep™ DNA Clean-Up and Concentration System

- ✓ Gel & PCR Clean-Up and DNA Concentration in one System
- ✓ Concentration and purification of up to 300 µl of diluted sample into as little as 7 µl volume
- ✓ Binding capacity up to 60 µg
- ✓ DNA fragments from 100 bp–10 kb can be extracted within 10 min from agarose gels or directly from PCR reactions, enzymatic reactions, and phenol/chloroform precipitates
- ✓ Also suitable for purification of NGS reactions (tailing, adapter ligation, enrichment)



QUANTITY		CAT.#
10 preps	Helix	A2891
50 preps	Helix	A2892
250 preps	Helix	A2893

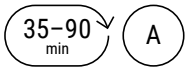
Wizard® SV Gel and PCR Clean-Up System

- ✓ One system for two applications!
- ✓ Extracts DNA fragments of 100 bp to 10 kb from standard or low-melting agarose gels
- ✓ Purifies up to 40 µg of DNA directly from amplification reactions and restriction digests, with a recovery rate of up to 95 %
- ✓ Purified DNA can be used for automated fluorescent sequencing, cloning, labelling or *in vitro* transcription directly without further processing steps
- ✓ Purifies DNA from up to 300 mg of agarose gel pieces or 1 ml of enzyme reaction
- ✓ For use with microcentrifuge (spin) or vacuum protocol e.g., Vac-Man® Laboratory Vacuum Manifold (p. 16)

QUANTITY		CAT.#
50 preps	Helix	A9281
250 preps	Helix	A9282
1,000 preps		A9285
1 × 96 preps | 96-well format	Helix	A9340
4 × 96 preps | 96-well format	Helix	A9341
8 × 96 preps | 96-well format	Helix	A9342
100 × 96 preps | 96-well format		A9345

Wizard® MagneSil® Sequencing Reaction Clean-Up System

- ✓ High-throughput purification of sequencing reactions including ProDye™ terminator reactions and BigDye® terminator reactions
- ✓ Purification is performed with MagneSil® GREEN Paramagnetic Particles on uncoated standard 96-well amplification plates
- ✓ No user-intervention necessary until the sample is ready for loading onto the sequencer
- ✓ Protocols for automated purification on Beckman Coulter, Eppendorf, PerkinElmer and Tecan instruments available
- ✓ 2 µl sequencing reaction



QUANTITY		CAT.#
4 × 96 preps	Helix	A1831
8 × 96 preps	Helix	A1832
100 × 96 preps		A1835

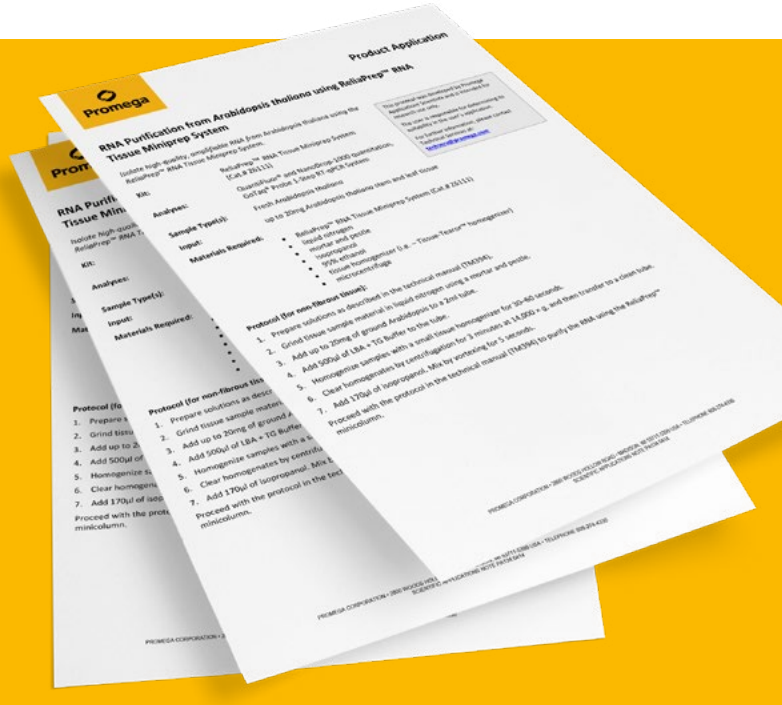
Every sample needs its protocol!

Are you looking for the ideal purification for your sample type? Promega has the right solution – or we can develop one for you! Request your sample type directly by contacting us or find the suitable protocol in the Application Note database.

www.promega.com/NAP-Application-Notes

Protocol library

Browse now



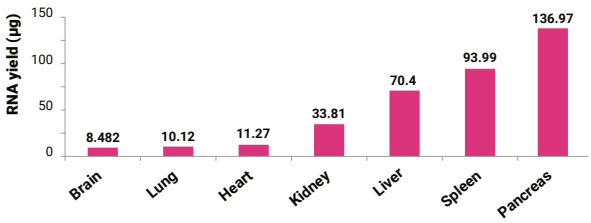
RNA and microRNA Purification

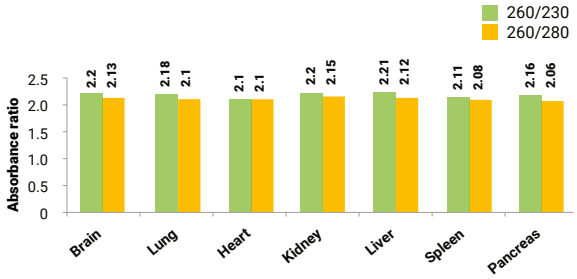
RNA from Cells, Tissues, Plants and Blood

ReliaPrep™ RNA Miniprep System

- ✓ High yields in only 30 minutes
- ✓ Complete kit includes RNase-free DNase
- ✓ Efficient RNA binding, even with low amounts of starting material
- ✓ Elute in as little as 7 µl; no further concentration necessary
- ✓ DNase treatment is performed directly on the minicolumn membrane, eliminating substances that can interfere with downstream applications
- ✓ No phenol:chloroform extraction or ethanol precipitation
- ✓ Advantage: You obtain directly usable, pure total RNA, which can also be utilized in challenging applications – further concentration is not necessary

Typical RNA Yield of Various Tissues





RNA was isolated from 10 mg samples of various mouse tissues. Subsequently, yield and purity were measured.

ReliaPrep™ RNA Cell Miniprep System

- ✓ 100 to 5 × 10^6 mammalian cells

30 min | V | M

QUANTITY		CAT.#
10 preps	Helix	Z6010
50 preps	Helix	Z6011
250 preps	Helix	Z6012

ReliaPrep™ RNA Tissue Miniprep System

- ✓ 0.25 to 20 mg tissue
- ✓ Application note for RNA isolation from buffy coat available

30 min | V | M

QUANTITY		CAT.#
10 preps	Helix	Z6110
50 preps	Helix	Z6111
250 preps	Helix	Z6112

SV Total RNA Isolation System

- ✓ Quick and easy preparation of intact total RNA from tissues, cells or white blood cells
- ✓ DNase treatment in membrane spin columns reduces genomic DNA contamination, which interferes with downstream PCR applications
- ✓ No phenol:chloroform extraction or ethanol precipitation necessary
- ✓ Special advantage: no DNase carryover into the finished RNA isolation
- ✓ Purify RNA from up to 5 × 10^5 mammalian cells or 15–60 mg of tissue
- ✓ For use with microcentrifuge (spin) or vacuum protocol e.g., Vac-Man® Laboratory Vacuum Manifold (p.16)

60 min | 0.27–5.3 µg/mg | M/A

QUANTITY		CAT.#
10 preps	Helix	Z3101
50 preps	Helix	Z3100
250 preps	Helix	Z3105
1 × 96 preps | 96-well format	Helix	Z3500
5 × 96 preps | 96-well format	Helix	Z3505

miRNA from Cells and Tissues – Efficiently Purify from the Smallest Sample Amounts!

ReliaPrep™ miRNA Cell and Tissue Miniprep System

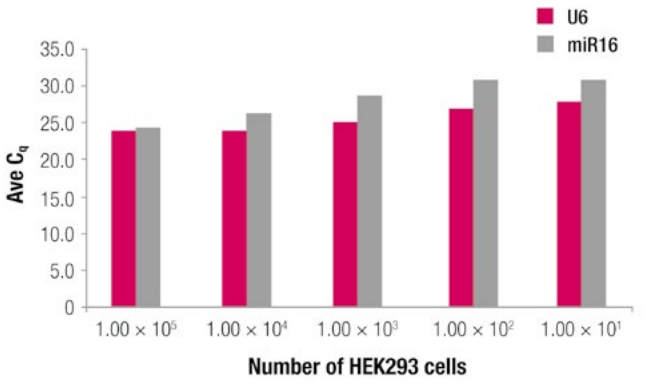
- ✓ Safe: without the use of harmful organic solvents
- ✓ Low elution volume: high concentration of amplifiable mRNA, miRNA, and other non-coding RNA (< 200 bp)
- ✓ Fast: convenient and simple protocol in only 40 minutes
- ✓ Pure: effective gDNA digestion of the eluate and subsequent use of a second column

40 min | V | M

QUANTITY		CAT.#
10 preps	Helix	Z6210
50 preps	Helix	Z6211
250 preps	Helix	Z6212

Here, the miRNA targets U6 and miR16 were amplified after RNA isolation from varying cell culture inputs. RNA was purified from as few as 10 cells to as many as 1x10^5 HEK293 cells. miR16 and U6 expression levels were determined using qPCR. The result shows that miRNA can be reliably isolated from as few as 10 cells.

Reliable extraction from very small amounts of input material



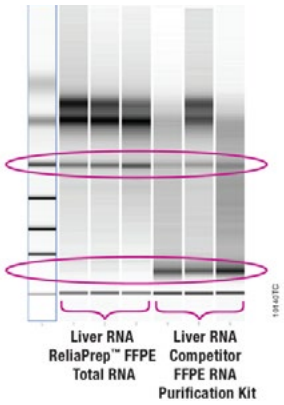
RNA from FFPE Tissue – Simple and Fast!

ReliaPrep™ FFPE Total RNA Miniprep System

- ✓ Complete system for RNA purification from formalin-fixed, paraffin-embedded tissue
- ✓ No hazardous solvents or overnight digestion necessary
- ✓ Total RNA from FFPE tissue can be isolated quickly, with less hands-on time
- ✓ Intact, amplifiable high-quality RNA
- ✓ Purify RNA from 5–50 µg tissue sections

90 min | V | M

QUANTITY		CAT.#
10 reactions	Helix	Z1001
100 reactions	Helix	Z1002



Total RNA was extracted from consecutive 10 µm mouse liver FFPE sections and analyzed on an Agilent Bioanalyzer.

The ReliaPrep™ FFPE Total RNA Miniprep System isolated more long RNA fragments than competitor kits.

RNA Fragment Purification and Concentration in High Quality

ReliaPrep™ RNA Clean-Up and Concentration System

- ✓ Easy and fast concentration of RNA without carry-over of interfering substances
- ✓ Processing of up to 300 µl diluted sample and elution in ≥7 µl water or TE buffer
- ✓ Binding capacity up to 80 µg
- ✓ Very good RNA recovery allows usage in subsequent applications such as RT-qPCR, Northern blot analysis or RNA sequencing

10 min | V | M

QUANTITY		CAT.#
10 preps	Helix	Z1071
50 preps	Helix	Z1072
250 preps	Helix	Z1073

RNA and DNA Extraction from Viruses

ReliaPrep™ Viral TNA Miniprep System

- ✓ RNA and DNA extraction from virus samples
- ✓ Fast and simple protocol – 30 minutes
- ✓ Proteinase K included
- ✓ Without ethanol precipitation
- ✓ High yield and purity in only 50 µl elution volume

30 min | V | M

QUANTITY		CAT.#
250 preps		AX4820

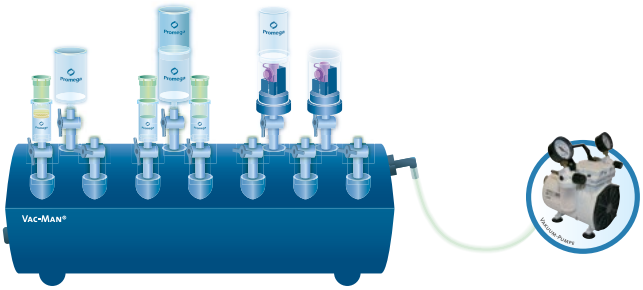
Wizard® Enviro TNA Kit

- ✓ Direct capture and purification of viral DNA/RNA from wastewater and enviromental samples
- ✓ Concentration and extraction from 40–100 ml sample
- ✓ Extraction of TNA in less than 2 hours
- ✓ Efficient removal of PCR inhibitors
- ✓ An optional step can be included to extract nucleic acids from sludge and solids

120 min | V | M

QUANTITY		CAT.#
25 preps	Helix	A2991

Purification without Centrifugation



The Vac-Man® Vacuum Station

Vac-Man® Laboratory Vacuum Manifold

- ✓ DNA and RNA purification in the shortest time, e.g. plasmid DNA midipreps in 30–45 minutes when eluting with the Eluator™ from the column directly into the Eppendorf tube
- ✓ Up to 20 parallel purifications
- ✓ No time spent waiting for the centrifuge
- ✓ Fewer manual steps
- ✓ Ethanol carryover minimized

QUANTITY	CAT.#
1 each	**A7231**

Vac-Man® 96 Vacuum Manifold

- ✓ DNA and RNA purification in 96-well plate-based format

QUANTITY	CAT.#
1 each	**A2291**

The Eluator™ Vacuum Elution Device

The Eluator™ Vacuum Elution Device makes the final centrifugation step during purification unnecessary. Perform all operations directly on your lab bench.

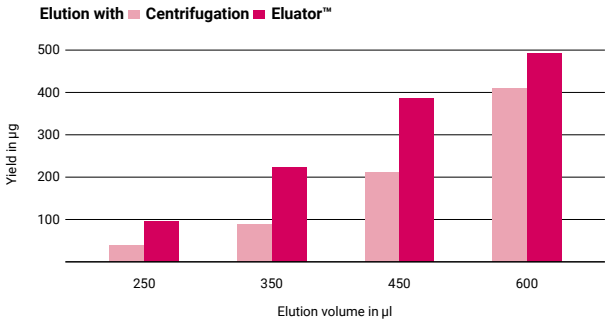
www.promega.com/vakuum-eluator-video

See how the Eluator™ Vacuum Elution Device Works!

Eluator™ Vacuum Elution Device

- ✓ 20 % more plasmid in the eluate due to reduced dead volume
- ✓ Fewer pipetting steps because elution occurs directly into a 1.5 ml microcentrifuge tube
- ✓ Elution in less than 1 minute

QUANTITY	CAT.#
4 each	**A1071**



Plasmid DNA yield determined using the Eluator™ Vacuum Elution Device:
Plasmid was purified using the PureYield™ Plasmid Midiprep System and either centrifugation or the Eluator™ Vacuum Elution Device for the elution step, was used. The yields were measured and compared at different elution volumes. The yield with the Eluator™ Vacuum Elution Device was higher at each elution volume compared to that of the centrifugation method.

Promega has many convenient purification starter packages to help you get started with vacuum purification

Your start-up purification package contains:

- ✓ Preps for purification
- ✓ Vac-Man® (vacuum station)
- ✓ Vacuum Eluator™ (depending on the purification package)
- ✓ **Free vacuum pump**

Start-Up Packages for Plasmid Purification

PureYield™ Plasmid Miniprep Start-Up Kit

CONTENTS	CAT.#
750 preps (3 × A1222) Vac-Man® (A7231)	**A6812**

PureYield™ Plasmid Midiprep Start-Up Kit

CONTENTS	CAT.#
100 preps (1 × A2495) Vac-Man® (A7231) 4 Eluators™ (1 × A1071)	**A6742**

PureYield™ Plasmid Maxiprep Start-Up Kit

CONTENTS	CAT.#
50 preps (2 × A2393) Vac-Man® (A7231) 4 Eluators™ (1 × A1071)	**A6732**

Wizard® *Plus* SV Minipreps Start-Up Kit

CONTENTS	CAT.#
750 preps (3 × A1470) Vac-Man® (A7231) Vacuum adapters(A1331)	**A6762**

Start-Up Packages for Genomic DNA Purification

Wizard® SV Genomic DNA Purification Start-Up Kit

CONTENTS	CAT.#
500 preps (2 × A2361) Vac-Man® (A7231) Vacuum adapters (A1331)	**A6772**

Wizard® SV 96 Genomic DNA Purification Start-Up Kit

CONTENTS	CAT.#
4 × 96 preps (1 × A2371) Vac-Man® 96 (A2291)	**A6782**

Start-Up Packages for Fragmented DNA Purification

Wizard® SV Gel and PCR Clean-Up Start-Up Kit

CONTENTS	CAT.#
500 preps (2 × A9282) Vac-Man® (A7231) Vacuum adapters (A1331)	**A6752**

Wizard® SV 96 PCR Clean-Up Start-Up Kit

CONTENTS	CAT.#
8 × 96 preps (A9342) Vac-Man® 96 (A2291)	**A6792**

Start-Up Packages for RNA Purification

SV Total RNA Isolation Start-Up Kit

CONTENTS	CAT.#
250 preps (1 × Z3105) Vac-Man® (A7231) Vacuum adapters (A1331)	**Z3382**

Wizard® Enviro Start-Up Kit

CONTENTS	
25 preps (A2991) 4 Eluatoren™ (1 × A1071) Vac-Man® (A7231) Vac-Man® Jr. Laboratory Vacuum Manifold (A7660) Polypropylene Vacuum Flask, 1,700 ml (AS1839)	**A3060**

Automated Nucleic Acid Purification – with Maxwell® and Maxprep™

Automated isolation of DNA and RNA from various samples with reproducible results and high yields.

Fast, safe, and user-friendly nucleic acid purification for any laboratory. The Maxwell® instruments are compact benchtop devices and use a paramagnetic particle-based purification technique with pre-filled disposable cartridges. Preloaded protocols and touch screen operation are very user-friendly. Per run, Maxwell® instruments allow processing of up to 16 (RSC/CSC) or 48 samples (RSC 48/CSC 48) at once. The CE-IVD certified Maxwell® CSC instruments are specifically designed for molecular diagnostics and manufactured according to cGMP guidelines.

All Maxwell® RSC instruments can be modularly combined with the Maxprep™ Liquid Handler.

- **Fast:** processes 1–16 or 1–48 samples in approximately 30–60 minutes
- **Reliable:** consistently high yields
- **Clean:** no detectable cross-contamination
- **Versatile:** suitable for solid or viscous samples as no liquids are transported and therefore no clogging occurs
- **Flexible:** combine modularly with the Maxprep™ Liquid Handler for greater automation and seamless sample tracking

www.promega.com/trymaxwell

Try the Maxwell® System without any commitment!

Please contact us for a free of charge demo appointment

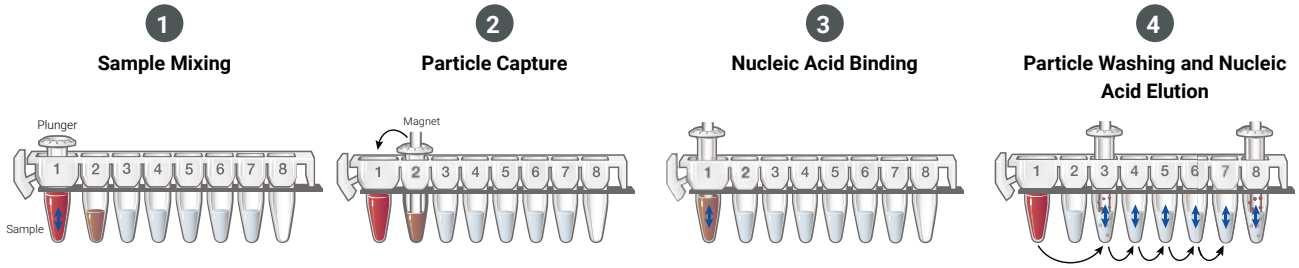
The Maxwell® instruments are used with a wide range of optimized extraction kits suitable for various sample types.

- DNA and RNA from tissue or cells
- Viral DNA and RNA from stool samples
- DNA and RNA from blood
- DNA from swabs
- DNA or RNA from FFPE tissue
- DNA from forensic trace samples
- DNA from grain for GMO analysis
- ccfDNA from serum or plasma
- miRNA from tissue, plasma, and serum
- …

Maxprep™ Liquid Handler
Complementary sample preparation and post-processing

As a complement to nucleic acid purification with Maxwell®, Promega offers automation of sample pre- and post-processing with the Maxprep™ instrument. This reduces hands-on time for manual steps, allowing you the freedom to focus on other tasks. For example, the Maxprep™ handles the transfer of eluates, addition of dyes for quantification, normalization or PCR setup. The instrument can be operated intuitively and comes pre-installed with ready-to-use protocols.

Maxwell® Purification Principle



Examples of available Maxwell® purification kits*

KIT	QUANTITY		CAT.#
Maxwell® CSC Blood DNA Kit**	48 preps	Helix	**AS1321**
Maxwell® CSC RNA Blood Kit**	48 preps	Helix	**AS1410**
Maxwell® CSC DNA FFPE Kit**	48 preps	Helix	**AS1350**
Maxwell® CSC RNA FFPE Kit**	48 preps	Helix	**AS1360**
Maxwell® CSC Viral TNA Kit**	48 preps	Helix	**AS1780**
Maxwell® CSC Genomic DNA Kit**	48 preps	Helix	**AS1850**
Maxwell® CSC Whole Blood DNA Kit**	48 preps	Helix	**AS1820**
Maxwell® RSC miRNA Tissue Kit	48 preps	Helix	**AS1460**
Maxwell® RSC ccfDNA Plasma Kit	48 preps	Helix	**AS1480**
Maxwell® RSC PureFood GMO and Authentication Kit	48 preps	Helix	**AS1600**
Maxwell® RSC Fecal Microbiome Kit	48 preps	Helix	**AS1700**
Maxwell® RSC Plant DNA Kit	48 preps	Helix	**AS1490**

Maxwell® and Maxprep™ Instruments*

MODEL	DESCRIPTION	FEATURES	CAT.#
Maxwell® RSC Instrument	Extraction instrument for all genomic applications	› For parallel purification of up to 16 samples › With a barcode tracking system, touch screen operation, UV lamp, and Quantus™ Fluorometer	**AS4500**
Maxwell® RSC 48 Instrument	Increased sample throughput with proven extraction technology	› For parallel purification of up to 48 samples › With barcode tracking system incl. barcode reader, touch screen operation, UV lamp, and optional Quantus™ Fluorometer › Integrated vision system eliminates manual setup error	**AS8500**
Maxwell® CSC Instrument	For CE-IVD certified processes in molecular diagnostics	› CE-IVD certified purification of up to 16 samples › With barcode tracking system incl. barcode reader, touch screen operation, and UV lamp › Dual mode software for maximum flexibility in diagnostics (IVD mode) or research (RUO mode)	**AS6000**
Maxwell® CSC 48 Instrument	For CE-IVD certified processes with increased sample throughput	› CE-IVD certified purification of up to 48 samples › With barcode tracking system incl. barcode reader, touch screen operation and UV lamp › Integrated vision system eliminates manual setup errors › Dual mode software for maximum flexibility in diagnostics (IVD mode) or research (RUO mode)	**AS8000**
Maxprep™ Liquid Handler	Pipetting platform for automated sample preparation and post-processing of Maxwell® samples	› Complement to the Maxwell® RSC instruments. With UV decontamination, simple plug-and-play software and pre-installed protocols, e.g. PCR setup	**AS9201**

* For further Maxwell® instruments and kits, visit www.promega.com/Maxwell
** also available as Maxwell® RSC Kit

Please note that Maxwell® CSC is not available in all countries. Please contact your local representative for more information.

Automated Nucleic Acid Purification for High Throughput

When suddenly faced with the challenge of automating the manual extraction of DNA or RNA, there are a few things to consider and the decision is not easy.

- Which liquid handler is the right one for me?
- Which reagents offer the optimal results for my research?
- How do I program the appropriate protocol on my liquid handler?

Promega – the ideal partner for answering these questions

www.promega.com/Labor-Automation

Learn more

Application Protocols for a Wide Range of Sample Types

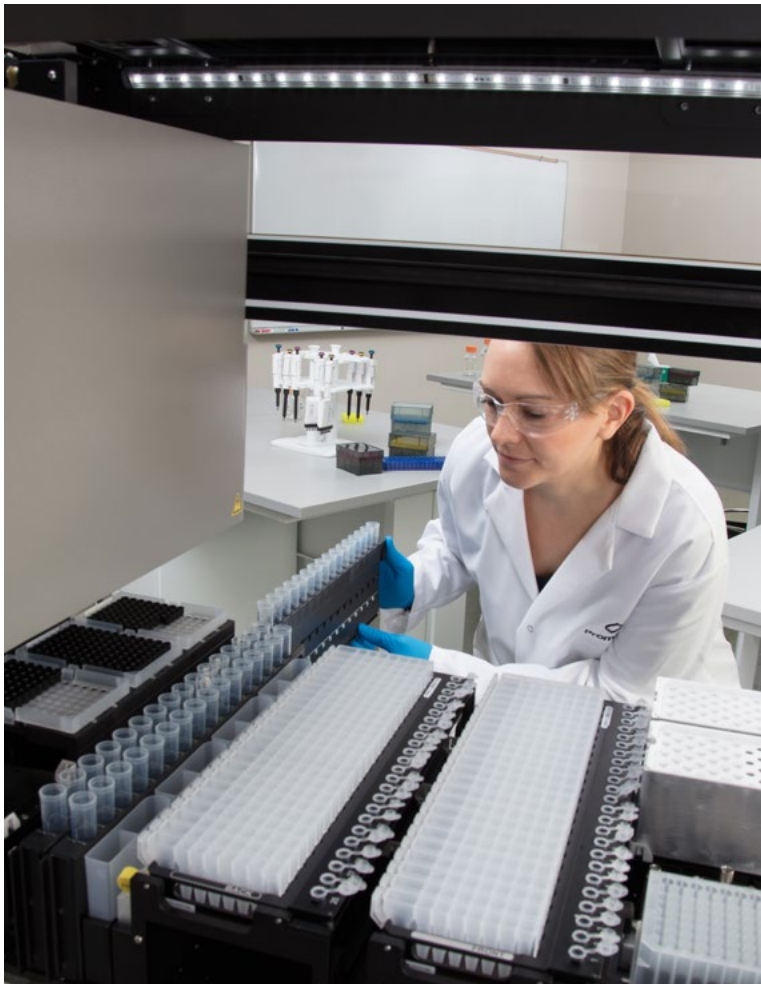
Promega offers kits for high-throughput isolation of genomic DNA (gDNA), plasmid DNA, ccfDNA, total RNA, viral RNA, and total nucleic acid from a variety of input materials, including:

- Blood
- Plasma
- FFPE-Tissue
- Cells
- Fresh or frozen tissue
- Plant material
- Swabs
- Wastewater

Suitable for all common downstream applications such as PCR, qPCR, RT-PCR, ddPCR, microarrays, NGS, genotyping, and cloning.

Can be automated on all commercially available platforms. i.a.

- Analytik Jena CyBio® FeliX
- Beckman Coulter Biomek® i5, i7
- Eppendorf® EpMotion™
- Hamilton® Microlab™ STAR
- Hamilton® Microlab™ Vantage
- Tecan Freedom EVO®
- Tecan Fluent®
- Thermo Fisher MagMax™/KingFisher™ Flex



Support from Automation and Application Experts

- Implementation and optimization of automated extraction methods – independent of the platform used
- Generation of data for the "proof of principle"
- Adaptation of reagents to your automation needs – if required, custom dispense options are available
- Assistance in selecting a suitable automation platform for the use of Promega kits
- Close collaboration with the platform manufacturers

Selection of the product portfolio for automated high-throughput nucleic acid purification

Wizard® MagneSil® Plasmid DNA Purification System

- ✓ Simple, reliable method for automated isolation of plasmid DNA
- ✓ Typical yield: 5–20 µg DNA from minipreps or 120–150 µg DNA from midipreps
- ✓ Purity: >1.8 (A_{260}/A_{280}), >1.7 (A_{260}/A_{280})
- ✓ The purified DNA can be used directly for automated fluorescence sequencing or other standard molecular biological techniques

QUANTITY		CAT.#
4 × 96 preps	Hélix	A1630
8 × 96 preps	Hélix	A1631
100 × 96 preps		A1635

Wizard MagneSil Tfx™ System

- ✓ Transfection-grade plasmid DNA
- ✓ Typical yield: 5–20 µg DNA from minipreps or 120–150 µg DNA from midipreps
- ✓ Purity: >1.7 (A_{260}/A_{280}), >1.8 (A_{260}/A_{230})

QUANTITY		CAT.#
4 × 96 preps	Hélix	A2380

Maxwell® HT 96 gDNA Blood Isolation System

- ✓ DNA yields up to 12 µg
- ✓ Purity: >1.9 (A_{260}/A_{280}) from 350 µl blood (depending on the number of lymphocytes)
- ✓ Purity and yield independent of sample storage or use of anti-clotting agents

QUANTITY		CAT.#
1 × 96 preps	Hélix	A2670
4 × 96 preps	Hélix	A2671

Maxwell® HT DNA FFPE Isolation System

- ✓ High yield of pure DNA from FFPE samples without the use of xylene or other hazardous solvents
- ✓ Protocol length (instrument dependent): approx. 3–6 hours

QUANTITY		CAT.#
4 × 96 preps	Hélix	A6372

Maxwell® HT Viral TNA Kit

- ✓ Samples from plasma, serum, Universal Transport Medium™ (UTM®), swabs, and whole blood
- ✓ Consistent yields over 5 orders of magnitude virus concentration with sample volumes of 300 µl plasma, serum or whole blood
- ✓ Purity >1.9 (A_{260}/A_{280})
- ✓ Protocol length (instrument dependent): approx. 90 minutes up to 3 hours

QUANTITY		CAT.#
4 × 96 preps	Hélix	AX2340

MagneSil® Total RNA Mini-Isolation System

- ✓ Fast and easy preparation of intact total RNA from cells, tissue lysate or fresh whole blood
- ✓ Low elution volume of only 15 µl – i.e. concentrated RNA for applications such as endpoint RT-PCR or real-time RT-PCR
- ✓ Tissue: for ≤2 mg tissue lysate in 100 µl
- ✓ Cells: for ≤1 × 10^5 cells

QUANTITY		CAT.#
4 × 96 preps	Hélix	Z3351

Wizard® Magnetic 96 DNA Plant System

- ✓ Isolates DNA from a variety of plant and seed tissues e.g. corn and tomato leaves, canola and sunflower seeds
- ✓ Typical yield: 10 ng–100 ng
- ✓ Purity: >2 (A_{260}/A_{280}), >1.9 (A_{260}/A_{230})
- ✓ Protocol length (instrument dependent): 25–50 min

QUANTITY		CAT.#
2 × 96 preps	Helix	FF3760
4 × 96 preps	Helix	FF3761

Maxwell® HT ccfDNA Kit

- ✓ Samples from plasma (100 µl–10 ml), serum and urine (≤8 ml)
- ✓ High yields of 1–20 ng per 1 ml plasma, depending on the number of lymphocytes
- ✓ Purity: >1.9 (A_{260}/A_{280})
- ✓ Protocol length (instrument dependent): < 3 h (2 ml plasma), < 4.5 h (4 ml plasma), < 7 h (8 ml plasma)

QUANTITY		CAT.#
4 × 96 preps	Helix	A6030

Maxwell® HT simplyRNA Kit

- ✓ Samples from cells, tissues, blood samples in EDTA or PAXGene tubes, fish, plants
- ✓ Yields depend on sample type, approx. 6–8 µg from 2.5 ml blood
- ✓ Purity >1.9 (A_{260}/A_{280}) or > 2.0 (A_{260}/A_{280}), respectively
- ✓ Protocol length (instrument dependent): less than 3 hours

QUANTITY		CAT.#
4 × 96 preps	Helix	AX7890

Maxwell® HT Genomic DNA Kit

- ✓ Extracts high quality DNA from whole blood, buffy coat, buccal swabs, cells and tissue
- ✓ Yields depend on sample type, approx. 8 - 14 µg per 300 µl whole blood (fresh/frozen)
- ✓ Purity (whole blood) >1.7 (A_{260}/A_{280}) or >1.7 (A_{260}/A_{280})
- ✓ High-performance DNA extraction for amplification-based tests

QUANTITY		CAT.#
4 × 96 preps	Helix	A6050

Helix

THE MORE *sustainable* WAY TO BUY PRODUCTS FROM PROMEGA

HELIX: SMART ON-SITE STOCKING

- Freezer or room temperature cabinet with intelligent RFID-based purchasing process
- Stocked with the Promega products you need
- 24/7 access to the reagents
- Good for the environment: consolidated shipments, efficient restocking plans and reduced packaging

HOW IT WORKS

1 CHECK INVENTORY

2 SCAN PASS

3 TAKE PRODUCT

4 BACK TO WORK

Helix

For more information visit:
www.promega.com/Helix

SEQUENCING

In next generation sequencing workflows, nucleic acid is extracted from a sample and fragmented, arranged into platform-specific library constructs, amplified and sequenced. Regardless of the sample type or the platform used, every step throughout this workflow is critical for successful results.

Promega products to support NGS workflows include ProNex® NGS Quantitation and Size Selective DNA Purification Systems for library preparation prior to sequencing, as well as nucleic acid extraction and quantification systems.

The Spectrum Compact Capillary Electrophoresis System and ProDye™ Terminator Sequencing System support Sanger sequencing applications, such as verification of NGS base calls and confirmation of genome edits in transformed cultures.

Sanger Sequencing

Capillary Electrophoresis

The benchtop 4-capillary electrophoresis instrument provides an easy way to perform Sanger sequencing and fragment analysis in your laboratory. The simple system delivers the highest performance and, most importantly, offers the user flexibility – both in the choice of polymer and kit systems and in the analysis.

Spectrum Compact CE System

- ✓ Capillary electrophoresis instrument with 4 capillaries
- ✓ Analysis of 1 to 32 samples per run
- ✓ Compatible with 4-, 5-, 6-, and 8-color kit systems from many manufacturers
- ✓ Prefilled, plug-and-play consumables allow maximal flexibility And resource efficiency
- ✓ Compact size and intuitive operation
- ✓ Customized service and training options

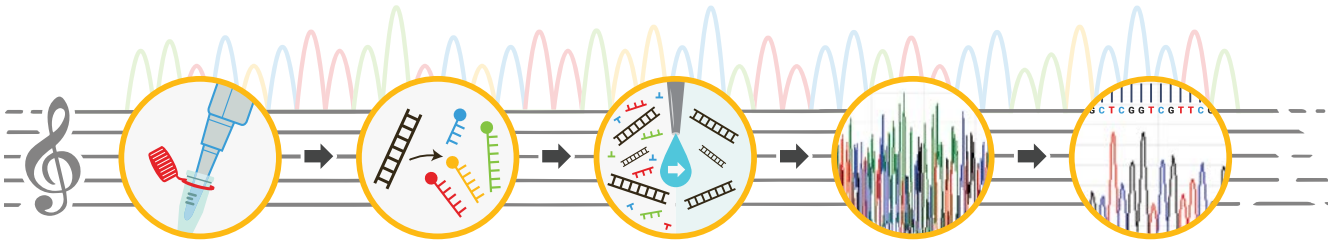
CAT.#
CE1304

www.promega.com/SpectrumCompactVideo

Product video

Get to know the CE instrument in a short video.

ProDye™ Sequencing Reagents – In Perfect Harmony with Your Workflow



The latest kit for Sanger sequencing uses a thermostable DNA polymerase and is based on the same fluorescent dyes as the BigDye® Terminator v3.1 kit, allowing for switching without recalibration.

The ProDye™ System can be used with Spectrum Compact CE, SeqStudio™ Genetic Analyzer, and all Applied Biosystems Genetic Analyzers. The simple cycling protocol delivers high performance and resolution as well as maximum read lengths, even with difficult templates.

ProDye™ Terminator Sequencing System

- ✓ Cycle sequencing for a wide range of templates
- ✓ Ready-to-use master mix with a thermostable polymerase
- ✓ Primer, control DNA, and Nuclease-Free Water included in the kit

QUANTITY		CAT.#
24 reactions	Helix	CR4324
200 reactions	Helix	CR4302
1,000 reactions	Helix	CR4310

Further fillings available upon request.

ProDye™ Standards and Buffer

ProDye™ 4C Matrix Standard

- ✓ DNA fragments labeled with four fluorescent dyes (dTMR, dCXR, dRSixG and dROneTen)
- ✓ Spectrum Compact CE System spectral calibration, Applied Biosystems® 3130, 3130xl, 3500, and 3500xL, and SeqStudio™ Genetic Analyzers

QUANTITY	CAT.#
5 reactions	CR4500

ProDye™ Sanger Sequencing Standard

- ✓ Control template DNA (pGEM®-3Zf(+) partial sequence) terminally labeled with ProDye™ Terminator Sequencing System
- ✓ For instrument installations and further test runs

QUANTITY		CAT.#
4 × 4 wells	Helix	CR4604
2 × 96 wells	Helix	CR4696

ProDye™ 5X Sequencing Buffer

QUANTITY		CAT.#
12 ml	Helix	CR1011

NGS Sample Preparation

Next-generation sequencing is extremely powerful, and also highly complex. Preparing samples for sequencing in an optimal way and, if necessary, pooling them in the correct ratio is crucial for meaningful results. In the ProNex® product series, you will find perfect tools for the essential steps of sample preparation.

NGS Sample Preparation Workflow – Extraction and Library Preparation

Nucleic acid purification for NGS

High-quality nucleic acid (inhibitor-free, non-degraded) is essential for the subsequent steps.

Promega offers a variety of manual and automated purification systems to obtain high-quality, NGS-ready DNA and RNA – even for challenging samples such as FFPE tissue, plant tissue or ccfDNA.

Automated:

- › Maxwell® RSC (16 or 48)
- › Maxwell® HT Reagents

Manual:

- › ReliaPrep™
- › Wizard®

Quantification for NGS

Precise quality and quantity determination of the isolated nucleic acids is crucial for the following steps in the NGS process. Contaminations and other impairments are identified in time for the user to remove them before sequencing.

Fluorescence-based:

- › Quantifluor® Dyes
- › Quantus™/GloMax®

qPCR:

- › ProNex® DNA QC Assay

Size selection of fragments

Size selection provides fragments of optimal length for the appropriate type of sequencing. Precisely defined fragment lengths ensure uniform sequence coverage, especially in case of short read lengths.

Fluorescence-based:

- › ProNex® Size-Selective Purification System

Adapter ligation, size selection, and purification.

The defined sequences attached to the DNA fragments are used to bind to the surface of the flow cell or particles (ion torrent) and contain the binding site for the sequencing primers.

Purification with size selection ensures that the library DNA has adapters and unbound adapters are removed.

Size selection with magnetic beads:

- › ProNex® Size-Selective Purification System

Quantification and normalization of the sequencing-ready library

Accurate quantification of libraries ensures that the correct amount for optimal clustering and fragment distribution in sequencing is used.

It also enables a well-defined mix of libraries in terms of molarity for optimal sequence coverage during multiplexing.

Fluorescence-based:

- › Quantifluor®
- › Quantus™/GloMax®

Adapter-specific qPCR:

- › ProNex® NGS Library Quant Kit

Quantification of NGS Libraries

Quantus™ NGS Starter Package

- ✓ Highly sensitive and easy-to-perform fluorescence-based DNA quantification method
- ✓ Ideal for next-generation sequencing applications, offered at a discounted package price
- ✓ The system includes Quantus™ Fluorometer, QuantiFluor® ONE dsDNA System, 500 reactions, and 500 × 0.5 ml PCR Tubes
- ✓ Also available with other dye systems on request

For more information on the Quantus™ Fluorometer and QuantiFluor™ Dye Systems, see p. 33.

QUANTITY	CAT.#
1 each	**E5150**

Quantification and Qualification of Potentially Degraded DNA Samples

Formalin-fixed paraffin-embedded (FFPE) tumor tissue is an important molecular pathology sample source for mutation analysis.

However, the quality and quantity of DNA from FFPE samples are severely compromised by the fixation procedure. The use of formaldehyde leads to cross-linking of DNA, which is often fragmented in this type of sample.

This affects the amplifiability and the results of NGS analysis.

Obtaining ccfDNA samples from plasma is noninvasive and can be done even in the case of a tumor that is difficult to access or undetectable. However, a major challenge is the low and often variable abundance of ccfDNA in blood.

The qPCR-based ProNex® DNA QC assay determines the quantity, quality, and amplifiability of genomic DNA extracted from FFPE samples or other sources of potentially degraded DNA. It can also be used to determine the ratio of ccfDNA to higher molecular weight genomic DNA in samples from plasma.

ProNex® DNA QC Assay

- › Human-specific probe-based multiplex qPCR assay
- › Includes internal positive control (IPC) to detect false-negative results due to PCR inhibitors
- › Amplifies 75 bp, 150 bp, and 300 bp human genomic DNA sequences

ProNex® DNA QC Assay BioRad CFX96™

QUANTITY		CAT.#
200 reactions	Helix	**NG1004**
800 reactions	Helix	**NG1005**

ProNex® DNA QC Assay ABI 7500/7500FAST

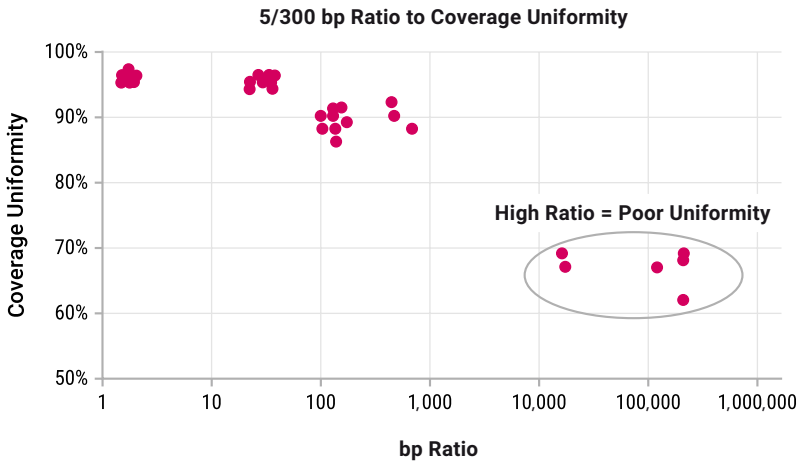
QUANTITY		CAT.#
200 reactions	Helix	**NG1002**
800 reactions	Helix	**NG1003**

ProNex® DNA QC Assay Calibration Kit

QUANTITY		CAT.#
1 each	Helix	NG1001

The ProNex® DNA QC assay determines the amount of amplifiable DNA in a sample.

Four separate FFPE tumor tissue samples of varying age and fixation times from 4 different tissue types (breast, lung, colon and rectal) were purified with three different methods for a total of 31 extractions. Each DNA sample was quantified using a single-target qPCR assay and normalized for 10 ng input into the Swift Biosciences Accel-Amplicon™ 56G Oncology Panel. After sequencing, samples were retroactively processed with the ProNex® DNA QC Assay and a degradation ratio (75/300 bp quantitation ratio) was calculated. Samples with high degradation ratios were clearly correlated with poor coverage uniformity of sequencing, enabling users of the DNA QC Assay to predict downstream performance.



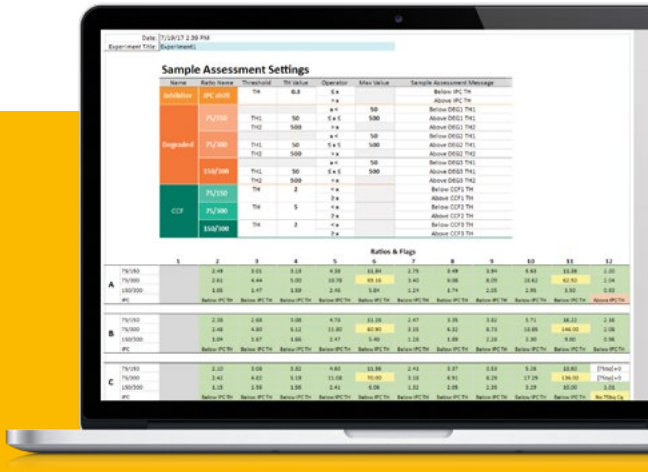
ASSAY ANALYSIS SOFTWARE

Analysis of the data with the free ProNex® DNA QC Assay Analysis Software

Easy data import with fast analysis:

- Check of standard curves (slope and R^2 values in the defined range)
- Sample quantification (based on the standard curves)
- Sample quality (possible PCR inhibition, contamination or degradation)
- Automatic calculation of the degradation rate

The software is compatible with data from the following cyclers: Applied Biosystems® 7500, 7500 Fast, QuantStudio™ 6 System, and BioRad CFX96 Touch™ System.



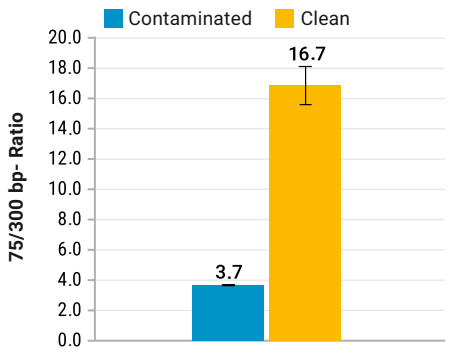
www.promega.com/pronexqcsoftware

ProNex® DNA QC Assay Analysis Software

Download here

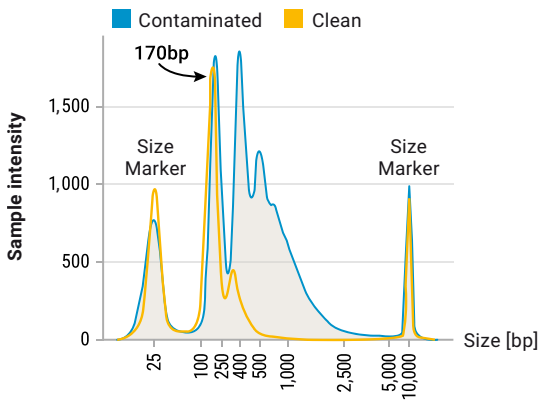
The ProNex® DNA QC assay evaluates the ratio of circulating cell-free DNA (ccfDNA) to higher molecular weight genomic DNA in serum samples.

Quality measure for ccfDNA before and after size selection



ccfDNA was extracted from a serum sample. DNA was quantified with the ProNex® DNA QC Assay, and the ratio of 75/300 bp concentrations was measured. Low ratios (close to 1) indicate gDNA contamination, whereas ratios >10 indicate extremely clean ccfDNA. "Contaminated" indicates sample as extracted without cleanup. "Clean" sample was processed with the ProNex® Size-Selective DNA Purification system to perform a dual-sided size selection and removal of DNA greater than 300–400 bp. The increase in 75/300 bp ratio is a result of the removal of gDNA.

Size distribution in ccfDNA samples before and after size selection



To verify correlation of 75/300 bp ratios generated by the ProNex® DNA QC Assay, samples shown in figure were run on the Agilent 2200 TapeStation System. The clean sample trace (yellow) is equivalent to a high ratio on the ProNex® DNA QC Assay, whereas the contaminated sample trace (blue) equates to a low ratio.

Size Selection of DNA Fragments for NGS Library Construction

Next-generation sequencing libraries require the use of high-quality nucleic acids. Depending on the method of library creation and sequencing platform, these vary in quantity, concentration, and size.

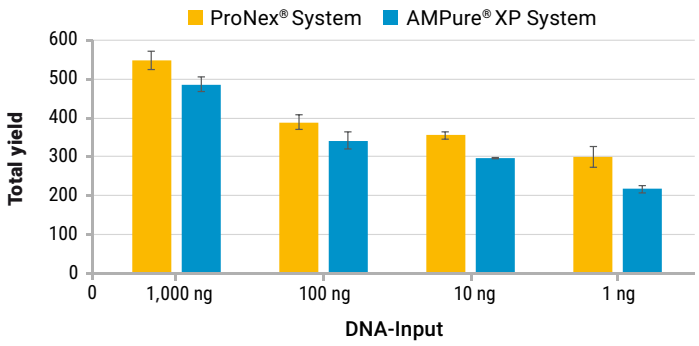
The ProNex® Size-Selective Purification System is based on magnetic beads and allows rapid and reliable size selection of double-stranded DNA (dsDNA) for subsequent NGS, PCR, and other molecular biology applications.

The ProNex® Size-Selective Purification System enables the selection of sharply defined and freely selectable fragment regions with a possible size exclusion between 100 and 1,000 bp. The novel reagent formulation offers significantly improved selectivity, reproducibility, and yield compared to conventional purification methods. The ProNex® Size-Selective Purification System can be used manually or automated in high throughput.

ProNex® Size-Selective Purification System

- ✓ High specificity of size selection with a low carryover of unwanted DNA
- ✓ Exceptionally high DNA yield in the desired fragment range
- ✓ Fast magnetic reaction time and low viscosity for precise pipetting

QUANTITY		CAT.#
10 ml	Helix	NG2001
125 ml	Helix	NG2002
500 ml	Helix	NG2003

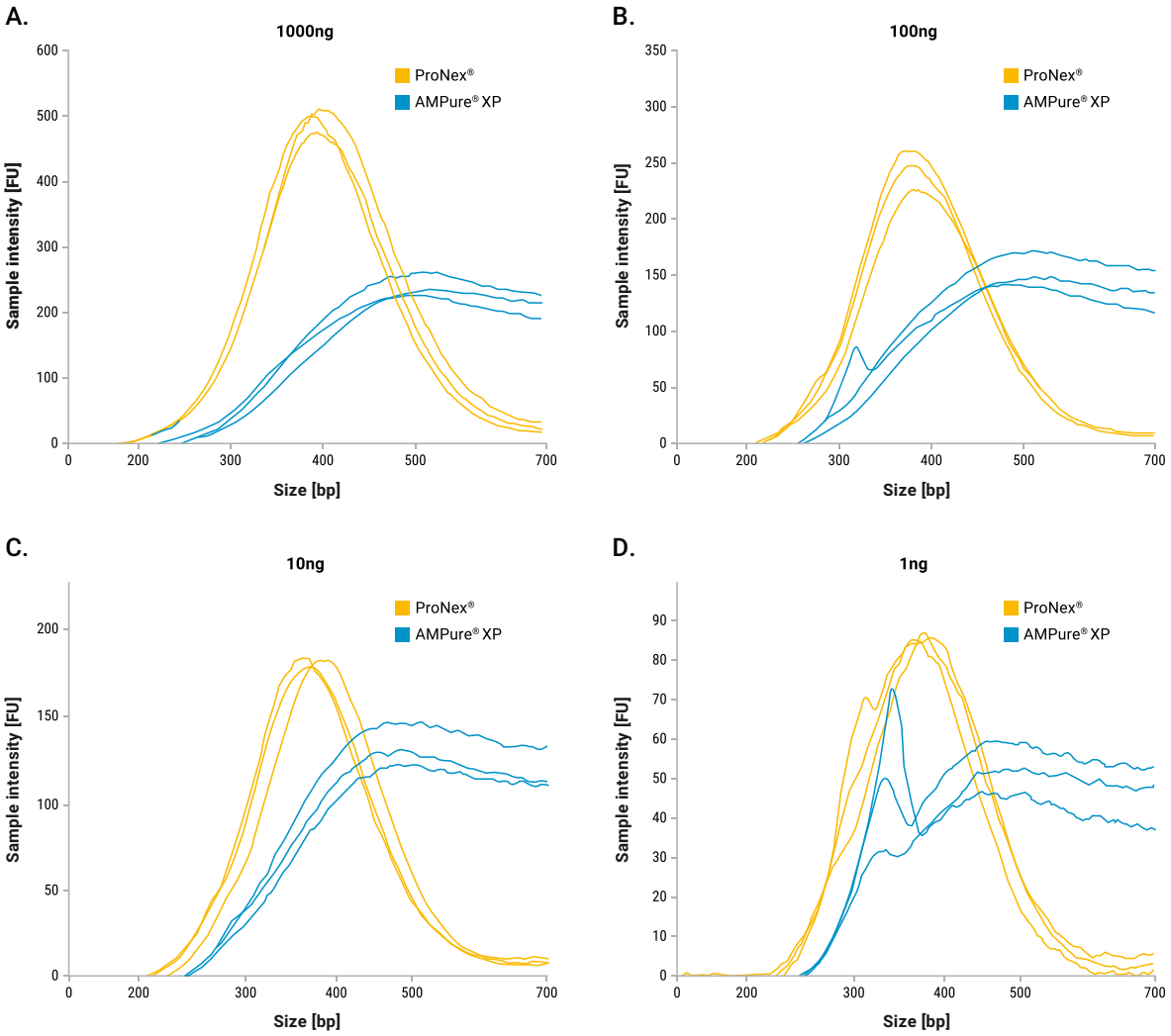


Total library yield comparison between ProNex® Size-Selective Purification System and AMPure® XP beads.

E. coli libraries were created using the NEBNext® Ultra™ II DNA Library Prep Kit for Illumina®, using starting input values of 1,000 ng, 100 ng, 10 ng and 1 ng. Libraries were size selected with either AMPure® XP beads or the ProNex® Size-Selective Purification System. Libraries were centered at 300 bp, using recommended library kit manufacturer's recommendations for size selection with AMPure® XP beads and Promega's guidelines for the ProNex® Size-Selective Purification System. Total yield of post size-selection libraries are shown.

Final size distribution of libraries after size selection

The ProNex® Size Selective Purification System not only removes more low- and high-molecular weight DNA than existing methods but also retains more of the target fragment sizes you really want.

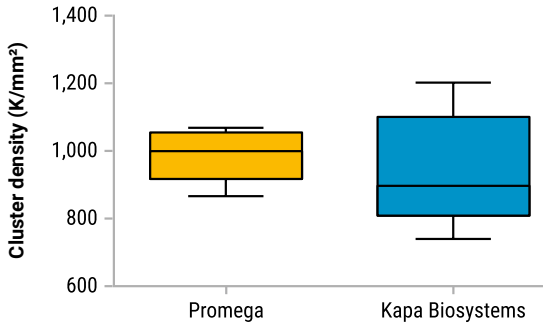


Quantification of Illumina Libraries

ProNex® NGS Library Quant Kit

- ✓ QPCR kit for extremely precise and reproducible molarity determination for sequencing libraries compatible with Illumina platforms
- ✓ For efficient clustering in the flow cells of all Illumina instruments
- ✓ BRYT Green® dye-based qPCR system
- ✓ Data can be used to adjust DNA quantities to desired molar ratios when pooling NGS libraries

QUANTITY		CAT.#
500 reactions	Helix	**NG1201**



Illumina NGS libraries were quantified using either the ProNex® NGS Library Quant Kit or the KAPA Library Quantification Kit for Illumina (Kapa BioSystems). The determined concentrations were used to normalize and pool libraries (n=10 pools) prior to sequencing on an Illumina MiSeq instrument. Targeted cluster density was 1,000K/mm^2. Cluster density was measured for all sequencing runs, showing significantly improved reproducibility when samples were quantified with the ProNex® system.

QUANTIFICATION AND DETECTION

Reliable Quantification of Nucleic Acids in Picogram Quantities

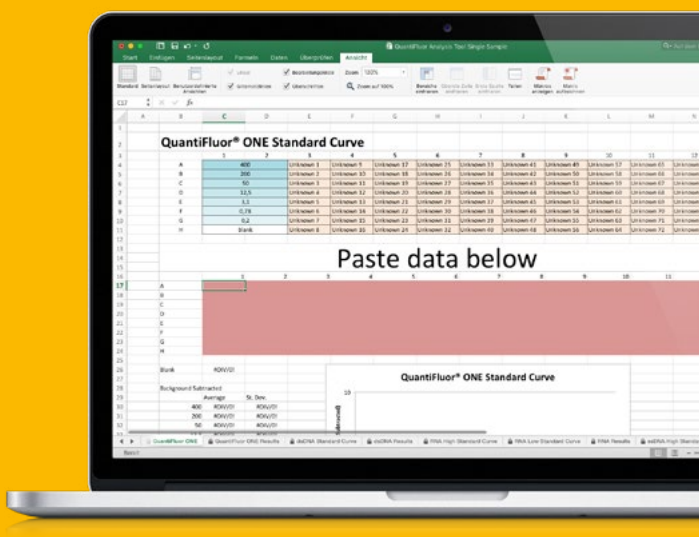
Fluorescence-based DNA and RNA quantification provides increased sensitivity compared to absorption-based methods. QuantiFluor® Systems quantify double-stranded or single-stranded nucleic acids and provide more accurate quantification than measurement of absorption at 260 nm. Fluorescence-based quantification is particularly suitable for sample preparation prior to molecular biology applications such as next-generation sequencing. The QuantiFluor® System dyes can be used with multiwell-plate readers or a single-tube fluorometer such as the Quantus™ Fluorometer.

PROMEGA TOOLS FOR PROFESSIONALS

QuantiFluor® Dye Systems Data Analysis

Easy and convenient data analysis in Excel:

- Plate assignment and design of experiments (for single samples and triplicates)
- Calculation of the initial concentration
- Evaluation (96-well plates) for QuantiFluor® ONE, QuantiFluor® dsDNA, ssDNA or RNA Dye systems
- Reliability check of the measured concentrations against the standard curve



www.promega.com/quantus-data-analysis

Convenient data analysis with Excel

Download here

DNA and RNA Quantification

The Complete Solution for Your Nucleic Acid Quantification

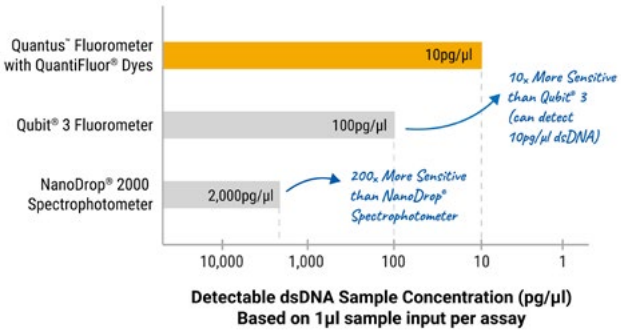
The Quantus™ Fluorometer and QuantiFluor® Dye Systems are designed for sensitive quantification of double-stranded and single-stranded DNA and RNA.

The Quantus™ Fluorometer is compatible with the QuantiFluor® Dye Systems and other fluorescence-based quantification kits. The Quantus™ Fluorometer is designed to operate as a standalone instrument, but by installing the free Quantus™ software and connecting the instrument to a computer, data can be transmitted in real time.

Using the Quantus™ Fluorometer with the QuantiFluor® Dyes, you can achieve a sensitivity 200 times higher than absorption-based methods. Due to its high sensitivity and broad linear range, the Quantus™ Fluorometer is ideal for samples with small amounts of DNA or RNA, such as formalin-fixed, paraffin-embedded tissues (FFPE sections) or next-generation sequencing samples.

QuantiFluor® Dyes can also be used with other fluorometers such as Qubit® Fluorometer or GloMax® Multimode Readers.

An overview of the GloMax® Multimode Readers can be found at **www.promega.com/glomax**



insidesales@promega.com

Quantus™ in your laboratory: Test it now!

Contact us for a demo:

✉ insidesales@promega.com

Quantus™ Fluorometer

Wavelengths:

- ✓ Excitation filter: red, 640 nm shortpass; blue, 495 nm shortpass
- ✓ Emission filter: red, 660–720 nm, blue; 510–580 nm

MENGE	CAT.#
1 each	**E6150**

QuantiFluor® ONE dsDNA System ("Ready-to-use")

- ✓ 100 × 200 µl reactions or 500 × 200 µl reactions
- ✓ System contains QuantiFluor® ONE dsDNA Dye, QuantiFluor® ONE Lambda DNA and 1X TE Buffer (pH 7.5)

Detection range and sensitivity:

- ✓ **Original DNA concentration of sample*:** 0.2–400 ng/µl
- ✓ **DNA concentration in the QuantiFluor® Assay:** 1–2,000 ng/ml

QUANTITY	CAT.#
20 ml	E4871
5 × 20 ml	E4870

QuantiFluor® ONE dsDNA Dye*² ("Ready-to-use")

- ✓ 100 × 200 µl reactions

Detection range and sensitivity:

- ✓ **Original DNA concentration of sample*:** 0.2–400 ng/µl
- ✓ **DNA concentration in the QuantiFluor® Assay:** 1–2,000 ng/ml

*² contains only the DNA fluorescent dye

QUANTITY	CAT.#
20 ml	E4891

QuantiFluor® dsDNA System

- ✓ 200 × 2 ml reactions or 2,000 × 200 µl reactions
- ✓ System contains QuantiFluor® dsDNA Dye, Lambda DNA Standard and 20X TE Buffer (pH 7.5)

Detection range and sensitivity:

- ✓ **Original DNA concentration of sample*:** 0.1–200 ng/µl
- ✓ **DNA concentration in the QuantiFluor® Assay:** 0.05–1,000 ng/ml

QUANTITY	CAT.#
1 ml	E2670

QuantiFluor® ssDNA System

- ✓ 200 × 2 ml reactions or 2,000 × 200 µl reactions
- ✓ System contains QuantiFluor® ssDNA Dye, ssDNA Standard and 20X TE Buffer (pH 7.5)

Detection range and sensitivity:

- ✓ **Original DNA concentration of sample*:** 0.2–400 ng/µl
- ✓ **DNA concentration in the QuantiFluor® Assay:** 1–2,000 ng/ml

QUANTITY	CAT.#
1 ml	E3190

QuantiFluor® RNA System

- ✓ 200 × 2 ml reactions or 2,000 × 200 µl reactions
- ✓ System contains QuantiFluor® RNA Dye, RNA Standard and 20X TE Buffer (pH 7.5)

Detection range and sensitivity:

- ✓ **Original RNA concentration of sample*:** 0.1–500 ng/µl
- ✓ **RNA concentration in the QuantiFluor® Assay:** 0.5–2,500 ng/ml

*Based on the addition of 1 µl of sample

QUANTITY	CAT.#
1 ml	E3310

0.5 ml thin-walled PCR Tubes

MENGE	CAT.#
50 pack	E4941
200 pack	E4942

We recommend

Quantus™ NGS Starter Package

- ✓ The Quantus™ NGS Starter Package provides a highly sensitive and easy-to-perform method for DNA quantification, especially for Next Generation Sequencing applications, at a discounted package price
- ✓ **The package includes a Quantus™ Fluorometer, the QuantiFluor® ONE dsDNA System (500 reactions), and 500× 0.5 ml thin-walled PCR Tubes**

MENGE	CAT.#
1 each	E5150

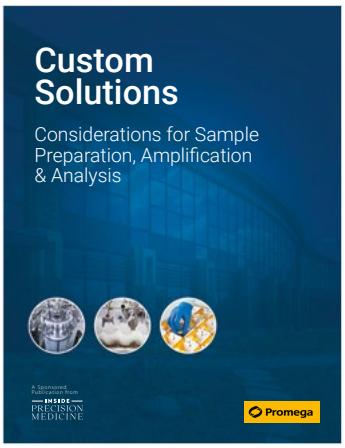
Also available with other dye systems on request.

Custom Solutions for Your Sample Preparation, Amplification and Analysis Challenges

Learn helpful tips, tricks & technique refreshers with our free eBook

Looking for a quick technique refresher or a way to support your mentee? Need to adapt an existing technology or need a unique formulation, but not sure where to start? Our Custom Solutions eBook can help.

This eBook was designed as an educational resource to address your sample preparation, amplification and analysis challenges in the lab. It also offers insight into the benefits and value of partnering with a Custom/OEM supplier.



www.promega.com/CustomSolutionsEbook

Custom Solutions

Download the free eBook

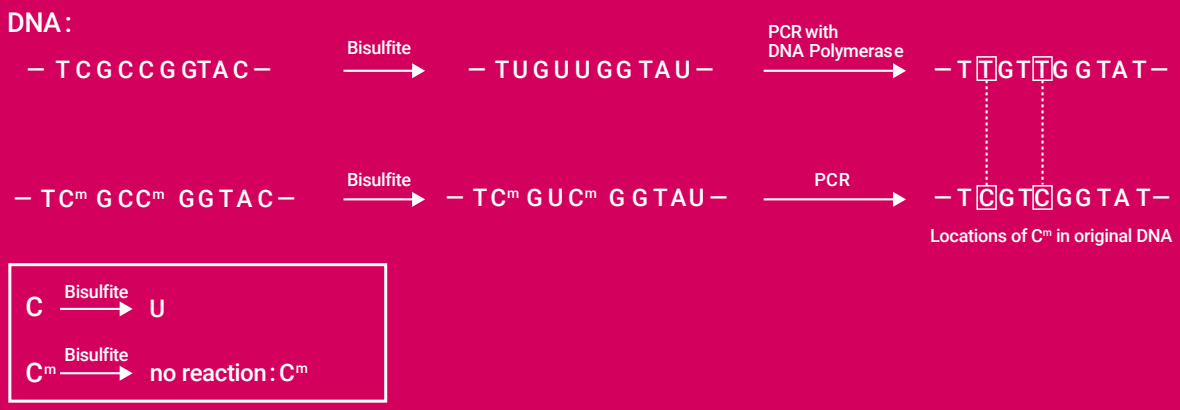
Let's TALK CUSTOM

EPIGENETICS

Reliable Detection of DNA Methylation

Epigenetics is an exciting field of research around the detection of chromatin modification and the resulting phenotypic expression. The bisulfite sequencing method is the gold standard for the identification of DNA methylation sites. The DNA sample preparation required for this is conceivably simple and absolutely reliable with the MethylEdge® Bisulfite Conversion Kit from Promega.

Bisulfite conversion



11352MA

www.promega.com/products/epigenetics

Interested in further epigenetic assays?

Find out more here!

Bisulfite Conversion for the Detection of DNA-Methylation

MethylEdge® Bisulfite Conversion System

- ✓ Highly efficient conversion of DNA
- ✓ Time-saving protocol: <30 min
- ✓ Lower DNA fragmentation than comparable systems
- ✓ Easy handling with minimal reagent preparation time
- ✓ Storage of reagents at room temperature

QUANTITY		CAT.#
50 reactions	Helix	N1301

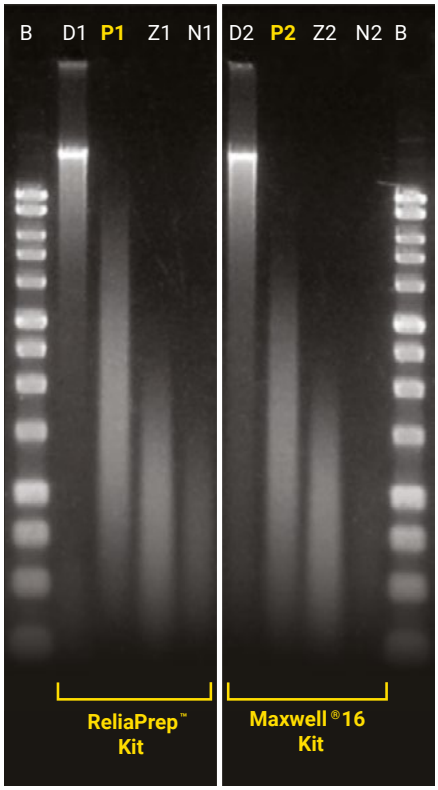
Methylated Human Control DNA

QUANTITY		CAT.#
5 µg	Helix	N1231

Converted Methylated Human Control DNA

QUANTITY		CAT.#
1 µg	Helix	N1221

Minimal DNA fragmentation with the MethylEdge® Bisulfite Conversion System



Comparison between the Promega MethylEdge® Bisulfite Conversion System (P) and two competitor systems (Z and N). Tested on genomic DNA from whole blood purified using either the ReliaPrep™ Blood gDNA Miniprep System or the Maxwell®16 LEV Blood Kit.

B	BenchTop 1 kb DNA Ladder
D1 + D2	Unconverted genomic DNA
P1 + P2	Converted DNA with MethylEdge® Bisulfite Conversion System
Z1 + Z2	Converted DNA with competitor Z
N1 + N2	Converted DNA with competitor N

www.ncbi.nlm.nih.gov/pubmed/26247357

Learn here from your colleagues why they are using the MethylEdge® Bisulfite Conversion System.

Leontiou, C.A. et al. PloS One. 2015 Aug 6;10(8):e0135058

EXPRESSION ANALYSIS

The HiBiT Protein Tagging System simplifies protein tagging in live cells. It provides a streamlined, antibody-free, add-and-read detection workflow. HiBiT (High-BiT, 11 amino acids) is an optimized peptide subunit derived from the extremely bright NanoLuc® luciferase. Addition of the complementary LgBiT (Large-BiT, 156 amino acids) subunit reconstitutes the functional NanoBiT® luciferase. In combination with CRISPR, the HiBiT-encoding sequence can be easily integrated into the genome to enable protein analyses at native expression levels.

No cloning, 5 steps, and ready to go!

10 Days

1. Design target-specific crRNA and HiBiT donor DNA
2. Order crRNA, tracrRNA, HiBiT donor DNA, and Cas9 endonuclease
3. Assemble the ribonucleoproteine (RNP) complex consisting of guide RNA (crRNA + tracer RNA) and Cas9 endonuclease, and transfer it into cells along with the HiBiT donor DNA
4. Validate genomic insertion
5. Run experiment and detect HiBiT-tagged protein

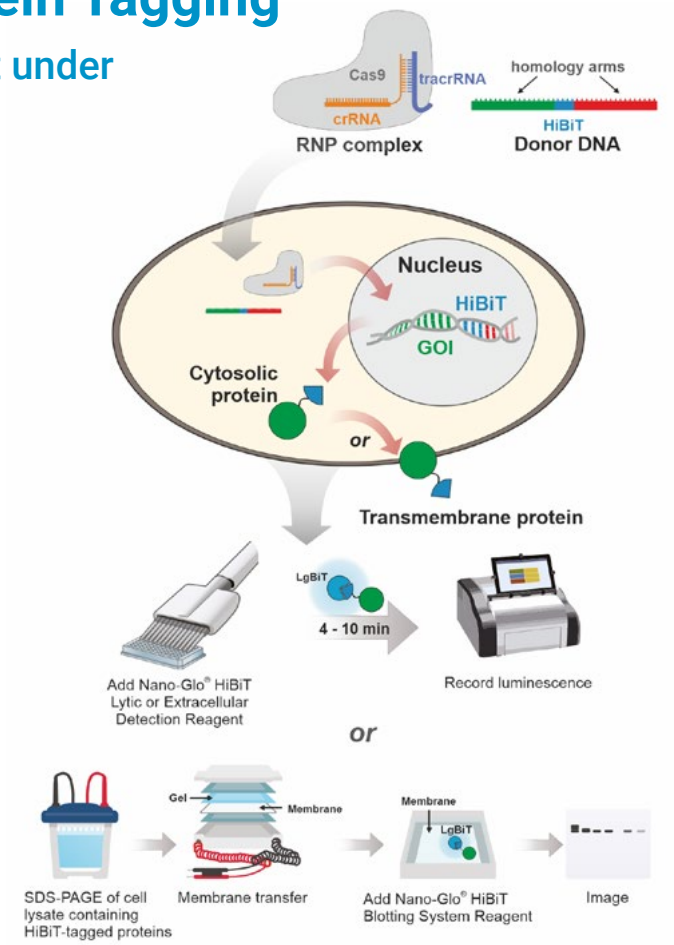
www.promega.com/protocol-crispr-hibit

Learn more about our cloning-free HiBiT-CRISPR workflow

HiBiT & CRISPR/Cas9 – A Perfect Match for Bioluminescent Gene/Protein Tagging

Analyze Your Gene/Protein of Interest under Cell-specific Expression Conditions

By utilizing CRISPR/Cas9 genome editing, the gene of interest (GOI) is tagged with the HiBiT-encoding sequence (33 nucleotides). This strategy allows expression to occur under the control of the native promoter and maintains associated regulatory mechanisms, thereby avoiding artifacts associated with gene overexpression. The gene-specific ribonucleoprotein (RNP) complex, along with the HiBiT donor DNA, is transferred into cells by electroporation. HiBiT-tagged proteins are readily detected in a single step using HiBiT detection reagents.



Applications

- Expression analyses
- Protein degradation
- Autophagy
- Alternative splicing
- Protein stabilization
- Viral or bacterial infection
- Protein secretion
- Quantification of cell surface receptors
- Internalization of cell surface receptors

Nano-Glo® HiBiT Lytic Detection System

- ✓ Detection of HiBiT-labeled proteins in cell lysates
- ✓ Fast and sensitive detection
- ✓ Antibody-free homogeneous assay format

QUANTITY		CAT.#
10 ml	Promega	N3030
100 ml	Promega	N3040
10 × 100 ml	Promega	N3050

Nano-Glo® HiBiT Extracellular Detection System

- ✓ Detection of HiBiT-labeled surface receptors, or secreted proteins in cell culture supernatants
- ✓ Detection of dynamic processes such as receptor internalization
- ✓ Antibody-free homogeneous assay format

QUANTITY		CAT.#
10 ml	Promega	N2420
100 ml	Promega	N2421
10 × 100 ml	Promega	N2422

Nano-Glo® HiBiT Blotting System

- ✓ Detection of HiBiT-labeled proteins on Western blot membranes
- ✓ Detection possible within minutes
- ✓ Antibody-free detection workflow

QUANTITY		CAT.#
100 ml	Promega	N2410

HiBiT Control Protein

QUANTITY		CAT.#
100 µl (20 µM)	Promega	N3010

PCR

Competitive Results – Reproducible Across All Batches – With GoTaq® Products from Promega

High-performance Taq polymerase, dNTPs, Buffers and Master Mixes provide increased reliability and consistency for routine endpoint PCR. GoTaq® products offer a choice of Taq DNA polymerase formulations covering basic PCR, hot-start PCR and long-range PCR applications.

GoTaq® G2 is a full-length, recombinant Taq DNA polymerase supplied with buffers designed for enhanced amplification. GoTaq® enzymes are available with buffer formulations with and without Magnesium (Flexi buffers), allowing the user the option of optimizing $MgCl_2$ concentration in PCR.

Each polymerase includes colorless and green buffers. The green buffer contains a gel loading dye so that the reaction can be loaded directly onto a gel after thermal cycling. For applications that require absorption or fluorescence measurement of PCR fragments before purification, a colorless reaction buffer is supplied.

Buy without risk:
PCR Satisfaction Guarantee!

If you are not satisfied with one of our PCR products you will get your money back!

Polymerasen Overview

APPLICATION	GoTaq® G2 DNA Polymerase	GoTaq® G2 Flexi DNA Polymerase	GoTaq® G2 Hot Start Polymerase	Pfu DNA Polymerase	GoTaq® Long PCR Master Mix
High throughput	⊗	⊗	✓	⊗	✓
Long PCR	⊗	⊗	⊗	⊗	✓
Cloning and subcloning	⊗	⊗	⊗	✓	✓
High-fidelity	⊗	⊗	⊗	✓	✓
Site-directed mutagenesis	⊗	⊗	⊗	✓	✓
Template generation for sequencing	⊗	⊗	⊗	✓	✓
Genotyping	✓	✓	✓	✓	✓
Multiplex PCR	⊗	⊗	✓	⊗	✓
Colony PCR	✓	✓	✓	✓	✓
Fast PCR	⊗	⊗	✓	⊗	⊗
Routine PCR	✓	✓	✓	⊗	⊗
CHARACTERISTICS					
5’-3’ exonuclease activity	✓	✓	✓	⊗	✓
3’-5’ exonuclease activity	⊗	⊗	⊗	✓	✓
Amplicon size	<5 kb	<5 kb	<5 kb	<10 kb	<40 kb
Enzyme type	Recombinant	Recombinant	Recombinant	Native	Recombinant
Product overhang	3’ A	3’ A	3’ A	blunt	3’ A/ blunt
Hot start technology	⊗	⊗	✓	⊗	✓
Enzyme with direct loading buffer	✓	✓	✓	⊗	⊗
Buffer without $MgCl_2$	⊗	✓	⊗	✓ (Contains MgSO4)	⊗
Master Mix available with direct loading Buffer, dNTPs and enhancers (Green)	✓ GoTaq® G2 Green Master Mix	⊗	✓ GoTaq® G2 Hot Start Green Master Mix	⊗	⊗
Master Mix available without direct loading Buffer, dNTPs and enhancers (Colorless)	✓ GoTaq® G2 Colorless Master Mix	⊗	✓ GoTaq® G2 Hot Start Colorless Master Mix	⊗	✓

Routine PCR

GoTaq® G2 DNA Polymerase

- ✓ Consistently high yields for different target sequences
- ✓ Amplification of small DNA amounts due to high sensitivity
- ✓ $MgCl_2$ concentration: 1.5 mM
- ✓ Contains both colorless and green reaction buffer

QUANTITY		CAT.#
100 U	Promega	M7841
500 U	Promega	M7845
2,500 U (5 × 500 U)	Promega	M7848

GoTaq® G2 Flexi DNA Polymerase

- ✓ Consistently high yield from different target sequences
- ✓ Amplification of small DNA amounts due to high sensitivity
- ✓ $MgCl_2$ concentration can be adjusted
- ✓ Contains both colorless and green reaction buffer

QUANTITY		CAT.#
100 U	Helix	M7801
500 U	Helix	M7805
2,500 U (5 × 500 U)	Helix	M7806
10,000 U (20 × 500 U)	Helix	M7808

GoTaq® G2 Green Master Mix

- ✓ Ready-to-use mix of GoTaq® G2 DNA Polymerase, dNTPs and reaction buffer
- ✓ Nuclease-Free Water supplied separately
- ✓ Green dye in buffer for direct loading onto a gel

QUANTITY		CAT.#
2.5 ml	Helix	M7822
25 ml	Helix	M7823

GoTaq® G2 Colorless Master Mix

- ✓ Ready-to-use mix of GoTaq® G2 DNA Polymerase, dNTPs and reaction buffer
- ✓ Nuclease-Free Water supplied separately
- ✓ Colorless reaction buffer

QUANTITY		CAT.#
2.5 ml	Helix	M7832
25 ml	Helix	M7833

Proofreading PCR

Pfu DNA Polymerase

- ✓ 3′→5′ exonuclease (proofreading) activity
- ✓ Lowest error rate among thermostable DNA polymerases
- ✓ Produces PCR products with blunt ends

Note: Product may not be available in all countries. Please contact your local representative for more information.

QUANTITY		CAT.#
100 U	Helix	M7741
500 U	Helix	M7745

Hot-Start PCR

GoTaq® G2 Hot Start Polymerase

- ✓ Increased processivity, sensitivity and specificity
- ✓ Reaction assembly at room temperature
- ✓ $MgCl_2$ concentration can be adjusted

QUANTITY		CAT.#
100 U	Helix	M7401
500 U	Helix	M7405
2,500 U (5 × 500 U)	Helix	M7406
10,000 U (20 × 500 U)	Helix	M7408

GoTaq® G2 Hot Start Green Master Mix

- ✓ Ready-to-use master mix containing GoTaq® G2 Hot Start Polymerase, dNTPs and reaction buffer
- ✓ Nuclease-Free Water supplied separately
- ✓ Green dye in the buffer for direct loading onto a gel

QUANTITY		CAT.#
2.5 ml	Helix	M7422
25 ml	Helix	M7423

GoTaq® G2 Hot Start Colorless Master Mix

- ✓ Ready-to-use master mix containing GoTaq® G2 Hot Start Polymerase, dNTPs and reaction buffer
- ✓ Nuclease-Free Water supplied separately
- ✓ Colorless reaction buffer

QUANTITY		CAT.#
2.5 ml	Promega	M7432
25 ml	Promega	M7433

Long PCR

GoTaq® Long PCR Master Mix

- ✓ Amplification of up to 30 kb of human genomic DNA or 40 kb from less complex templates such as lambda DNA
- ✓ Obtained DNA corresponds to the initial sequence and can be used for functional assays
- ✓ Master mix of GoTaq® DAN polymerase and thermostable proofreading polymerase, dNTPs and reaction buffer
- ✓ Control primers, human genomic DNA, and Nuclease-Free Water are supplied

QUANTITY		CAT.#
2.5 ml	Promega	M4021

dUTP

dUTP

- ✓ High quality (> 98 % pure)
- ✓ Supplied at a concentration of 100 mM in water with a pH of 7.5

QUANTITY	KONZ.		CAT.#
40 µmol	100 mM	Promega	U1191

Set of dATP, dCTP, dGTP, dUTP

- ✓ Packaged separately
- ✓ High quality (> 98 % pure)
- ✓ All dNTPs are supplied at a concentration of 100 mM in water with a pH of 7.5

QUANTITY	KONZ.		CAT.#
4 × 10 µmol	100 mM	Promega	U1335
4 × 40 µmol	100 mM	Promega	U1245

dNTPs

Set of dATP, dCTP, dGTP, dTTP

- ✓ Packaged separately
- ✓ Individual nucleotides can be mixed as needed
- ✓ High quality (> 98 % pure)
- ✓ All dNTPs are supplied at a concentration of 100 mM in water with a pH of 7.5

QUANTITY	KONZ.		CAT.#
4 × 10 µmol	100 mM	Helix	U1330
4 × 25 µmol	100 mM	Helix	U1420
4 × 40 µmol	100 mM	Helix	U1240
4 × 200 µmol	100 mM	Helix	U1410

dNTPs are also available as single nucleotides (see www.promega.com)

dNTP Mix

- ✓ Ready-to-use mix of dATP, dCTP, dGTP and dTTP (10 mM each)
- ✓ High quality (> 98 % pure)

QUANTITY	KONZ.		CAT.#
200 µl	10 mM	Helix	U1511
1,000 µl	10 mM	Helix	U1515

PCR Nucleotide Mix

- ✓ Ready-to-use mix of dATP, dCTP, dGTP and dTTP (10 mM each)
- ✓ High quality (> 98 % pure)
- ✓ PCR tested
- ✓ Specific QC
- ✓ Produced under GMP conditions

QUANTITY	KONZ.		CAT.#
200 µl	10 mM	Helix	C1141
1,000 µl	10 mM	Helix	C1145
200 µl	25 mM	Helix	U1431
1,000 µl	25 mM	Helix	U1432

Nuclease-Free Water

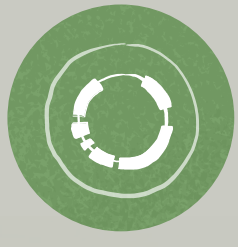
Nuclease-Free Water

- ✓ No inhibitors: The water is untreated and has no chemical additives
- ✓ Guaranteed nuclease-free: intensive quality control
- ✓ Small packages (2× 25 ml) to avoid contamination in the laboratory

QUANTITY		CAT.#
50 ml (2 × 25 ml)	Helix	P1193
150 ml	Helix	P1195
500 ml	Helix	P1197

Visit the Student Resource Center

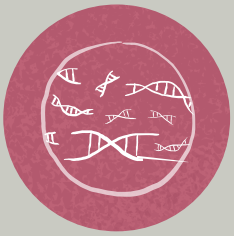
Need help with an experiment, or want to try something completely new? Want to take the next step in finding a job? The Student Resource Center offers help for problems in student / PhD life.



Cloning

Cell Health Assays

Cell Culture

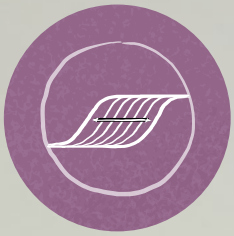


Nucleic Acid Purification and Quantitation

Professional Skills and Development

Reporter Assays

Techniques and Tools

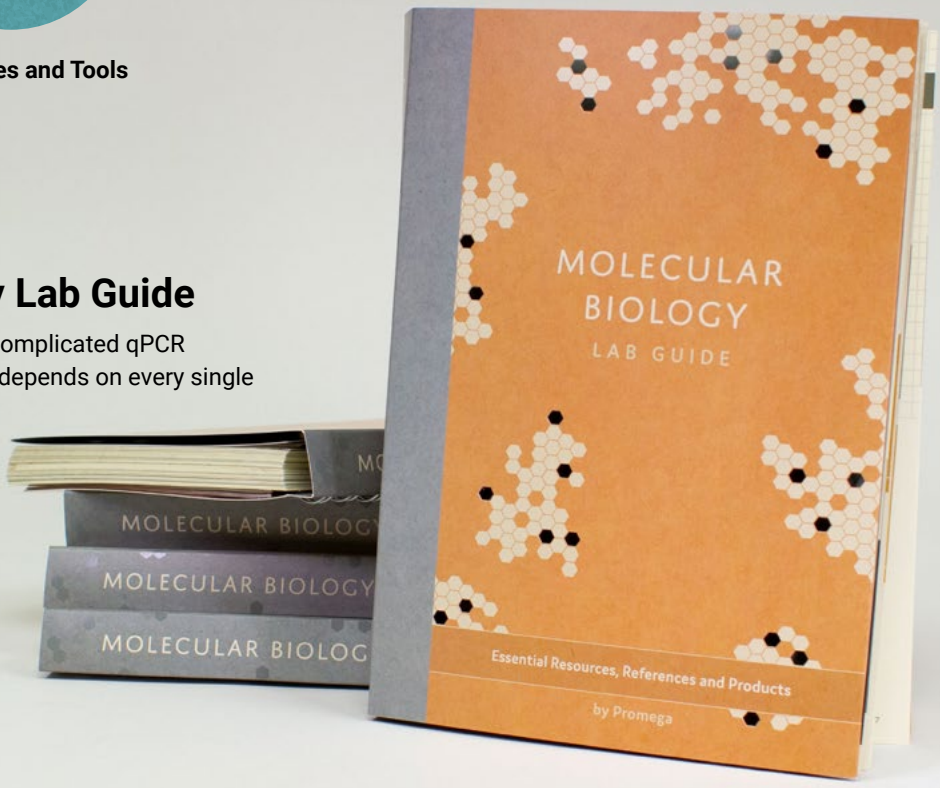


Nucleic Acid Amplification

Get the Molecular Biology Lab Guide

From simple DNA purification to the most complicated qPCR experiment. The outcome of your research depends on every single step and on many little things – the centrifugation steps, the pipetting, the buffers and other solutions and much more.

In the Molecular Biology Lab Guide you will find resources, references, protocols and tips & tricks for your daily lab work.



www.promega.com/resources/student-resource-center/

Explore our collection of resources on common cellular and molecular biology techniques here, as well as our guide for more guidance in the early stages of your career.

On this page you can request a copy of the Molecular Biology Lab Guide (Lab Essentials → Techniques and Tools).

RT-PCR

Kit or Enzyme? Promega Offers Both Enzymes and Full Kits for Convenient cDNA Synthesis and RT-PCR

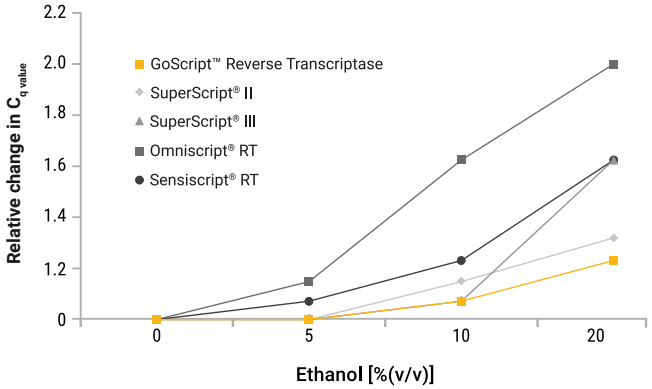
Promega reverse transcription-PCR (RT-PCR) products include standalone reverse transcriptases (AMV, M-MLV and GoScript™) and a range of complete kits containing all the required enzymes, buffers and reagents for successful RT-PCR.

GoScript™ Reverse Transcriptase includes M-MLV reverse transcriptase and a proprietary buffer designed for robust, reliable cDNA synthesis from a full range of rare and abundant transcripts. GoScript™ is available as a standalone enzyme, or in convenient mixes with either oligo(dT) primers or random primers as part of a complete kit.

Reverse transcriptases and RT-PCR kits allow for easy and reliable synthesis of full-length cDNA. Promega's Genomic Essentials offer reliable solutions for efficient transcription of low and highly expressed amounts of mRNA – even with difficult secondary structures.

GoScript™ Reverse Transcriptase

GoScript™ Reverse Transcriptase combines M-MLV transcriptase and state-of-the-art buffers for reliable and complete cDNA synthesis even for rare and long sequences. Difficult, GC-rich and long templates are successfully transcribed into cDNA – even in the presence of strong PCR inhibitors. GoScript™ Reverse Transcriptase is available as a **separate enzyme, as a kit with individual components, or conveniently as ready-to-use master mixes.**



Minimal effect of PCR inhibitors on reverse transcription

Human reference RNA was reverse transcribed using oligo(dT) primers and reverse transcriptases from different suppliers according to the manufacturer's instructions.

Reverse transcription was performed in the presence of ethanol as an inhibitor (0 %, 5 %, 10 % and 20 %). The cDNA was analyzed by real-time PCR using GoTaq® qPCR Master Mix. The relative changes in C_q values as a function of ethanol concentration were plotted (as the mean of three independent experiments). GoScript™ Reverse Transcriptase showed the smallest increase in Cq value under the influence of ethanol (5 %, 10 % and 20 %) compared to the enzymes from other suppliers.

GoScript™ Reverse Transcription Mix, Oligo(dT)

- ✓ First strand synthesis of eukaryotic mRNA starting from the 3' end
- ✓ Reverse transcription of total RNA or mRNA yields oligo(dT)-primed products from any poly(A) RNA
- ✓ cDNA products for many different downstream applications from a single reverse transcription reaction
- ✓ Contains a first-class RNase inhibitor (denaturation resistant up to 70°C and optimal for long-term storage)
- ✓ Includes: GoScript™ Enzyme Mix, GoScript™ Reaction Buffer Oligo(dT), and Nuclease Free Water

QUANTITY		CAT.#
50 reactions	Helix	**A2790**
100 reactions	Helix	**A2791**

GoScript™ Reverse Transcription Mix, Random Primers

- ✓ The use of random primers is the most common method to generate cDNA from a wide variety of RNA templates
- ✓ First-strand synthesis from all RNA types: prokaryotic RNA, RNA with many secondary structures or degraded RNA, no poly(A)+ tail required, more cDNA transcripts at the 5' end of the RNA
- ✓ Contains a first-class RNase inhibitor (denaturation resistant up to 70°C and optimal for long-term storage)
- ✓ Contains: GoScript™ Enzyme Mix, GoScript™ Reaction Buffer Random Primers, and Nuclease Free Water

QUANTITY		CAT.#
50 reactions	Helix	**A2800**
100 reactions	Helix	**A2801**

www.promega.com/goscript-quick

Scientific article: Effect of a Shortened Reverse Transcription Time on qPCR Amplification

For a successful qPCR amplification, the ready-to-use GoScript™ Master Mixes (oligo(dT)$_{15}$ and random primers), the time of reverse transcription can be reduced to up to 5 minutes. Here you can find the technical article including an abbreviated protocol.

Reverse Transcriptase

GoScript™ Reverse Transcriptase

QUANTITY		CAT.#
100 reactions/16,000 U	Helix	A5003
500 reactions/80,000 U	Helix	A5004

AMV Reverse Transcriptase

QUANTITY		CAT.#
300 U	Helix	M5101
1,000 U	Helix	M5108

M-MLV Reverse Transcriptase

QUANTITY		CAT.#
10,000 U	Helix	M1701
50,000 U	Helix	M1705

M-MLV Reverse Transcriptase RNase H-, Point Mutant

QUANTITY		CAT.#
2,500 U	Helix	M3681
10,000 U	Helix	M3682
50,000 U	Helix	M3683

FEATURES	GoScript™ Reverse Transcriptase	AMV Reverse Transcriptase	M-MLV Reverse Transcriptase	M-MLV Reverse Transcriptase RNase H-, Point Mutant
Reaction temperature	37–55°C	37–58°C	37–42°C	40–55°C
cDNA length	Up to 9 kb	Up to 4 kb	Up to 5 kb	Up to 7.5 kb
Sensitivity	0.2 fg–5 µg total RNA	1 pg–1 µg total RNA 1 pg–100 ng poly(A)+ RNA	NA	100 fg–100 ng total RNA
RNase H-activity	low	yes	low	no
Suitable for RNAs with secondary structure	★★★	★★★	★	★★★
Error rate	NA	Approx. 5 errors in 10,000 bases	Approx. 1 error in 10,000 bases	Approx. 1 error in 10,000 bases
Main applications	› RT-PCR › Incorporation of marked nucleotides › Primer extension/RACE	› Reverse transcription › Primer extension/RACE	› Reverse transcription › Primer extension/RACE	› Reverse transcription › Primer extension/RACE
Advantage	› Low RNase H activity › For cDNA up to 9 kb › Optimized conditions for one-tube RT-PCR and RT-qPCR › Particularly resistant to inhibitors	› Especially suitable for RNA with secondary structures › For cDNA up to 4 kb › High processivity	› Low RNase H activity › For cDNA up to 5 kb	› No RNase H activity › For cDNA over 7.5 kb › Reaction temperature up to 55°C › Very stable › High selectivity
Inhibited by	› Inorganic phosphate and pyrophosphate › Actinomycin D (50 µg/ml) › Spermidine	› Actinomycin D (50 µg/ml) › RRNA and tRNA › Glycerol <10 % › Ribonucleoside vanadyl complexes (2 mM) › N-ethylmaleimide	› Inorganic phosphate and pyrophosphate › Actinomycin D (50 µg/ml) › Spermidine	› Inorganic phosphate and pyrophosphate › Actinomycin D (50 µg/ml) › Spermidine
Units per reaction	160 U/20 µl	15–30 U/25 µl	200 U/25 µl	200 U/25 µl

Oligonucleotides and Primers

Oligo(dT)$_{15}$ Primer

- ✓ Primer for first-strand cDNA synthesis with a reverse transcriptase
- ✓ Hybridizes to the poly(A) tail of mRNA

QUANTITY		CAT.#
20 µg	Helix	C1101

Random Primers

- ✓ Primer for first-strand cDNA synthesis and cloning

QUANTITY		CAT.#
20 µg	Helix	C1181

Nuclease-Free Water

Nuclease-Free Water

- ✓ No inhibitors: The water is untreated and has no chemical additives
- ✓ Guaranteed nuclease-free: intensive quality control
- ✓ Small packages (2 × 25 ml) to avoid contamination in the laboratory

QUANTITY		CAT.#
50 ml (2 × 25 ml)	Helix	P1193
150 ml	Helix	P1195
500 ml	Helix	P1197

Reverse Transcription Systems

GoScript™ Reverse Transcription System

- ✓ Robust full-length cDNA synthesis for reproducible analysis of rare and long RNA sequences
- ✓ All components in one kit: GoScript™ Reverse Transcriptase, 5X GoScript™ Reaction Buffer, PCR Nucleotide Mix, Oligo(dT)$_{15}$ Primer, Random Primers, Recombinant RNasin® Ribonuclease Inhibitor, $MgCl_2$ and Nuclease-Free Water

QUANTITY	CAT.#
50 reactions	A5000
100 reactions	A5001

Reverse Transcription System

- ✓ Reverse transcription in only 15 minutes
- ✓ First-strand synthesis of cDNA molecules with a length of up to 5 kb
- ✓ All reagents in one kit: AMV Reverse Transcriptase (HC), 10X Reverse Transcription Buffer, dNTP Mix, Oligo(dT)$_{15}$ Primers, Random Primers, Recombinant RNasin® Ribonuclease Inhibitor, Nuclease-Free Water, $MgCl_2$ and Positive Control RNA

QUANTITY	CAT.#
100 reactions	A3500

Access RT-PCR System

- ✓ All RT-PCR reagents in one kit: AMV Reverse Transcriptase, *Tfl* DNA Polymerase, 5X AMV/*Tfl* Reaction Buffer, $MgSO_4$, Nuclease-Free Water, Positive Control RNA, and Upstream and Downstream Control Primers

QUANTITY	CAT.#
20 reactions	A1260
100 reactions	A1250
500 reactions	A1280

AccessQuick™ RT-PCR System

- ✓ Convenient master mix for 1-step RT-PCR
- ✓ 2X AccessQuick™ Master Mix, AMV Reverse Transcriptase and Nuclease-Free Water

QUANTITY	CAT.#
20 reactions	A1701
100 reactions	A1702
500 reactions	A1703

	REVERSE TRANSCRIPTION FOLLOWED BY PCR		REVERSE TRANSCRIPTION AND PCR IN ONE STEP	
FEATURES	**GoScript™ Reverse Transcription System**	**Reverse Transcription System**	**Access RT-PCR System**	**AccessQuick™ RT-PCR System**
Application / Nature of input material	› Low-abundance mRNA › Synthetic RNA › Long RNA › Incorporation of modified nucleotides › (Cy3 / Cy5 labelling for microarray analysis)	› RNA with strong secondary structure › Multiple PCRs after RT	› RT and PCR in one reaction step › Gene-specific RT-PCR › Low-abundance mRNA › RNA with strong secondary structure	› RT and PCR in one reaction step › Gene-specific RT-PCR › Low-abundance mRNA › RNA with strong secondary structure › Fewer pipetting step
Special features	› Highest sensitivity › Can be used as one-step RT-qPCR by incorporating Taq DNA polymerase	› For difficult RNAs with secondary structure › Compatible with various types of PCR	› One-step RT-PCR eliminates pipetting between RT and PCR › High sensitivity	› One-step RT-PCR eliminates pipetting between RT and PCR › Components provided as master mix › High sensitivity
Recommended RT primer	Oligo(dT)$_{15}$, random primers, or gene-specific primer	Oligo(dT)$_{15}$ or random primers	Gene-specific primer	Gene-specific primer
Included primers	Oligo(dT)$_{15}$, random primers and control primer	Oligo(dT)$_{15}$ or random primers	RT-PCR control primer	
Reaction temperature	37–55°C	42–50°C	37–45°C	37–45°C
Rnase H-activity	✓	✓	✓	✓
Length of resulting cDNA	› Up to 9 kb	› Up to 5 kb	› Up to 5 kb	› Up to 5 kb
Sensitivity	› 1 pg–1 µg total RNA, 10 copies	› 1 µg total RNA or 1 pg–1 µg poly(A)+ RNA	› 1 pg–1 µg total RNA 1–10 ng poly(A)+ RNA	› 0.2 fg–5 µg total RNA › 1–10 ng poly(A)+ RNA
Input material	› Total RNA › Poly(A)+ RNA › Synthetic RNA	› Total RNA › Poly(A)+ RNA	› Total RNA › Poly(A)+ RNA	› Total RNA › Poly(A)+ RNA

RIBONUCLEASE INHIBITORS

RNasin® – The Original from Promega

Thousands of papers have cited RNasin® Ribonuclease Inhibitors as the source of RNase protection since Promega introduced RNasin® Inhibitors over 35 years ago, making them the most trusted reagents for RNA protection. RNasin® RNase Inhibitors work by binding strongly to RNases, preventing them from degrading vulnerable RNA molecules during manipulation in the laboratory. Reliable RNase inhibitors satisfy three major criteria:

1. Protection of RNA without introducing RNases
2. Compatibility with various experimental conditions and applications
3. Efficient and fast

RNasin® Ribonuclease Inhibitors fulfill all of these criteria. Therefore, its use is highly recommended for RNA isolation, RT-PCR, *in vitro* transcription or any situation where RNase is a concern.

If you haven't thought about protecting your RNA, maybe you should!

Buffer or water samples that had been in use for 1 to 14 months in a presumed RNase-free zone of an academic laboratory were tested for RNase contamination. RNA (5 µg) and RNase ONE™ buffer were added to two aliquots (17.5 µl each) of each of the nine samples. In addition, 40 U RNasin® were added to one of each of the two aliquots and all samples were incubated at 37°C overnight.

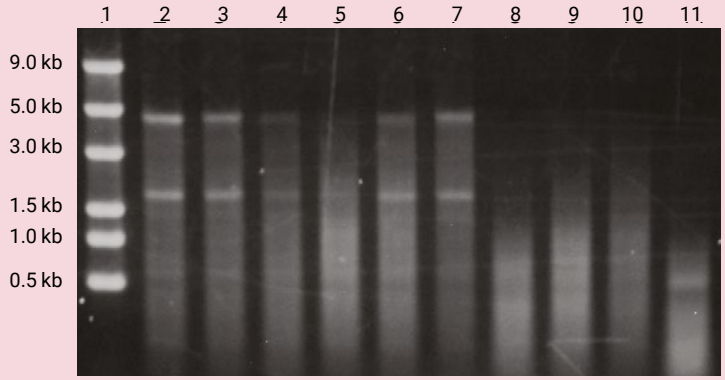
Lane 1: marker
Lane 2: control RNA
Lane 3-11: laboratory samples

Conclusion: Six of the nine samples showed RNA degradation by RNases. RNasin® successfully prevents degradation in all six cases.

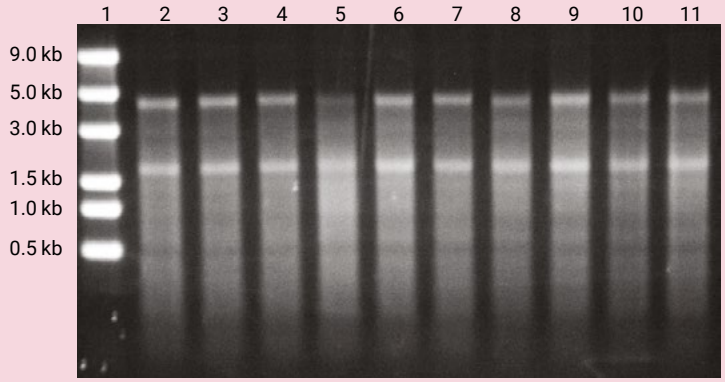
www.promega.com/pubs/tpub_047

Here you find the experimental details.

without RNasin®



with RNasin®



Recombinant RNasin® Ribonuclease Inhibitor

- ✓ Inhibits RNase A, B and C as well as human placental RNase
- ✓ Does not inhibit other RNases and modifying enzymes like reverse transcriptases
- ✓ Results in higher yield in RNA extractions and better performance in RT-qPCR, cDNA synthesis, microarrays and *in vitro* transcription/translation

QUANTITY		CAT.#
2,500 U	Helix	N2511
10,000 U	Helix	N2515

We recommend: **For templates with challenging secondary structure and storage of valuable RNA samples, use RNasin® Plus RNase Inhibitor.**

RNasin® Plus RNase Inhibitor

- ✓ Possesses all the proven features of Recombinant RNasin® Ribonuclease Inhibitor
- ✓ Heat resistant, therefore applicable for enzymatic reactions at high temperatures and denaturation steps up to 70°C
- ✓ Particularly suitable for long-term storage of RNA sample

QUANTITY		CAT.#
2,500 U	Helix	N2611
10,000 U	Helix	N2615

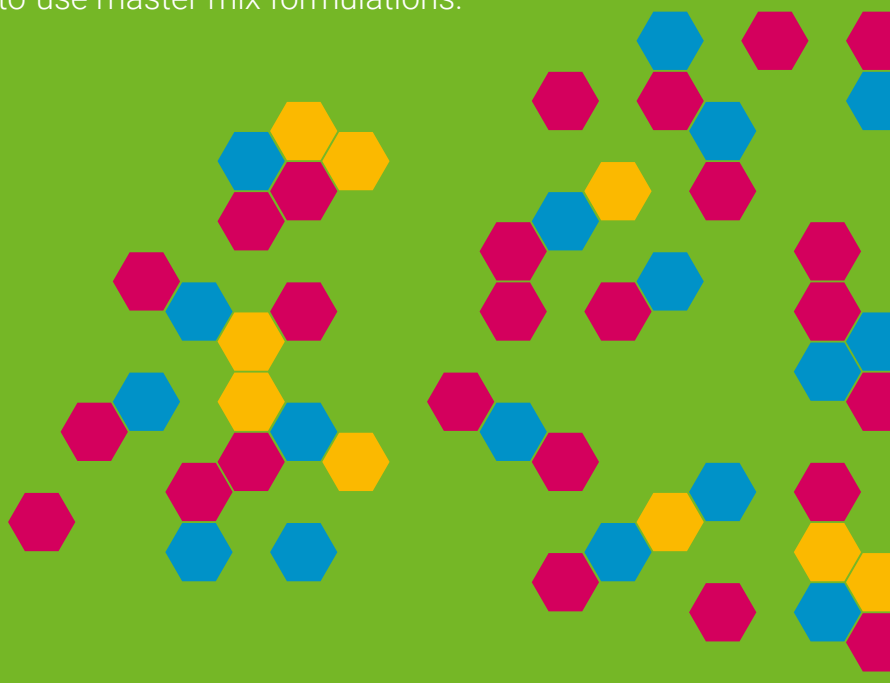
REAL-TIME PCR

Probe-based or Dye-based – Everything for Your qPCR and RT-qPCR Applications

Real-time quantitative PCR (qPCR) is a powerful tool to detect and quantify nucleic acids. Promega supports qPCR applications with high-performance dye-based and probe-based qPCR master mixes and RT-qPCR kits.

Both probe and dye-based qPCR assay systems provide sensitive detection for reproducible and earlier quantification of low- and high-copy-number targets over a broad dynamic range, together with resistance to a wide range of PCR inhibitors. They provide sensitive detection on most real time PCR instruments and are amenable to both fast and standard cycling methods.

All real-time qPCR and RT-qPCR systems also include the convenience of room-temperature reaction setup and easy-to-use master mix formulations.

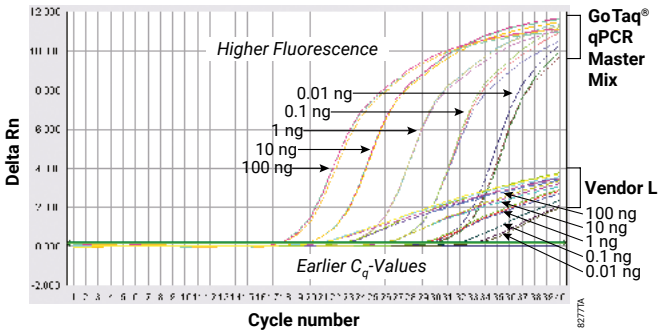


Dye-Based Real-Time qPCR

Improved Sensitivity with the Strong Fluorescent Signal of BRYT Green® Dye

The GoTaq® qPCR and RT-qPCR Systems are ready-to-use, 2X master mixes containing BRYT Green® Dye, a fluorescent DNA binding dye with minimal PCR inhibition, providing maximum amplification efficiency and greater fluorescence enhancement than SYBR® Green. Excitation and emission of the BRYT Green® dye are similar to those of SYBR® Green and ROX™, so it is compatible with commonly available real-time PCR instrumentation.

A:



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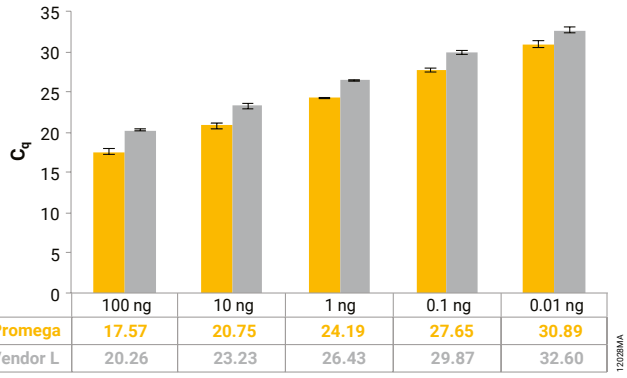


	100 ng	10 ng	1 ng	0.1 ng	0.01 ng
Promega	17.57	20.75	24.19	27.65	30.89
Vendor L	20.26	23.23	26.43	29.87	32.60

A series of five tenfold dilutions of human gDNA was amplified with GoTaq® qPCR Master Mix or Vendor L's equivalent master mix, to examine GAPDH expression. GoTaq® qPCR Master Mix shows a higher fluorescent signal (Panel A) and earlier C_q values (Panel B) for all sample input amounts. All no-template control reaction wells were blank.

- ✓ **New Dye:** higher fluorescence increase upon binding to dsDNA
- ✓ **Sensitive:** detection of sequences with low expression
- ✓ **Robust:** optimized buffer in combination with GoTaq® Hot Start Polymerase ensures reproducible results
- ✓ **Convenient:** fully compatible with SYBR® Green I protocol

GoTaq® qPCR Master Mix

- ✓ 2X GoTaq® qPCR Master Mix with GoTaq® Hot Start Polymerase, BRYT Green® Dye, $MgCl_2$, dNTPs and buffer
- ✓ CXR Reference Dye, included in the mix and in a separate tube
- ✓ Nuclease free water is included separately

QUANTITY		CAT.#
5 × 1 ml (500 reactions in 20 µl)	Promega	A6001
25 × 1 ml (2,500 reactions in 20 µl)	Promega	A6002

GoTaq® 1-Step RT-qPCR System

- ✓ 1-step RT-qPCR for RNA quantification

QUANTITY		CAT.#
5 ml (500 reactions in 20 µl)	Promega	A6020

GoTaq® 2-Step RT-qPCR System

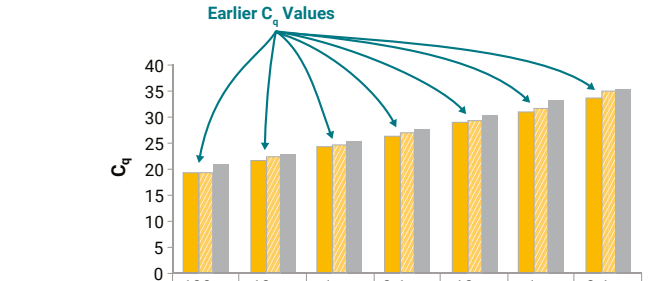
- ✓ 2-step RT-qPCR for RNA quantification
- ✓ cDNA synthesis with the GoScript™ Reverse Transcription System and quantification using GoTaq® qPCR Master Mix
- ✓ All reagents in one kit: 2X GoTaq® qPCR Master Mix, GoScript™ Reverse Transcriptase, 5X GoScript™ Reaction Buffer, PCR Nucleotide Mix, $Oligo(dT)_{15}$ Primer, Random Primers, Recombinant RNasin® Ribonuclease Inhibitor, CXR Reference Dye, $MgCl_2$ and Nuclease-Free Water

QUANTITY		CAT.#
50 × 20 µl RT reactions and 200 × 50 µl qPCR reactions	Promega	A6010

Probe-Based Real-Time qPCR

The GoTaq® Probe qPCR and RT-qPCR Systems are ready-to-use, 2X master mixes that simplify reaction assembly for qPCR using hydrolysis probes (e.g., TaqMan®). These real-time qPCR systems are designed for sensitive detection and quantification of a broad range of DNA or RNA targets in the presence of a wide range of PCR inhibitors.

All GoTaq® Probe 1-Step and 2-Step RT-qPCR Systems include GoScript™ Reverse Transcriptase to enable efficient synthesis of first-strand cDNA prior to PCR amplification.



	100 ng	10 ng	1 ng	0.1 ng	10 pg	1 pg	0.1 pg
Promega · Standard	19.3	21.7	24.3	26.3	29.0	31.1	33.8
Promega · Fast	19.2	22.2	24.7	26.9	29.3	31.7	34.9
Vendor L · Fast	20.9	23.1	25.4	27.8	30.3	33.2	35.5

1172AMA

Comparison: Standard vs. Fast Cycling

GoTaq® Probe qPCR Master Mix gives comparable results when GAPDH is amplified from human pancreas cDNA using standard and fast thermal cycling conditions. Earlier C_q values were observed for both standard and fast thermal cycling conditions when GoTaq® Probe qPCR Master Mix was compared to a competing product (Vendor L).

GoTaq® Probe qPCR Master Mix

- ✓ 2X GoTaq® Probe qPCR Master Mix with GoTaq® Polymerase, $MgCl_2$, dNTPs, Buffer and Nuclease-Free Water
- ✓ Separate CXR Reference Dye

QUANTITY		CAT.#
2 × 1 ml (200 reactions in 20 µl)	Helix	A6101
10 × 1 ml (1,000 reactions in 20 µl)	Helix	A6102

GoTaq® Probe 1-Step RT-qPCR System

- ✓ 1-step RT-qPCR for RNA quantification
- ✓ Inclusion of dUTP allows control of carryover DNA contamination through the use of uracil-DNA glycosylase (UNG)

QUANTITY		CAT.#
2 ml (200 reactions in 20 µl)	Helix	A6120
12.5 ml (1,250 reactions in 20 µl)	Helix	A6121

GoTaq® Probe 2-Step RT-qPCR System

- ✓ 2-step RT-qPCR for RNA quantification
- ✓ cDNA synthesis with the GoScript™ Reverse Transcription System and quantification using GoTaq® qPCR Master Mix
- ✓ All reagents in one kit: 2X GoTaq® qPCR Master Mix, GoScript™ Reverse Transcriptase, 5X GoScript™ Reaction Buffer, PCR Nucleotide Mix, $Oligo(dT)_{15}$ Primer, Random Primers, Recombinant RNasin® Ribonuclease Inhibitor, CXR Reference Dye, $MgCl_2$ and Nuclease-Free Water

QUANTITY		CAT.#
50 reactions RT + 2 × 1 ml GoTaq® Probe qPCR Master Mix	Helix	A6110

Sensitive Detection for Environmental Samples

The GoTaq® Enviro qPCR and RT-qPCR Systems are ready-to-use master mixes optimized for amplifying targets from environmental samples (e.g., water/wastewater, soil, biological material). The GoTaq® Enviro Systems are optimized for quantitative PCR assays using a hydrolysis probe for real-time amplicon detection. The systems are resistant to a wide range of PCR and RT-qPCR inhibitors such as humic acid and tannic acid, which are commonly found in environmental samples. The integrated hot-start chemistry allows setup at room temperature.

GoTaq® Enviro qPCR System

- ✓ Separate CXR Reference Dye included
- ✓ Internal Positive Control (IPC) available separately (AM2030)

QUANTITY		CAT.#
200 reactions	Helix	AM2000
1,000 reactions	Helix	AM2001

GoTaq® Enviro RT-qPCR System

- ✓ 1-step RT-qPCR System with GoScript™ Reverse Transcriptase and GoTaq® Enviro Master Mix
- ✓ Contains premium RNase inhibitor RNasin® Plus
- ✓ Separate CXR Reference Dye included
- ✓ Internal Amplification Control (IAC) available separately (AM2040)

QUANTITY		CAT.#
200 reactions	Helix	AM2010
1,000 reactions	Helix	AM2011

GoTaq® Endure: The Solution (not only) for Clinical Samples

The GoTaq® Endure qPCR Master Mix and RT-qPCR System are advanced solutions for researchers facing the challenges of inhibitor-rich samples, especially in the clinical field. Designed for samples from blood, bacteria, viruses, feces, plants, and food, both systems demonstrate very high resistance to humic acid, ethanol, sodium citrate, heparin, hematin, and EDTA. GoTaq® Endure has a unique proprietary formulation that employs rapid hot-start activation, high multiplexing capabilities, and seamless integration into both standard and fast cycling protocols.

GoTaq® Endure qPCR Master Mix

- ✓ Separate CXR Reference Dye included
- ✓ Internal Positive Control (IPC) available separately (AM2030)

QUANTITY		CAT.#
200 reactions	Helix	A6220
1,000 reactions	Helix	A6201

GoTaq® Endure RT-qPCR Master Mix

- ✓ 1-step RT-qPCR System with GoScript™ Reverse Transcriptase
- ✓ Separate CXR Reference Dye included
- ✓ Contains premium RNase inhibitor RNasin® Plus
- ✓ Internal Amplification Control (IAC) available separately (AM2040)

QUANTITY		CAT.#
200 reactions	Helix	A6222
1,000 reactions	Helix	A6223

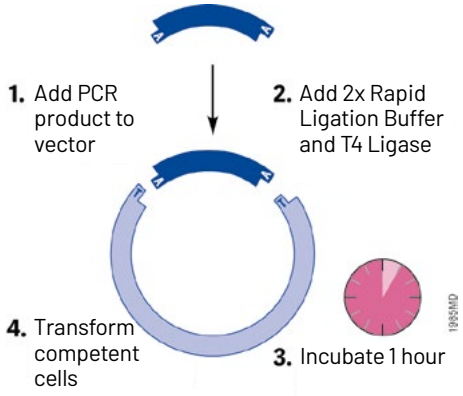
CLONING SYSTEMS

Whether PCR cloning with the pGEM®-T Vector Systems, the pTARGET™ Mammalian Expression Vector System for expression in mammalian cells, or open reading frame (ORF) cloning for protein expression – with the Flexi® Vector Cloning System, you'll find what you're looking for.

PCR Cloning

Clone PCR Products Rapidly and Efficiently with Proven T-Vector Systems

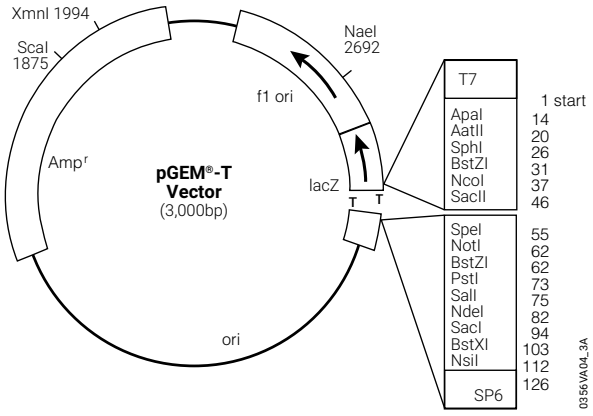
In PCR, A-overhangs are usually produced at the ends of the amplicon. Linearized vectors with corresponding T-overhangs provide a convenient solution for successful cloning. We offer various T-cloning vectors, with an extended multiple cloning site, with or without competent cells, and for expression in mammalian cells.



pGEM®-T Vector System I

- ✓ System for easy cloning of PCR products with a 3' A overhang
- ✓ Linearized pGEM®-5Zf(+) Vector with 3'-T overhangs on both ends
- ✓ Rapid ligation buffer enables cloning in 1 hour at room temperature
- ✓ Competent cells not included

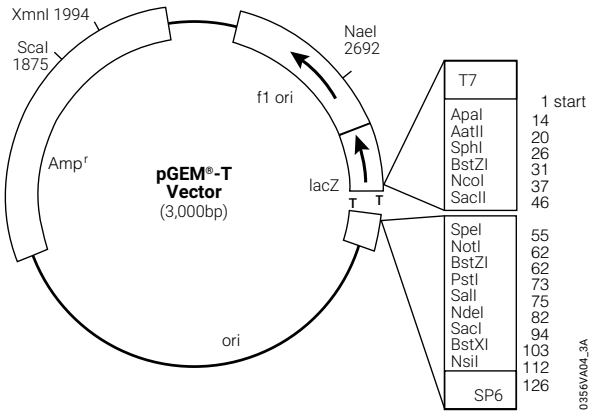
QUANTITY	CAT.#
20 reactions	A3600



pGEM®-T Vector System II

- ✓ Identical to the pGEM®-T Vector System I, with JM109 Competent Cells included

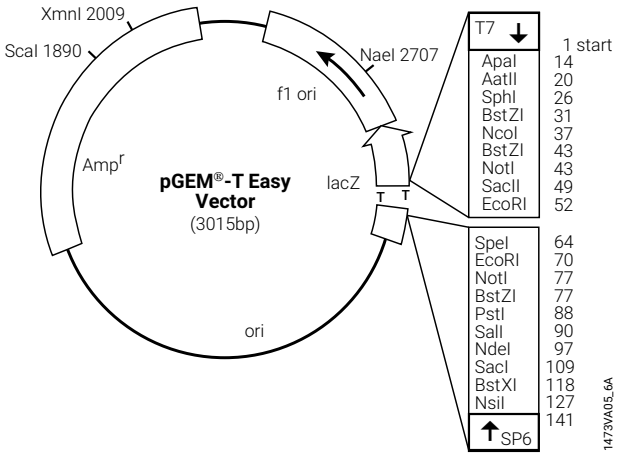
QUANTITY	CAT.#
20 reactions	A3610



pGEM®-T Easy Vector System I

- ✓ System for cloning PCR products
- ✓ Identical to the pGEM®-T Vector System I, with additional restriction sites flanking the insertion site
- ✓ Rapid ligation buffer enables cloning in 1 hour at room temperature
- ✓ Competent cells not included

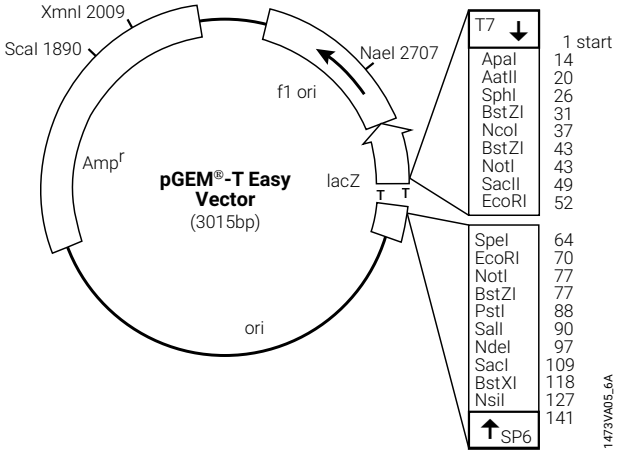
QUANTITY	CAT.#
20 reactions	A1360



pGEM®-T Easy Vector System II

- ✓ Identical to the pGEM®-T Easy Vector System I, with JM109 Competent Cells included

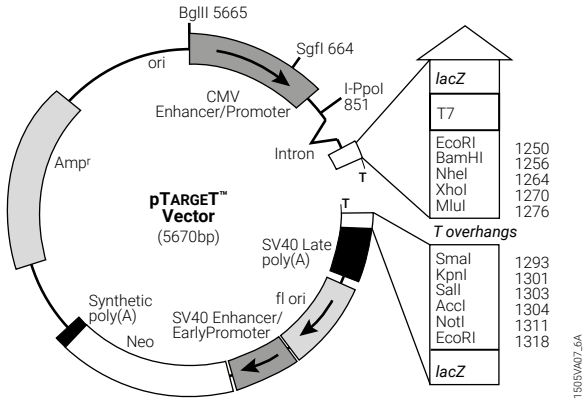
QUANTITY	CAT.#
20 reactions	A1380



pTARGET™ Mammalian Expression Vector System

- ✓ For easy cloning of PCR products
- ✓ Enables direct expression of the cloned sequence in mammalian cells

QUANTITY	CAT.#
20 reactions	A1410



Flexi® Cloning Systems

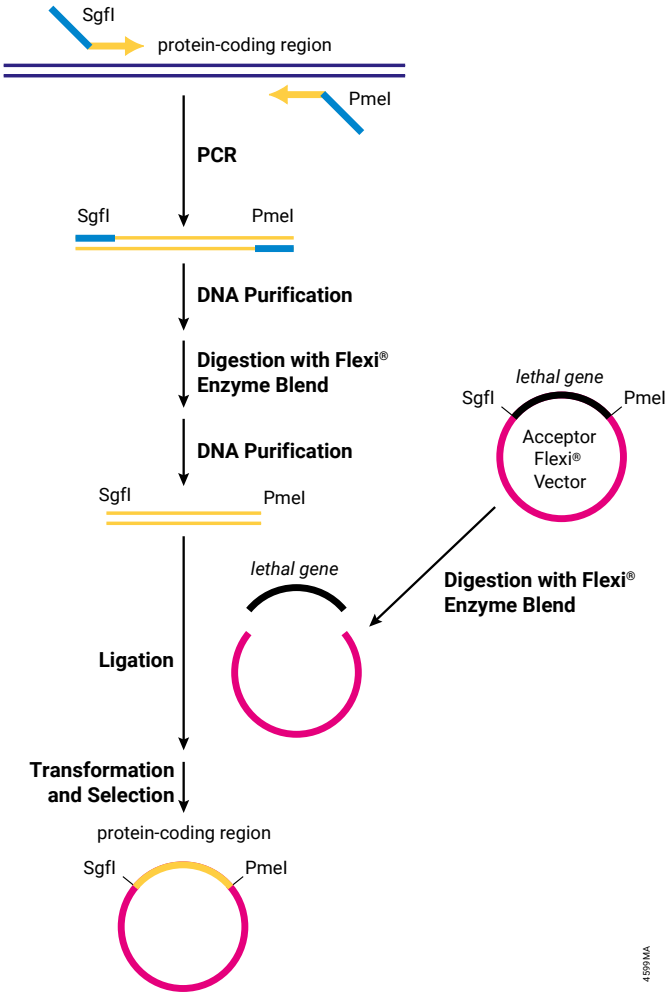
Directional Cloning System for Recombinant Protein Expression

The Flexi® Vector System provides a method for directional cloning of protein-coding sequences based on two rare-cutting restriction enzymes, SgfI and PmeI. The system provides a quick and efficient way to transfer inserts between vectors without the need to resequence. No licensing fees or complicated transfer restrictions needed.

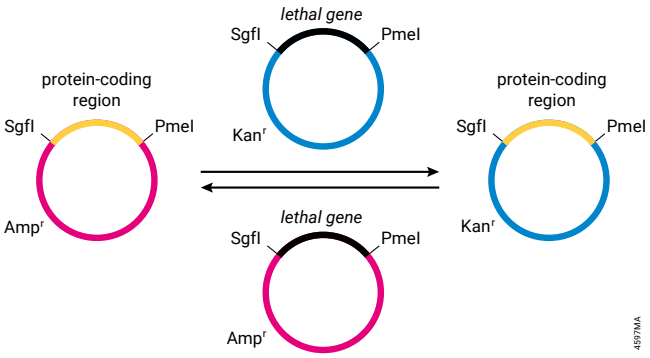
- Directional cloning of open reading frames (ORF)
- Particularly suitable for the preparation of N- or C-terminal tagged fusion proteins
- Easy transfer of ORF in a variety of vectors – no resequencing
- Adaptable to high-throughput formats for large screening projects to increase productivity

All Flexi® Vectors carry the lethal barnase gene, which is replaced by the DNA fragment of interest and acts as a positive selection for the successful ligation of the insert.

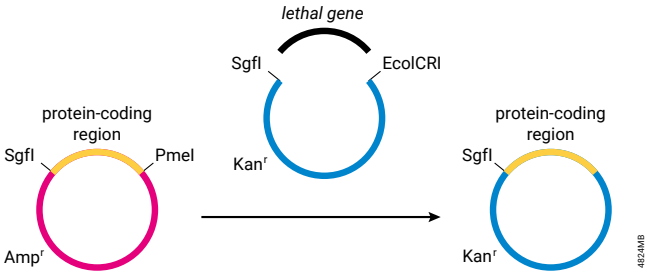
Unlike site-specific recombination vector systems, the Flexi® Vector Systems do not require appending multiple amino acids to the amino or carboxy termini of the protein of interest. In addition, the systems do not require an archival entry vector, and most applications allow direct entry into the vector suited to the experimental design.



Cloning of a protein coding sequence into a Flexi® Vector



Transfer of a protein-coding region between Flexi® Vectors: The Flexi® Vector System provides a flexible method for directional cloning to produce plasmids for protein expression. The Flexi® Vectors contain the deadly barnase gene and an antibiotic-resistance marker for positive selection of clones.



Transferring protein-coding regions into C-terminal Flexi® Vector Systems: C-terminal Flexi® Vectors contain SgfI and EcoICRI sites and are designed for expression of C-terminal-tagged proteins. Joining PmeI and EcoICRI blunt ends eliminates the stop codon present in the PmeI site and allows readthrough to the C-terminal protein-coding sequences in the C-terminal Flexi® Vectors. Since both restriction sites are destroyed by ligation, transfer into C-terminal Flexi® Vectors is not reversible (i.e., it is a one-way exchange).

Flexi® System, Entry/Transfer

Flexi® System, Transfer

Carboxy Flexi® System, Transfer

www.promega.com/flexi-vector-system

Faster cloning means faster results. Read more about the Flexi®Cloning Systems.

Save Time and Money with Restriction Enzymes from Promega

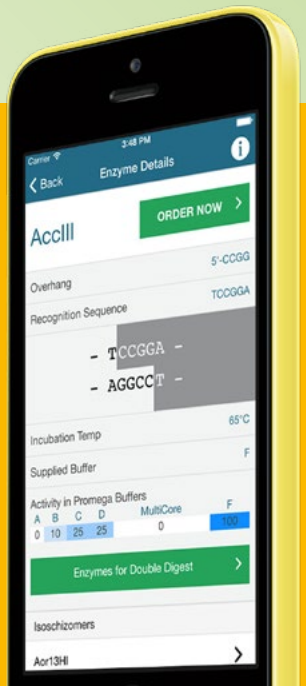
Fast DNA Digestion at an Affordable Price

Do you need restriction enzymes that cut DNA quickly and efficiently? Promega has tested the most popular restriction enzymes to digest DNA in 15 minutes or less. Standard enzymes and buffers were used for this purpose. Use the Restriction Enzyme Tool on the Calculators & Data Analysis Tools page for more information on buffer compatibility, double digestion, neo/isoschizomers, and multiple enzyme compatibility.

Here You Can Find all Restriction Enzymes:

www.promega.com/restriction-enzymes

Here you will find all available restriction enzymes and their properties.



PROMEGA TOOLS FOR PROFESSIONALS

Restriction Enzyme Tool

With the restriction enzyme tool, you can search restriction enzymes by name, recognition sequence or overhang, and can quickly and easily find enzymes for double digestion.

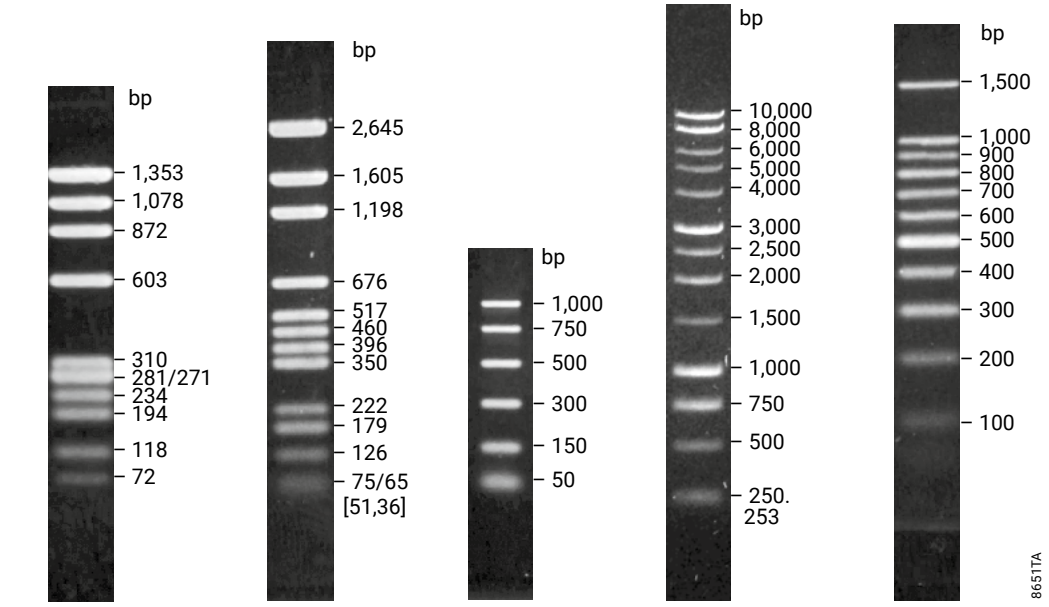
Download on the App Store

MARKERS

Promega BenchTop DNA Markers can be stored at room temperature, providing the ultimate in ready-to-use convenience. We also offer a wide range of conventional markers, including DNA Step Ladders, RNA Markers, and a selection of other markers covering a range of fragment sizes.

BenchTop DNA Marker

The BenchTop DNA Markers are supplied in 1X Blue/Orange Loading Dye. They can be stored conveniently at room temperature (22–25°C) and loaded directly onto agarose gels without addition of loading buffer. The DNA fragments can be stained with ethidium bromide or Diamond™ Nucleic Acid Dye.



2% Agarose | 2% Agarose | 2% Agarose | 0.7% Agarose | 2% Agarose

BenchTop φX174 DNA/HaeIII Markers
Cat.# G7511
5 µl/lane

BenchTop pGEM® DNA Markers
Cat.# G7521
5 µl/lane

BenchTop PCR Markers
Cat.# G7531
6 µl/lane

BenchTop 1 kb DNA Ladder
Cat.# G7541
6 µl/lane

BenchTop 100bp DNA Ladder
Cat.# G8291
6 µl/lane

BenchTop X174 DNA/HaeIII Markers

QUANTITY	CAT.#
250 µl (50 lanes)	G7511

BenchTop pGEM® DNA Markers

QUANTITY	CAT.#
250 µl (50 lanes)	G7521

BenchTop PCR Markers

QUANTITY	CAT.#
300 µl (50 lanes)	G7531

BenchTop 1 kb DNA Ladder

QUANTITY	CAT.#
600 µl (100 lanes)	G7541

BenchTop 100 bp DNA Ladder

QUANTITY	CAT.#
300 µl (50 lanes)	G8291

www.promega.com/marker

Here you can find information and images for all markers.

DNA Step Ladders

The DNA Step Ladders are DNA markers with equal intervals between bands. Each ladder is supplied with 6X Blue/Orange Loading Dye. The fragments can be stained with ethidium bromide or Diamond™ Nucleic Acid Dye.

10 bp DNA Step Ladder

QUANTITY		CAT.#
32.5 µg (50 lanes)	Helix	G4471

25 bp DNA Step Ladder

QUANTITY		CAT.#
100 µg (55 lanes)	Helix	G4511

50 bp DNA Step Ladder

QUANTITY		CAT.#
90 µg (52 lanes)	Helix	G4521

100 bp DNA Step Ladder

QUANTITY		CAT.#
100 µg (100 lanes)	Helix	G6951

200 bp DNA Step Ladder

QUANTITY		CAT.#
100 µg (100 lanes)	Helix	G6961

1 kb DNA Step Ladder

QUANTITY		CAT.#
90 µg (300 lanes)	Helix	G6941

DNA Ladders

The DNA Ladders have fragment sizes of approximately equal intensity on the gel. They are supplied with 6X Blue/Orange Loading Dye. The fragments can be stained with ethidium bromide or Diamond™ Nucleic Acid Dye.

PCR Markers

QUANTITY		CAT.#
250 µl (50 lanes)	Helix	G3161

100 bp DNA Ladder

QUANTITY		CAT.#
250 µl (50 lanes)	Helix	G2101

1 kb DNA Ladder

QUANTITY		CAT.#
500 µl (100 lanes)	Helix	G5711

www.promega.com/marker

Here you can find information and images for all markers.

Conventional DNA Markers

Conventional DNA markers are generated by the complete restriction digestion of lambda DNA, ΦX174 phage DNA (replicative form) or plasmids. The fragments can be stained with ethidium bromide or Diamond™ Nucleic Acid Dye.

	QUANTITY		CAT.#
Lambda DNA/HindIII Markers	100 µg (200 lanes)	Helix	**G1711**
Lambda DNA/EcoRI Markers	100 µg (200 lanes)	Helix	**G1721**
Lambda DNA/EcoRI + HindIII Markers	100 µg (200 lanes)	Helix	**G1731**
ΦX174 DNA/HaeIII Markers	50 µg (50 lanes)	Helix	**G1761**
ΦX174 DNA/HinfI Markers	50 µg (50 lanes)	Helix	**G1751**
pGEM® DNA Markers	50 µg (50 lanes)	Helix	**G1741**

RNA Marker

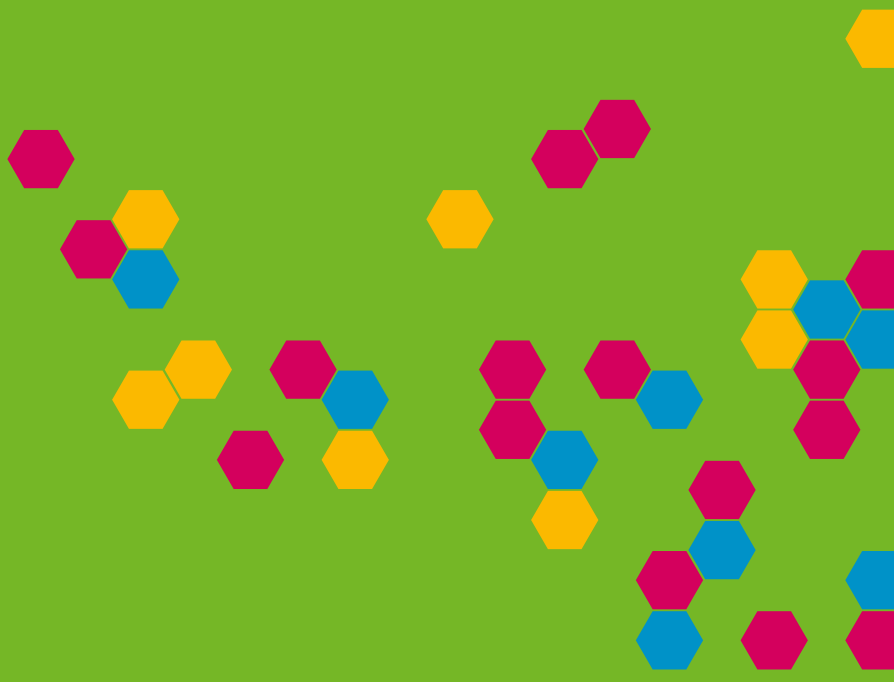
The Promega RNA marker is suitable for the size determination of single-stranded RNA from 0.28–6.58 kb in glyoxal or formaldehyde agarose gels. After electrophoresis, the fragments can be visualized with ethidium bromide staining.

	QUANTITY		CAT.#
RNA Markers	50 µg (50 lanes)	Helix	**G3191**

MODIFYING ENZYMES

Essential tools for the quality-minded molecular biologist: alkaline phosphatases, various DNA and RNA polymerases, ligases and kinases.

Leave nothing to chance. Choose enzymes of the highest quality.



Alkaline Phosphatases

Alkaline phosphatases catalyze the hydrolysis of the 5'-phosphate group of DNA and RNA, along with ribo- and deoxyribonucleoside triphosphates. They are used to prevent religation of linearized vectors during cloning.

Alkaline Phosphatase, Calf Intestinal (CIAP)

QUANTITY		CAT.#
1,000 U	Helix	M1821

Polymerases

DNA Polymerase I

- ✓ DNA-dependent DNA polymerase with 5'→3' and 3'→5' exonuclease activity
- ✓ Can be used for a variety of applications such as radioactive labelling of DNA through nick translation and second-strand cDNA synthesis

QUANTITY		CAT.#
500 U	Helix	M2051
2,500 U	Helix	M2055

DNA Polymerase I Large (Klenow) Fragment

- ✓ DNA-dependent DNA polymerase with 3'→5' exonuclease activity but without 5'→3' exonuclease activity
- ✓ For filling protruding 5' ends with unlabelled or labelled dNTPs, single- or double-stranded DNA for sequencing templates and other applications

QUANTITY		CAT.#
150 U	Helix	M2201
500 U	Helix	M2206

T4 DNA Polymerase

- ✓ Catalyzes the 5'→3' synthesis of DNA from a primed single-stranded DNA template
- ✓ High fidelity enzyme of choice for applications where misincorporation is a concern

QUANTITY		CAT.#
100 U	Helix	M4211
500 U	Helix	M4215

SP6 RNA Polymerase

- ✓ Extremely high affinity and specificity to SP6 promoter sequences
- ✓ >90 % pure as determined by SDS polyacrylamide gel electrophoresis
- ✓ Incorporates ^{32}P, ^{33}P, ^{3}H and ^{35}S nucleotide triphosphates

QUANTITY		CAT.#
1,000 U	Helix	P1085
5,000 U	Helix	P1081

T3 RNA Polymerase

- ✓ Extremely high affinity and specificity to T3 promoter sequences
- ✓ >90 % pure as determined by SDS polyacrylamide gel electrophoresis
- ✓ Incorporates ^{32}P, ^{33}P, ^{3}H and ^{35}S nucleotide triphosphates

QUANTITY		CAT.#
1,000 U	Helix	P2083

T7 RNA Polymerase

- ✓ Extremely high affinity and specificity to T7 promoter sequences
- ✓ >90 % pure as determined by SDS polyacrylamide gel electrophoresis
- ✓ Incorporates ^{32}P, ^{33}P, ^{3}H and ^{35}S nucleotide triphosphates

QUANTITY		CAT.#
1,000 U	Helix	P2075
5,000 U	Helix	P2077

Ligases

T4 DNA Ligase

- ✓ Catalyzes the ligation of two DNA strands at the 5′-phosphate and 3′-hydroxyl groups
- ✓ Suitable for DNA inserts with 5′ or 3′ overhangs or blunt ends
- ✓ Qualified for blue/white screening

QUANTITY		CAT.#
100 U	Helix	M1801
500 U	Helix	M1804

LigaFast™ Rapid DNA Ligation System

- ✓ Ligation of cohesive ends in 5 minutes and blunt ends in 5 minutes at room temperature
- ✓ Qualified for blue/white screening

QUANTITY		CAT.#
30 reactions	Helix	M8221
150 reactions	Helix	M8225

T4 RNA Ligase

- ✓ Catalyzes the ATP-dependent ligation of single-stranded RNA or DNA onto the 5′-phosphoryl termini of single-stranded RNA or DNA

QUANTITY		CAT.#
500 U	Helix	M1051

Kinases

T4 Polynucleotide Kinase

- ✓ Catalyzes the transfer of the γ-phosphate of ATP to the 5′-terminus of polynucleotides or to mononucleotides bearing a 5′-hydroxyl group

QUANTITY		CAT.#
100 U	Helix	M4101
1,000 U	Helix	M4103

Nucleases

Exonuclease III

- ✓ 3′→5′ exonuclease specific for double-stranded DNA
- ✓ Catalyzes the step-by-step removal of mononucleotides
- ✓ Degradation rate can be controlled by varying the incubation temperature
- ✓ Heat inactivated at 75°C

QUANTITY		CAT.#
5,000 U	Helix	M1811
25,000 U	Helix	M1815

Ribonuclease H

- ✓ Specifically hydrolyzes the phosphodiester bonds of RNA hybridized to DNA; produces 3′-OH and 5′-P-terminated products

QUANTITY		CAT.#
50 U	Helix	M4281
250 U	Helix	M4285

RNase ONE™ Ribonuclease

- ✓ Catalyzes the degradation of RNA

QUANTITY		CAT.#
1,000 U	Helix	M4261
5,000 U	Helix	M4265

RQ1 RNase-Free DNase

- ✓ Degrades single- or double-stranded DNA to produce 3'-OH oligonucleotides
- ✓ Qualified for applications in which maintaining RNA integrity is critical

QUANTITY		CAT.#
1,000 U	Promega	M6101

S1 Nuclease

- ✓ Degrades single-stranded DNA and RNA endonucleolytically to yield 5'-P-terminated products
- ✓ Double-stranded nucleic acids are resistant to degradation except with extremely high concentrations of enzyme

QUANTITY		CAT.#
10,000 U	Promega	M5761

Other Enzymes

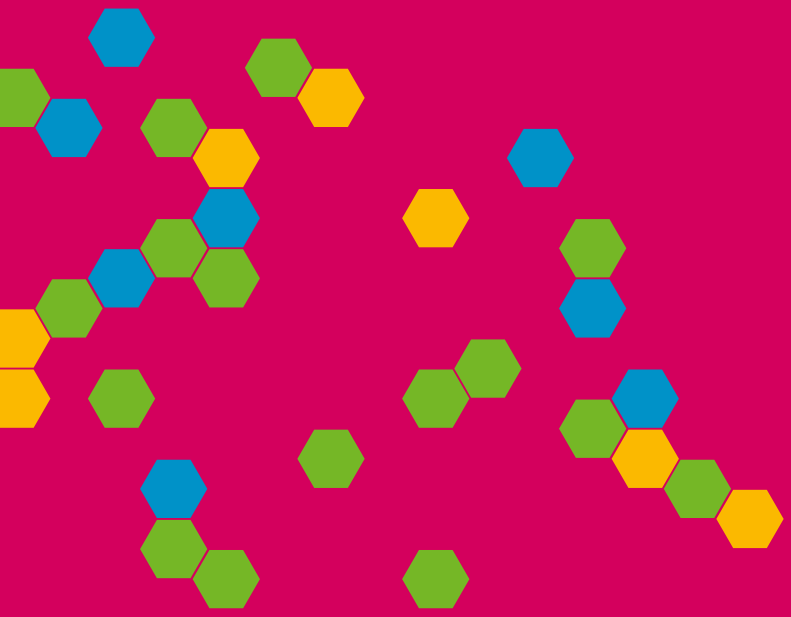
Terminal Deoxynucleotidyl Transferase, Recombinant

- ✓ Catalyzes the repetitive addition of mononucleotides to the terminal 3'-OH of a DNA initiator accompanied by the release of inorganic phosphate

QUANTITY		CAT.#
300 U	Promega	M1871
1,500 U	Promega	M1875

COMPETENT CELLS

For standard cloning experiments, competent cells are available in two formats: high efficiency at greater than 10^8 cfu/µg for cloning (JM109, HB101), and subcloning efficiency at greater than 10^7 cfu/µg (HB101). JM109 cells allow for blue/white screening of recombinants/colonies.



Competent Cells

High-quality *E. coli* competent cells are an essential part of a successful cloning protocol. Newly constructed plasmids are transformed into competent *E. coli* cells for further propagation and selection. Promega offers two different genotypes of competent *E. coli* cells for cloning purposes:

- JM109 competent cells are available for convenient transformation in two efficiencies: High efficiency at greater than 10^8 cfu/µg and subcloning efficiency at greater than 10^7 cfu/µg. JM109 cells are ideal hosts for many molecular biology applications, including blue/white screening.
- HB101 competent cells are available in high efficiency (10^8 cfu/µg) and are useful for cloning in vectors that do not require alpha-complementation for blue/white screening.

Single-Use JM109 Competent Cells, >10^8 cfu/µg

- ✓ Highly chemically competent *E. coli* cells in practical, 50 µl quantities
- ✓ No need to aliquot; direct transformation in tube
- ✓ Blue/white screening

QUANTITY	CAT.#
1 ml (20 × 50 µl)	**L2005**

Single-Use HB101 Competent Cells, >10^8 cfu/µg

- ✓ Highly chemically competent *E. coli* cells in practical, 50 µl quantities
- ✓ No need to aliquot; direct transformation in tube
- ✓ Blue/white screening

QUANTITY	CAT.#
1 ml (20 × 50 µl)	**L2015**

JM109 Competent Cells, >10^8 cfu/µg

- ✓ K strain, which is recA- and endA-, minimizes recombination
- ✓ Blue/white screening

QUANTITY	CAT.#
1 ml (5 × 200 µl)	**L2001**

JM109 Competent Cells, >10^7 cfu/µg

- ✓ K strain, which is recA- and endA-, minimizes recombination
- ✓ Blue/white screening

QUANTITY	CAT.#
1 ml (5 × 200 µl)	**L1001**

www.promega.com/genetic-markers

Explanation of genotypes

An explanation of the genotypes of these bacterial strains is available on our web site under "Technical References"

TRANSFECTION

Expect Expertise and Reliability with Transfection Reagents from Promega!

Whether FuGENE® or ViaFect™ – high transfection efficiencies combined with low toxicity are the rule. A simple protocol without medium changes reduces variability between experiments and makes everyday work easier.

Transfection Reagents

FuGENE® Transfection Reagents

- ✓ Transfection of adherent cells, suspension cell lines, primary cells and stem cells
- ✓ Tested for a wide range of mammalian cells and insect cells
- ✓ High transfection efficiency with low toxicity
- ✓ Easy to perform without medium change resulting in high reproducibility
- ✓ Serum compatible
- ✓ Contains no animal components
- ✓ Best suited for highly sensitive luciferase assays
- ✓ Comprehensive online database with transfection protocols for different cell lines and cell types

FuGENE® 4K Transfection Reagent

QUANTITY		CAT.#
1 ml	Helix	E5911
5 × 1 ml	Helix	E5912

FuGENE® 6 Transfection Reagent

QUANTITY		CAT.#
0.5 ml	Helix	E2693
1 ml	Helix	E2691
5 × 1 ml	Helix	E2692

FuGENE® HD Transfection Reagent

QUANTITY		CAT.#
1 ml	Helix	E2311
5 × 1 ml	Helix	E2312

FuGENE® SI Transfection Reagent (for small RNAs)

QUANTITY		CAT.#
1 ml	Helix	E9311
5 × 1 ml	Helix	E9312

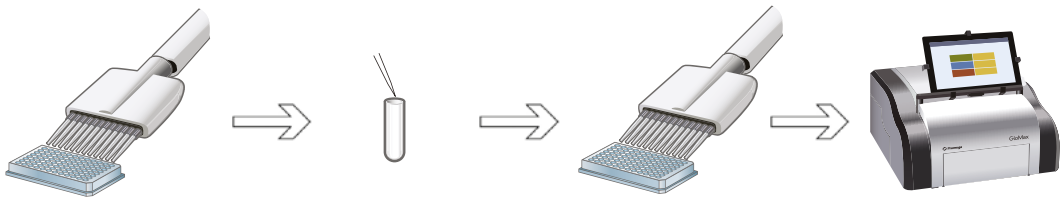
ViaFect™ Transfection Reagent

- ✓ Transfection of adherent cells, suspension cell lines, primary cells and stem cells
- ✓ High transfection efficiency with low toxicity
- ✓ Easy handling without medium change and washing of cells
- ✓ Stable throughput with minimal optimization
- ✓ Tested on a wide range of cells

QUANTITY		CAT.#
0.75 ml	Helix	E4981
2 × 0.75 ml	Helix	E4982

Simple protocol without medium change

Schematic procedure of transfection with FuGENE® or ViaFect™



Seed adherent cells one day before transfection. On the day of transfection, they should be 50–80 % confluent. Seed suspension cells on the day of transfection.

Dilute DNA in medium; add FuGENE® or ViaFect™ and incubate.

Addition of the lipid:DNA mixture to the cells. Neither medium change nor reduction of the serum is required.

Performance and measurement of luciferase activity usually after 24–48 hrs.

LEGAL INFORMATION

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We link our future to our environment

We think that everyone should contribute to the preservation of our environment. Therefore, there are numerous sustainable initiatives at Promega. Of course, we are not perfect, but we try to get better every day.

Building concepts that preserve resources

Ecological sustainability as a core value of Promega determines the design and construction of new buildings.

Promega's new buildings use sustainable resources and technologies:

- **Geothermal energy and photovoltaics**
- **Natural lighting**
- **Climate and comfort concept**
- **Rainwater utilization**

Improving the eco-balance

New targets for 2030! As we link our future to our environment, Promega has decided to set our reduction goal even higher. Our targets for 2030 include three main area for environmental protection and preservation of recources. The reductions goals relate to the base year 2019.

WASTE MINIMIZATION

Reduce waste to landfill by 30%

CLIMATE ACTION

Reduce emissions by 50%

WATER CONSERVATION

Reduce water usage by 30%

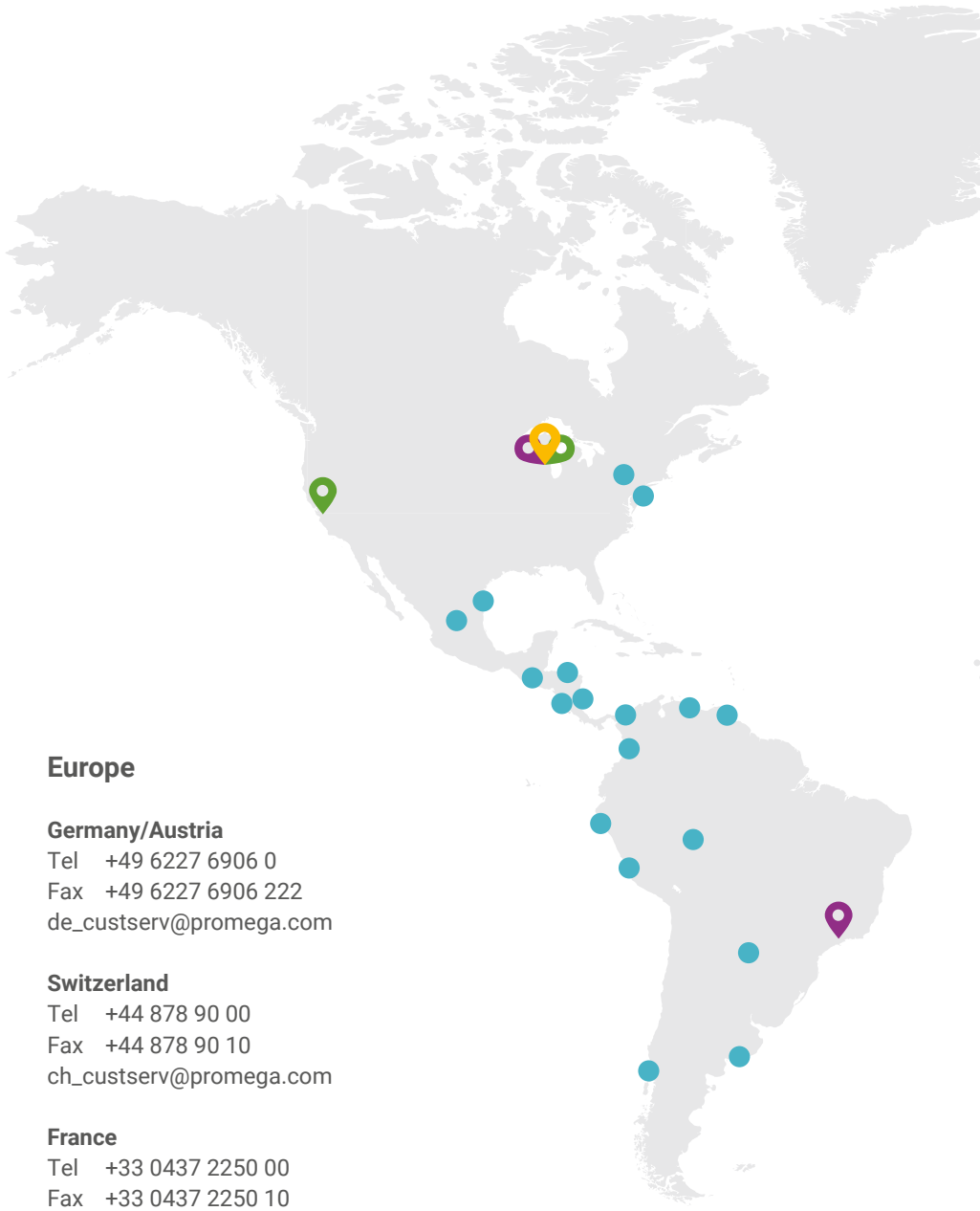
Product Design, Packaging and Distribution

Promega has reduced packaging materials in recent years:

- Smaller and lighter product packaging
- Less plastic wrapping
- Reduction of refrigerated shipments
- Reduction of paper consumption by providing invoices, user manuals and certificates as pdfs only

Thanks to the Helix® storage systems at the customer's site, many individual deliveries became a one monthly collective delivery. By purchasing CO_2 certificates, we also offset the CO_2 emissions generated in the process.

Contact



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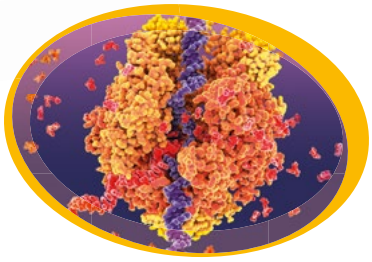
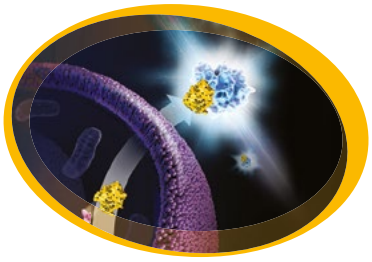
Product Portfolio

The Foundation for Scientific Progress & Innovation



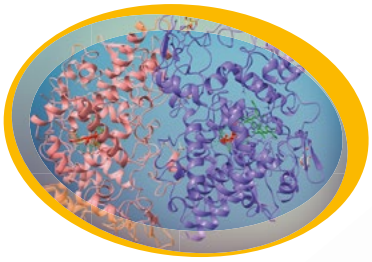
DNA & RNA Analysis

- Cloning, Enzymes, and DNA Markers
- Transfection and Epigenetics
- DNA and RNA Purification
- DNA and RNA Quantification
- DNA Amplification, PCR, and qPCR
- Reverse Transcription
- RNase Inhibitors
- NGS Sample Preparation
- Sanger Sequencing
- STR Analysis



Cell Biology

- Gene and Protein Reporters
- Viability, Cytotoxicity, and Apoptosis
- Cell Metabolism
- Oxidative Stress
- 3D Culture Analysis
- Real-time Analysis
- Signal Transduction
- Cellular Imaging
- Immunoassays

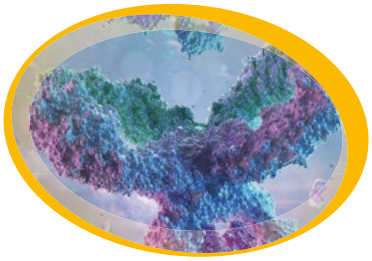


Protein Analysis

- Protein Expression
- Protein Quantification
- Protein Degradation
- Pull-down Assays
- Protein Interaction
- Protein Purification
- Mass Spectrometry

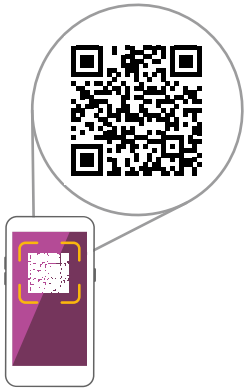
Instruments

- Luminometer, Fluorometer, and Multimode-Reader
- Automated DNA and RNA Extraction
- DNA and RNA Concentration Measurement
- Capillary Electrophoresis for Sanger Sequencing and Fragment Analysis



Reporter Potency Assays

- Fc Effector Function
- Cytokines & Growth Factors
- Immune Checkpoints
- T Cell Activation
- Drug-Target Interaction and Activity



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