Winter 2007, vol. 1.4

NEB expressions

a scientific update from New England Biolabs

Welcome to the winter edition of NEB Expressions. This issue highlights our growing line of competent cells for cloning and expression, as well as a new selection of high efficiency transfection reagents. The feature article introduces the Ocean Genome Legacy, a foundation housed at NEB, whose mission is to document, preserve and protect biological diversity of the oceans.

As always, we invite your feedback on our products, services and corporate philosophy.

inside:

NEW ENGLAND BioLabs® Inc.
the leader in enzyme technology

Preserving Marine Biodiversity

Ocean Genome Legacy facilitates effective ecosystem protection

Daniel L. Distel, Executive Director,
Ocean Genome Legacy

The ocean is the cradle of life – where life began and where most of life's fantastic diversity exists today. We depend on the ocean, not just for food, employment, and recreation, but also for the variety of ecosystem services it provides. The complex web of life in the sea produces half the oxygen we breathe, processes much of our waste, and powerfully influences the temperature, rainfall and climate of our planet. Yet this web is delicate. Mounting evidence shows that rising ocean temperatures, seawater acidification, pollution, habitat destruction and over-fishing are taking a grave toll on all marine species, from the smallest bacteria to the largest animals ever to inhabit the Earth. As a result, extinction rates of marine species are now thought to be among the highest in Earth's history.

Given the vastness of marine biodiversity, why should we care about the loss of these species? In part, the answer to this question can be found in the relationship between species diversity and ecosystem stability. Recent evidence shows that diverse marine ecosystems (ones that contain many species) are more stable, more resistant to change, and more efficient at providing the ecosystem services upon which we, and all other species, depend (1).

(continued on page 2)

Fairy basslet fish (Gramma loret) dart among blooms of lettuce coral.
© Paul Nicklen/National Geographic Image Collection

For Robust and Reliable PCR Reactions…

NEB provides high quality polymerases and ultrapure dNTPs

NEB offers a wide range of polymerases suitable for PCR and related applications. *Taq* DNA Polymerase, known for robust and reliable reactions, is already offered in a variety of formats from NEB. Now, for high-throughput reactions, we offer *Taq* DNA Polymerase in an extra-large size. This new size will perform up to 800 reactions while maintaining our value price.

In addition, NEB offers ultrapure deoxynucleotide triphosphates (dNTPs) for use in your PCR reactions. These high quality reagents are available separately, or as a convenient mix to accommodate a variety of applications.

Free dNTP Mix

For a limited time, purchase an extra-large pack of *Taq* DNA Polymerase and receive a small pack of the Deoxynucleotide Solution Mix for free.

Special Offer
Free dNTPs for PCR

Available through March 30, 2007

Taq DNA Polymerase with Standard Taq Buffer

#M0273S	400 units
#M0273L	2,000 units
#M0273X	4,000 units
#E0544S	4,000 units plus dNTPs

Taq DNA Polymerase with ThermoPol Buffer

#M0267S	400 units
#M0267L	2,000 units
#M0267X	4,000 units
#E0545S	4,000 units plus dNTPs

Deoxynucleotide Solution Mix

#N0447S	8 µmol*
#N0447L	40 µmol

*now available as 4 x 200 µl aliquots

Deoxynucleotide Solution Set

#N0446S	25 µmol of each

Preserving Marine Biodiversity

(continued from page 1)

Therefore, as individual species are lost and ecosystem diversity declines, the extinction risk for all remaining species rises, as does the threat of disruption of vital ecosystem functions.

The effects of this kind of marine ecosystem degradation are not just hypothetical, they are already beginning to impact our daily lives. For example, nearly one third of all major commercial marine fisheries are now considered to be in collapse (i.e., production has fallen below 10% of historic levels). It is estimated that, without serious intervention, all remaining fisheries will fail within the next 50 years. Certain marine communities may be at even more imminent risk. For example, since pre-industrial times 25% of all coral reefs have already disappeared. The majority of the remaining coral reef communities, which support more than one quarter of all known fish species, may be lost within the next 25 years (2). Once lost, these species and ecosystems will never return. These changes come with great human costs: higher food prices, fewer jobs, lost livelihoods and lost opportunities.

What then can be done in the face of this emerging marine biodiversity crisis? Considerable efforts are now moving towards improved regulation of fisheries, coastal development and pollution, as well as establishing marine protected areas as refuges for endangered species. However, these efforts by themselves are not enough. The fact remains that we still know very little about the extent and nature of marine biodiversity. The majority of marine species have not yet been discovered, named or described. Thus, the greatest roadblocks to effective ecosystem protection are ignorance of "normal" baseline levels of diversity within and among marine species and ecosystems, and lack of understanding of the biological interactions that create and maintain stable marine ecosystems. Without this knowledge it is impossible to devise rational conservation strategies or to assess their effectiveness. In other words, we cannot effectively protect what we do not know.

Unfortunately, progress towards understanding and protecting biological diversity is slow while habitat destruction and species extinction proceed at alarming rates. As a result, many species are disappearing before they can be discovered and described, and ecosystems are degrading before their natural undisturbed state is known and understood. For these reasons, the scientific community desperately needs ways to quickly document and preserve knowledge of threatened species and ecosystems, while at the same time speeding the progress of research that can lead to their recovery and future protection.

Ocean Genome Legacy (OGL), a non-profit organization established and supported in part by New England Biolabs Inc., believes that these goals can be achieved through the creation of a system of genome resource libraries, collections of genomic samples and supporting information representing many of the threatened species of the sea. Each genome in a collection is the sum of all of the genetic information contained within its associated organism. It can be thought of as a biochemical book that describes that organism's physiological, developmental and ecological potential, as well as its biochemical identity and evolutionary history. By preserving genomes and associated ecological and biological data, a genome resource library safeguards information and materials that have tremendous value for species and ecosystem conservation.

Ocean Genome Legacy is housed on the NEB campus.

Beyond a role in conservation, genome resource libraries also facilitate critical biological, medical and ecological research. As genome-based molecular methods become increasingly important in the natural sciences, there is an increasing need for centralized storage, management, authentication and distribution of genome source materials and their associated data. By providing broad access to limited genomic materials, fostering communication among researchers and connecting authenticated specimens with experimental and field observations, genome resource repositories increase the speed and efficacy of research that can help to cure disease and improve the sustainability of global food and energy supplies.

The idea of building biological specimen repositories is not a new one. In fact, biological repositories (e.g. blood banks, tumor banks, sperm banks, etc.) have a long and distinguished history in medical

Genomic analysis of marine biodiversity benefits many areas of science	
Physiology and Development	The genome is a complete blueprint of the physiological and developmental potential of an organism.
Evolutionary History	DNA sequences record evolutionary relationships predicting how newly discovered species might be similar or different from more well known and well studied species.
Population History	Genomic information can infer whether existing populations are thriving or heading toward possible extinction.
Ecological Functions	Genome content can reveal potential ecological roles of organisms, even those that have never been observed alive or in their natural habitat.
Identification	Genetic signatures can identify species and populations to track migrations, interbreeding and reproductive success.
Forensic Information	DNA information can track seafood product origination, aiding enforcement of environmental regulations and helping to evaluate the effectiveness of conservation efforts.
Genetic Applications	The genomes of marine organisms contain undiscovered genes with potential value for medicine, biotechnology, agriculture and industry.

research and have amply proven their ability to foster discovery and promote scientific understanding. Moreover, the recent advent of the Internet, which gives broad access to information and materials from these collections, now promises to greatly increase their value and to provide more innovative ways to use them. The time has come to apply these ideas, which have proven so valuable for medical research, to the problem of protecting the health of our natural environments.

OGL seeks to accomplish this by creating a public genome resource collection and research institute dedicated to the exploration and permanent preservation of the biological diversity of marine life. The collection will be built with the help and cooperation of the marine research community. Independent researchers and research institutions are encouraged to participate in this community resource by depositing genomic materials and information describing the species and environments from which these materials were collected. All materials and information will be made accessible, at cost, to the research community via a web site and online database to be called the Ocean Genome Resource. In this way, OGL expects the Ocean Genome Resource to grow to become not just a genome repository, but also a forum for sharing samples, information and ideas, and ultimately, an online encyclopedia and archive of the diversity of life in the oceans.

In summary, Ocean Genome Legacy is a non-profit environmental research organization dedicated to documenting, preserving and protecting the threatened biological diversity of the oceans through preservation and study of genomic materials (DNA). The mission of OGL is to preserve and provide broad access to this global genomic legacy, and so to support understanding and protection of the oceans, our planet's greatest and most influential ecosystem.

For more information about OGL or to find out how you can help support their efforts, visit their web site <www.oglf.org> or contact:

The Ocean Genome Legacy Foundation
240 County Road
Ipswich, MA 01938
E-mail: info@oglf.org
Phone: 978-380-7425

References:

1. Worm, B. et al., *Science* (2006) 314: 787–90.
2. Global Coral Reef Monitoring Network, Annual Report (2000).

The author would like to acknowledge Dr. Don Comb of New England Biolabs for his efforts and generous support in the conception and establishment of the OGL.

Marine Genome Reserves

a tool for promoting and enhancing the value of marine protected areas

Marine protected areas (MPAs) are the national parks of the sea – places where marine species and habitats are protected from unregulated development and exploitation. To date, less than 1% of the oceans fall within such protected areas, as compared to approximately 12% for terrestrial environments. OGL believes that genome conservation efforts can greatly enhance the value of existing MPAs and can provide additional incentives and financial resources for creating and maintaining new ones. To this end, OGL proposes the concept of the marine genome reserve (MGR): a public repository of genome resources and information specifically associated with and representing the principle inhabitants of an individual marine protected area. The purpose of an MGR is to enhance the conservation value of its associated marine protected area as well as protect valuable genomic information that might otherwise be lost to species extinction and ecosystem degradation.

There are a number of reasons why it is useful to archive genomes from individual MPAs. Genomic materials are easy to preserve, enormously informative, extraordinarily compact and can yield reproducible copies. Analysis of these materials yields information that can help assess the health, genetic fitness and long-term survival prospects of species and populations. Genomic materials provide a means of discovering cryptic species that are not easily detected by traditional morphological approaches. They can give insights into biological functions and biochemical capabilities of organisms that are otherwise difficult to observe. Genomic materials can be used to recreate and study functional biomolecules and biochemical pathways and so improve our understanding of the ways in which organisms function, survive and interact. These materials also provide a means for retrospective analyses that will help us to understand species decline and ecosystem degradation and guide our efforts in restoring damaged habitats to their former natural state. Finally, as methods for genetic analysis become better and cheaper, these preserved genomic materials will continue to increase in value and to provide more valuable insights into the complex biology of the marine realm.

It is relatively straightforward to incorporate an MGR into a new or existing marine protected area. Genomic materials for a marine genome reserve can be collected as part of the biotic surveys that are typically conducted in the creation and maintenance of an MPA. These genomic materials can provide improved documentation of identity and abundance of species present within the proposed protection area. Moreover, the existence of a publicly available archive of genetic materials from a well-documented and protected ecosystem is a strong incentive attracting research interest and research funding to the marine protected area and so reinforcing support for maintaining the area's protected status.

Orange-fin anemonefish (Amphiprion chrysopterus) inspects eggs laid by mate in sea anemone, as seen in the Pheonix Islands, a marine protected area.
© Paul Nicklen/National Geographic Image Collection

Marine genome reserves can also help to resolve intellectual property issues associated with marine protected areas. By improving documentation of potentially valuable genetic resources within an MPA, an MGR helps to ensure that any products or intellectual property arising from that marine protected area are used in a regulated and non-destructive manner and that a fair proportion of the benefits are returned to the nation of origin in the form of protection for its critical natural resources.

Marine genome reserves enhance the conservation value of existing marine protected areas, and increase the financial and intellectual incentives for creating new ones.

New Competent Cells and Convenient Formats

for cloning and expression

Seven new strains and several new formats have been added to the line of optimized competent cells available from NEB, resulting in a broader selection of strains with unique features for your cloning and expression needs.

Cloning Strains

NEB 5-alpha is a high efficiency derivative of DH5α™, the industry standard cloning strain. It is also offered in a *lacI*^{q} version for the cloning of toxic genes. NEB Turbo brings unmatchable speed to your transformations with visible colonies after just 8 hours. Other cloning strains include NEB 10-beta, a DH10B™ derivative, an excellent strain for transforming large plasmids and BACs, as well as dam$^-$/dcm$^-$, a strain for dam and dcm methylation-free plasmid growth.

Protein Expression

Our protein expression strains offer an extra level of confidence. NEB Express is an enhanced BL21 derivative available with or without the added control of IPTG-induced expression of non-T7 plasmids from *lacI*^{q}. Several NEB strains feature the *lysY* gene for exceptional control of expression. LysY is a variant of T7 lysozyme lacking amidase activity making the cells lysis-resistant, while retaining the ability to inhibit T7 RNA Polymerase. Basal expression of the target gene is minimized without inhibiting IPTG-induced expression. *LysY* is encoded on a single-copy miniF plasmid that does not require antibiotic selection for propagation. T7 Express (an enhanced derivative of BL21, (DE3)) is available with or without the added control of *lacI*^{q}, and both versions can be purchased with or without the *lysY* feature. T7 Express *lysY/I*^{q} provides the highest level of uninduced control. The last strain of this series, T7 Express Crystal, is a *metB* strain optimized for crystallographic experiments.

Formats

For your convenience, we offer all of these strains in two formats; 20 single-use transformation tubes (50 µl each) or 6 tubes containing 200 µl each. Both formats are supplied with SOC Outgrowth Media and a pUC19 plasmid control. The most popular cloning strain, NEB 5-alpha is offered at a subcloning efficiency for substantial value. NEB 5-alpha and NEB 10-beta are also available in electrocompetent formats. See www.neb.com for tips on Enhancing Transformation Efficiencies and for the availability of these exciting new strains.

DH5α and DH10B are trademarks of Invitrogen Corporation.

Strain Selection Cart

Characteristics	Strain
Fastest Growth – Colonies Visible After 8 Hours	NEB Turbo Competent *E. coli*
Versatile Cloning Strain	NEB 5-alpha Competent *E. coli*
Toxic Gene Cloning	NEB 5-alpha F´ *I*^{q} Competent *E. coli*
Large Plasmid and BAC Cloning	NEB 10-beta Competent *E. coli*
dam/dcm Methyltransferase Free Plasmid Growth	dam$^-$/dcm$^-$ Competent *E. coli*
Most Popular Expression Strain	NEB Express Competent *E. coli*
Control of IPTG Induced Expression	NEB Express *I*^{q} Competent *E. coli*
Most Popular T7 Expression Strain	T7 Express Competent *E. coli*
Tighter Control of IPTG Induced Protein Expression	T7 Express *I*^{q} Competent *E. coli*
Tight Control of Protein Expression by Inhibition of T7 RNA Polymerase	T7 Express *lysY* Competent *E. coli*
Highest Level of Expression Control	T7 Express *lysY/I*^{q} Competent *E. coli*
For Crystallography Experiments	T7 Express Crystal Competent *E. coli*

Advantages of NEB Competent Cells

- No animal products used
- T1 phage resistance
- Media and control plasmid included
- A variety of convenient formats, including single use transformation tubes and, on request, 96 well plates
- Bulk sales capabilities with custom packaging

Cloning Strains

NEB Turbo Competent *E. coli*
(High Efficiency)
#C2984H 20 tubes x 0.05 ml
#C2984I 6 tubes x 0.2 ml

NEB 5-alpha Competent *E. coli*
(High Efficiency)
#C2987H 20 tubes x 0.05 ml
#C2987I 6 tubes x 0.2 ml

NEW
NEB 5-alpha Competent *E. coli*
(Subcloning Efficiency)
#C2988J 6 tubes x 0.4 ml

NEW
NEB 5-alpha Electrocompetent *E. coli*
#C2989K 6 tubes x 0.1 ml

NEW
NEB 5-alpha F´ *I*^{q} Competent *E. coli*
(High Efficiency)
#C2992H 20 tubes x 0.05 ml
#C2992I 6 tubes x 0.2 ml

NEW
NEB 10-beta Competent *E. coli*
(High Efficiency)
#C3019H 20 tubes x 0.05 ml
#C3019I 6 tubes x 0.2 ml

NEW
NEB 10-beta Electrocompetent *E. coli*
#C3020K 6 tubes x 0.1 ml

dam$^-$/dcm$^-$ Competent *E. coli*
#C2925H 20 tubes x 0.05 ml
#C2925I 6 tubes x 0.2 ml

Strain Properties	NEB Turbo	NEB 5-alpha	NEB 5-alpha F´ I^q	NEB 10-beta	dam⁻/ dcm⁻	NEB Express	NEB Express I^q	T7 Express	T7 Express I^q	T7 Express *lysY*	T7 Express *lysY*/I^q	T7 Express Crystal
Transformation Efficiency (cfu/µg)*	1-3 x 10^9	1-3 x 10^9	1-3 x 10^9	1-3 x 10^9	1-3 x 10^6	2-6 x 10^8	2-6 x 10^8	2-6 x 10^8	2-6 x 10^8	2-6 x 10^8	2-6 x 10^8	2-6 x 10^8
Strain	K12	K12	K12	K12	K12	B	B	B	B	B	B	B
T1 Phage Resistant	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Blue/White Screening	✓	✓	✓	✓	–	–	–	–	–	–	–	–
lacI^q	✓	–	✓	–	–	–	✓	–	✓	–	✓	–
lysY	–	–	–	–	–	–	–	–	–	✓	✓	–
Colonies Visible after 8 hours	✓	–	–	–	–	–	–	–	–	–	–	–
Endonuclease I Deficient	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Protease Deficient	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓
Restriction Deficient	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
M13 Phage Capable (F^+)	✓	–	✓	–	–	–	–	–	–	–	–	–
RecA Deficient	–	✓	✓	✓	–	–	–	–	–	–	–	–

*Transformation Efficiencies given are for High Efficiency chemically competent strains. TE for electrocompetent strains is 1-3 x 10^{10} cfu/µg.

Expression Strains

NEW

NEB Express Competent *E. coli* (High Efficiency)
#C2523H 20 tubes x 0.05 ml
#C2523I 6 tubes x 0.2 ml

NEW

NEB Express I^q Competent *E. coli* (High Efficiency)
#C3037H 20 tubes x 0.05 ml
#C3037I 6 tubes x 0.2 ml

T7 Express Competent *E. coli* (High Efficiency)
#C2566H 20 tubes x 0.05 ml
#C2566I 6 tubes x 0.2 ml

T7 Express I^q Competent *E. coli* (High Efficiency)
#C3016H 20 tubes x 0.05 ml
#C3016I 6 tubes x 0.2 ml

Companion Product

SOC Outgrowth Media
#B9020S 100 ml

NEW

T7 Express *lysY* Competent *E. coli* (High Efficiency)
#C3010H 20 tubes x 0.05 ml
#C3010I 6 tubes x 0.2 ml

NEW

T7 Express *lysY*/I^q Competent *E. coli* (High Efficiency)
#C3013H 20 tubes x 0.05 ml
#C3013I 6 tubes x 0.2 ml

NEW

T7 Express Crystal Competent *E. coli* (High Efficiency)
#C3022H 20 tubes x 0.05 ml
#C3022I 6 tubes x 0.2 ml

T7 Express High Efficiency Sampler
#C3009I 8 tubes x 0.2 ml

For complete information on this growing line of products as well as technical tips on enhancing transformation efficiencies, please visit our web site, www.neb.com.

New T7 Express High Efficiency Sampler

Not sure which T7 Expression Strain to use? Find the optimal level of expression for your experiments by purchasing the sampler. It contains a sample of each of our superior high efficiency expression strains at an exceptional value when compared to purchasing each strain separately.

Sampler includes:
2 x 0.2 ml T7 Express
2 x 0.2 ml T7 Express I^q
2 x 0.2 ml T7 Express *lysY*
2 x 0.2 ml T7 Express *lysY*/I^q
25 ml SOC Outgrowth Media
0.025 ml 50 pg/µl puC19 Control DNA

T7 Express High Efficiency Sampler
#C3009I 8 tubes x 0.2 ml

Quick Blunting™ Kit

for efficient blunt-end ligations

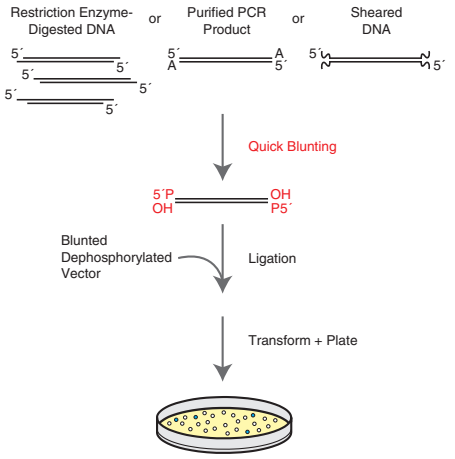
Optimize your blunt-end cloning reactions with the Quick Blunting™ Kit from NEB. This kit provides a fast and convenient method for preparing sheared, nebulized or restriction enzyme-digested DNA for blunt-ended ligation into a plasmid, cosmid, fosmid or BAC vector. In addition, it can also be used to prepare PCR products generated using non-phosphorylated primers for efficient blunt-end cloning.

Advantages

- **Fast** – Restriction enzyme-digested DNA blunted in less than 30 minutes
- **Convenient** – Reactions are performed at room temperature in a ready-to-use mix
- **Flexible** – Suitable for restriction enzyme-digested DNA, sheared or nebulized DNA and PCR products

Quick Blunting Kit
#E1201S 20 reactions
#E1201L 100 reactions

Companion Product
Quick Ligation Kit
#M2200S 30 reactions
#M2200L 150 reactions



The Quick Blunting Kit facilitates blunt-end cloning reactions.

Value Purchase

To be even more efficient with your cloning reactions, purchase the Quick Blunting™ Kit with the Quick Ligation™ Kit, and save 15%.

Quick Blunting and Quick Ligation Kits
#E0542S 20 reactions
#E0542L 100 reactions

Restriction Endonucleases from NEB

Three new restriction endonucleases have been added to our comprehensive list of over 230 specificities. For a complete listing of these essential reagents, see our web site, www.neb.com.

BspQI (R)

5′...GCTCTTC(N)$_1$▼...3′
3′...CGAGAAG(N)$_4$▲...5′

BspQI is a recombinant SapI isoschizomer with a 4-fold unit increase.

#R0712S 200 units
#R0712L 1,000 units

(R) = Recombinant

Nb.BtsI (R)

5′...GCAGTGNN...3′
3′...CGTCAC▲NN...5′

Nb.BtsI is a nicking endonuclease that cleaves only one strand of DNA on a double-stranded DNA substrate.

#R0707S 1,000 units
#R0707L 5,000 units

Nt.CviPII (R)

5′...▼CCD...3′
3′...GGH...5′

Nt.CviPII is a nicking endonuclease that cleaves only one strand of DNA on a double-stranded DNA substrate. CCT is cut less efficiently than CCG and CCA. Some of the CCT sites are not cleaved.

#R0626S 100 units
#R0626L 500 units

Coming this Spring...

The 2007•08 NEB Catalog & Technical Reference

Some highlights of the 2007•08 catalog include:

- over 100 new products
- updated reference appendix
- technical tips for PCR, transformation and protein expression

Please make sure your contact information is up-to-date by contacting your local distributor.

Coming this Summer...

22nd Annual Molecular Biology Workshop

This intensive, two-week summer course held at Smith College in Massachusetts, USA, emphasizes hands-on molecular biology laboratory work and covers a wide variety of topics and techniques, including:

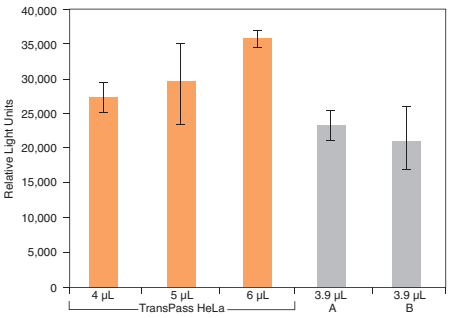
- gene cloning
- PCR and qRT-PCR
- DNA sequencing and fingerprinting
- gene expression analysis
- genomics and bioinformatics
- RNAi, siRNA and microarrays

No previous experience in molecular biology is required or expected. For additional information, course dates and to fill out an application, visit the Summer Workshop web site: http://www.science.smith.edu/neb

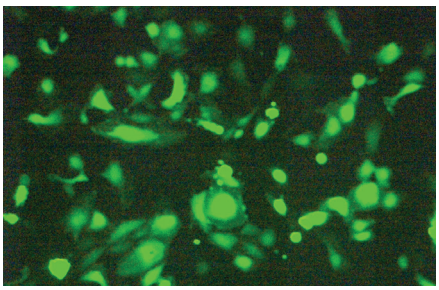
High Efficiency Transfection Reagents

for the transfection of mammalian cells with DNA, RNA and protein

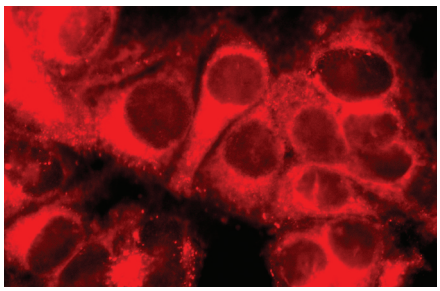
NEB offers a broad selection of high efficiency transfection reagents suitable for transfecting DNA, siRNA and protein. For the transfection of DNA and siRNA, choose from a selection of general purpose reagents or reagents optimized for specific cell lines. In addition, NEB introduces a reagent that can deliver proteins, peptides or antibodies with exceptional efficiency. If you work with common cell lines, difficult to transfect or primary cells, NEB has a transfection reagent to satisfy your needs.



TransPass HeLa Transfection Reagent:
Comparison to other commercially available transfection reagents (A,B) for HeLa cells by transfection with a Gaussia luciferase construct.



TransPass HUVEC Transfection Reagent:
Transfection of primary Human Umbilical Vein Endothelial Cells (HUVEC) with a GFP-expressing vector.



TransPass P Protein Transfection Reagent:
NIH 3T3 cells were transfected with a recombinant protein labeled with Rhodamine and TransPass P.

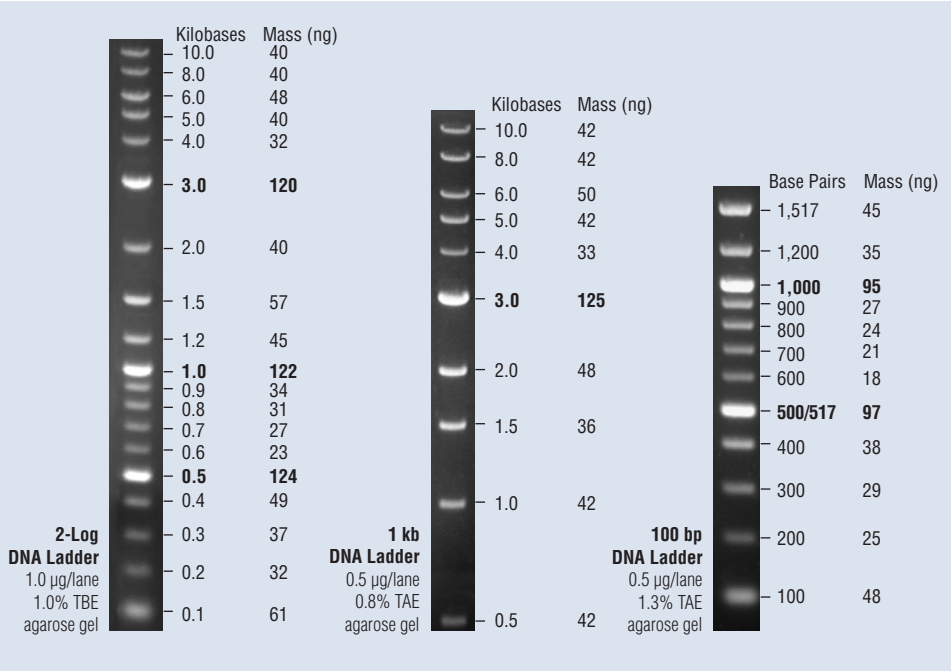
Transfection Reagents Selection Chart	Description	Catalog #	Number of Transfections*
Transfection of DNA			
TransPass™ D1 Transfection Reagent	A cationic lipid vesicles formulation for transfection of plasmid DNA in many mammalian cell lines, including primary hepatocytes.	M2553S	65–200
		M2553L	325–1000
TransPass™ D2 Transfection Reagent	A general use non-lipid cationic polymer based reagent for transfection of plasmid DNA in many mammalian cell lines, including primary cells and endothelial cell lines.	M2554S	50–100
		M2554L	250–500
NEW TransPass™ HeLa Transfection Reagent	A lipid/cationic polymer formulation for transfection of plasmid DNA or siRNA into HeLa cells with a serum-compatible protocol.	M2556S	70–100
NEW TransPass™ COS/293 Transfection Reagent	Based on TransPass D2 and customized for optimal transfection of plasmid DNA into COS and HEK293 cells with a serum compatible protocol.	M2557S	200–400
NEW TransPass™ HUVEC Transfection Reagent	A two component formulation specifically designed for transfecting endothelial cells, including HUVEC and HMVEC, with optimal efficiency.	M2558S	150–250
Transfection of siRNA			
TransPass™ R1 Transfection Reagent	A polyamine-lipid formulation designed specifically for the efficient transfection of siRNA in mammalian cell lines.	M2551S	50–100
TransPass™ R2 Transfection Reagent	A two component formulation specifically developed for the efficient transfection of siRNAs into difficult to transfect mammalian cell lines, including primary cells, endothelial cells, lymphocytes and muscle cells.	M2552L	200
Transfection of Protein			
NEW TransPass™ P Protein Transfection Reagent	For efficient delivery of proteins and peptides into a wide range of mammalian cells via endocytosis. The direct delivery of active proteins such as enzymes and antibodies eliminates the need for a DNA expression construct.	M2563S	125–250**

* Number of transfections is based on a 6-well plate format.
** Number of transfections determined for 1 µg protein.

DNA Ladders from NEB

now available in a variety of convenient formats

Our 2-Log, 1 kb and 100 bp DNA Ladders are now offered in three formats. Choose from the conventional ladder, the Quick-Load version using bromophenol blue as a tracking dye, or TriDye containing three dyes to facilitate monitoring of gel migration. Our ladders include only DNA fragments that are part of the ladder with no "extra" backbone DNA – you pay for the ladder and nothing else.



2-Log DNA Ladder Formats

2-Log DNA Ladder (0.1–10.0 kb)
#N3200S 100 µg
#N3200L 500 µg

Biotinylated 2-Log DNA Ladder
#N7554S 25 µg

Quick-Load™ 2-Log DNA Ladder
#N0469S 125 gel lanes

TriDye™ 2-Log DNA Ladder
#N3270S 125 gel lanes

1 kb DNA Ladder Formats

1 kb DNA Ladder
#N3232S 100 µg
#N3232L 500 µg

Quick-Load™ 1 kb DNA Ladder
#N0468S 125 gel lanes

TriDye™ 1 kb DNA Ladder
#N3272S 125 gel lanes

100 bp DNA Ladder Formats

100 bp DNA Ladder
#N3231S 50 µg
#N3231L 250 µg

Quick-Load™ 100 bp DNA Ladder
#N0467S 125 gel lanes

TriDye™ 100 bp DNA Ladder
#N3271S 125 gel lanes

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