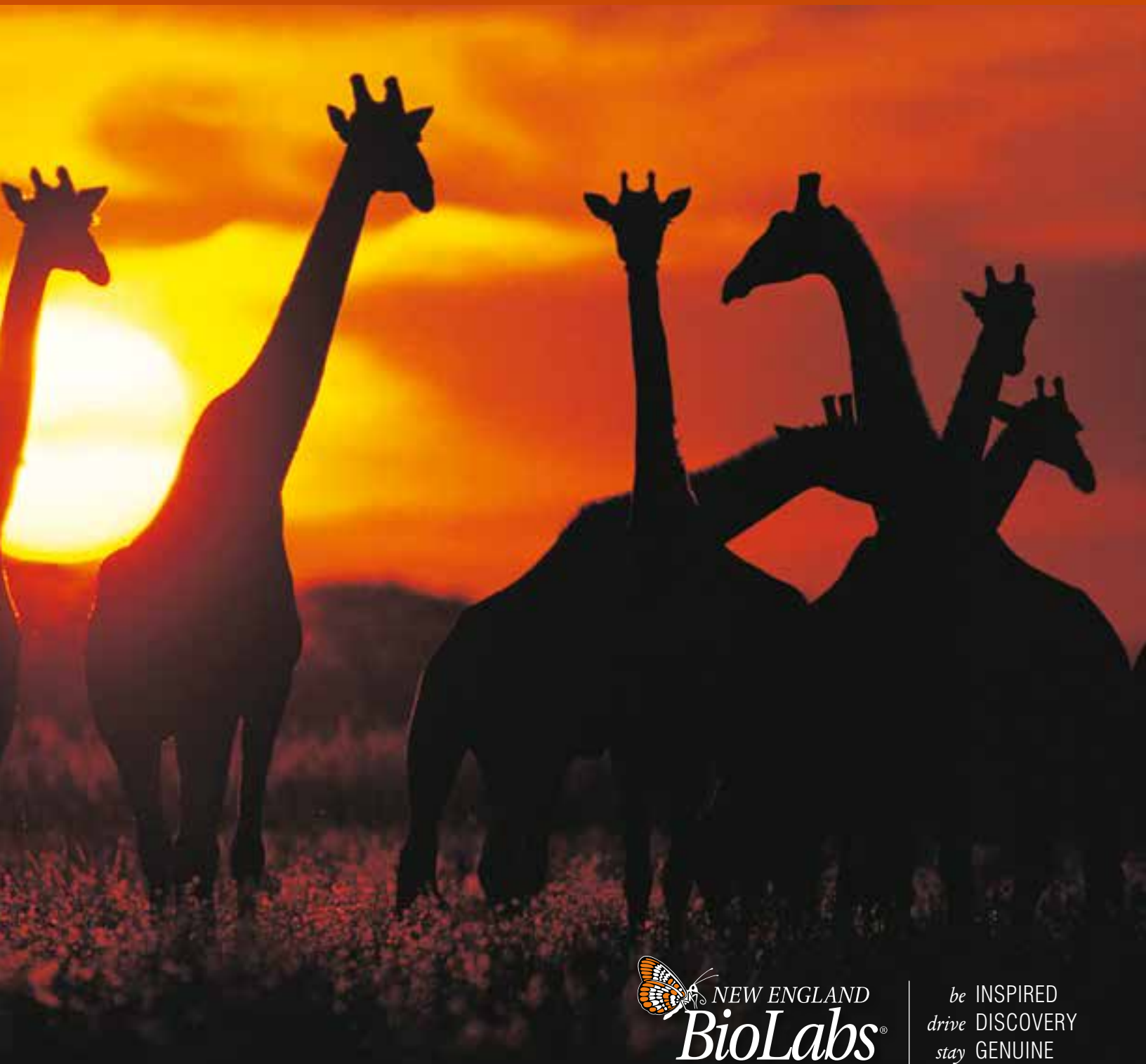


# DNA Ligases and Ligase Master Mixes

STICK TOGETHER



*be* INSPIRED  
*drive* DISCOVERY  
*stay* GENUINE

# Stick together.

## DNA Ligases and Ligase Master Mixes from New England Biolabs

With over 40 years of experience in the development and production of enzymes for molecular biology, NEB® now offers the most extensive selection of high-quality, and performance- optimized DNA ligases and ligase master mixes.

### Benefits of DNA Ligases and Ligase Master Mixes:

- Fast ligations
- Robust ligation efficiency
- Industry standard for purity
- Most extensive selection commercially available
- New formulations optimized for your substrates
- Convenient master mix formats
- Highest fidelity



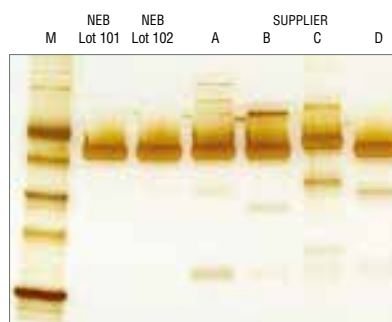
Interested in tips to optimize your ligation experiments?  
Visit [NEBStickTogether.com](http://NEBStickTogether.com) to view videos from NEB scientists.



# Choose NEB DNA Ligases for quality and performance

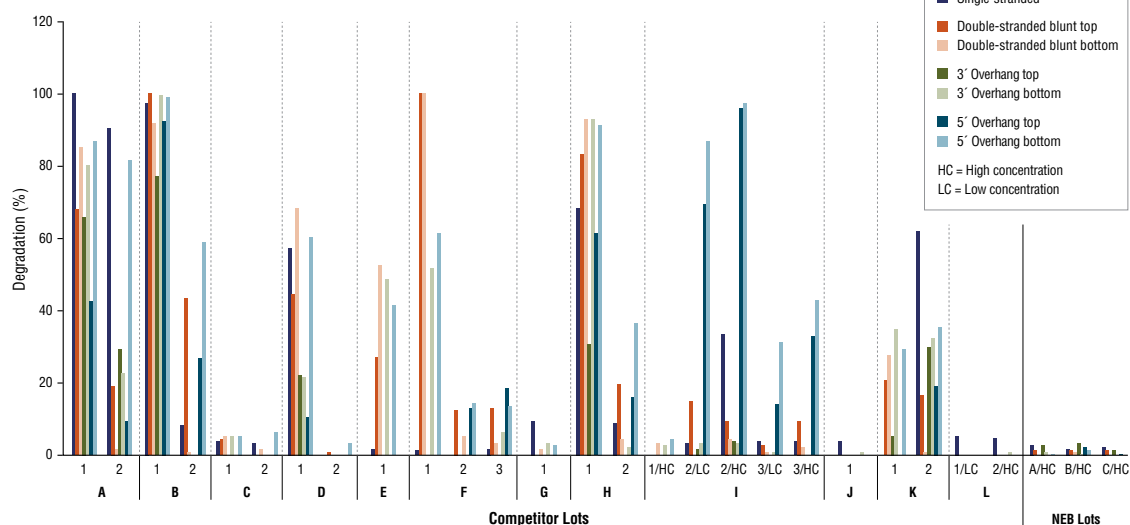
NEB ligases and ligase master mixes are manufactured to the highest level of purity, and then rigorously tested for optimal performance. NEB's T4 DNA Ligase has been referenced in peer-reviewed publications for decades, and is renowned for its consistent quality. For details on quality controls performed, see [www.neb.com/ligasequality](http://www.neb.com/ligasequality).

Experience extreme purity with NEB's T4 DNA Ligase



Equivalent amounts of protein were loaded and silver stained using SilverXpress™. Marker M is NEB's Broad Range Protein Marker (NEB #P7702).

NEB's T4 DNA Ligase contains less contaminating activity



T4 DNA Ligase from multiple suppliers was tested in reactions containing a fluorescent labeled single stranded, double stranded blunt, 3' overhang or 5' overhang containing oligonucleotides. The percent degradation by contaminating nucleases is determined by capillary electrophoresis and peak analysis. The resolution is at the single nucleotide level.

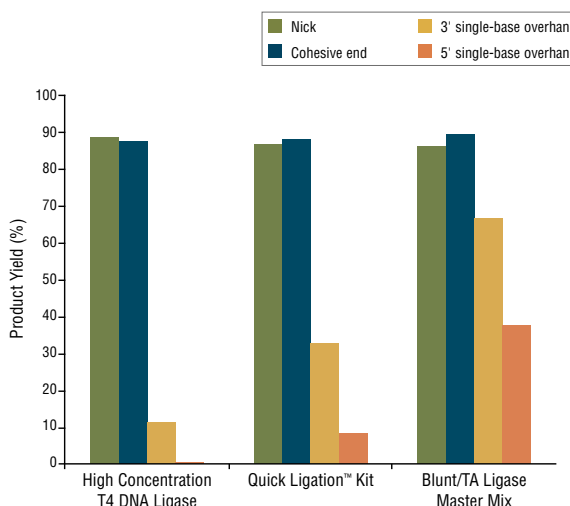
## Ensure success with formulations specific for blunt-, T/A or sticky-ends

End architecture (blunt-, T/A or sticky-ends) determines ligation efficiency. NEB offers ligases specifically optimized for either blunt or sticky ends, including single-base overhangs. This increased efficiency gives you confidence that your cloning experiment will succeed the first time, every time.



To learn more about how NEB's Blunt/TA Ligase Master Mix outperforms other ligases on difficult to ligate substrates, download our application notes at [NEBStickTogether.com](http://NEBStickTogether.com)

Blunt/TA Ligase Master Mix improves yields for ends that typically react slowly



Yields of final ligation product for all reaction conditions using high concentration T4 DNA Ligase (NEB #M0202), The Quick Ligation Kit (NEB #M2200), and the Blunt/TA Ligase Master Mix (NEB #M0367). Nick, cohesive end and cohesive end 3' single-base overhang substrates were incubated for 15 minutes; the 5' single-base overhang was incubated for 1 hour.

# Properties of DNA Ligases

This chart summarizes the activity information for NEB's DNA Ligases.  
For performance in various applications, see chart on other side.

LIGASE	PRODUCT NUMBER	RECOMMENDED REACTION TEMP. (USEFUL RANGE)	HEAT INACT.	COFACTOR	MAIN APPLICATIONS	OTHER NOTES
<b>T4 DNA Ligase</b>	M0202S/L	25°C (4–37°C)	Y (65°C)	ATP	Ligation of nicks in dsDNA and joining dsDNA fragments with complementary overhangs > 2 bases in length. Routine cloning.	T4 DNA Ligase can ligate other substrates with reduced efficiency, including: nicks containing mismatches and 1 or 2 nt gaps; dsDNA fragments with blunt ends and single-base overhangs; and the 3' end of RNA to a 5' pDNA when annealed to a DNA complement.
<b>T4 DNA Ligase, High Concentration</b>	M0202T/M	25°C (4–37°C)	Y (65°C)	ATP	Ligation of nicks in dsDNA and joining dsDNA fragments with complementary overhangs > 2 bases in length. Routine cloning.	5X enzyme concentration over standard T4 DNA Ligase, good for increasing reaction rates or for bulk users. See additional notes for T4 DNA Ligase.
<b>Quick Ligation™ Kit</b>	M2200	25°C (4–37°C)	N	ATP	Rapid ligation of dsDNA fragments with sticky or blunt ends. Routine cloning.	Buffer contains PEG—do not heat inactivate or transform via electroporation. Will also ligate nicks containing mismatches and 1 or 2 nt gaps with high efficiency.
<b>Blunt/TA Ligase Master Mix</b>	M0367	25°C (4–37°C)	N	ATP	Fastest ligation of blunt and single base overhang (T/A) substrates. T/A cloning. Best choice for adaptor ligation in NGS sequencing library preparation.	One-tube master mix format. Contains a proprietary enhancer that increases ligation yields. Contains PEG—do not heat inactivate or transform via electroporation. Will also ligate nicks containing mismatches and 1 or 2 nt gaps with high efficiency.
<b>Instant Sticky End Ligase Master Mix</b>	M0370	25°C (4–37°C)	N	ATP	Fastest ligation of dsDNA with sticky ends. Routine cloning.	One tube master mix format. Contains a proprietary enhancer that increases ligation yields. Contains PEG—do not heat inactivate or transform via electroporation. Will also ligate nicks containing mismatches and 1 or 2 nt gaps with high efficiency.
<b>ElectroLigase®</b>	M0369	25°C (4–37°C)	Y (65°C)	ATP	Efficient ligation of nicks, sticky ends, and blunt or T/A ends when a PEG-free mixture is required. Suitable for direct transformation via electroporation.	Contains a proprietary enhancer that increases ligation yields. See also notes for T4 DNA Ligase.
<b>T3 DNA Ligase</b>	M0317	25°C (4–37°C)	N	ATP	A salt-tolerant enzyme for the ligation of nicks, cohesive ends, and blunt ends in dsDNA. Routine cloning.	Buffer contains PEG—do not heat inactivate or transform via electroporation. Can be used with the PEG-free T4 DNA Ligase Buffer (NEB #B0202) with reduced activity. Can also ligate the 3' end of RNA to 5' pRNA when annealed to a DNA complement.
<b>T7 DNA Ligase</b>	M0318	25°C (4–37°C)	N	ATP	Allows selective ligation of nicks and cohesive ends in dsDNA, not ligating blunt ends or single base overhangs.	Buffer contains PEG—do not heat inactivate or transform via electroporation. High specificity for correctly base-paired nicks if used with T4 DNA Ligase Buffer (NEB #B0202) instead of supplied T7 DNA Ligase Buffer.
<b><i>E. coli</i> DNA Ligase</b>	M0205	25°C (4–37°C)	Y (65°C)	NAD	Selective ligation of nicks in dsDNA without significant joining of dsDNA fragments regardless of end type. cDNA synthesis.	Used in some cDNA library preparation protocols.
<b>HiFi Taq DNA Ligase</b>	M0647S	60°C (37–75°C)	N	NAD	Thermostable NAD dependent ligase that ligates only nicks in dsDNA with the highest discrimination against mismatched bases. Useful for SNP detection through LDR and other ligation based detection methods.	Use Thermostable Ligase Reaction Calculator to estimate incubation temperature.
<b>9°N™ DNA Ligase</b>	M0238	60°C (45–70°C)	N	ATP	Thermostable ATP-dependent ligase that ligates only nicks in dsDNA with a high discrimination against mismatched bases. Useful for LDR and other ligation-based detection methods.	
<b>Taq DNA Ligase</b>	M0208	60°C (37–75°C)	N	NAD	Thermostable NAD-dependent ligase that ligates only nicks in dsDNA with a high discrimination against mismatched bases. Useful for LDR and other ligation-based detection methods.	Used in Gibson Assembly® methods.
<b>SplintR® Ligase</b>	M0375	25°C (4–37°C)	Y (65°C)	ATP	Ligation of the 3' end of DNA to a 5' pDNA annealed to an RNA complement. Specific detection of RNA sequences through the ligation of complementary DNA probes.	Ligates fully DNA substrates with high efficiency. Can also ligate the 3' end of RNA to 5' pDNA when annealed to either DNA or RNA complements.

# Choose the right DNA ligase product for your needs.

NEB offers a variety of ligases for DNA research. All of these enzymes are recombinant, and all offer the quality and value you have come to expect from our products. While more than one ligase may work for your application, the following selection chart presents our recommendations for optimal performance.

	BLUNT/TA LIGASE MASTER MIX #M0367	INSTANT STICKY-END LIGASE MASTER MIX #M0370	QUICK LIGATION™ KIT #M2200	T4 DNA LIGASE #M0202	ELECTRO LIGASE® #M0369	T3 DNA LIGASE #M0317	T7 DNA LIGASE #M0318	HIFI TAQ DNA LIGASE #M0647	<i>E. coli</i> DNA LIGASE #M0205	TAQ DNA LIGASE #M0208	9°N™ DNA LIGASE #M0238	NEBNEXT® QUICK LIGATION MODULE #E6056	SPLINTR® LIGASE #M0375
DNA APPLICATIONS													
Ligation of sticky ends	★★	★★★★	★★★★	★★	★★	★★	★★	★	★	★	★		
Ligation of blunt ends	★★★★	★	★★★★	★★	★★	★★							
T/A cloning	★★★★	★	★★	★★	★★	★	★						
Electroporation				★★	★★★★								
Ligation of sticky ends only							★★★★						
Repair of nicks in dsDNA	★★	★★	★★	★★★★	★★	★★	★★	★★	★★	★★	★★		★★
High complexity library cloning	★★	★★	★★	★★★★	★★								
Adaptor Ligation	★★★★	★★	★★	★	★★	★						▲	
Ligation Dependent DNA Sequence & SNP Detection (LCR, LDR, & related methods)								★★★★		★★	★★		
Ligation Dependent RNA Sequence & SNP Detection				★									★★★★
Ligation of adjacent ssDNA on an ssRNA Splint													★★★★
NGS APPLICATIONS													
NGS Library Prep dsDNA-dsDNA (ligation)	▲			▲		▲						▲	
FEATURES													
Salt tolerance (> 2X that of T4 DNA Ligase)						✓							
Ligation in 15 min. or less	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓
Master Mix Formulation	✓	✓										✓	
Thermostable								✓		✓	✓		
Recombinant	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

★★★★ Optimal, recommended ligase for selected application

★★ Works well for selected application

★ Will perform selected application, but is not recommended

▲ Please consult the specific NGS protocol to determine the optimal enzyme for your needs



# Choose from the widest selection of ligases commercially available

NEB offers 13 different DNA ligase products, more than any other supplier. Why look elsewhere for ligases when NEB has the widest selection?

PRODUCT	NEB #	UNIT SIZE
9°N DNA Ligase	M0238S/L	2,500/12,500 units
Blunt/TA Ligase Master Mix	M0367S/L	50/250 reactions
<i>E. coli</i> DNA Ligase	M0205S/L	200/1,000 units
ElectroLigase	M0369S	50 reactions
HiFi <i>Taq</i> DNA Ligase	M0647S	50 reactions
Instant Sticky-end Ligase Master Mix	M0370S/L	50/250 reactions
NEBNext Quick Ligation Module	E6056S/L	20/100 reactions
Quick Ligation Kit	M2200S/L	30/150 reactions
SplintR Ligase	M0375S/L	1,250/6,250 units
T3 DNA Ligase	M0317S/L	100,000/750,000 units
T4 DNA Ligase	M0202S/L/M/T	20,000/10,000 units
T7 DNA Ligase	M0318S/L	100,000/750,000 units
<i>Taq</i> DNA Ligase	M0208S/L	2,000/10,000 units

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For more information,  
visit **NEBStickTogether.com**

## Featured Online Tools



For help with choosing the best ligase for your experiment,  
try NEBcloner at [NEBcloner.neb.com](http://NEBcloner.neb.com).



For help with calculating molar ratios for your ligation reaction  
try NEBioCalculator at [NEBioCalculator.neb.com](http://NEBioCalculator.neb.com).



For help with calculating optimal ligase reaction temperature,  
try Thermostable Ligase Reaction Temperature Calculator  
at [LigaseCalc.neb.com](http://LigaseCalc.neb.com)

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