

SUPPORTING MOLECULAR DIAGNOSTICS

NGS- AND AMPLIFICATION-BASED SOLUTIONS



NEW ENGLAND

BioLabs

be INSPIRED
drive DISCOVERY
stay GENUINE

IT'S TIME TO THINK DIFFERENTLY

The COVID-19 pandemic elevated many of the challenges faced by clinical labs, requiring new and innovative solutions to address them. Technology development is happening faster than ever before, increasing the need for innovation and thinking differently about how diagnostics should be developed, manufactured and deployed.

Many scientists know NEB as a trusted reagent provider to the life science community. What many do not know is that we also offer a portfolio of products that serve as critical components for a wide array of diagnostic products and services. Extensive molecular biology and enzymology experience enable us to help customers solve the challenges inherent in technology development and ultimately in scale-up and commercialization. The acquisition of Fluorogenics™ Limited (FGL), now NEB Lyophilization Sciences™, combines lyophilization expertise with NEB's diverse product portfolio to offer lyophilized and lyo-compatible products, along with custom services optimized for diagnostic assay and platform developers.

Learn more at www.neb.com/MDx.



NGS-BASED MOLECULAR DIAGNOSTICS

Sequencing is enabling scientists to make rapid advances in epidemiology and surveillance, basic and clinical research, and diagnostics. A fast-growing number of methods are being developed to address whole genome, as well as targeted approaches. In all cases, streamlined workflows that result in high-quality, high yield libraries are critical towards optimizing your next generation sequencing (NGS) results. The table below summarizes some of the products available from NEB for diagnostic applications.

APPLICATION		PRODUCTS	NOTES
NGS-BASED MOLECULAR DIAGNOSTICS	DNA Sequencing	DNA library preparation with enzymatic DNA fragmentation NEBNext® Ultra™ II FS DNA Library Prep Kit for Illumina® (NEB #E7805) NEBNext® Ultra™ II FS DNA PCR-free Library Prep Kit for Illumina® (NEB #E7730) NEBNext Ultra II FS DNA Module (NEB #E7810) NEBNext Ultra II Q5® Master Mix (NEB #M0544) NEBNext Adaptors and Primers (www.neb.com/oligos)	<ul style="list-style-type: none"> • Range of packaging options including 96-well plates • Component and kit customization • Kitting • Automation-compatible • Streamlined workflows
		DNA library preparation for cDNA or pre-sheared DNA NEBNext Ultra II DNA Library Prep Kit for Illumina (NEB #E7645) NEBNext Ultra II DNA PCR-free Library Prep Kit for Illumina (NEB #E7410) NEBNext Ultra II End Repair/dA-Tailing Module (NEB #E7546) NEBNext Ultra II Ligation Module (NEB #E7595) NEBNext Ultra II Q5 Master Mix (NEB #M0544) NEBNext Adaptors and Primers	
	RNA Sequencing	Depletion of abundant RNAs and enrichment of poly(A)-tailed mRNA NEBNext rRNA Depletion Kit v2 (Human/Mouse/Rat) (NEB #E7400) NEBNext Globin & rRNA Depletion Kit (Human/Mouse/Rat) (NEB #E7750) NEBNext rRNA Depletion Kit (Bacteria) (NEB #E7850) NEBNext RNA Depletion Core Reagent Set (for customized depletion) (NEB #E7865) NEBNext Poly(A) mRNA Magnetic Isolation Module (NEB #E7490)	
		RNA library preparation NEBNext Ultra II Directional RNA Library Prep Kit for Illumina (NEB #E7760) NEBNext Ultra II RNA First Strand Synthesis Module (NEB #E7771) NEBNext Ultra II Directional RNA Second Strand Synthesis Module (NEB #E7550) NEBNext Ultra II End Repair/dA-Tailing Module (NEB #E7546) NEBNext Ultra II Ligation Module (NEB #E7595) NEBNext Ultra II Q5 Master Mix (NEB #M0544) NEBNext Adaptors and Primers NEBNext Immune Sequencing Kit (Human) (NEB #E6320)	
		Virus sequencing and detection NEBNext ARTIC SARS-COV-2 FS Library Prep Kit (Illumina) (NEB #E7658) NEBNext ARTIC SARS-COV-2 Library Prep Kit (Illumina) (NEB #E7650) NEBNext ARTIC SARS-COV-2 Companion Kit (Oxford Nanopore Technologies) (NEB #E7660) NEBNext ARTIC SARS-COV-2 RT-PCR Module (NEB #E7626) LunaScript RT SuperMix Kit (NEB #E3010) Q5 Hot Start High-Fidelity 2X Master Mix (NEB #M0494) NEBNext Ultra II End Repair/dA-Tailing Module (NEB #E7546) Blunt/TA Ligase Master Mix (NEB #M0367) NEBNext Quick Ligation Module (NEB #E6056) NEBNext Ultra II RNA Library Prep Kit for Illumina (NEB #E7770) WarmStart® LAMP Kit (DNA & RNA) (NEB #E1700)	

To inquire about bulk and/or custom formats, or GMP-grade* reagent production, contact us at custom@neb.com.



AMPLIFICATION-BASED MOLECULAR DIAGNOSTICS

As the first company to sell *Taq* DNA Polymerase, NEB has a long history in the development of reliable and convenient tools for amplification, and offers a large selection of products for PCR, qPCR, RT-qPCR and isothermal amplification. Our expertise in this area has allowed us to develop optimized enzymes for a variety of applications, including incorporation into diagnostics. The table below summarizes some of the products available.

APPLICATION	PRODUCTS	PRODUCT NOTES	CUSTOM FORMULATIONS AVAILABLE	
PCR APPLICATIONS	DNA, Dye Luna® Universal qPCR Master Mix (NEB #M3003) DNA, Probe Luna Universal Probe qPCR Master Mix (NEB #M3004)	<ul style="list-style-type: none"> Compatible with automation and reaction miniaturization Room temperature stable for ≥ 24 hours 	<ul style="list-style-type: none"> Blue-dye-free Lyo-compatible 	
	RNA (1-step), Dye Luna Universal One-Step RT-qPCR Kit (NEB #E3005) RNA (1-step), Probe Luna Probe One-Step RT-qPCR 4X Mix with UDG (NEB #M3019) Luna Probe One-Step RT-qPCR 4X Mix with UDG (No ROX) (NEB #M3029) Luna Universal Probe One-Step RT-qPCR Kit (NEB #E3006) Luna Probe One-Step RT-qPCR Kit (No ROX) (NEB #E3007) Luna SARS-CoV-2 RT-qPCR Multiplex Assay Kit (NEB #E3019) LyoPrime Luna™ Probe One-Step RT-qPCR Mix with UDG (NEB #L4001)	<ul style="list-style-type: none"> Luna WarmStart RT paired with Hot Start <i>Taq</i> increases reaction specificity and robustness Compatible with automation and reaction miniaturization Room temperature stable for ≥ 24 hours Lyophilized format (NEB #L4001) 	<ul style="list-style-type: none"> Blue-dye-free Lyo-compatible Add primers and probes (NEB #L4001) 	
	RNA (2-step) LunaScript® RT SuperMix Kit (NEB #E3010/M3010)	<ul style="list-style-type: none"> Novel engineered RT Single-tube format 13-minute cDNA synthesis protocol 	<ul style="list-style-type: none"> Blue-dye-free Primer-free 	
	Master Mixes Q5® Hot Start High-Fidelity 2X Master Mix (NEB #M0494) Q5 High-Fidelity 2X Master Mix (NEB #M0492) Standalone Enzyme & Buffer Q5 Hot Start High-Fidelity DNA Polymerase (NEB #M0493) Q5 High-Fidelity DNA Polymerase (NEB #M0491)	<ul style="list-style-type: none"> ~280X fidelity of <i>Taq</i> Consistent, fast, reliable performance Compatible with automation and reaction miniaturization Room temperature stable for ≥ 24 hours 	<ul style="list-style-type: none"> High conc. Glycerol-free Custom mixes 	
	Q5 Blood Direct 2X Master Mix (NEB #M0500)	<ul style="list-style-type: none"> Amplification direct from blood 		
	Hot Start <i>Taq</i> DNA Polymerase (NEB #M0495) Hot Start <i>Taq</i> 2X Master Mix (NEB #M0496)	<ul style="list-style-type: none"> Unique aptamer-based enzyme control supports fast protocols 	<ul style="list-style-type: none"> High conc. Glycerol-free 	
	ISOTHERMAL APPLICATIONS	WarmStart® Colorimetric LAMP 2X Master Mix (DNA & RNA) (NEB #M1800) WarmStart Colorimetric LAMP 2X Master Mix with UDG (NEB #M1804)	<ul style="list-style-type: none"> Fast, clear pink-to-yellow visible detection of amplification Results in approximately 30 minutes Automation-compatible when coupled with absorbance plate reader 	
		SARS-CoV-2 Rapid Colorimetric LAMP Assay Kit (NEB #E2019)	<ul style="list-style-type: none"> Simple, colorimetric detection of amplification of SARS-CoV-2 nucleic acid 	
		WarmStart LAMP Kit (DNA & RNA) (NEB #E1700) WarmStart Multi-Purpose LAMP/RT-LAMP 2X Master Mix (with UDG) (NEB #M1708) WarmStart Fluorescent LAMP/RT-LAMP Kit (with UDG) (NEB #E1708)	<ul style="list-style-type: none"> Master mix for LAMP and RT-LAMP workflows Supports multiple detection methods, including fluorescence and turbidity 	<ul style="list-style-type: none"> Lyo-compatible High conc.
		<i>Tte</i> UvrD Helicase (NEB #M1202)	<ul style="list-style-type: none"> Improves specifically of fluorescent LAMP reactions 	<ul style="list-style-type: none"> High conc.
<i>Bsf</i> 2.0 WarmStart DNA Polymerase (NEB #M0538) <i>Bsf</i> 2.0 DNA Polymerase (NEB #M0537)		<ul style="list-style-type: none"> Improved reaction properties compared to wild-type <i>Bsf</i> DNA Polymerase Increased dUTP tolerance enables carryover prevention 	<ul style="list-style-type: none"> Glycerol-free High conc. 	
<i>Bsf</i> 3.0 DNA Polymerase (NEB #M0374)		<ul style="list-style-type: none"> DNA binding domain fusion supports robust performance Significantly increased RT activity up to 72°C enables single enzyme RT-LAMP 	<ul style="list-style-type: none"> Glycerol-free High conc. 	
WarmStart RTx Reverse Transcriptase (NEB #M0380)		<ul style="list-style-type: none"> <i>In-silico</i> designed RT for RT-LAMP with reversibly-bound aptamer that inhibits activity below 40°C 	<ul style="list-style-type: none"> Glycerol-free High conc. 	
Strand Displacement Nt.BstNBI (NEB #R0607) WarmStart Nt. BstNBI (NEB #R0725) phi29 DNA Polymerase (NEB #M0269)			<ul style="list-style-type: none"> Glycerol-free High conc. 	
Helicase-dependent Amplification IsoAmp II Universal tHDA Kit (NEB #H0110)		<ul style="list-style-type: none"> Requires only two primers Produces short, discrete DNA products 		
Other		<ul style="list-style-type: none"> <i>Bsu</i> DNA Polymerase Large Fragment (NEB #M0330) T4 Gene 32 Protein (NEB #M0300) Deoxynucleotide (dNTP) Solution Mix (NEB #N0447) Nuclease-free water (NEB #B1500) Antarctic Thermolabile UDG (NEB #M0372) Proteinase K, Molecular Biology Grade (NEB #P8107) Thermolabile Proteinase K (NEB #P8111) 	<ul style="list-style-type: none"> Enables low temperature isothermal applications Can increase yield and efficiency of amplification reactions Custom conc. Unique thermolabile version is completely inactivated in typical isothermal and RT-qPCR workflows Unique thermolabile version is completely inactivated in typical isothermal and RT-qPCR workflows 	<ul style="list-style-type: none"> High conc. Glycerol-free Custom conc.

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