NEW ENGLAND BioLabs Inc.

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New England Biolabs
Certificate of Analysis

Product Name:	*Ph.D.™-12 Phage Display Peptide Library Kit*
Catalog #:	*E8110S*
Kit Components:	*Ph.D.™-12 Phage Display Peptide Library (E8111) — Store at -20°C* *-96 gIII Sequencing Primer (20-mer) (S1259) — Store at -20°C* *-28 gIII Sequencing Primer (22-mer) (S1258) — Store at -20°C* *E. coli K12 ER2738 (E4104) — Store at -80°C* *Biotin (N7024) — Store at -20°C* *Streptavidin, lyophilized (N7023) — Store at -20°C*

Lot #:	*0431801*
Assay Date:	*01/2018*
Expiration Date:	*01/2020*
Storage Temp:	*Multi-temperature*
Specification Version:	*PS-E8110S v1.0*
Effective Date:	*18 Jun 2018*

Assay Name/Specification (minimum release criteria)	**Lot #0431801**
Absolute Phage Titer - Infection of a mid-log culture of *E. coli* ER2738 with Ph.D.™-12 Phage Display Peptide Library followed by plating, yields ≥ 1 x 10^{13} pfu/ml.	**Pass**
Functional Testing (Panning) - A 100-fold representation of the Ph.D.™-12 Phage Display Peptide Library containing approximately 10^{11} pfu is diluted in 200 µl TBS and panned against 300 ng β-endorphin monoclonal antibody. The bound phage is affinity captured using magnetic beads and eluted with 1 ml of 0.2M Glycine-HCl, pH 2.2. After three rounds of selection, ≥75% of sequences contain a motif related to the known epitope for the antibody.	**Pass**
Phage Contamination (Environmental) - A 1:100 dilution of an overnight culture of *E. coli* ER2738 was made in 20 ml LB, to which 10^5 pfu of Ph.D.™-12 Phage Display Peptide Library was added. The flask was incubated at 37°C on a rotating shaker for 5 hours. A 1 ml volume of culture was removed and centrifuged. Five microliters (5 µl) of phage-containing supernatant was used for three successive rounds of amplification. The final culture supernatant was plated on three LB/IPTG/Xgal plates and then titered. Fewer than 5% clear or white plaques were observed in a minimum of 100 total plaques counted on each plate.	**Pass**

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Assay Name/Specification (minimum release criteria)	**Lot #0431801**
Sequence Verification (DNA) - The Ph.D.™-12 Phage Display Peptide Library was sequenced using 5'-CCCATGTACCGTAACACTGAGTTTC-3' as a primer to confirm the correct form of the cloned insert on the displayed peptide, X_{12}-GGG.	**Pass**

Authorized by
Derek Robinson
18 Jun 2018

Inspected by
Beth Paschal
02 Jan 2018

ISO 9001 Registered Quality Management
ISO 14001 Registered Environmental Management
ISO 13485 Registered Medical Devices