NEW ENGLAND BioLabs Inc.
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New England Biolabs
Certificate of Analysis

Product Name:	*Ph.D.™-12 Phage Display Peptide Library*
Catalog Number:	*E8111L*
Lot Number:	*10032269*
Expiration Date:	*04/2021*
Storage Temperature:	*-20°C*
Storage Conditions:	*25 mM Tris-HCl, 75 mM NaCl, 50% Glycerol, (pH 7.5 @ 25°C)*
Specification Version:	*PS-E8111L v1.0*

Ph.D.™-12 Phage Display Peptide Library Component List			
NEB Part Number	**Component Description**	**Lot Number**	**Individual QC Result**
E8111LVIAL	Ph.D.™-12 Phage Display Peptide Library	10042016	**Pass**

Assay Name/Specification	**Lot # 10032269**
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, X12-GGG.	**Pass**
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 1011 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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This product has been tested and shown to be in compliance with all specifications.

Beth Paschal
Production Scientist
12 Apr 2019

Michael Tonello
Packaging Quality Control Inspector
12 Apr 2019