Product datasheet

Hyperphage M13 KO7pIII (5x 2 ml)

Short overview

Cat. No.	PRHYPE
Quantity	5x2 ml (lyoph.)

Product description

Reconstitution	Reconstitute each vial with 2 ml H2O dist.
Application	Provides helper phage function in packaging a common phage display phagemid (for example pSEX, pHen2)
Specificity	Infection of bacteria via pIII
Working dilution	The concentration of hyperphage particles per ml after reconstitution is indicated on the label. For infection use a MOI of 20
Stability	After reconstitution use immediately
Synomym	Hyperphage
Purification	PEG precipitation
Storage	2-8°C
Intended use	Research use only

Background

An Effective Tool for the Isolation of Recombinant Antibodies, Proteins or Peptides from Hyperphage-Packed Libraries.
Advantages

- Increases panning efficiency

- Allows panning with reduced amount of panning antigen

- Identifies high and low affinity binders

Introduction

A helper phage technology ("Hyperphage System") was developed by Rondot et al. (Nature Biotechnology 19:75-81, 2001). The Hyperphage System allows to improve antibody presentation in phage display by increasing the number of antibodies displayed per phage particle (up to 5 vs. 0.01) and thereby the system offers great advantage in the fields of functional gene analysis and proteomics. Panning of phages can be performed with small amounts of antigen and higher efficiency. For example, the application of universal libraries for antibody isolation can be improved by employing panning of hyperphage-packed libraries on blots of protein spots after 2-dimensional gel electrophoresis.
More Applications

Large numbers of open reading frames (ORFs) can be analyzed by panning against synthetic membrane- bound peptide epitopes. In cancer research, the hyperphage-packed library could be a tool to discover new tumour markers by panning against cellular surfaces.

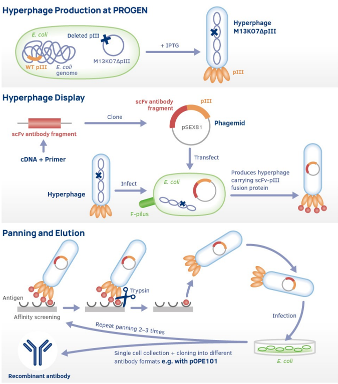
The Hyperphage System

Hyperphages carry a deletion in the pIII gene. They are generated by an E. coli packaging cell line producing functional pIII which is used to package a phage genome with a pIII deletion. The resulting hyperphages carry functional pIII on their surface but lack the pIII gene in their genome. These hyperphages can then be used to infect bacteria with a phagemid library. Each of the resulting display phages carries several copies of the antibody or peptide on its surface, thus dramatically increasing panning efficiency.
Example with pSEX Phagemid Antibody Gene Library

Antigen binding was enhanced by more than two orders of magnitude by using hyperphage. Further, since the antibody carrying plasmid (phagemid) encodes a protease cleavage site between pIII and scFv fragment, the hyperphage-packed library can be eluted by protease treatment, allowing to elute the highest affinity binders, plus restoring wild-type infectivity phenotype to optimize the recovery of the antibody gene of interest.

Product images

Hyperphage M13 KO7pIII (5x 2 ml)



Functional principle of the Hyperphage System.

References

Publication	Species	Application
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DÃ-az-Perlas, C. et al. High-affinity peptides developed against calprotectin and their application as synthetic ligands in diagnostic assays. Nat. Commun. 14, 2774 (2023).		
Costantini, E., Calvaresi, M. & Danielli, A. iScience A modular phage vector platform for targeted photodynamic therapy of Gram-negative bacterial pathogens. ISCIENCE 26, 108032 (2023).		
Zhu, C. et al. Epitope-Directed Antibody Elicitation by Genetically Encoded Chemical Cross-Linking Reactivity in the Antigen. (2023) doi:10.1021/acscentsci.3c00265.		
Zhang, Y. et al. Preparation of a Single-Chain Antibody against Nucleocapsid Protein of Porcine Deltacoronavirus by Phage Display Technology. Viruses 14, (2022).		