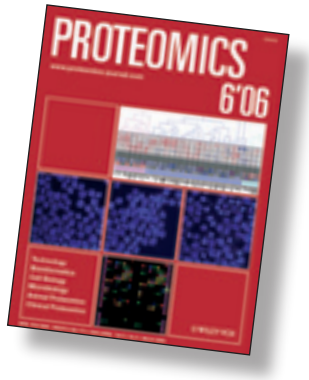
Citation Spotlight

T7 lytic phage-displayed peptide libraries exhibit less sequence bias than M13 filamentous phage-displayed peptide libraries

Lauren R. H. Krumpe[1], Andrew J. Atkinson[1], Gary W. Smythers[2], Andrea Kandel[3,4], Kathryn M. Schumacher[3,4], James B. McMahon[4], Lee Makowski[5], and Toshiyuki Mori[4,6]

[1] Basic Research Program, SAIC-Frederick, Inc., Frederick, MD, USA [2] Advanced Biomedical Computing Center, SAIC-Frederick, Inc., Frederick, MD, USA [3] Werner H. Kirsten Student Internship Program, Center for Cancer Research, National Cancer Institute-Frederick, Frederick, MD, USA [4] Molecular Targets Development Program, Center for Cancer Research, National Cancer Institute-Frederick, Frederick, MD, USA [5] Argonne National Laboratory, Argonne, IL, USA [6] Biomedical Research Laboratories, Pharmaceutical Research Division, Takeda Pharmaceutical Company Ltd., Osaka, Japan



Read the full article in
Proteomics
August, 2006, **6(15)**: 4210-4222

We investigated whether the T7 system of phage display could produce peptide libraries of greater diversity than the M13 system of phage display due to the differing processes of lytic and filamentous phage morphogenesis. Using a bioinformatics-assisted computational approach, collections of random peptide sequences obtained from a T7 12-mer library (X_{12}) and a T7 7-mer disulfide-constrained library (CX_7C) were analyzed and compared with peptide populations obtained from New England BioLabs' M13 Ph.D.™-12 and Ph.D.™-C7C libraries. Based on this analysis, peptide libraries constructed with the T7 system have fewer amino acid biases, increased peptide diversity, and more normal distributions of peptide net charge and hydropathy than the M13 libraries. The greater diversity of T7-displayed libraries provides a potential resource of novel binding peptides for new as well as previously studied molecular targets. To demonstrate their utility, several of the T7-displayed peptide libraries were screened for streptavidin- and neutravidin-binding phage. Novel binding motifs were identified for each protein.

Greater diversity in a phage-displayed peptide library improves the chances of successfully isolating peptides that bind to the molecular target. Using the Novagen® T7Select® 10-3b vector and T7Select System, the authors compared the peptide diversity of T7 to M13 phage-displayed libraries. They concluded that, "For each library characteristic analyzed in this study, the T7 system created libraries of greater diversity than the M13 displayed libraries." For the T7 X_{12} libraries they found that, "The overall amino acid sequence diversity of the T7 X_{12} library exceeded the diversity of the M13 Ph.D.-12 library by 14-fold, approximated the diversity of the human proteome, and surpassed the diversity of computationally random peptide libraries." The T7 phage display system relies on a lytic pathway to release the phage from the bacterial cell. By comparison, filamentous phage, like M13, are secreted. This article demonstrates greater diversity in peptide libraries generated from the lytic phage. ■

Product	Size	Cat. No.	Price
T7Select®10-3 Cloning Kit	1 kit	70550-3	$697
T7Select®1-1 Cloning Kit	1 kit	70010-3	$697
T7Select®415-1 Cloning Kit	1 kit	70015-3	$697
T7Select®1-1 OrientExpress™ cDNA Cloning System, Random Primer	1 system	70202-3	$1101
T7Select®1-1 OrientExpress™ cDNA Cloning System, Oligo(dT)	1 system	70200-3	$1101
T7Select®10-3 OrientExpress™ cDNA Cloning System, Random Primer	1 system	70580-3	$1101
T7Select®10-3 OrientExpress™ cDNA Cloning System, Oligo(dT)	1 system	70581-3	$1101

Components

Cat. Nos. 70550, 70010, 70015

- 5 µg T7Select *Eco*R I/*Hind* III Vector Arms
- 0.2 pmol T7Select Control Insert
- 6 T7 Packaging Extracts
- 1 µg T7Select Packaging Control DNA
- 0.2 ml BLT5403, BLT5615, and BL21 Glycerol Stock
- 500 pmol T7SelectUP primer
- 500 pmol T7SelectDOWN primer

Cat. Nos. 70202, 70200, 70580, 70581

- 1 OrientExpress Random Primer *or* Oligo(dT) Primer cDNA Synthesis Kit
- 1 *Eco*R I/*Hind* III End Modification Kit
- 1 Mini Column Fractionation Kit
- 1 DNA Ligation Kit
- 1 T7Select10-1b *or* T7Select10-3b Cloning Kit

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