



SAROTUP 2.0: a suite of web tools for finding potential target-unrelated peptides from phage display

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Introduction

- Phage display has made a great impact on modern medicine. It has been widely used for epitope mapping, analysis of protein-protein interactions, prediction of drug target, and identification of enzyme substrates and inhibitors.
- Some peptides derived from phage display have been developed into new drugs, such as romiplostim and peginesatide which are approved by FDA; others have shown promise for the development of diagnostics, vaccines, and the targeted delivery of therapeutics.
- However, phage display data are suffered from target-unrelated peptides (TUPs), which creep into or even dominate the experiment results through growing faster (propagation-related TUP), or binding to contaminants or other components of the screening system (selection-related TUP).
- In this poster, we present SAROTUP version 2.0, a suite of web tools that are helpful for cleaning phage display data. The tools are freely available at <http://immunet.cn/sarotup>.

TUPScan

- This tool can check if your peptides are with known TUP motifs or identical to known TUP sequences.

MimoScan

- This tool can check if any peptide in the MimoDB database matches your mimotope motifs, which can indicate how specific your mimotope motifs are.

MimoSearch

- This tool can check if any peptide in the MimoDB database is identical to your peptides, which indicates if any of your peptides “binds” multiple targets. If so, it might be a TUP rather than a mimotope.

MimoBlast

- This tool can check if any peptide in the MimoDB database is highly similar to your peptides. If so, it may be a “binder” of multiple targets.

Your Query Peptide	Similar Peptide in MimoDB	Blast Report
TESTPEPTIDES	No hits found!	Report 1
YLFVSVHWPPLKA	YLFVSVHWPPLKA in mimoset: 405	Report 2
SAHGTSTGVPWP	SAHGTSTGVPWP in mimoset: 1883	Report 3
	SAHGTSTGVPWP in mimoset: 1725	
	SAHGTSTGVPWP in mimoset: 1524	
SAHGTSTGVPWP	SAHGTSTGVPWP in mimoset: 1262	

- This tool can also be used to check if a known TUP has highly similar peptides in the MimoDB database, which can further be used to derive new TUP motifs. Possible TUPs similar with the notorious **SVSVGMKPSRP** are found with MimoBlast and shown below.

Peptide	Target numbers	Mimoset numbers	Expect value
SVSVGMNPSRP	1	1	0.14
SVSVGLKPSRP	1	1	0.15
SVSVGMKPSHRP	1	1	0.16
SVSVGMKPRPRP	2	2	0.17
SVSVGMKPSPRK	1	1	0.17
SVSVGKKPSRP	1	1	0.24
SVSGGMKPSRP	1	1	0.26
SVSVGMLPSRP	1	1	0.32
YVYVGMKPSRP	1	1	0.32