



PamChip® Peptide Phosphosites: Inferring Upstream Kinases

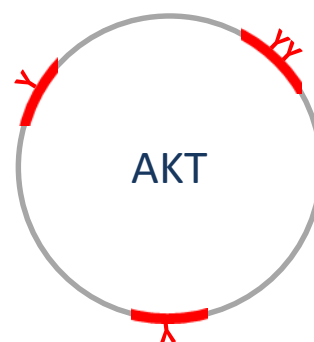
Peptides on PamChip (PTK 86402 and STK 87102) can be phosphorylated by a number of kinases. One kinase can phosphorylate multiple peptides on the PamChip. Some basic information is shown below how we interpret the PamChip data (phosphorylation profiles).

Deriving information for Kinases phosphorylating PamChip peptides

The 13 amino acid peptide sequences on the PamChip are derived from substrates (with UniPROT IDs). Kinases that are known or predicted to phosphorylate specific Tyr or Ser/Thr residues, on the PTK and STK PamChip respectively, are derived from six databases (HPRD, UniPROT, Phosphosite-Plus, Phospho-ELM, Reactome and Kinexus). We provide statistical tools to obtain a ranking of kinases most differential between conditions. The differential substrates can also be used with pathway analysis tools to infer upstream kinases and top pathways. An example for AKT peptides is shown below.

1. Peptide sequence derived from a Kinase Substrate Protein

ID (PamChip Peptide)	Sequence	Tyr	UniprotAccession
AKT1_170_182	KATGRYYAMKILK	[175, 176]	P31749
AKT1_309_321_C310S	FSGTPEYLAPEVL	[315]	P31749
AKT1_320_332	VLEDNDYGRAVDW	[326]	P31749



PamChip Data

- Sequence homology



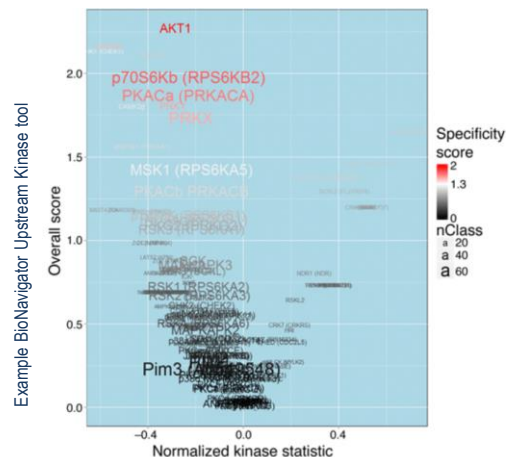
Protein Databases

- UniPROT

2. Phosphosites/ Substrate Peptides (sets) to Kinase

Post-Translational Modification Databases

- HPRD
- Phosphosite PLUS
- Phospho.elm
- UniPROT
- Reactome
- Kinexus (PhosphoNet)



3. Phosphosites/ Substrate Peptides to Pathways

Pathway and Network Databases

- GeneGo
- Ingenuity
- Reactome
- Netpath
- KEGG
- NCI pathway
- NetworkKIN
- STRING

