

Omic-Sig

User Guide

Input parameters

Outputfolder

Specify an output directory for exporting results.

Rcmd.exe

Specify the location of Rcmd.exe file since the data visualization is done in R. Rcmd.exe file is usually located in “..\bin\i386” of R.

Example: C:\Program Files\R\R-3.5.3\bin\i386

Global proteome

Expression matrix of global proteins (normalized and log-transformed).

Phosphosite




Expression matrix of phosphosites (normalized and log-transformed).

Sample information

- (1) Sample.ID: sample IDs that are corresponding to the sample IDs in uploaded expression matrices.
- (2) Pair.Tag: a paired sample (e.g., tumor and its normal adjacent tissue) must be given the same identification tag.
- (3) Tissue: type of sample (e.g., Tumor or NAT).

PhosphoSitePlus

Kinase_Substrate_Dataset file download from PhosphoSitePlus.

-  Start the process
-  Cancel the process
-  Show results

Parameter setting

Additional input

RNA-seq Browse

Phosphoprotein Browse

Target kinase and substrate pair(s) Browse

% of quantified samples % Fold change Top %

RNA-Seq (optional)

Expression matrix of mRNA (normalized and log-transformed).

Phosphoprotein (optional)

Expression matrix of phosphoproteins (normalized and log-transformed).

Target kinase and substrate pair(s)

If you would like to use your own list of kinases and substrates instead of the ones from PhosphoSitePlus.

% of samples quantified

Only consider substrates and kinases quantified in 75% (by default) of samples.

Fold change

Either 1.5 fold or 2 fold changes currently.

Top k %

Only phospho-substrates (based on phosphosite data) have more than k % ($k=60$ by default) of tumors with > 1.5 fold changes (by default) are considered for analysis.



OK (i.e., save changes made)



Cancel

Input file format

Basic format for phospho, global, and mRNA expression matrices

Index	Sample 1	Sample 2	...	Sample n-1	Sample n

Row = phosphosites/proteins/genes
Columns = samples

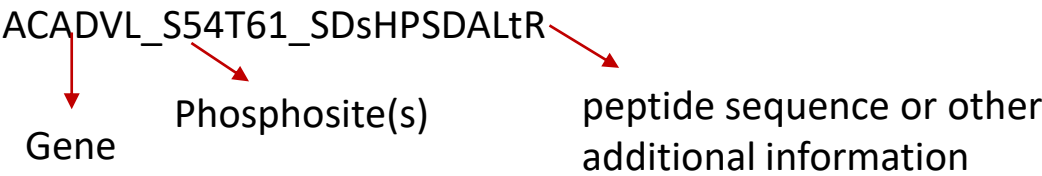
Omic-Sig requires unique index for each entry.

- Global/mRNA/Phosphoprotein**

The index should be the official gene symbols/gene names, such as SYNM, CD44, and COL6A1.

- Phosphosites**

The index format has to be the following:



- **Sample information**

- (1) Sample.ID: sample IDs that are corresponding to the sample IDs in uploaded expression matrices.
- (2) Pair.Tag: a paired sample (e.g., tumor and its normal adjacent tissue) must be given the same identification tag.
- (3) Tissue: type of sample (e.g., Tumor or NAT).

Example:

Sample.ID	Pair.Tag	Tissue
Sample 1	1	NAT
Sample 2	1	Tumor
Sample 3	S3	NAT
Sample 4	S3	Tumor

This is a pair

This is another pair

- **Target kinase and substrate pairs**

Kinase	Substrate	Substrate.Site
PRKCD	GSK3A	S21
EIF2AK1	EIF2S1	S52

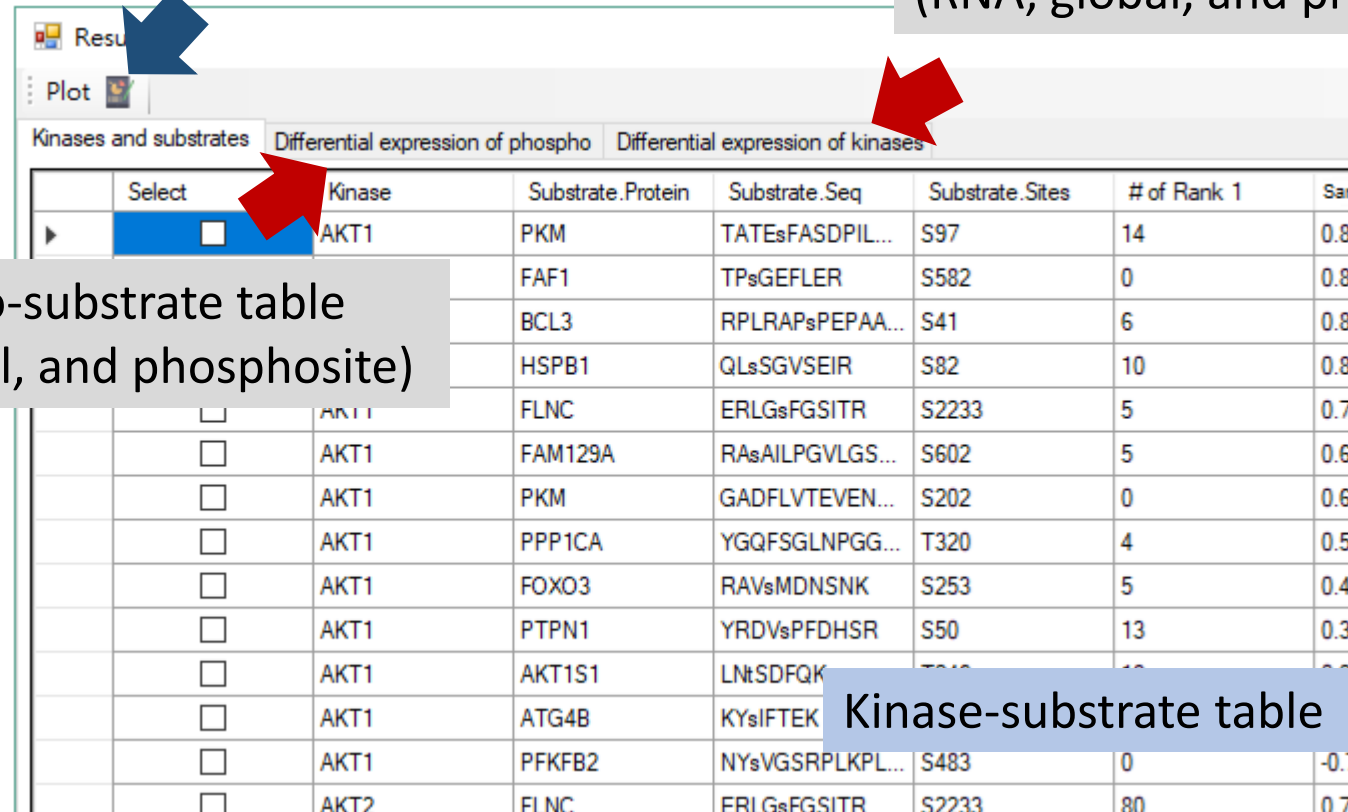
One line per kinase-substrate pair

Output

Generate plots of selected
kinases and substrates

Kinase table
(RNA, global, and phosphoprotein)

Phospho-substrate table
(RNA, global, and phosphosite)



Kinases and substrates		Differential expression of phospho	Differential expression of kinases			
Select	Kinase	Substrate.Protein	Substrate.Seq	Substrate.Sites	# of Rank 1	Score
<input checked="" type="checkbox"/>	AKT1	PKM	TATEsFASDPIL...	S97	14	0.8
<input type="checkbox"/>		FAF1	TPsGEFLER	S582	0	0.8
<input type="checkbox"/>		BCL3	RPLRAPsPEPAA...	S41	6	0.8
<input type="checkbox"/>		HSPB1	QLsSGVSEIR	S82	10	0.8
<input type="checkbox"/>		FLNC	ERLGsFGSITR	S2233	5	0.7
<input type="checkbox"/>	AKT1	FAM129A	RAAILPGVLGS...	S602	5	0.6
<input type="checkbox"/>	AKT1	PKM	GADFLVTEVEN...	S202	0	0.6
<input type="checkbox"/>	AKT1	PPP1CA	YGQFSGLNPPG...	T320	4	0.5
<input type="checkbox"/>	AKT1	FOXO3	RAVsMDNSNK	S253	5	0.4
<input type="checkbox"/>	AKT1	PTPN1	YRDVsPFDHSR	S50	13	0.3
<input type="checkbox"/>	AKT1	AKT1S1	LNtSDFQK	S2233	10	0.3
<input type="checkbox"/>	AKT1	ATG4B	KYsIFTEK	S483	0	-0.1
<input type="checkbox"/>	AKT1	PFKFB2	NYsVGSRLKPL...	S483	0	-0.1
<input type="checkbox"/>	AKT2	FLNC	FRIGsFGSITR	S2233	80	0.7

Kinase-substrate table

* All computational results of phospho/global/mRNA are automatically exported to the user-specified output directory as csv files upon completion of data analysis.

Kinase-substrate table

Results						
Plot						
Kinases and substrates Differential expression of phospho Differential expression of kinases						
Select	Kinase	Substrate Protein	Substrate Seq	Substrate Sites	# of Rank 1	
<input checked="" type="checkbox"/>	PRKCD	FCER1G	SDGVYTGaTR	S49	51	1
<input type="checkbox"/>	PRKCD	CYBA	ERPGIGGK	T147	15	1
<input type="checkbox"/>	PRKCD	SHC1	HGdFVKKPTR	S29	4	0
<input checked="" type="checkbox"/>	PRKCD	LCP1	GeVSDDEEMELR	S5	10	0
<input type="checkbox"/>	PRKCD	PRKCD	LLAEALNGVITQ	S299	0	-4
<input type="checkbox"/>	PRKCD	PRKCD	ARLaYSDK	S645	0	-4
<input type="checkbox"/>	PRKCD	PRKD1	RvVSTPAYLAP	S742	0	-4
<input type="checkbox"/>	CSNK2A1	CAV2	FADuGDDPDRHR	S36	64	1
<input type="checkbox"/>	CSNK2A1	NOL3	ASDPDEAGGRE	T149	2	0
<input type="checkbox"/>	CSNK2A1	MCM2	RGLLYDnDEED	S139	1	0

By selecting the kinases and substrates (highlighted rows) in the kinase-substrate table, the same group of substrates and kinases in the phospho-substrate and kinase tables will also be automatically selected.

Phospho-substrate able

Results						
Plot						
Kinases and substrates Differential expression of phospho Differential expression of kinases						
Select (phospho)	Protein	Phospeptide	Phosphosite	Sample 1	Sample 2	
<input checked="" type="checkbox"/>	LCP1	NEALLALREGE...	S257	0.624	0.011	1.
<input type="checkbox"/>	LCP1	IGNFzTDIK	S290	0.982	0.791	1.
<input checked="" type="checkbox"/>	LCP1	GeVSDDEEMELR	S5	0.553	-0.267	1.
<input type="checkbox"/>	LCP1	GSVdDEEMELR	S7	0.839	0.325	0.
<input type="checkbox"/>	PRKCD	VLMsVQYFLED...	S130	-1.129	-1.293	-0.
Select (RNA)	Gene	Sample 1	Sample 2	Sample 3	Sample 4	
<input checked="" type="checkbox"/>	LCP1	2.364	2.543	1.906	2.186	1
<input type="checkbox"/>	PRKCD	-0.437	-0.677	-1.607	-0.494	0
<input type="checkbox"/>	PRKD1	-0.766	-0.995	-1.848	-0.305	-4
<input type="checkbox"/>	PRKCD	-0.437	-0.677	-1.607	-0.494	0
<input type="checkbox"/>	CYBA	0.824	0.274	1.679	1.526	0
<input type="checkbox"/>	SHC1	1.176	0.873	1.766	1.266	0
<input checked="" type="checkbox"/>	FCER1G	2.396	3.232	2.899	2.422	2
<input type="checkbox"/>	MME	-0.431	-0.984	-0.588	-1.382	-4
<input type="checkbox"/>	CAV2	2.907	2.391	2.542	2.418	2
<input type="checkbox"/>	CTNNA1	0.412	0.451	-0.423	-0.237	0
Select (phospho)	Protein	Sample 1	Sample 2	Sample 3	Sample 4	
<input checked="" type="checkbox"/>	PRKCD	-0.776	-0.522	-0.418	-0.17	
<input type="checkbox"/>	GTF2F1	-0.311	-0.501	-0.019	-0.388	
<input type="checkbox"/>	CDK7	0.02	1.084	0.654	0.577	
<input type="checkbox"/>	PRKAA1	0.213	0.269	-0.246	-0.004	

Kinase able

Results						
Plot						
Kinases and substrates Differential expression of phospho Differential expression of kinases						
Select (phospho)	Protein	Phospeptide	Phosphosite	Sample 1	Sample 2	Sam
<input checked="" type="checkbox"/>	LCP1	NEALLALREGE...	S257	0.624	0.011	1.193
<input type="checkbox"/>	LCP1	IGNFzTDIK	S290	0.982	0.791	1.004
<input checked="" type="checkbox"/>	LCP1	GeVSDDEEMELR	S5	0.553	-0.267	1.513
<input type="checkbox"/>	LCP1	GSVdDEEMELR	S7	0.839	0.325	0.845
<input type="checkbox"/>	PRKCD	VLMsVQYFLED...	S130	-1.129	-1.293	-0.89
<input type="checkbox"/>	PRKCD	VLMsVQYFLED...	S130	-1.039	-1.188	-0.79
<input type="checkbox"/>	PRKCD	LLAEALNGVITQ...	S299	-0.03	-0.011	-0.68
<input type="checkbox"/>	PRKCD	ASfCGTPDYIA...	T507	-0.31	-0.582	-0.79
<input type="checkbox"/>	PRKCD	ARLaYSDK	S645	-0.16	-1.349	-0.73
<input type="checkbox"/>	PRKD1	TSaELSTSAPD...	S219	-1.164	-1.594	-1.01
Select (RNA)	Gene	Sample 1	Sample 2	Sample 3	Sample 4	Sam
<input checked="" type="checkbox"/>	LCP1	2.364	2.543	1.906	2.186	1.962
<input type="checkbox"/>	PRKCD	-0.437	-0.677	-1.607	-0.494	0.395
<input type="checkbox"/>	PRKD1	-0.766	-0.995	-1.848	-0.305	-0.69
<input type="checkbox"/>	PRKCD	-0.437	-0.677	-1.607	-0.494	0.395
<input type="checkbox"/>	CYBA	0.824	0.274	1.679	1.526	0.033
Select (Global)	Protein	Sample 1	Sample 2	Sample 3	Sample 4	Sam
<input checked="" type="checkbox"/>	LCP1	1.642	1.317	1.133	0.994	0.24
<input type="checkbox"/>	PRKCD	0.069	-0.544	-0.219	-0.323	0.293
<input type="checkbox"/>	PRKD1	-0.281	-0.576	-0.457	-0.24	-0.28