

**PEPTIDE DEPOT**  
**SOFTWARE USER MANUAL**

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# Introduction to Peptide Depot

## What is Peptide Depot

Peptide Depot is a custom FileMaker interface that provides a central location for phosphoproteomic peptide data management and analysis. Peptide Depot organizes peptide records by experiments and collections and provides an interface to easily browse through experiments. This software also offers an interface to manage and analyze comparisons between datasets such as timecourses or wild-type/mutant comparisons. Once viewing an experiment or comparison, many tools such as spectra viewers, protein network maps, and condensed timecourse data heatmaps can greatly enhance phosphoproteomic analysis.

## What You'll Learn

This manual will show you how to quickly set up Peptide Depot in your lab and will guide you through all the functionalities available in different layouts of the software.

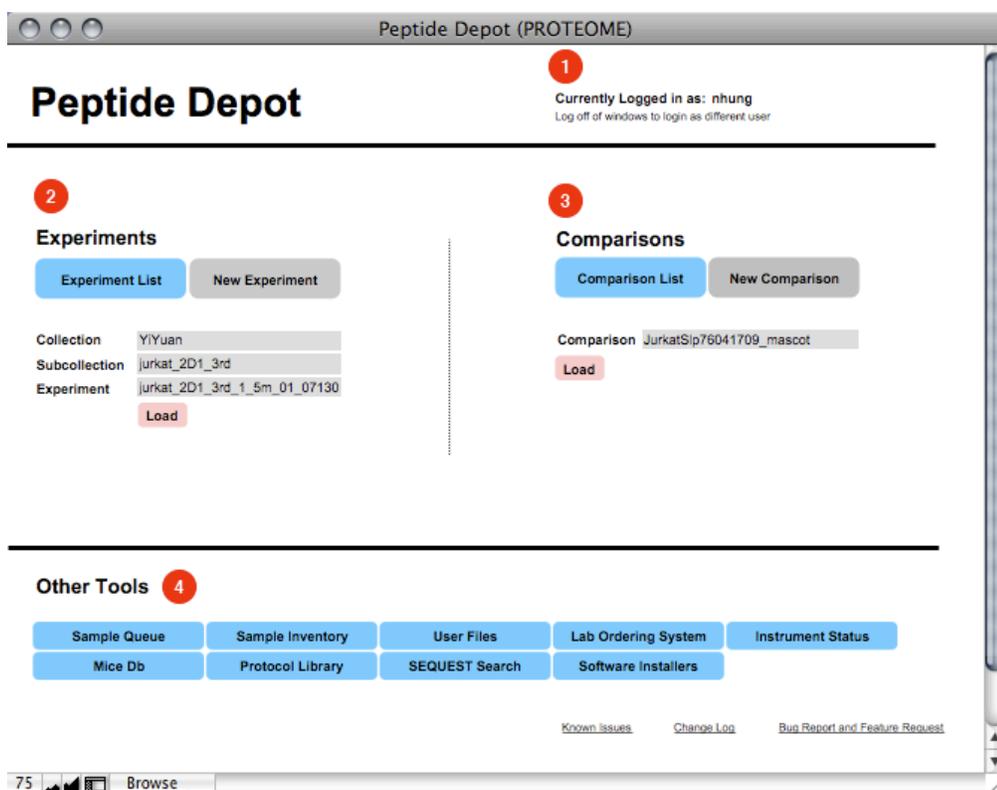
## Setting Up Peptide Depot in Your Lab

1. Install FileMaker server 9 or higher on your computer .  
(If you don't have a copy, you need to purchase it from FileMaker corp.)
2. Unzip the downloaded file to any folder.
3. After installation of FileMaker server, copy all database files (.fp7) in the FileMaker folder to FileMaker server's data folder (PC Default: c:\program files\FileMaker server\data\).
4. Open FileMaker admin console and enable those files.
5. To verify FileMaker server and copied files, open FileMaker pro 9 or higher (if you don't have a copy, you need to purchase it from FileMaker corp.) and in open remote menu, connect to your FileMaker server's address and select to open 'peptide depot.'
6. You shall be asked for username and password. Use admin and default password: brownuniv  
(Since this username and password is used to open all related databases, you may change password for all databases if you change one).
7. if server is OK, you shall be able to open the database and explore data in FileMaker.
8. Go to the installer folder, install MySQL and mysql\_connector\_odbc.
9. Two types of MySQL database are provided in zip file under folder "MySQL DB": in sql format and folder dump. Both contains three sample data set. For sql, you can execute in terminal via command: `mysql -h hostname -u username -p < ***your_path_to_the_sql***.sql`; For the folder type, copy it to mysql's data folder and restart mysql server, you may receive errors but it should work.
10. You will also need to setup a system DSN for mysql database. Go to administrator tools and open "data sources (ODBC)" for management.
11. Go to system DSN panel and click Add New. Choose "MySQL ODBC 3.51 driver" (3.51.14) as your driver.
12. Configure DSN according to your mysql server info. Choose 'sequest' as the database
13. You are almost all set! Open 'peptide depot' in FileMaker and go to menu "file->manage->external data sources."
14. Select "Peptide\_Depot\_SQL" and type in username as password (this is optional. if password is not set, FileMaker will ask you password every time you login to this database)
15. Now your FileMaker and MySQL database should be all linked up. Try it out and tell us what you think!

# Navigating Peptide Depot

## Peptide Depot Home Page

This page is the first page you will see when you open up peptide depot. It acts as a portal to other views in the database. From here, you can access all experiments and experiment comparisons in the database. As analysis of experiments and comparisons is the main functionality of this software, this is probably what the homepage will be used for most of the time. However, buttons at the bottom will lead you to other features of the software.



Category	Tool	Description
Experiments	Experiment List	Shows a list of all experiments with summaries
	New Experiment	Switches to sample queue view to make new experiments
	Experiment Loader	Load an experiment directly by selecting an experiment from a drop down menu
Comparisons	Comparison List	Shows a list of all comparisons with summaries
	New Comparison	Allows user to make a new comparison

Comparison Loader

*Load a comparison directly*

**Other Tools**

Sample Queue

Mice DB

Sample Inventory

*Tells you where things are.*

Protocol Library

User Files

SEQUEST Search

Lab Ordering System

*Doesn't work outside of Salomon Lab*

Software Installer

*Doesn't work outside of Salomon Lab*

**Misc.**

User

*Shows currently logged in user*

Known Issues

Change Log

Bug Report and Feature Request

## Experiment List

This view lists all of your experiments and relevant summary information about each experiment. To provide a more realistic picture of your experiment, the summaries only take into account proteins that survive a 1% FDR threshold. In addition, you can arrange experiments by name, date, or collection by clicking on their respective labels at the top.

Peptide Depot (PROTEOME)

Easy 20 filtered  
# Unique OPO3 Sites

**Experiment List**

1	2	3	4	5	6	FDR thres	Peptides	Phosphopep.	pThr	pSer	pTyr	Total	search engine	database	identifier	type
Load	Tue, 7 /28/2009	Jlung	ERLIC	ERLIC_23min_072609_054447					%	%	%		Sequest	GI		
Load	Tue, 7 /28/2009	Jlung	ERLIC	ERLIC_22min_072609_032600	0.96	47	42	1684 31%	3349 61%	486 9%	5519	Sequest	GI			
Load	Tue, 7 /28/2009	Jlung	ERLIC	ERLIC_21min_072609_010717	0.97	51	34	1758 32%	3286 59%	531 10%	5575	Sequest	GI			
Load	Tue, 7 /28/2009	YiYuan	jurkat_2D1_3rd	BSAFThrp2_400f_072609_022349	0.98	32	32	0 7%	0 7%	0 7%	0	Sequest	GI			
Load	Tue, 7 /28/2009	unassigned	unassigned	ERLIC_20min_072509_224820	0.99	40	31	1257 31%	2450 60%	368 9%	4075	Sequest	GI			
Load	Mon, 7 /27/2009	Jlung	ERLIC	ERLIC_19min_072509_202934	0.97	45	34	1607 31%	3115 61%	412 8%	5134	Sequest	GI			
Load	Mon, 7 /27/2009	Jlung	ERLIC	ERLIC_18min_072509_181042	0.97	7	5	189 30%	383 60%	62 10%	634	Sequest	GI			
Load	Mon, 7 /27/2009	YiYuan	jurkat_2D1_3rd	BSAFThrp2_200f_072509_224358	0.37	33	33	0 7%	0 7%	0 7%	0	Sequest	GI			
Load	Mon, 7 /27/2009	YiYuan	jurkat_2D1_3rd	BSAFThrp2_200f_072509_205409	0.00	33	33	0 7%	0 7%	0 7%	0	Sequest	GI			
Load	Mon, 7 /27/2009	Jlung	ERLIC	ERLIC_7min_072409_195715	0.98	19	17	473 32%	673 59%	123 8%	1469	Sequest	GI			
Load	Mon, 7 /27/2009	Jlung	ERLIC	ERLIC_6min_072409_173818	0.98	68	55	2175 30%	4431 61%	630 9%	7236	Sequest	GI			
Load	Mon, 7 /27/2009	Jlung	ERLIC	ERLIC_5min_072209_073406	0.96	2	2	68 31%	122 55%	30 14%	220	Sequest	GI			
Load	Mon, 7 /27/2009	Jlung	ERLIC	ERLIC_4min_072209_060124	0.89	20	13	230 33%	399 57%	76 11%	705	Sequest	GI			
Load	Mon, 7 /27/2009	Jlung	ERLIC	ERLIC_3min_072209_042844	0.99	57	47	1820 31%	3559 61%	467 8%	5846	Sequest	GI			

Home Page

Collection: YiYuan

Sub-Collection: jurkat\_2D1\_3rd

Experiment: jurkat\_2D1\_3rd\_1\_6m\_01\_071309\_17215 Load

75 Browse

# Experiment View

This layout offers a view of all the peptides found in an experiment. In addition to the peptide itself, the software automatically determines a best-fit protein for each peptide as shown in the protein name – the associated protein can easily be changed by clicking on the protein name. Details and statistics on each peptide are also displayed.

Filtering options are available to narrow down peptides based on statistical confidence and protein relevance. In addition to the main experiment view, there are a variety of subviews available that provide either a more technical or detailed view of each peptide or additional information on the experiment. For example, to learn more about a particular peptide, you can click on the info button next to that peptide, which will show you existing online knowledge on that particular protein. When the experiment is ready for publication, multiple export options are offered.

**Peptide Depot (PROTEOME) Experiment View**

1	2	3	4	5	6	HPRO															
Peptide	Peptide length	Protein Name	Phosphosite	Protein Name	Accession	Mass Error	Charge	Score	# Hits	Site	HIT	pEUM	POB	Mod	S/N	Area	Match	Scan	# ID	Isolated Mass	
F RDNLTWISDITGDGDAKAGEGGEN-	14-3-3 zeta	Y125	MSK	3.983	7.1	2	2.0499				X	X	X	X				2639	67221	1344	1205.0933
F K*YLLSLPARKKL	5 hydroxytryptamine receptor 6	Y484	MSK	3.993	6.4	2	2.0698				X	X						1536	284508	1130	734.9136
F K*SYVYTGESKQ.E	84 kD heat shock protein	Y484	MSK	3.993	6.9	2	2.5363				X	X						1355	303017	1207	624.7911
F K*SYVYTGESK.E	84 kD heat shock protein	Y484	MSK	3.992	11.5	2	2.7085				X	X						1399	303017	1407	620.7896
R KAGSLVGRDGGITR.P	apoptotic chromatin condensation	S11	MSK	3.979	14.5	2	2.0855											775	760228	1236	676.3211
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	Y15	MSK	3.999	1.7	2	2.2876				X	X	X	X				1548	28639	1230	633.2932
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	Y15	MSK	3.999	1.7	2	3.4023				X	X	X	X				1549	28639	1530	637.3004
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	Y15	MSK	3.999	6.9	2	2.4262				X	X	X	X				1930	28639	1536	633.2936
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	Y15	MSK	3.993	1.8	2	2.7236				X	X	X	X				1931	28639	1530	637.3006
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	Y15	MSK	3.979	1.4	2	2.2185				X	X	X	X				1936	28639	1530	633.2936
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	Y15	MSK	3.997	6.9	2	2.1247				X	X	X	X				1207	28639	1430	633.2936
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14	MSK	3.997	1.4	2	2.7577				X	X	X	X				1252	28639	1630	633.2936
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	Y15	MSK	3.995	1.8	2	2.7249				X	X	X	X				1295	28639	1230	633.2933
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	Y15	MSK	3.993	14.0	2	2.4477				X	X	X	X				1305	28639	1230	637.3105
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	Y15	MSK	3.979	1.7	2	2.4518				X	X	X	X				1342	28639	1530	633.2932
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.999	1.8	2	2.5509				X	X	X	X				1500	28639	1640	673.2764
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.995	6.1	2	2.6355				X	X	X	X				1507	28639	1640	677.2847
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.994	7.6	2	3.5601				X	X	X	X				1557	28639	2040	673.2826
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.999	6.9	2	3.5869				X	X	X	X				1564	28639	1640	677.2839
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.999	10.2	2	3.6713				X	X	X	X				1602	28639	2040	673.2857
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.994	12.5	2	3.564				X	X	X	X				1614	28639	2040	677.2930
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.999	6.4	2	3.8835				X	X	X	X				1671	28639	2140	673.2831
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.997	10.5	2	3.5061				X	X	X	X				1686	28639	2040	677.2917
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.997	1.2	2	3.5084				X	X	X	X				1735	28639	2040	673.2783
F K.IGEGTYYGVVYKA	CDC2 polypeptide (CDC2) (AA 1-297)	T14Y15	MSK	3.973	11.7	2	2.6345				X	X	X	X				1750	28639	1640	677.2925

Category	Tool	Description
Main Table	Decoy DB Direction	Describes whether peptide is a forward or reverse hit in decoy database.
	Peptide Sequence	Displays the peptide sequence of the peptide record. Phosphorylated sites are shown in red. <b>Click to view the peptide spectra.</b>
	Phosphosite	Displays the phosphorylated amino acid(s) in the peptide. Phosphosites in red denote pTyr containing sites.

	Protein Name	<i>Displays the chosen protein name. Hover over to choose other protein names.</i>
	Additional Names	<i>Shows other possible protein names for the given peptide.</i>
	Info Button	<i>Click to show online database information on the current peptide record. (e.g., HRPRD, NCBI, OMIM, Pubmed, Wikipedia)</i>
<b>Go To</b>	Home Page	<i>Brings you to the home page</i>
	Exp. List	<i>Shows a list of all experiments with summaries</i>
	Collection	<i>Use the drop-down menu to pick a collection of experiments</i>
	Sub-Collection	<i>Use the drop-down menu to pick a subcollection of experiments</i>
	Experiment	<i>Use the drop-down menu to pick an experiment</i>
	Load	<i>Loads the selected experiment</i>
	Custom Load ...	<i>Use this to load records from more than one experiment. In order for this to work, records need to be from experiments with a matching unique keyword in their names.</i>
<b>Subviews</b>	DTA/OUT	<i>DTA = raw MS/MS Spectra file. OUT = database search output (mascot or sequest)</i>
	Logistic Score	<i>Probability score indicates the validity of peptide sequence identifications</i>
	Protein List	<i>Shows all proteins captured by the dataset</i>
	Map Network	<i>Move button to Comparison View</i>
	User Files	<i>Opens the user folder.</i>
	Protocols	<i>This view allows the user to view and edit protocols used to create this dataset.</i>
<b>Export</b>	DTA/OUT	<i>Exports the DTA/OUT</i>
	PDF	<i>Exports a PDF of all the records including heat maps</i>
	Excel	<i>Exports all numerical and metadata as an excel database</i>
	Raw File	<i>Opens the raw data file for the entire experiment</i>
	Sequest File	<i>Opens a Zip file containing all database search output</i>
<b>Filters</b>	Autofilter	<i>Combination of most commonly used filters (limit mass error, remove redundant, kill IgG, etc)</i>
	Limit Log. Score	
	Limit Mass Error	
	Reduce FDR	<i>Many filters (remove unnamed proteins, Ig's) that help reduce the FDR</i>
	Limit Ascore	
	Xcorr/charge	<i>Custom Value</i>
	Limit FDR	
	Redundinator	<i>Removes all redundant peptides.</i>
	Phosphorylated	<i>Filters out all records with unphosphorylated peptides.</i>
	pTyr	<i>Filters out all records without phosphotyrosine.</i>
	Limit # Phospho	<i>Limits no. phosphorylation sites per peptide</i>
	Remove Invalid Spectra	<i>Removes any manually invalidated spectra.</i>
	Mowse Score	<i>Custom value.</i>
	Forward DB only	<i>Removes all records that are a hit against reverse sequences in the decoy database.</i>

	Kill IgG	<i>Removes any immunoglobulin.</i>
<b>Statistics</b>	Calculate	<i>Calculates and refreshes the statistics for the dataset</i>
	Sub20ppm	<i>Numbers peptides with mass error &lt; 20ppm</i>
	Avg. pSites/peptide	
	ppm	<i>Average ppm in current dataset</i>
	Redundant	<i>Number of redundant peptides</i>
	Length	<i>Average length</i>
	FDR	<i>Average FDR</i>
	Natural/Experimental Rate Table	<i>Displays the difference between the natural rate of occurrence of an amino acid and the experimental rate</i>
<b>Other Functions</b>	Rename Experiment	
	Reassign Collection	
	Reassign Subcollection	
	Find a Protein	
<b>Species</b>	Set Species	<i>Assigns current dataset to a particular species. Used for protein interaction.</i>

## Comparison List

This view lists all of your comparisons and relevant summary information about each experiment. You can arrange experiments by name, date, or type by clicking on their respective labels at the top.

1	2	3	4	5	Replicates	Comparisons	Description	Cell Type	Proteomic Method	Quant. Method
Load	_T03_3T3_SCX	07/20/2009	4. multi frac/MS1-Label	1	7					
Load	_T02_FOCUS_SCX	07/18/2009	3. multi frac/Label-free	1	7					
Load	_T01_FOCUS_IP	07/15/2009	1. single frac/Label-free	2	6					
Load	Serio_rub1_tag	06/15/2009	1. single frac/Label-free	1	4					
Load	BMMC timecourse 052209	05/22/2009	2. single frac/MS1-Label	3	4					
Load	Gokhan_May09_RLRefed_Fr1_RepsComp_Hybrid	05/01/2009	1. single frac/Label-free	1	3					
Load	Gokhan_April2009_Comparison5_042809	04/28/2009	1. single frac/Label-free	1	2					
Load	Gokhan_April2009_Comparison4_042809	04/28/2009	1. single frac/Label-free	1	2					
Load	Gokhan_April2009_Comparison3_042809	04/28/2009	1. single frac/Label-free	1	2					
Load	Gokhan_april2009_Comparison2_042709	04/27/2009	1. single frac/Label-free	1	2					
Load	Gokhan_April2009_ComparisonFr1_2_HybridSet_042409	04/24/2009	1. single frac/Label-free	1	2					
Load	JurkatSlp76042409_mascot_with3min	04/24/2009	2. single frac/MS1-Label	3	8					
Load	JurkatSlp76042409_mascot	04/24/2009	2. single frac/MS1-Label	3	7					
Load	Gokhan_April2009_RatLiverRefed_PHOSTIO_Fr22	04/23/2009	1. single frac/Label-free	1	3					
Load	Gokhan_April2009_RatLiverRefed_PHOSTIO_Fr1	04/22/2009	1. single frac/Label-free	1	3					

Home Page    Comparison JurkatSlp76041709\_mascot  
New Comparison    Load

Browse

## Comparison View

This view is used to do any analysis on two-state comparisons. Each peptide record displays its name, phosphorylated sites, phosphoproteomic data in heatmaps, a free-for-all notes section, and the peptide sequence. Rollover the heatmaps for more detailed information on each datapoint. Also, clicking on the heatmap squares allows you to look at or validate the corresponding spectra. The comparison view offers various statistical and biological filtering tools to help clean up the data set. Peptides can be manually categorized into groups for further organization. When the data set is set for publication, several export options including pdf export for publication and raw data in excel format are available.



Category	Tool	Description
Main Table	Grouping Check Box	Use the check box to select proteins for a new group.
	Protein Name	Displays the default (usually HPRD) or manually chosen protein name for the peptide record. Hover over to view other names. Click to manually edit the name.
	Phosphosites	Displays the phosphorylated amino acid(s) in the peptide. An asterisk defines sites that are known in the linked HPRD database. Click to manually edit the phosphorylation site.
	Label-Free Heatmaps	Displays Label-Free data in heatmap form. (Wild-Type data by default). Hover over to see more detailed information. Go to Reading Heatmaps section for more information.
	SILAC Heatmaps	Displays SILAC ratio data in heatmap form. Hover over to see more detailed information. Go to Reading Heatmaps section for more information.
	Comments/References	A free for all area to insert your own notes or references for each peptide. Click to edit.
	Peptide Sequence	Displays the peptide sequence of the peptide record. Phosphorylated sites are shown in red. Click to view the peptide spectra.

<b>Go To</b>	Home Page	<i>Brings you to the home page.</i>
	Comparison List	<i>Shows a list of all comparisons with summaries.</i>
	Experiment Load	<i>Loads the selected experiment. Use the drop-down menu to pick an experiment.</i>
	Group Load	<i>Loads a specific group in the experiment. Use the drop-down menu to pick a group.</i>
<b>Basic Functions</b>	Rebuild Cache	<i>Rebuilds the heatmap cache. Use when heatmap parameters have changed. (Caution: this script may take up to a couple of hours to complete)</i>
	Find a Peptide	<i>Search for a peptide by using keywords.</i>
	Make New Group	<i>Creates a new group from the selected peptides (use the check box to select).</i>
	Calculate Log Score Dist.	
<b>Export</b>	PDF	<i>Exports the records in PDF format</i>
	Excel	<i>Exports all comparison data in an excel table</i>
	Spectra by Counter	<i>Exports spectra in</i>
	Spectra by Name	
	Build ProteinNetVis	
	Run ProteinNetVis	
	Current DTA/OUT Set	
	All Raw Files	
<b>SILAC Graph</b>	SILAC Graph	
<b>Filters</b>	Applied Filters	<i>This area displays all currently applied filters</i>
	Reduce FDR	<i>Custom value.</i>
	Limit AScore	<i>Custom value.</i>
	Limit Logistic Score	<i>Custom value</i>
	Set Min. Timepoints	<i>Filters out any peptide records that have below a certain amount of timepoints. (Number of timepoints in manually set after clicking the button)</i>
	Show pTyr containing	<i>Filters out any peptide records that do not contain a phospho-tyrosine.</i>
<b>Color Change Legends</b>	LF	<i>Displays the heatmap color key for current label-free heatmap data.</i>
	SILAC	<i>Displays the heatmap color key for current SILAC heatmap data.</i>
	%CV	<i>Displays the color key for coefficient of variation percentage of each timepoint.</i>
<b>Statistics</b>	Proteins	<i>Displays number of proteins represented by the current dataset.</i>
	Sites	<i>Displays the number of phosphorylation sites represented by the current dataset.</i>
	% pTyr	<i>Displays the percentage of phosphorylation sites that are phospho-tyrosine sites represented by the current dataset.</i>
	pY	<i>Displays the number of phospho-tyrosine sites represented by the current dataset.</i>

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pT	<i>Displays the number of phospho-threonine sites represented by the current dataset.</i>
pS	<i>Displays the number of phospho-serine sites represented by the current dataset.</i>
Count	<i>Counts and refreshes the statistics based on the current data set.</i>

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