



Repository for
Targeted Proteomics Assays

Josh Eckels

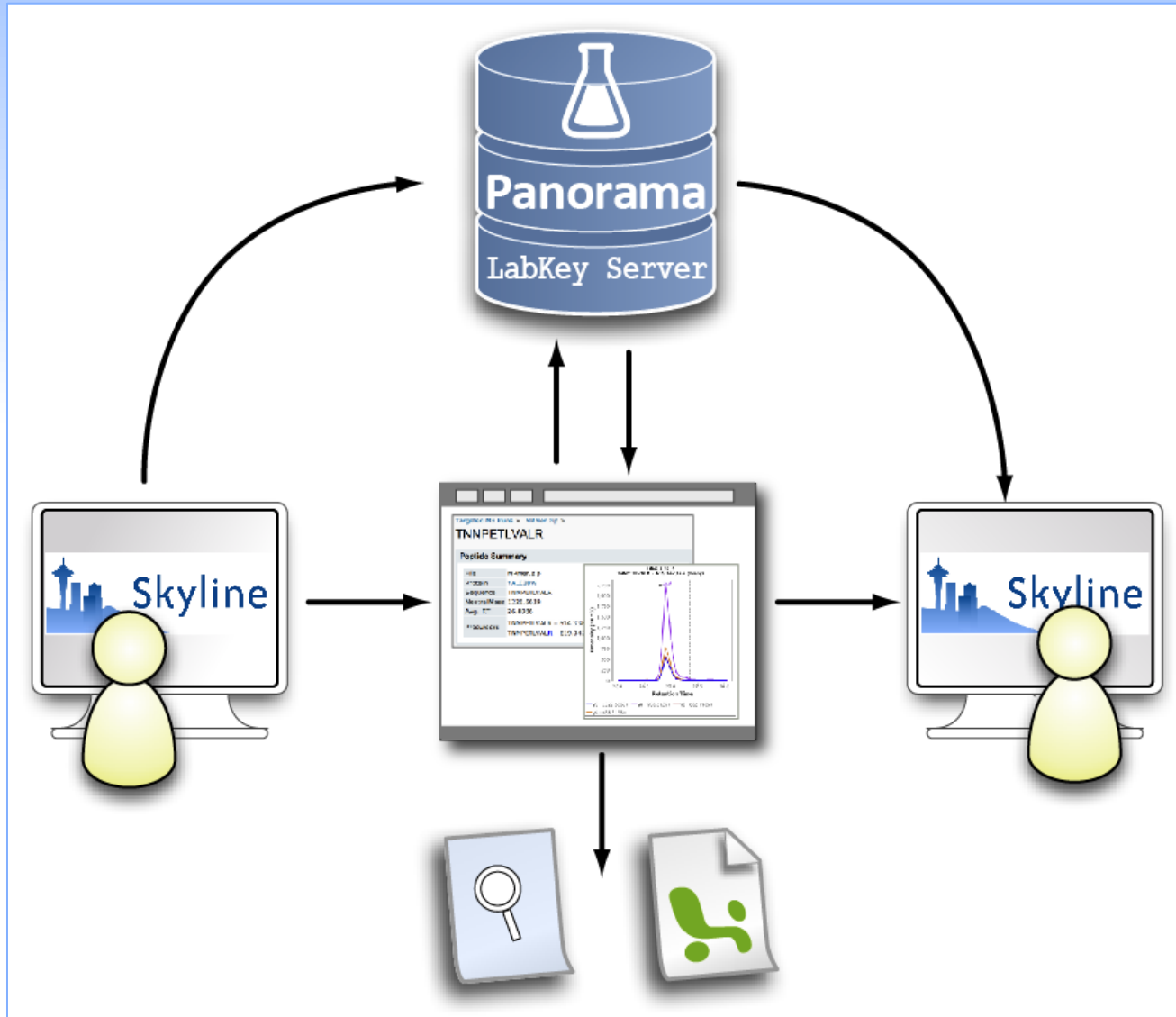
jeckels@labkey.com

Skyline Users Group - June 9, 2013

Goals

- Organize and reuse targeted assays
 - Search and review a large body of data
 - Use previous results to inform new experiments
- Facilitate data sharing
 - Private, with access for internal/external collaborators
 - Public, for published data
- Excellent integration with Skyline
 - Import and retain the complete data model
 - Support data from various workflows

Skyline/Panorama Workflow



History

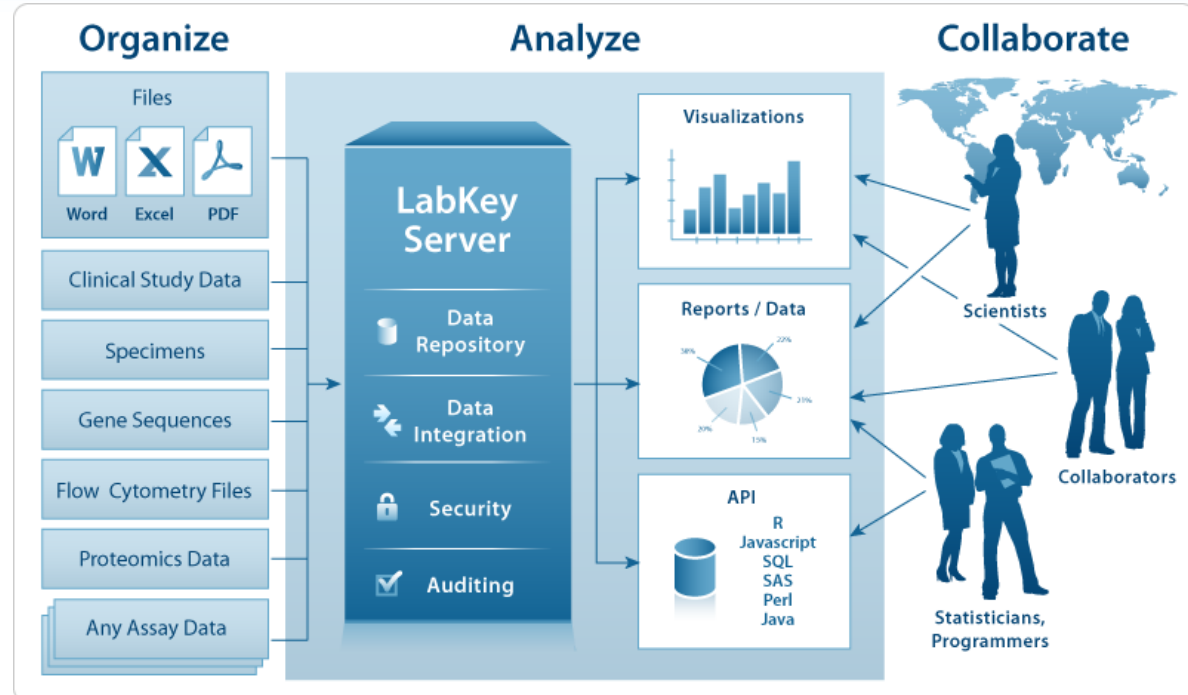
- Work started in late 2011
- Announced at ASMS 2012
- Publicly released in December 2012
 - Part of LabKey Server version 12.3
- Released to PanoramaWeb.org in February 2013
 - Hosted server managed by MacCoss Lab
 - Recorded webinar has full details
- Second public release in April 2013
 - Added search features, reporting enhancements, fixes
- Next release scheduled for July 2013

LabKey Server

- Open source (Apache 2.0 license)
- Web user interface
- Powerful security and permissions system
- Other assay data
 - MS/MS peptide search
 - Flow cytometry
 - Sequencing
 - Plate-based assays
- Specimen tracking
- Clinical study data
- Collaboration tools
- Extensive client APIs



LabKey Software Foundation
Open Source Software for Scientists

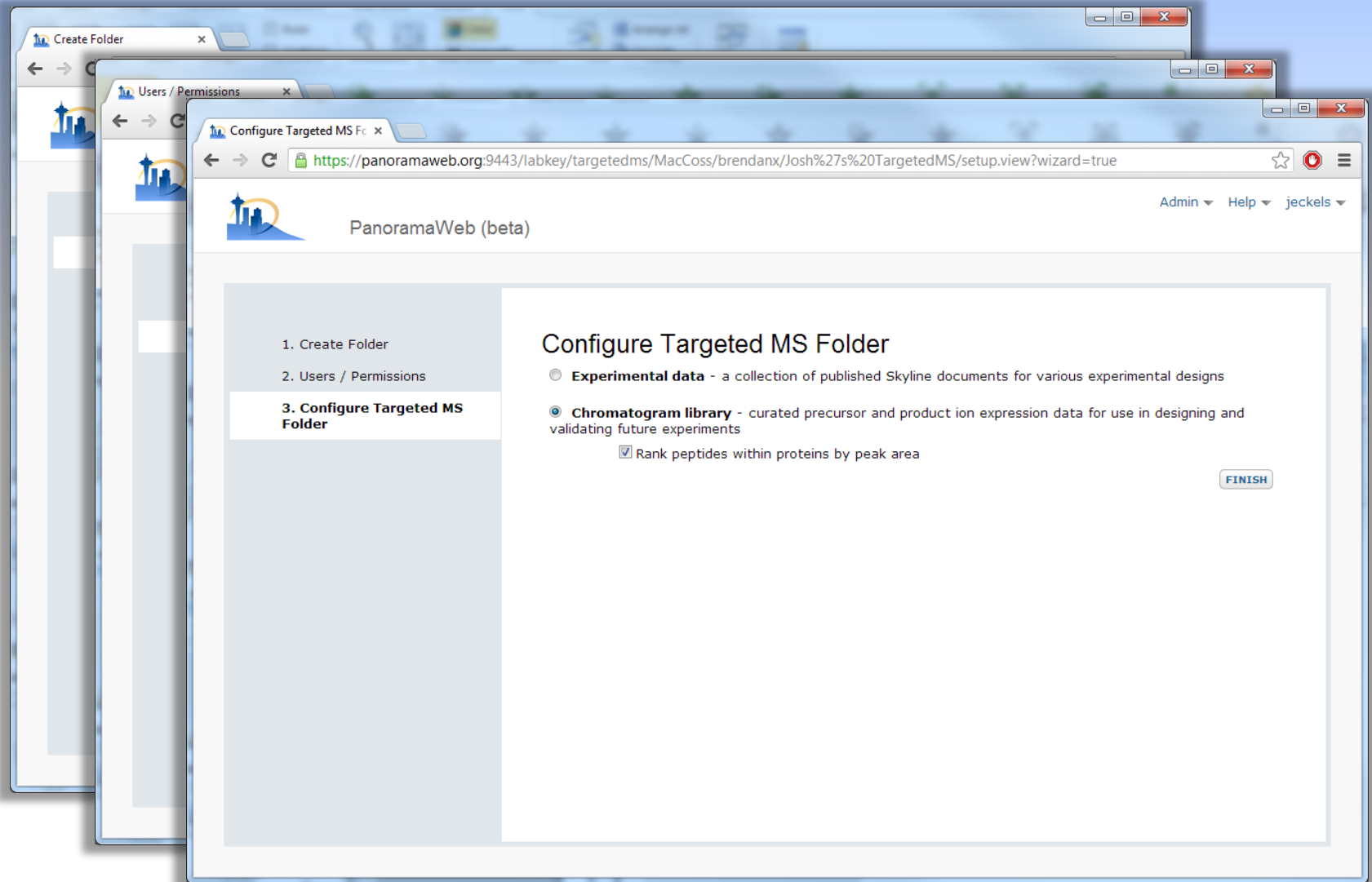


LabKey Software

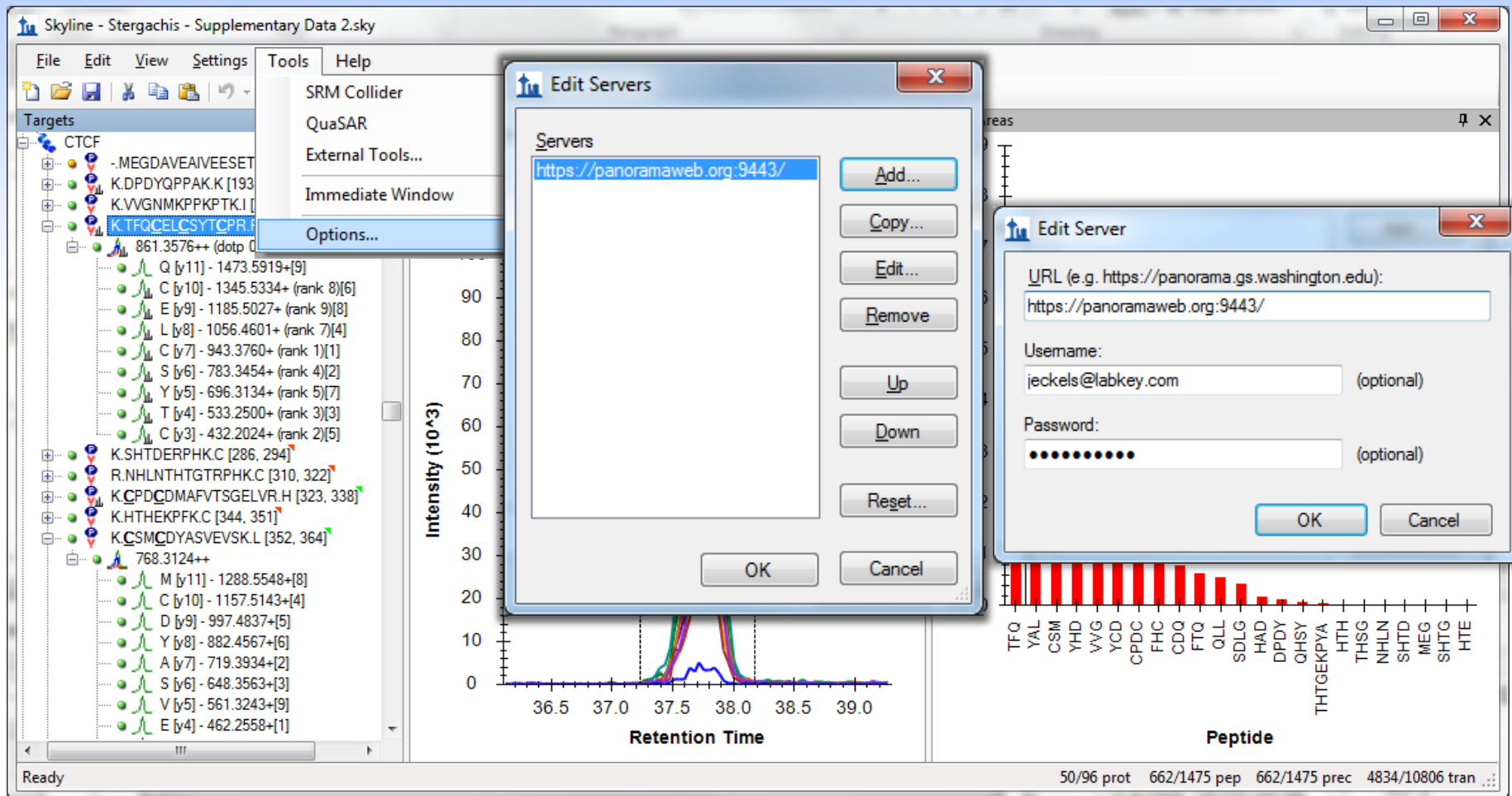
- Co-developers with MacCoss Lab on Panorama
- Consulting company focused on LabKey Server
 - 25 employees in Seattle and San Diego
 - 8 years history working with scientists
- Strength in computer science and data management
- Partner with researchers to develop software
- Related service offerings include:
 - Training
 - Technical support
 - Customization
 - Hosting



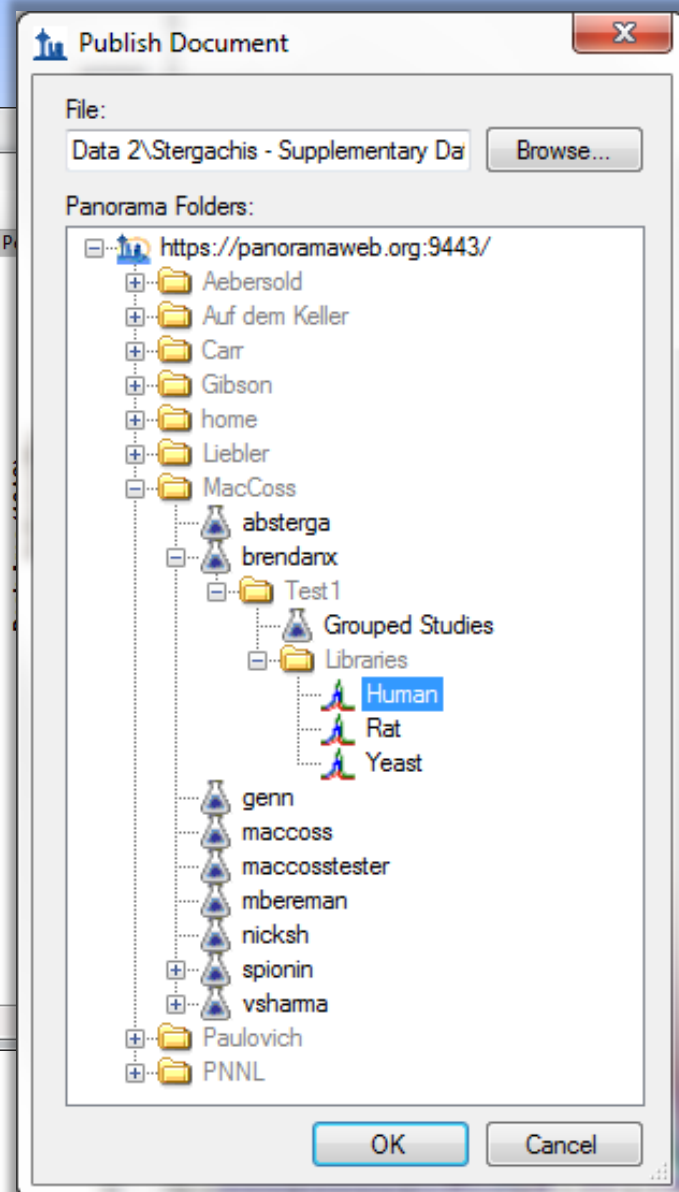
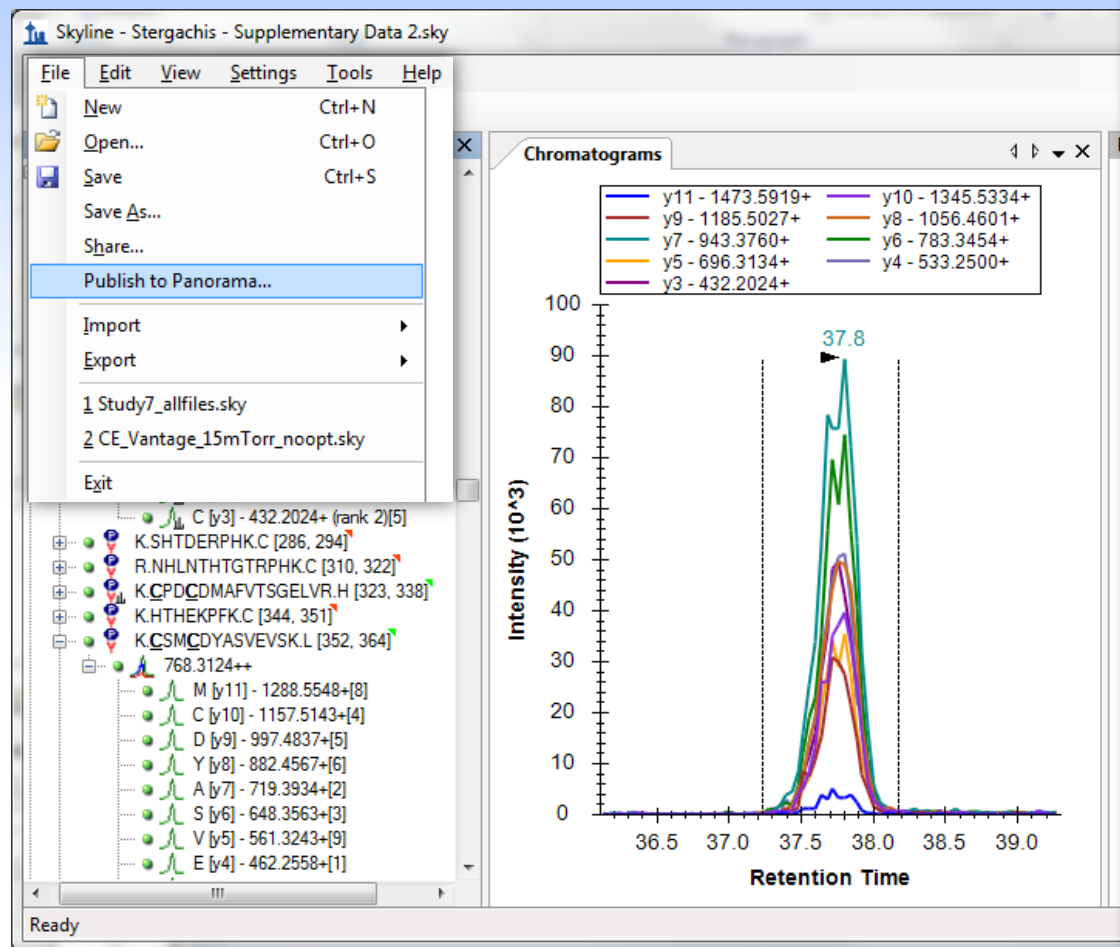
Panorama - Setup



Publishing to Panorama - Setup



Publishing to Panorama



Stergachis - Supplemental

← → ↺

https://panoramaweb.org:9443/labkey/targetedms/MacCoss/brendanx/Test1/Libraries/Human/showPrecursorList.view?id=229

☆ ↻ ☰

Human

Targeted MS Dashboard

Data Pipeline +

Targeted MS Runs >

Stergachis - Supplementary Data 2_2013-06-02_17-14-10.zip

Document Summary

Name

Stergachis - Supplementary Data 2_2013-06-02_17-14-10.zip

DOWNLOAD

Protein Count

96

Precursor Count

1475

Peptide Count

1475

Transition Count

10806

RENAME

Precursor List

VIEWS CHARTS EXPORT PRINT PAGE SIZE

1 - 10 of 96 Next Last

Protein / Label

Description

Protein Annotations

TAF11

HsCD00301672 (1-A03)

Peptide	Peptide Annotations	Missed Cleavages	Peptide Neutral Mass	Rank	Precursor	Precursor Annotations	Label	Precursor Neutral Mass	Q1 m/z	Q1 Z	Transition Count	
MDDAHESPSDK	Quality Score: 4	0	1230.4823		MDDAHESPSDK		light	1230.4823	616.2484	2+	7	
EAAAEEGELESQDVSDLTTVER	Quality Score: 4	0	2377.077		EAAAEEGELESQDVSDLTTVER		light	2377.0769	1189.5457	2+	11	
EDSSLLNPAAK	Quality Score: 1	0	1143.5771		EDSSLLNPAAK		light	1143.5771	572.7958	2+	7	
VDEDEIQK	Quality Score: 2	0	974.4556		VDEDEIQK		light	974.4556	488.2351	2+	4	
MQILVSSFSEEQLNR	Quality Score: 1	0	1779.8826		MQILVSSFSEEQLNR		light	1779.8826	890.9485	2+	10	
LIQSITGTSVSQNVVIAMSGISK	Quality Score: 1	0	2332.267		LIQSITGTSVSQNVVIAMSGISK		light	2332.2671	1167.1409	2+	12	
VFVGEVVEEALDVCEK	Quality Score: 1	0	1820.8866		VFVGEVVEEALDVCEK		light	1820.8866	911.4506	2+	11	
WGEMPLLQPK	Quality Score: 1	0	1181.5903		WGEMPLLQPK		light	1181.5903	591.8024	2+	6	
GQIPNSK	Quality Score: 4	0	742.39734		GQIPNSK		light	742.3973	372.2060	2+	3	

POLR2F

HsCD00301192 (1-A06)

Peptide	Peptide Annotations	Missed Cleavages	Peptide Neutral Mass	Rank	Precursor	Precursor Annotations	Label	Precursor Neutral Mass	Q1 m/z	Q1 Z	Transition Count	
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Protein / Label		Description				Protein Annotations					
TAF11		HsCD00301672 (1-A03)									
Peptide	Peptide Annotations	Missed Cleavages	Peptide Neutral Mass	Rank	Precursor	Precursor Annotations	Label	Precursor Neutral Mass	Q1 m/z	Q1 Z	Transition Count
MDDAHESPSDK	Quality Score: 4	0	1230.4823		MDDAHESPSDK		light	1230.4823	616.2484	2+	7
EAAAEEGELESQDVSDLTTVR	Quality Score: 4	0	2377.077		EAAAEEGELESQDVSDLTTVR		light	2377.0769	1189.5457	2+	11
EDSSLLNPAAK	Quality Score: 1	0	1143.5771		EDSSLLNPAAK		light	1143.5771	572.7958	2+	7
VDEDEIQK	Quality Score: 2	0	974.4556		VDEDEIQK		light	974.4556	488.2351	2+	4
MQILVSSFEEQLNR	Quality Score: 1	0	1779.8826		MQILVSSFEEQLNR		light	1779.8826	890.9485	2+	10
LIQSITGTSVSQNVVIAMSGISK	Quality Score: 1	0	2332.267		LIQSITGTSVSQNVVIAMSGISK		light	2332.2671	1167.1409	2+	12
VFVGEVVEEALDVCEK	Quality Score: 1	0	1820.8866		VFVGEVVEEALDVCEK		light	1820.8866	911.4506	2+	11
WGEMPLQPK	Quality Score: 1	0	1181.5903		WGEMPLQPK		light	1181.5903	591.8024	2+	6
GQIPNSK	Quality Score: 4	0	742.39734		GQIPNSK		light	742.3973	372.2060	2+	3
POLR2F		HsCD00301192 (1-A06)									
Peptide	Peptide	Missed	Peptide Neutral	Rank	Precursor	Precursor	Label	Precursor Neutral	Q1 m/z	Q1	Transition Count

Viewing Runs - Transitions

Stergachis - Supplemental x

https://panoramaweb.org:9443/labkey/targetedms/MacCoss/brendanx/Test1/Libraries/Hum

PanoramaWeb (beta)

Admin Help jeckels

Human

Targeted MS Runs >

Stergachis - Supplementary Data 2_2013-06-02_17-14-10.zip

Document Summary

Name	Stergachis - Supplementary Data 2_2013-06-02_17-14-10.zip	DOWNLOAD
Protein Count	96	
Precursor Count	1475	

RENAME

Peptide Count
Transition Count

Transition List

VIEWS CHARTS EXPORT PRINT PAGE SIZE

Protein / Label	Description
TAF11	HsCD00301672 (1-A03)

Peptide	Peptide Annotations	Missed Cleavages	Peptide Neutral Mass	Rank	Precursor
MDDAHESPSDK	Quality Score: 4	0	1230.4823		MDDAHESPSDK
MDDAHESPSDK	Quality Score: 4	0	1230.4823		MDDAHESPSDK
MDDAHESPSDK	Quality Score: 4	0	1230.4823		MDDAHESPSDK
MDDAHESPSDK	Quality Score: 4	0	1230.4823		MDDAHESPSDK
MDDAHESPSDK	Quality Score: 4	0	1230.4823		MDDAHESPSDK
MDDAHESPSDK	Quality Score: 4	0	1230.4823		MDDAHESPSDK
MDDAHESPSDK	Quality Score: 4	0	1230.4823		MDDAHESPSDK
EAAAEERGELESQDVSLTTVER	Quality Score: 4	0	2377.077		EAAAEERGELESQDVSLTTVER

Opening Stergachis - Supplementary Data 2_2013-06-02_17-14-10.zip

You have chosen to open:

Stergachis - Supplementary Data 2_2013-06-02_17-14-10.zip
which is a: WinZip File
from: https://panoramaweb.org:9443

What should Firefox do with this file?

☐ Open with WinZip (default)

☒ Save File

☐ Do this automatically for files like this from now on.

OK Cancel

Organize Extract all files

Search Stergachis - Supple...

Computer

- OSDisk (C:)
- Recovery (D:)
- 2TBDrive (F:)

Network

- BRN001BA9EE6DAF

4 items

- human_consensus_final_true_lib.blib
- Stergachis - Supplementary Data 2.sky
- Stergachis - Supplementary Data 2.sky.view
- Stergachis - Supplementary Data 2.skyd

Viewing Proteins

Peptide Group

Protein / Label **CTCF**
 Description **HsCD00078657 (2-D02)**
 Decoy **false**

Sequence Coverage

0	10	20	30	40	50	60	70	80	90
MEGDAVEAIVEESETFIK	KERKTYQRRRE	GGQEEDACHL	PQNQTDGGEV	VQDVNSSVQM	VMMEQLDPTL	LQMKTEVM	EGTVAPEAEAAV	DDTQIITLQV	
1									

Peptides

VIEWS CHARTS EXPORT PRINT PAGE SIZE

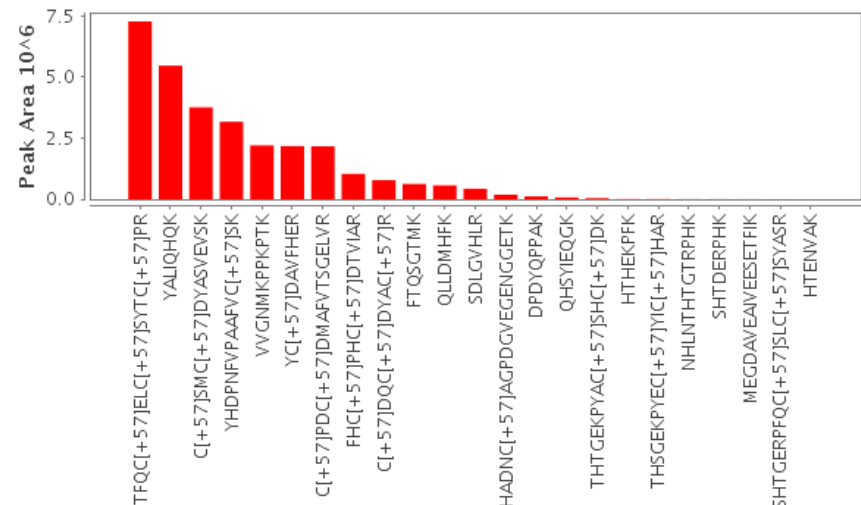
1 - 23 of 23

	Peptide	Peptide Neutral Mass	Missed Cleavages	Rank	Avg. Measured RT	Predicted RT
DETAILS	MEGDAVEAIVEESETFIK	1995.9347	0		24.9907	
DETAILS	DPDYQPPAK	1029.4767				
DETAILS	VVGNMKPPKPTK	1294.7432				
DETAILS	TFQCELCSTYCP	1720.7008				
DETAILS	SHTDERPHK	1105.5265				
DETAILS	NHLNHTGTGRPHK	1511.7705				
DETAILS	CPDCDMAFVTSGELVR	1855.7903				
DETAILS	HTHEKPFK	1022.5298				
DETAILS	CSMCDYASVEVSK	1534.6102				
DETAILS	SHTGERPFQCSLCSYASR	2141.937				
DETAILS	THSGEKPYECYICAR	2006.8727				
DETAILS	FTQSGTMK	898.4219				
DETAILS	HTENVAK	797.40314				
DETAILS	FHCPCDVTIAR	1511.6761				
DETAILS	SDLGVHLR	895.48755				
DETAILS	QHSYIEQGK	1088.525				
DETAILS	YCDAVFHER	1195.508				
DETAILS	YALIQHQK	999.5502				
DETAILS	CDQCDYACR	1246.4165				
DETAILS	THTGEKPYACSHCDK	1789.7512				
DETAILS	QLLDMHFK	1030.527				
DETAILS	YHDPNFVPAAFVCSK	1750.8137				
DETAILS	HADNCAGPDGVEGENGGETK	2012.813				

VIEWS CHARTS EXPORT PRINT PAGE SIZE

Peak Areas

CTCF



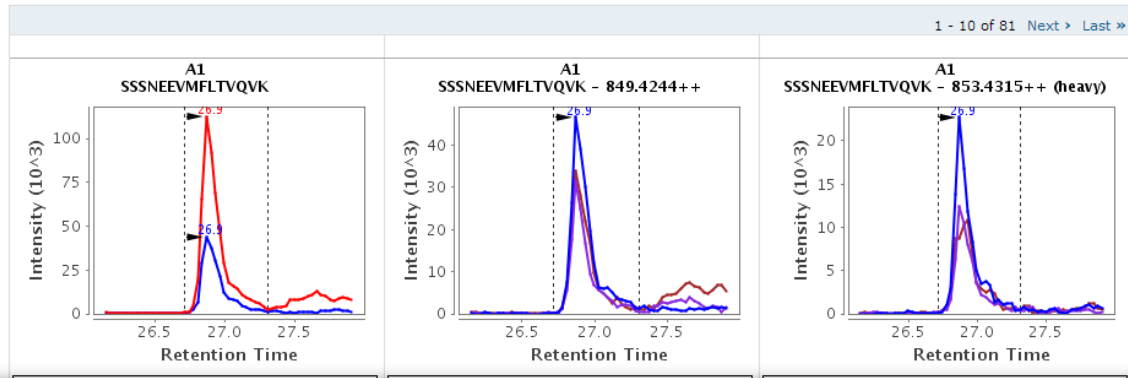
Peptide

Viewing Peptides

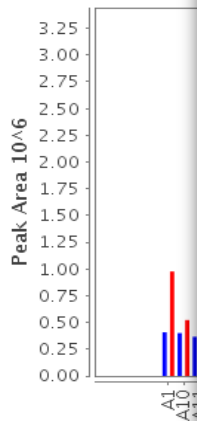
Peptide Summary

Name	Human_plasma.zip
Group	A2MG
Sequence	SSSNEEVMFLTVQVK
NeutralMass	1696.8342
Avg. RT	26.6774
Predicted RT	26.3900
Precursors	SSSNEEVMFLTVQVK - 8 SSSNEEVMFLTVQVK - 8

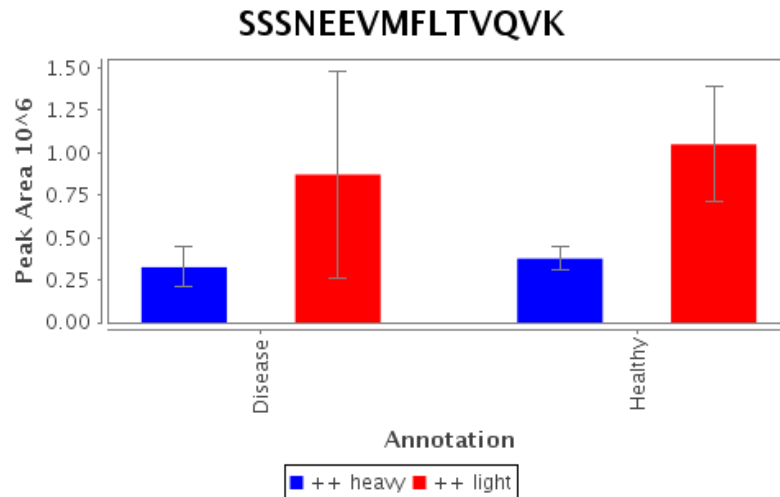
Chromatograms



Peak Areas



Peak Areas



Group By:

Condition

CV Values:

☐

Width:

500

Height:

300

UPDATE

Protein and Peptide Search

Mass Spec Search ↑ ↓ ×

Protein Search **Peptide Search** **Modification Search**

Protein Name * ?

Search in subfolders ? ☒

SEARCH

Mass Spec Search ↑ ↓ ×

Protein Search **Peptide Search** **Modification Search**

Peptide sequence * ? **SEARCH**

Exact matches only ? ☐

Search in subfolders ? ☒

Targeted MS Peptides

VIEWS ▾	CHARTS ▾	EXPORT ▾	PRINT	PAGE SIZE ▾	
	Protein / Label	Peptide	Path	File	
DETAILS ▸	TAF11 ▾	MQILVSSFEEQLNR	/MacCoss/brendanx/Test1/Libraries/Human	Stergachis - Supplementary Data 2_2013-05-30_10-54-36.zip	
DETAILS ▸	TAF11 ▾	MQILVSSFEEQLNR	/MacCoss/brendanx/Test1/Libraries/Human	Stergachis - Supplementary Data 2_2013-06-02_17-14-10.zip	
Distinct Count:		1		2	

Modification Search

Targeted MS Modification Search

Search By: ☐ Delta Mass ☒ Modification Name

Type: ☒ Names used in imported experiments
☐ Common Unimod modifications
☐ All Unimod modifications

Include: ☒ Structural ☒ Isotope Label

Custom Name:

Search in Subfolders:

SEARCH

Label: 13C(6)15N(2)

Carbamidomethyl (

Carbamidomethyl C

Heavy K

Heavy R

Label: 13C(6)15N(2)

Label: 13C(6)15N(4

Phospho (S,T)

Phospho (Y)

Targeted MS Peptides

VIEWS CHARTS EXPORT PRINT PAGE SIZE					1 - 20 of 48 Next Last
	Protein / Label	Peptide	Precursor	File	
DETAILS	Rv3133c devR	TLLGLLSEGLTNK	TLLGLLSEGLTNK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	Rv2626c hrp1	HLPEHAIVQFVK	HLPEHAIVQFVK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	Decoys	HLIDDALK	HLIDDALK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	Decoys	TLLGLLSEGLTNK	TLLGLLSEGLTNK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	Rv2623 TB31.7	HLIDDALK	HLIDDALK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	Rv2031c hspX	TVSLPVGAEDEDDIK	TVSLPVGAEDEDDIK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	Rv2031c hspX	GILTVSVAVSEGKPTK	GILTVSVAVSEGKPTK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	Decoys	TVSLPVGAEDEDDIK	TVSLPVGAEDEDDIK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	Decoys	GILTVSVAVSEGKPTK	GILTVSVAVSEGKPTK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	Decoys	HLPEHAIVQFVK	HLPEHAIVQFVK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	
DETAILS	B2MG	VNHVTLSPQK	VNHVTLSPQK	Human_plasma.zip	
DETAILS	CO4A	GSFEFPVGDAVSK	GSFEFPVGDAVSK	Human_plasma.zip	
DETAILS	CO4A	LGQYASPTAK	LGQYASPTAK	Human_plasma.zip	
DETAILS	CO5	FQNSAILTIQPK	FQNSAILTIQPK	Human_plasma.zip	
DETAILS	CFAB	YGLVTYATYPK	YGLVTYATYPK	Human_plasma.zip	
DETAILS	B2MG	VEHSDLSFSK	VEHSDLSFSK	Human_plasma.zip	
DETAILS	APOA1	DLATVYVDVLK	DLATVYVDVLK	Human_plasma.zip	
DETAILS	CFAB	QLNEINYEDHK	QLNEINYEDHK	Human_plasma.zip	
DETAILS	GELS	AGALNSNDAFVLK	AGALNSNDAFVLK	Human_plasma.zip	
DETAILS	C1R	YTTTGMGVNTYK	YTTTGMGVNTYK	Human_plasma.zip	
VIEWS CHARTS EXPORT PRINT PAGE SIZE					1 - 20 of 48 Next Last

Customizing Views, Sorts, Filters

Targeted MS Peptides

Targeted MS Peptides

VIEWS CHARTS EXPORT PRINT PAGE SIZE 1 - 20 of 48 Next Last

Columns Available Fields

Filter

Sort (1)

Selected Fields

Protein / Label
Peptide
Precursor
File
Predicted RT

Peptide
Group
Peptide
Start Index
End Index
Peptide Neutral Mass
Missed Cleavages
Rank
RT Score
Predicted RT
Avg. Measured RT
Decov

Show Hidden

DELETE REVERT

	Protein / Label	Peptide	Precursor
DETAILS	Rv3133c devR	TLLGLLSEGLTNK	TLLGLLS
DETAILS	Rv2626c hrp1	HLPEHAIVQFVK	HLPEHAIV
DETAILS	Decoys	HLIDDALK	HLIDDALK
DETAILS	Decoys	TLLGLLSEGLTNK	TLLGLLS
DETAILS	Rv2623 TB31.7	HLIDDALK	HLIDDALK
DETAILS	Rv2031c hspX	TVSLPVGAEEDDIK	TVSLPVG
DETAILS	Rv2031c hspX	GILTVSVAVSEGKPTK	GILTVSV
DETAILS	Decoys	TVSLPVGAEEDDIK	TVSLPVG
DETAILS	Decoys	GILTVSVAVSEGKPTK	GILTVSV
DETAILS	Decoys	HLPEHAIVQFVK	HLPEHAIV
DETAILS	B2MG	VNHVTLISQPK	VNHVTLIS
DETAILS	CO4A	GSFEFPVGDVSK	GSFEFPV
DETAILS	CO4A	LGQYASPTAK	LGQYASF
DETAILS	CO5	FQNSAILTIQPK	FQNSAIL
DETAILS	CFAB	YGLVTYATYPK	YGLVTYA
DETAILS	B2MG	VEHSDLSFSK	VEHSDLS
DETAILS	APOA1	DLATVYVDVLK	DLATVYV
DETAILS	CFAB	QLNEINYEDHK	QLNEINYI
DETAILS	GELS	AGALNSNDAFVLK	AGALNSN
DETAILS	C1R	YTTMTGMVNTYK	YTTMTGM

VIEWS CHARTS EXPORT PRINT PAGE SIZE

Targeted MS Peptides

Targeted MS Peptides

VIEWS CHARTS EXPORT PRINT PAGE SIZE 1 - 20 of 37 Next

View: With RT

Filter: (PredictedRetentionTime > 15)

	Protein / Label	Peptide	Precursor	File	Predicted RT
DETAILS	CO6	IGESIELTCPK	IGESIELTCPK	Human_plasma.zip	17.6500
DETAILS	PON1	IQNILTEEPK	IQNILTEEPK	Human_plasma.zip	17.7100
DETAILS	Rv2626c hrp1	HLPEHAIVQFVK	HLPEHAIVQFVK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	17.9000
DETAILS	Decoys	HLPEHAIVQFVK	HLPEHAIVQFVK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	17.9000
DETAILS	THBG	EGQMESVEAAMSSK	EGQMESVEAAMSSK	Human_plasma.zip	18.0700
DETAILS	FN1	SYTITGLQPGTDYK	SYTITGLQPGTDYK	Human_plasma.zip	19.3800
DETAILS	Rv2031c hspX	GILTVSVAVSEGKPTK	GILTVSVAVSEGKPTK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	20.2700
DETAILS	Decoys	GILTVSVAVSEGKPTK	GILTVSVAVSEGKPTK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	20.2700
DETAILS	HPT	VTSIQDWVQK	VTSIQDWVQK	Human_plasma.zip	20.4300
DETAILS	GELS	AGALNSNDAFVLK	AGALNSNDAFVLK	Human_plasma.zip	20.5000
DETAILS	C1QB	LEQGENVFLQATDK	LEQGENVFLQATDK	Human_plasma.zip	20.6600
DETAILS	CFAB	YGLVTYATYPK	YGLVTYATYPK	Human_plasma.zip	20.6800
DETAILS	CO5	FQNSAILTIQPK	FQNSAILTIQPK	Human_plasma.zip	20.6900
DETAILS	Rv2031c hspX	TVSLPVGAEEDDIK	TVSLPVGAEEDDIK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	20.7000
DETAILS	Decoys	TVSLPVGAEEDDIK	TVSLPVGAEEDDIK	SRMCourse_DosR-hDP__20130501_forBrendan.zip	20.7000
DETAILS	AACH	EIGELYLPK	EIGELYLPK	Human_plasma.zip	21.3600
DETAILS	TTHY	AADDTWEPFASGK	AADDTWEPFASGK	Human_plasma.zip	21.4600
DETAILS	RET4	FSGTWYAMAK	FSGTWYAMAK	Human_plasma.zip	21.8700
DETAILS	CO4A	GSFEFPVGDVSK	GSFEFPVGDVSK	Human_plasma.zip	22.9400
DETAILS	IC1	VTTSQDMLSIMEK	VTTSQDMLSIMEK	Human_plasma.zip	23.8500

VIEWS CHARTS EXPORT PRINT PAGE SIZE 1 - 20 of 37 Next

Export and Client APIs

The image displays the PanoramaWeb (beta) interface, which is used for managing and exporting targeted mass spectrometry data. The interface is divided into several sections:

- Targeted MS Peptides:** This section shows a table of peptides with columns for Protein / Label, Peptide, and Precursor. The table is filtered by PredictedRetentionTime > 15. The export options include Excel 2007 File (.xlsx), Excel 97 File (.xls), and Refreshable Web Query (.iqy). The current view is set to "With RT".
- Excel 2007 File (.xlsx):** This section shows the export options for the Excel 2007 File format, including the maximum number of rows and columns.
- Excel 97 File (.xls):** This section shows the export options for the Excel 97 File format, including the maximum number of rows and columns.
- Refreshable Web Query (.iqy):** This section shows the export options for the Refreshable Web Query format.
- Query Schema Browser:** This section shows the schema for the targetedms data, including the columns for Peptide, Max Neutral Mass, and Total Count.
- Edit PeptideCounts:** This section shows the export options for the Edit PeptideCounts format, including the columns for Peptide, Max Neutral Mass, and Total Count.

The interface also includes a search bar, a navigation menu, and a sidebar with various options like "Human", "Query Schema", and "Edit PeptideCounts".

Below the main interface, there is a code snippet showing the R script used to generate the data:

```
colFilter=makeFilter(c("PeptideId/PredictedRetentionTime","GREATER_THAN","15")),
containerFilter=NULL)
```

Permissions

https://panoramaweb.org x
https://panoramaweb.org:9443/labkey/security/MacCoss/brendanx/project.view?

Admin ▾ Help ▾ jeckels ▾

PanoramaWeb (beta)

Permissions for /MacCoss/brendanx

[SAVE AND FINISH](#) [SAVE](#) [CANCEL](#)

Folders

- MacCoss
 - absterga
 - brendanx**
 - genn
 - maccoss
 - maccosstester
 - mbereman
 - nicksh
 - spionin
 - vsharma

Permissions **Project Groups** **Site Groups** **Impersonate** **Group Diagram**

[VIEW PERMISSIONS REPORT ▸](#)

☐ Inherit permissions from parent

Roles

Folder Administrator
Folder Administrators have full control over their particular folder, but not others.

Editor
Editors may read, add, update and delete information.

Author
Authors may read and add information in some cases, but may update and delete only information they added.

Reader
Readers may read information but may not change anything.

Submitter
Submitters may submit new information, but may not read or change anything.

Assay Designer
Assay designers may perform several actions related to designing assays.

Groups

[BRENDANX@PROTEINMS.NET](#) [Add user or group...](#)

[MACCOSS MEMBERS](#) [ABSTERGA@UW.EDU](#) [Add user or group...](#)

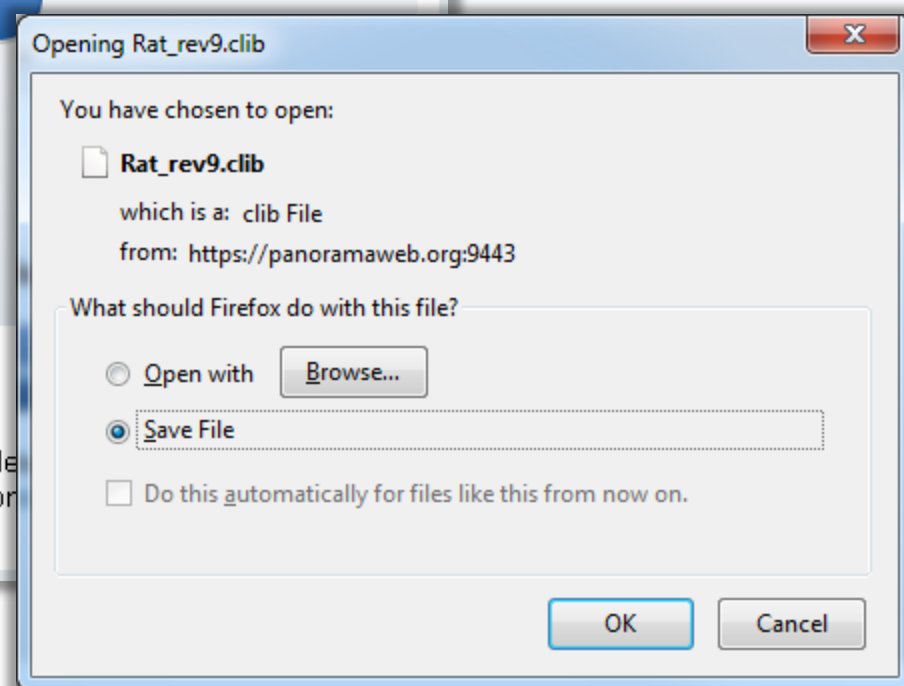
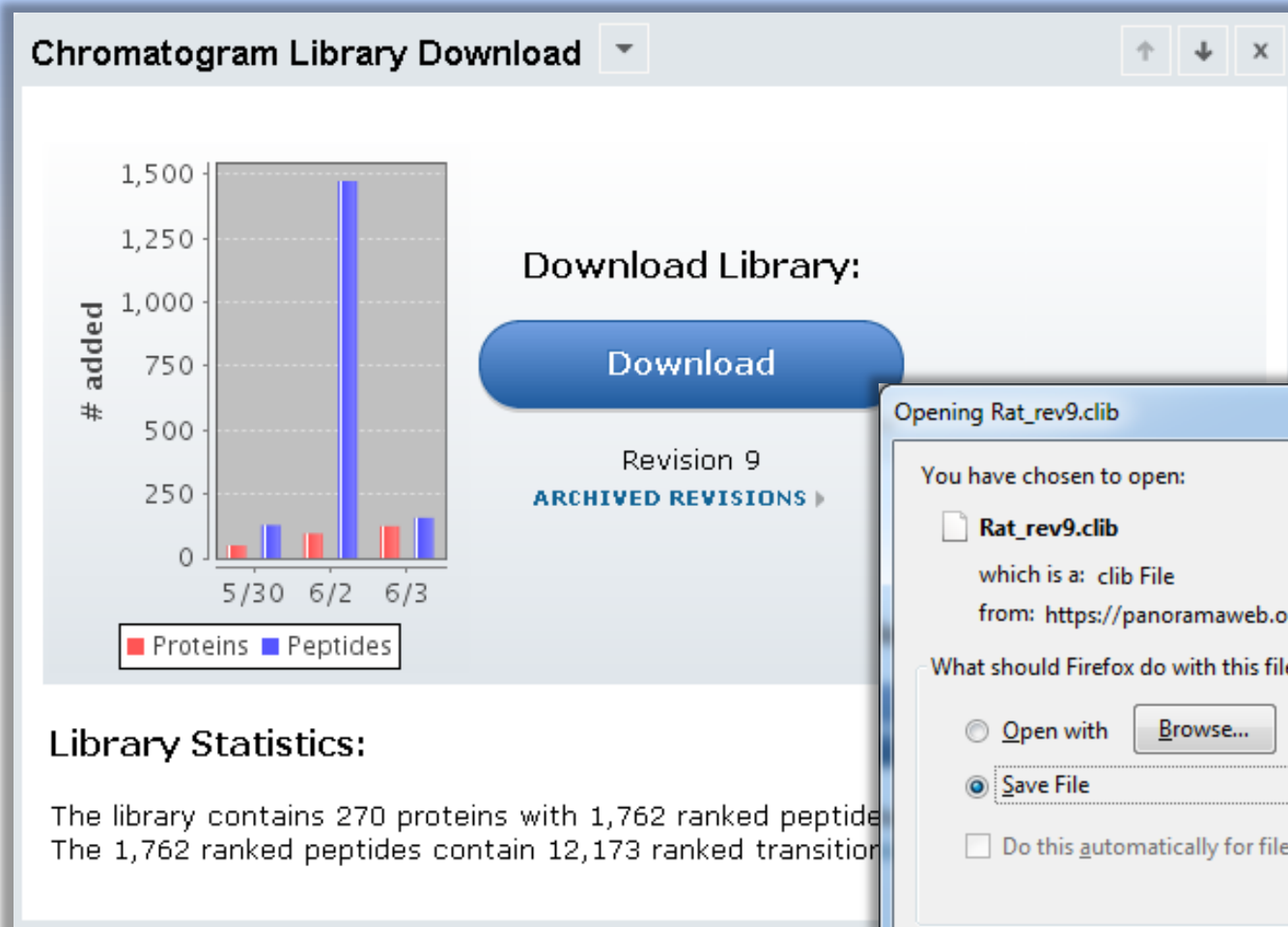
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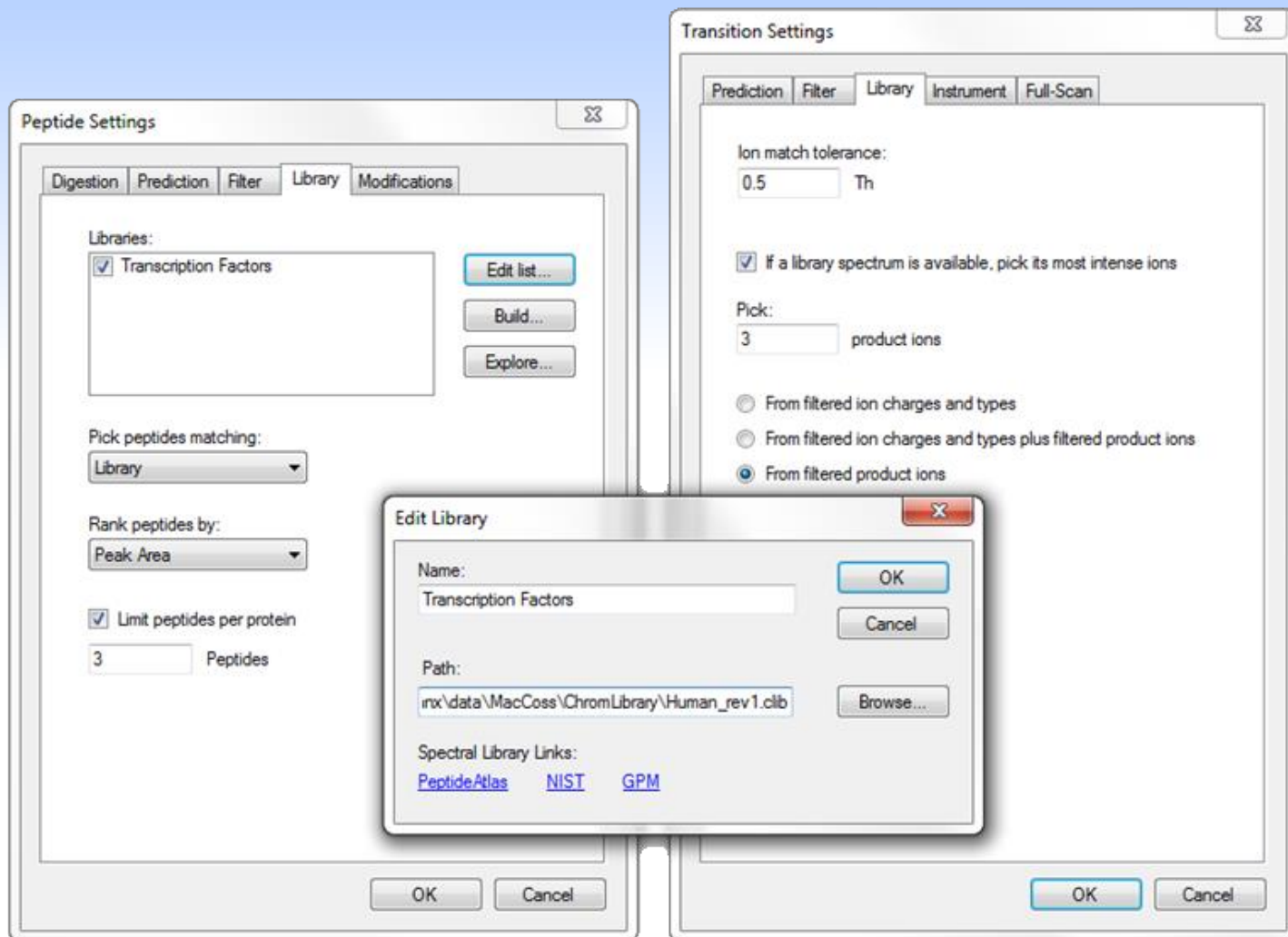
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** indicates permissions are inherited*

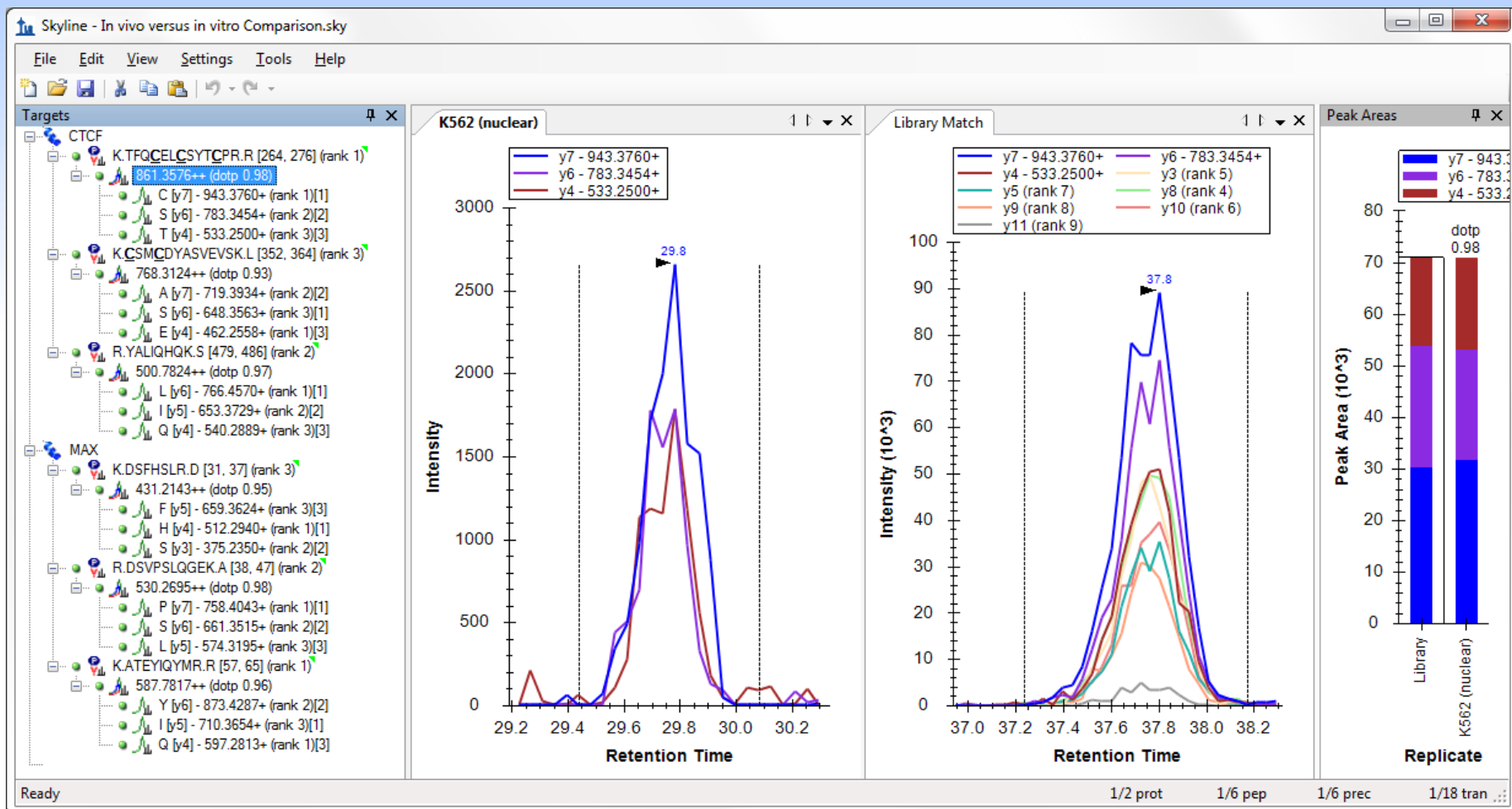
Chromatogram Library Export



Chromatogram Library Import



Chromatogram Library Usage



How to Get Panorama

- PanoramaWeb (panoramaweb.org)
 - Hosted at University of Washington
 - Request access for a lab or organization
 - Data can be private or public
- Create your own installation
 - Download and documentation at labkey.com
 - Install on Windows, Linux, OSX, etc
- Use LabKey Software's private hosting

Future Plans

- Release chromatogram library support
 - July 2013
 - Will coincide with new Skyline release
- Store and calculate normalized retention times (iRT)
- Store and view QC runs
- Show more Skyline graphs
- Support response curves with QuaSAR

More Information

- Poster tomorrow
 - **Sharing Targeted Proteomics Assays using Skyline and Panorama**
 - MP 382
- panoramaweb.org
 - View recorded webinar
 - Request a project
- labkey.org/labkey.com
 - General information
 - Downloads for installers and source code



Questions

Josh Eckels
jeckels@labkey.com

Skyline Users Group - June 9, 2013