

Supplementary Materials for

An Integrated Quantitative Proteomics Workflow for Cancer Biomarker Discovery and Validation in Plasma

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This file includes

Supplementary method 1

Supplementary method 2

Supplementary method 3

Supplementary Figures

Figure S1 | Steps involved in the preparation of the C18 desalting tip.

Figure S2 | Creating a data-dependent method using Thermo Xcalibur software.

Figure S3 | LC and MS parameters used for label-free quantitation.

Figure S4 | Peptide settings for Multiple Reaction Monitoring and Parallel

Reaction Monitoring using Skyline.

Figure S5 | Transition settings for Multiple Reaction Monitoring and Parallel

Reaction Monitoring using Skyline

Figure S6 | **(A, B)** Procedure for exporting the list of peptides for Multiple Reaction Monitoring **(A)** and Parallel Reaction Monitoring **(B)** experiment.

Figure S7 | Method Parameters for Multiple Reaction Monitoring experiment on TSQ Altis.

Figure S8: Method parameters for the Parallel Reaction Monitoring experiment on Orbitrap Fusion.

Figure S9 | Data analysis using Skyline. **(A)** Importing the result files into the Skyline document. **(B)** Steps to view the retention time of peptides.

Figure S10 | **(A)** The gradient used for a 2-hour separation through liquid chromatography. **(B)** Correlation analysis of the technical replicates of three different biological pools of plasma samples.

Figure S11 | The total no. proteins which has a coefficient of variation of less than 20% and 10% in each of the iTRAQ 4-plex labels- 114, 115, 116, and 117 after applying 1% FDR. The number of labelled peptides varied across the iTRAQ reagents.

Figure S12 | Targeted proteomics using MS-based approaches. (A, B) Workflow for Multiple Reaction Monitoring (MRM), this approach considers the transitions of the peptide (A) and Parallel Reaction Monitoring (PRM), this approach considers only selection of peptides (B). It is independent of transitions.

Figure S13 | The abundance profile of alpha-1B-glycoprotein in the pooled samples (iTRAQ experiment) and individual samples (TMT, MRM, and PRM experiments) using different proteomic techniques. The y-axis represents the abundance in Log₂, and the x-axis represents samples used in iTRAQ, TMT, MRM, and PRM experiments. The protein abundance of alpha-1B-glycoprotein is the average abundance of three peptides (R.SGLSTGWTQLSK.L, R.CEGPIPDVTFELLR.E, and R.TPGAAANLELIFVGPQHAGNYR.C) in case of MRM and PRM experiments. P: Pooled sample, S: individual sample.

Figure S14 | The abundance profile of vascular cell adhesion protein 1 in label-free quantitation (LFQ), iTRAQ-4plex, TMT-6plex, and MRM experiments. The y-axis represents the abundance in Log₂, and the x-axis represents samples used in LFQ, iTRAQ-4plex, and TMT-6plex experiments. S: Plasma sample.

Supplementary Tables

Table S1 | (Microsoft Excel format). The list of identified proteins in label-free quantitation experiment.

Table S2 | (Microsoft Excel format). The list of identified proteins in iTRAQ 4-plex experiment.

Table S3 | (Microsoft Excel format). The list of identified proteins in TMT 6-plex experiment.

Supplementary method 1

Material

Biological Materials

1. Blood

CAUTION In this study, the collection of blood samples was done at the Calcutta Medical College, Kolkata, India. Prior to the sample collection process, written informed consent was received from each participant after giving detailed explanations about the experimental procedure in the language best understood by the potential participants. This study was approved by the institutional review boards and ethics committee of the Indian Institute of Technology Bombay (IITB-IEC/2016/026). Human Body fluids should be handled in a Biosafety level 2 environment.

Reagents

1. Pierce™ Top 12 Abundant Protein Depletion Spin Columns (Thermo Fisher Scientific, cat no. 85165)
2. Quick Start Bradford Protein Assay Kit (BioRad, cat. no. 5000205) **CRITICAL** Please go through the manufacturer's instruction to check the compatibility of the reagent.
3. Urea (Sigma-Aldrich, cat. no. U0631) **CAUTION** It is a health hazard level 2 compound. Use gloves and avoid direct contact with skin and eyes.
4. Ammonium bicarbonate (Sigma-Aldrich, cat. no. 09830)
5. Tris (2-carboxyethyl) phosphine hydrochloride solution, 0.5 M, pH 7.0 (aqueous solution; pH was adjusted with ammonium hydroxide) (Sigma life Science, cat. no. 646547-10X1ML) **CAUTION** It is health hazard level 2, 2A and 3 compounds. Use gloves and avoid direct contact with skin and eyes.

6. Iodoacetamide (Sigma-Aldrich, cat. no. A3221)
7. Pierce™ trypsin protease, MS Grade (Thermo Fisher Scientific, cat. no. 90057)
8. Empore™ Octadecyl C18 47mm Extraction Disks (cat no. 66883-U)
9. iTRAQ® Reagents – 4-plex (SCIEX, PN 4374321)
10. TMT 6-plex™ Isobaric Label Reagent Set, 1 x 0.8 mg (Thermo Scientific™, cat no. 90061)
11. Pierce™ High pH Reversed-Phase Peptide Fractionation Kit (Thermo Scientific™, cat no. 84868)
12. Acetonitrile: Optima™ LC/MS grade (cat. no. A9554) **CAUTION** Flammable liquid and vapor. Irritating to eyes. May cause skin and respiratory tract irritation.
13. Methanol: Optima™ LC/MS grade, (cat. no. A456-500) **CAUTION** Flammable liquid and vapor. Irritating to eyes. May cause skin and respiratory tract irritation.
14. Formic Acid: LC-MS Ultra (Sigma-Aldrich; cat. no. 14265)

Equipment

1. Mini_PROTEAN® Tetra Cell and Systems (BioRad, cat no. 1658000)
2. Liquid chromatography: EASY-nLC 1200 (Thermo Fisher Scientific)
3. Mass spectrometer: Orbitrap Fusion and TSQ Altis (Thermo Fisher Scientific)
4. Pre-column: Acclaim™ PepMap™ 100 C18 HPLC Columns, 5 µm, 100 µm I.D. x 2 cm, nanoViper (Thermo Fisher Scientific, P/N 164564, S/N 10694527)
5. Analytical Column: PepMap™ RSLC C18, 2 µm, 75 µm x 50 cm (Thermo Fisher Scientific, P/N ES803A, S/N 10918620)
6. Thermo Scientific SPEEDVAC Savant SpeedVac Kit ISS110 P1
7. SmartSpec™ Plus Spectrophotometer (BioRad, cat. no. 170-2525)
8. Multiskan GO (Thermo Fisher Scientific, cat. no. N10588)

9. Micro-centrifuge capable of operating at 1000 ×g
10. End-over-end mixer
11. BD Vacutainer® PST™ (cat no. 367960)

Reagent setup

1. Plasma digestion buffer: Prepare a 100 mM ammonium bicarbonate solution at pH 8.0 by adding 3.953 g of ammonium bicarbonate to 1 l of milli-Q-water.
2. 6 M urea: Prepare 6 M urea by adding 3.6 g of urea to 10 ml of 100 mM ammonium bicarbonate buffer.
3. Solvent for desalting column, Solvent 1, for eluting the peptides, is 40% (v/v) acetonitrile.
Solvent 2, for eluting the peptides, is 50% (v/v) acetonitrile.
Solvent 3, for eluting the peptides, is 60% (v/v) acetonitrile.
4. Solvents for nLC, Solvent A 0.1% (v/v) formic acid in water, Solvent B 80% (v/v) acetonitrile in 0.1% (v/v) formic acid

Supplementary method 2

Chromatography Gradients

The liquid chromatography gradient used for label-free quantitation (LFQ) experiment is shown below. It summarizes the time duration for solvent B at different intervals of time with flow rate of 300 nl/min (Step 39).

Time [mm:ss]	Duration [mm:ss]	Flow [nl/min]	Mixture [%B]
00:00	00:00	300.00	02.00
05:00	05:00	300.00	05.00
75:00	70:00	300.00	25.00
105:00	30:00	300.00	45.00
115:00	10:00	300.00	95.00
120:00	05:00	300.00	95.00

The liquid chromatography gradient used for the label-based quantitation (iTRAQ 4-plex) experiment is shown below. It summarizes the time duration for solvent B at different intervals of time with flow rate of 300 nl/min (Step 40).

Time [mm:ss]	Duration [mm:ss]	Flow [nl/min]	Mixture [%B]
00:00	00:00	300.00	00.00
10:00	10:00	300.00	05.00
120:00	110:00	300.00	30.00
170:00	50:00	300.00	65.00
175:00	05:00	300.00	90.00
180:00	05:00	300.00	90.00

The liquid chromatography gradient used for the label-based quantitation (TMT 6-plex) experiment is shown below. It summarizes the time duration for solvent B at different intervals of time with flow rate of 300 nl/min (Step 40).

Time [mm:ss]	Duration [mm:ss]	Flow [nl/min]	Mixture [%B]
00:00	00:00	300.00	00.00
04:00	04:00	300.00	05.00
62:00	58:00	300.00	25.00
80:00	18:00	300.00	50.00
83:00	03:00	300.00	90.00
90:00	07:00	300.00	90.00

The liquid chromatography gradient used for Multiple Reaction Monitoring (MRM) and Parallel Reaction Monitoring (PRM) experiment is shown below. It summarizes the time duration for solvent B at different intervals of time with flow rate of 300 nl/min (Step 41 and 42).

Time [mm:ss]	Duration [mm:ss]	Flow [nl/min]	Mixture [%B]
00:00	00:00	300.00	02.00
05:00	05:00	300.00	10.00
42:00	37:00	300.00	35.00
52:00	10:00	300.00	45.00
55:00	03:00	300.00	90.00
60:00	05:00	300.00	90.00

Supplementary method 3

OT-HCD-OT MS/MS Method The following MS parameters were used for the LFQ experiment (Step 39). The same parameters were used for the iTRAQ 4-plex/TMT 6-plex experiment instead of collision energy. In case of the iTRAQ 4-plex/TMT 6-plex MS method, the collision energy was set 35% (Step 40).

Method settings

Application mode: Peptide

Method duration (min): LFQ:120 mins, iTRAQ 4-plex:180 mins, TMT 6-plex: 90 mins/fraction

NSI source/gas parameters

Spray voltage: 1900 V

Capillary temperature: 275°C

Sheath gas: 0

Auxiliary gas: 0

MS global settings

Default charge state: 1

Internal mass calibration: Lock Mass (445.12003 m/z)

Experiment #1 [MS]

Start time (min): 0

End time (min): 120

Cycle time (sec): 3

MS OT

Detector type: Orbitrap

Resolution: 60,000

Mass range: Normal

Use quadrupole isolation: True
Scan range (m/z): 375-1700
RF lens (%): 60
AGC target: 4.0e5
Maximum injection time (ms): 50
Microscans: 1
Data type: Profile
Polarity: Positive
NCE: 28
Lock masses: 445.12003 m/z

Monoisotopic peak determination: Peptide

Charge state

Include charge state (s): 2-6
Include undetermined charge states: False
Include charge states 25 and higher: False

Dynamic exclusion

Exclude after n times: 1
Exclusion duration (s): 40
Mass Tolerance: ppm
Low: 10
High: 10
Exclude Isotopes: True
Perform a dependent scan on single charge state per precursor only: False

Intensity

Filter Type: Intensity Threshold
Intensity Threshold: 5.0e3

Data Dependent

Data Dependent Mode: Cycle Time

Time between Master Scans (sec): 3

ddMS² OT HCD

Isolation Mode: Quadrupole

Isolation Window (m/z): 1.2

Isolation Offset: Off

Activation Type: HCD

Collision Energy (%): LFQ: 30, iTRAQ 4-plex/TMT 6-plex: 35

Detector Type: Orbitrap

Scan Range Mode: Auto: m/z Normal

Orbitrap Resolution: LFQ: 15000, iTRAQ 4-plex and TMT 6-plex: 30000

First Mass (m/z): 100

AGC Target: 1.0e4

Inject Ions for all available parallelizable time: True

Maximum Injection Time (ms): 30

Microscans: 1

Data Type: Centroid

Use EASY-ICtm: False

The following MS parameters were used for Multiple Reaction Monitoring (Step 41).

NSI Source/Gas parameters

Spray Voltage: 2200 V

Capillary Temperature: 300 °C

Sheath Gas: 0

Auxiliary Gas: 0

MRM parameters

Use cycle time (sec): 3

Use calibrated RF lens: True

Q1 Resolution (FWHM): 0.7
Q3 Resolution (FWHM): 0.7
CID Gas (mTorr): 2
Source Fragmentation (V): 0
Chromatographic Peak Width (sec): 30
Use Chromatographic Filter: False
Use retention time reference: False
Display retention time: false
Use quan ion: False
Show visualization: false

The following MS parameters were used for Parallel reaction monitoring (Step 42).

NSI Source/Gas parameters

Spray Voltage: 1900 V
Capillary Temperature: 275 °C
Sheath Gas: 0
Auxiliary Gas: 0

tMS² OT HCD

MSⁿ Level (n): 2
Multiplex Ions: False
Isolation Mode: Quadrupole
Isolation window (m/z): 1.2
Activation Type: HCD
HCD collision energy (%): 30
Stepped collision energy: false
Detector type: Orbitrap
Orbitrap resolution: 60000
Mass range: normal
Scan range (m/z): 350-1500
RF lens (%): 60

AGC Target: 1.0e5

Inject Ions for all available parallelizable time: False

Maximum Injection Time (ms): 118

Microscans: 1

Data Type: Centroid

Polarity: Positive

Use EASY-ICtm: False

Loop control: All

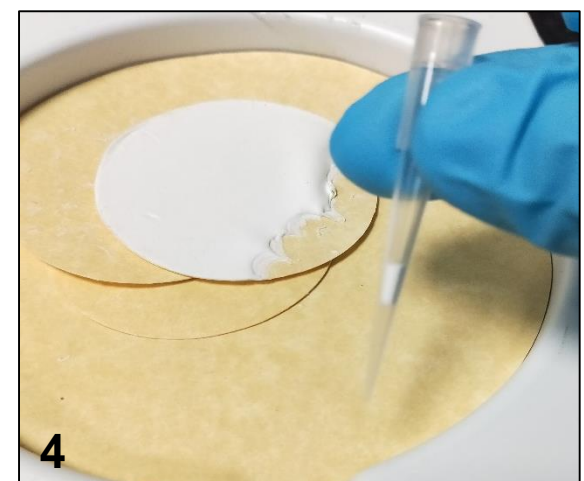


Figure S1 | Steps involved in the preparation of the C18 desalting tip.

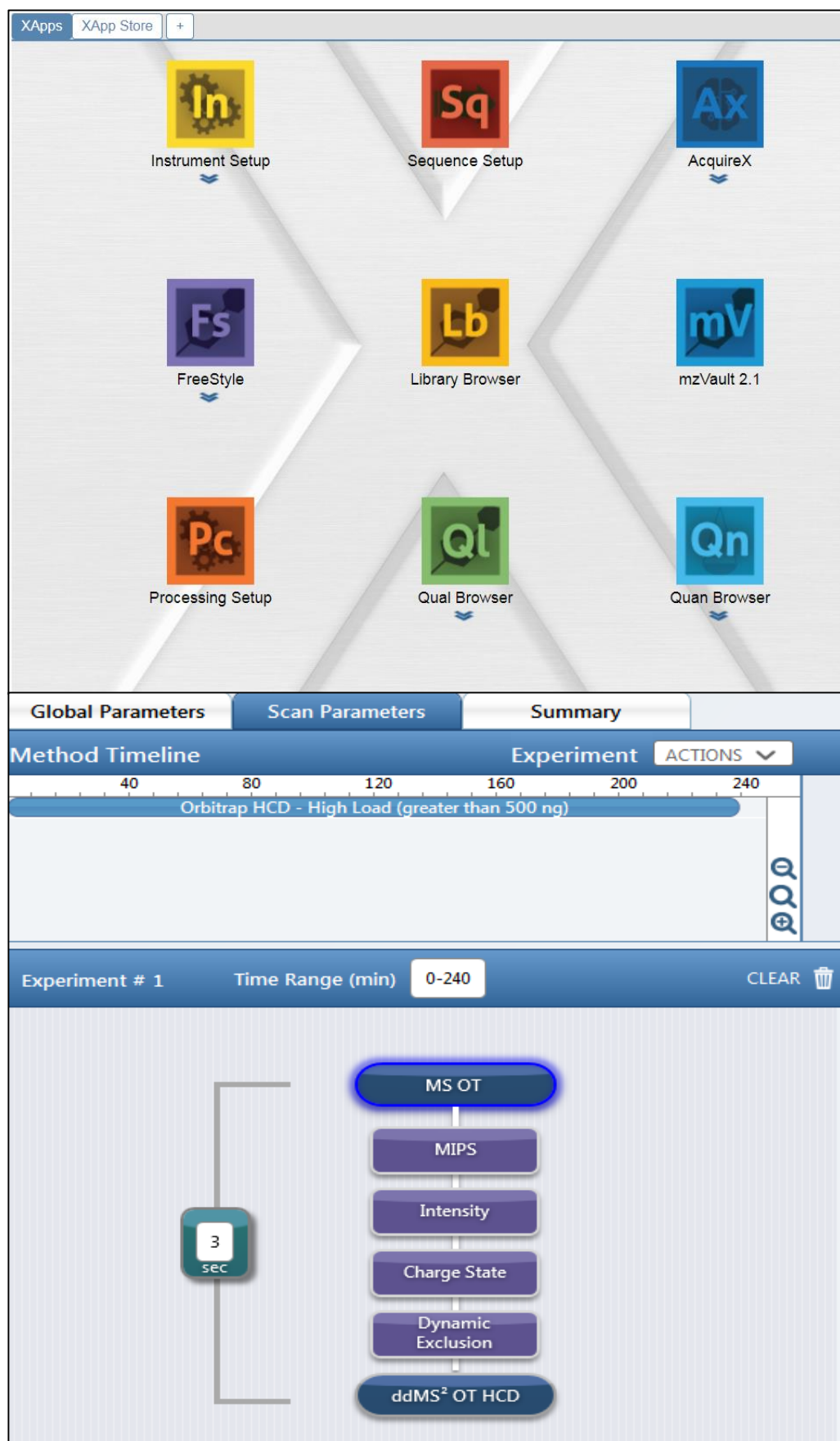


Figure S2 | Creating a data-dependent method using Thermo Xcalibur software.

Thermo EASY-LC method print for Fusion

Sample pickup:

Volume [µl] : 3.00
Flow [µl / min] : 5.00

Sample loading:

Volume [µl] : 15.00
Flow [µl / min] : (unspecified)
Max. pressure [Bar] : 750.00

Gradient: _

Time [mm:ss]	Duration [mm:ss]	Flow [nl/min]	Mixture [%B]
00:00	00:00	300.00	2.00
05:00	05:00	300.00	5.00
75:00	70:00	300.00	25.00
105:00	30:00	300.00	45.00
115:00	10:00	300.00	95.00
120:00	05:00	300.00	95.00

Pre-column equilibration: _

Volume [µl] : 15.00
Flow [µl / min] : (unspecified)
Max. pressure [Bar] : 750.00

Analytical column equilibration:

Volume [µl] : 10.00
Flow [µl / min] : (unspecified)
Max. pressure [Bar] : 750.00

Autosampler wash: _

Flush volume [µl] : 100.00

Method Summary

End Time (min): 120
Cycle Time (sec): 3

Perform dependent scan on single charge state per precursor only: **False**

Method Settings

Application Mode: **Peptide**
Method Duration (min): 120

Global Parameters

Ion Source

Use Ion Source Settings from Tune: **True**
FAIMS Mode: **Not Installed**

MS Global Settings

Default Charge State: 1
Internal Mass Calibration: **User-defined Lock Mass**
Current Lock Mass: **Current**

Positive Ion

Positive Ion

m/z
445.12003

Negative Ion

Negative Ion

m/z

Experiment#1 [MS]

Start Time (min): 0

Master Scan:

MS OT

Detector Type: **Orbitrap**
Orbitrap Resolution: **60000**
Mass Range: **Normal**
Use Quadrupole Isolation: **True**
Scan Range (m/z): 375-1700
RF Lens (%): **60**
AGC Target: **4.0e5**
Maximum Injection Time (ms): 50
Microscans: 1
Data Type: **Profile**
Polarity: **Positive**
Source Fragmentation: **Disabled**
Scan Description:

Filters:

MIPS

Monoisotopic Peak Determination: **Peptide**

Charge State

Include charge state(s): 2-6
Include undetermined charge states: **False**
Include charge states 25 and higher: **False**

Dynamic Exclusion

Exclude after n times: 1
Exclusion duration (s): 40
Mass Tolerance: **ppm**
Low: 10
High: 10
Exclude Isotopes: **True**

Intensity

Filter Type: **Intensity Threshold**
Intensity Threshold: 5.0e3

Data Dependent

Data Dependent Mode: **Cycle Time**
Time between Master Scans (sec): 3

Scan Event Type 1:

Scan:

ddMS² OT HCD

Isolation Mode: **Quadrupole**
Isolation Window (m/z): 2
Isolation Offset: **Off**
Activation Type: **HCD**
Collision Energy Mode: **Fixed**
HCD Collision Energy (%): 30
Detector Type: **Orbitrap**
Scan Range Mode: **Auto: m/z Normal**
Orbitrap Resolution: 15000
First Mass (m/z): 100
AGC Target: **1.0e4**
Inject Ions for All Available Parallelizable Time: **True**
Maximum Injection Time (ms): 30
Microscans: 1
Data Type: **Centroid**
Use EASY-IC™: **False**
Scan Description:

Figure S3 | LC and MS parameters used for label-free quantitation.

DigestionPredictionFilterLibraryModificationsQuantification

Enzyme:
Trypsin [KR | P]

Max missed cleavages:
0

Background proteome:
None

Enforce peptide uniqueness by:
None

DigestionPredictionFilterLibraryModificationsQuantification

Retention time predictor:
None

☐ Use measured retention times when present

Time window:
2 min

Ion mobility predictor:
None

☐ Use spectral library ion mobility values when present

Resolving power:

☐ Linear peak width

DigestionPredictionFilterLibraryModificationsQuantification

Min length: 6Max length: 25

Exclude N-terminal AAs:
25

☐ Exclude potential ragged ends

Exclude peptides containing:
☐ Cys
☐ Met
☐ His
☐ NXT/NXS
☐ RP/KP

☒ Auto-select all matching peptides

DigestionPredictionFilterLibraryModificationsQuantification

Libraries:
☐ PFalciparum
☐ Synthetic Peptide
☐ P. Falciparum
☐ Human_Plasma_71
☒ Synthetic Peptide_22

Pick peptides matching:
Library

Rank peptides by:

☐ Limit peptides per protein
 Peptides

DigestionPredictionFilterLibraryModificationsQuantification

Structural modifications:
☒ Carbamidomethyl (C)
☐ Oxidation (M)
☐ Acetyl (S)
☐ Phospho (ST)
☐ Acetyl (T)
☐ Acetyl (N-term)

Max variable mods: 3Max neutral losses: 1

Isotope label type:
heavy

Isotope modifications:
☒ Label:13C(6)15N(4) (C-term R)
☒ Label:13C(6)15N(2) (C-term K)
☐ mTRAQ:13C(6)15N(2) (K)

Internal standard type:
heavy

DigestionPredictionFilterLibraryModificationsQuantification

Regression fit:
None

Normalization method:
None

Regression weighting:
None

MS level
All

Units

Figures of merit
Max LOQ bias: %Max LOQ CV: %
Calculate LOD by:
None

Figure S4 | Peptide settings for Multiple Reaction Monitoring and Parallel Reaction Monitoring using Skyline.

Prediction

Filter

Library

Instrument

Full-Scan

Precursor mass:

Monoisotopic

Product ion mass:

Monoisotopic

Collision energy:

None

Declustering potential:

None

Optimization library:

None

Compensation voltage:

None

☐ Use optimization values when present

Prediction

Filter

Library

Instrument

Full-Scan

Peptides

Precursor charges:

2,3

Ion charges:

1,2

Ion types:

y,b

Product ion selection

From:

ion 2

To:

last ion - 1

Special ions:

☒ N-terminal to Proline
☐ C-terminal to Glu or Asp
☐ iTRAQ-114
☐ iTRAQ-115
☐ iTRAQ-116
☐ iTRAQ-117

Edit List...

Precursor m/z exclusion window:

m/z

☒ Auto-select all matching transitions

Prediction

Filter

Library

Instrument

Full-Scan

Ion match tolerance:

0.05

m/z

☒ If a library spectrum is available, pick its most intense ions

Pick:

5

product ions

5

minimum product ions

☐ From filtered ion charges and types
☐ From filtered ion charges and types plus filtered product ions
☒ From filtered product ions

Prediction

Filter

Library

Instrument

Full-Scan

Min m/z:

50

m/z

Max m/z:

2000

m/z

☐ Dynamic min product m/z

Method match tolerance m/z:

0.055

m/z

Firmware transition limit:

Firmware inclusion limit:

Min time:

min

Max time:

min

Prediction

Filter

Library

Instrument

Full-Scan

MS1 filtering

Isotope peaks included:

Count

Precursor mass analyzer:

Orbitrap

Peaks:

3

Resolving power:

35,000

At:

200

m/z

Isotope labeling enrichment:

Default

MS/MS filtering

Acquisition method:

Targeted

Product mass analyzer:

Centroided

Isolation scheme:

Mass Accuracy:

10

ppm

☐ Use high-selectivity extraction

Retention time filtering

☒ Use only scans within 5 minutes of MS/MS IDs
☐ Use only scans within 5 minutes of predicted RT
☐ Include all matching scans

Figure S5 | Transition settings for Multiple Reaction Monitoring and Parallel Reaction Monitoring using Skyline

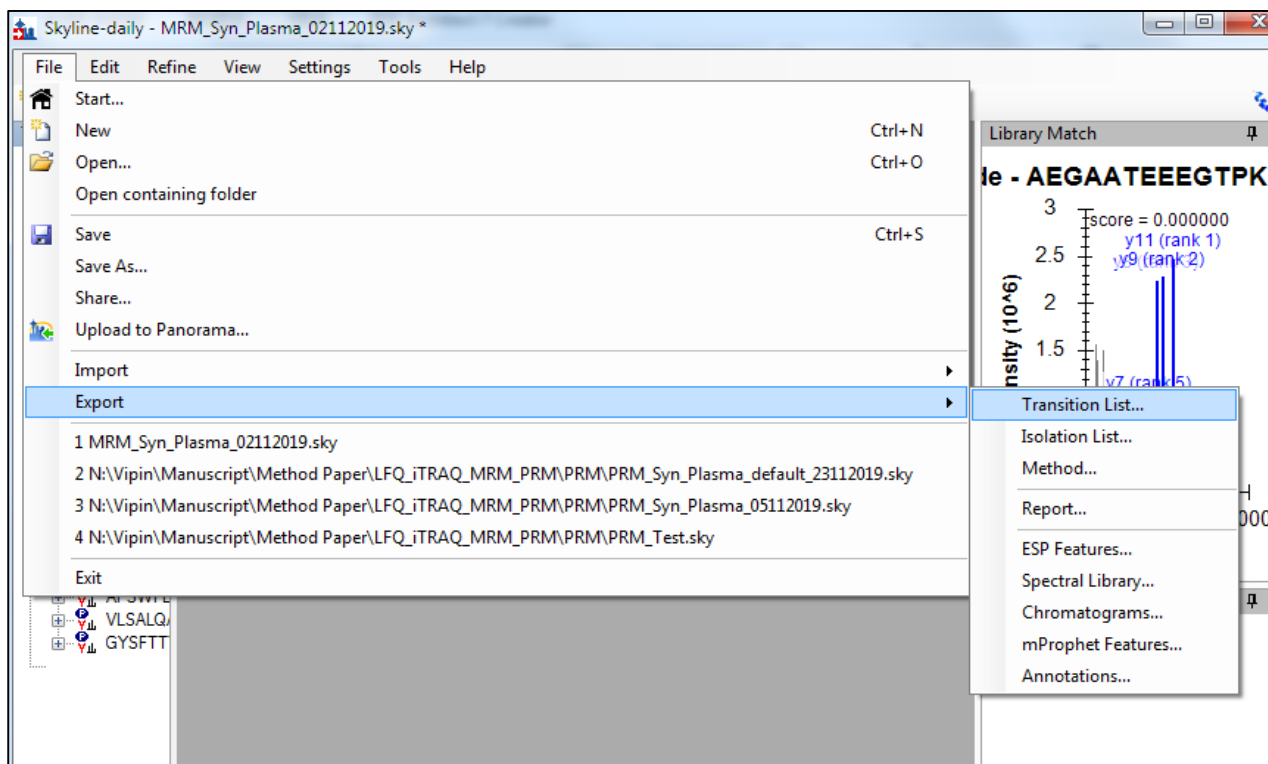
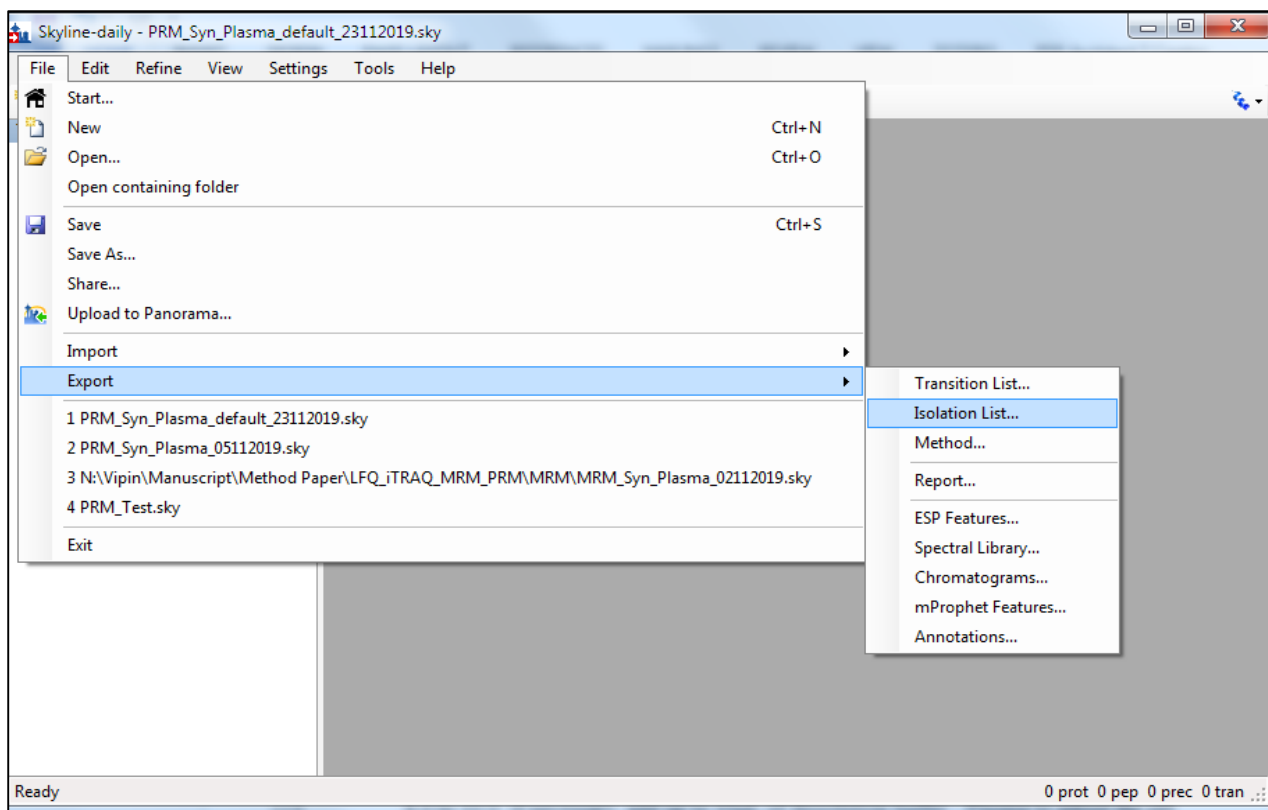
A**B**

Figure S6 | (A,B) Procedure for exporting the list of peptides for Multiple Reaction Monitoring (A) and Parallel Reaction Monitoring experiment (B).

Method Summary

Method Settings

Method Duration (min): 60

Global Parameters

Ion Source

Ion Source Type: **NSI**
Spray Voltage: **Static**
Positive Ion (V): **2200**
Negative Ion (V): **600**

Positive Ion

Positive Ion	
Time (min)	Voltage (V)

Negative Ion

Negative Ion	
Time (min)	Voltage (V)

Sweep Gas (Arb): 0
Ion Transfer Tube Temp (°C): 300

Experiment 1

Start Time (min): 0
End Time (min): 60

Master Scan:

SRM

Use Cycle Time: **True**

Cycle Time (sec): 3
Use Calibrated RF Lens: **True**
Q1 Resolution (FWHM): **0.7**
Q3 Resolution (FWHM): **0.7**
CID Gas (mTorr): 2
Source Fragmentation (V): 0
Chromatographic Peak Width (sec): 30
Use Chromatographic Filter: **False**
Use Retention Time Reference: **False**
Display Retention Time: **False**
Use Quan Ion: **False**
Show Visualization: **False**

SRM Table

Comp ound	Start Time (min)	End Time (min)	Polari ty	Precu rsor (m/z)	Produ ct (m/z)	Collisi on Ener gy (V)	Min Dwell Time (ms)
AVLTI DEK (heav y)(+2)	0	60	Positi ve	448.7 62	399.1 97	18.4	15.27 4
AVLTI DEK (heav y)(+2)	0	60	Positi ve	448.7 62	512.2 81	18.4	15.27 4
AVLTI DEK (heav y)(+2)	0	60	Positi ve	448.7 62	613.3 28	18.4	15.27 4
AVLTI DEK (heav y)(+2)	0	60	Positi ve	448.7 62	726.4 12	18.4	15.27 4
LTWA SHEK (heav y)(+2)	0	60	Positi ve	490.2 57	401.2 18	19.8	15.27 4
LTWA SHEK (heav y)(+2)	0	60	Positi ve	490.2 57	421.2 29	19.8	15.27 4

y)(+2)							
LTWA SHEK (heav y)(+2)	0	60	Positi ve	490.2 57	472.2 55	19.8	15.27 4
LTWA SHEK (heav y)(+2)	0	60	Positi ve	490.2 57	508.2 61	19.8	15.27 4
LTWA SHEK (heav y)(+2)	0	60	Positi ve	490.2 57	559.2 87	19.8	15.27 4
LTWA SHEK (heav y)(+2)	0	60	Positi ve	490.2 57	579.2 98	19.8	15.27 4
LTWA SHEK (heav y)(+2)	0	60	Positi ve	490.2 57	696.3 46	19.8	15.27 4
LTWA SHEK (heav y)(+2)	0	60	Positi ve	490.2 57	765.3 77	19.8	15.27 4
FYQT VVHR (heav y)(+2)	0	60	Positi ve	530.2 84	375.2 18	21.2	15.27 4
FYQT VVHR (heav y)(+2)	0	60	Positi ve	530.2 84	421.2 55	21.2	15.27 4
FYQT VVHR (heav y)(+2)	0	60	Positi ve	530.2 84	439.1 98	21.2	15.27 4
FYQT VVHR (heav y)(+2)	0	60	Positi ve	530.2 84	520.3 23	21.2	15.27 4
FYQT VVHR	0	60	Positi ve	530.2 84	540.2 45	21.2	15.27 4

(heav y)(+2)							
FYQT VVHR (heav y)(+2)	0	60	Positi ve	530.2 84	621.3 71	21.2	15.27 4
FYQT VVHR (heav y)(+2)	0	60	Positi ve	530.2 84	639.3 14	21.2	15.27 4
FYQT VVHR (heav y)(+2)	0	60	Positi ve	530.2 84	738.3 82	21.2	15.27 4
FYQT VVHR (heav y)(+2)	0	60	Positi ve	530.2 84	749.4 29	21.2	15.27 4
SADT LWGI QK (heav y)(+2)	0	60	Positi ve	563.8 02	396.2 7	22.3	15.27 4
SADT LWGI QK (heav y)(+2)	0	60	Positi ve	563.8 02	453.2 91	22.3	15.27 4
SADT LWGI QK (heav y)(+2)	0	60	Positi ve	563.8 02	639.3 7	22.3	15.27 4
SADT LWGI QK (heav y)(+2)	0	60	Positi ve	563.8 02	752.4 54	22.3	15.27 4
SADT LWGI QK (heav y)(+2)	0	60	Positi ve	563.8 02	853.5 02	22.3	15.27 4

Figure S7 | Method Parameters for Multiple Reaction Monitoring experiment on TSQ Altis.

Scans

MS

MSⁿ

Filters

Precursor Selection Range

MIPS

Intensity

Charge State

Dynamic Exclusion

Targeted Inclusion

tMS² OT HCD

Method Summary

Method Settings

Global Parameters

Ion Source

MS Global Settings

Experiment#1 [tMSn]

Master Scan:

tMS² OT HCD

Application Mode: **Peptide**

Method Duration (min): **60**

Use Ion Source Settings from Tune: **True**

FAIMS Mode: **Not Installed**

Default Charge State: **2**

Internal Mass Calibration: **Off**

Start Time (min): **0**

End Time (min): **60**

MSⁿ Level (n): **2**

Multiplex Ions: **False**

Isolation Mode: **Quadrupole**

Isolation Window (m/z): **1**

Activation Type: **HCD**

HCD Collision Energy (%): **30**

Stepped Collision Energy: **False**

Detector Type: **Orbitrap**

Orbitrap Resolution: **60000**

Mass Range: **Normal**

Scan Range (m/z): **350-1700**

RF Lens (%): **60**

AGC Target: **1.0e5**

Inject Ions for All Available Parallelizable Time: **False**

Maximum Injection Time (ms): **118**

Microscans: **1**

Data Type: **Centroid**

Polarity: **Positive**

Source Fragmentation: **Disabled**

Use EASY-IC™: **False**

Loop Control: **All**

Scan Description:

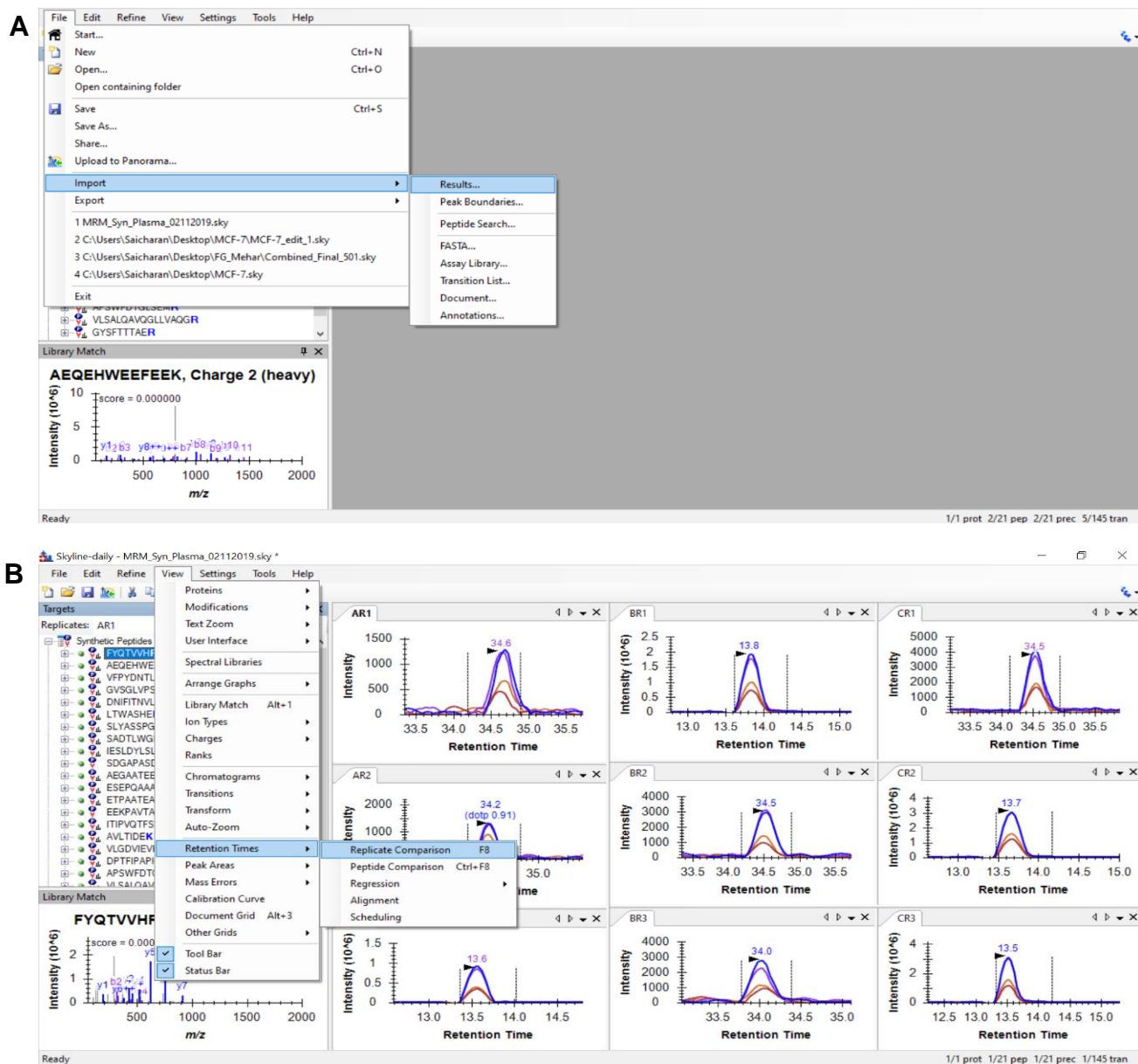
Include Start/End Times: **False**

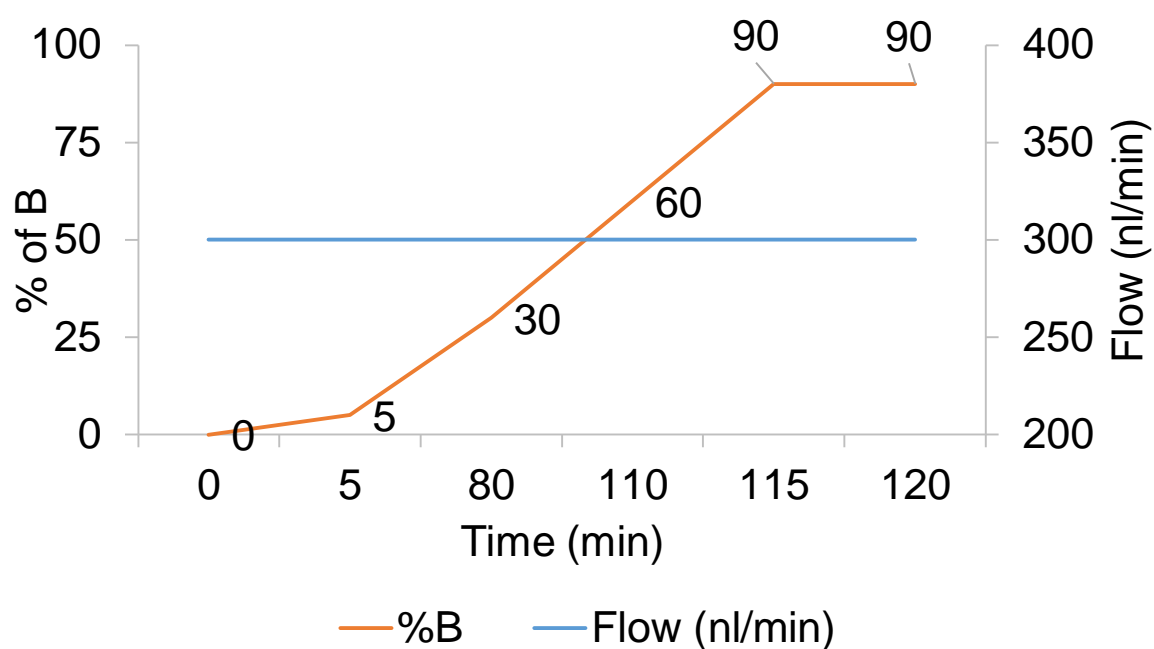
Mass List Table

Compound	Formula	m/z	z
FYQTVVHR (heavy)		530.2841	2
AEQEHWEFEEK (heavy)		799.8461	2
VFPYDNTLPK (heavy)		601.3208	2

GVSGLVPSSNSLQETLR (heavy)	934.0116	2
DNIFITNVLDQWIK (heavy)	863.9663	2
LTWASHEK (heavy)	490.258	2
SLYASSPGGVYATR (heavy)	719.8637	2
SADTLWGIQK (heavy)	563.8028	2
IESLDYLSLFK (heavy)	668.3679	2
SDGAPASDSKPGSSEAAPSSK (heavy)	970.9498	2
AEGAATEEGTPK (heavy)	649.3035	2
ESEPQAAEPAEAK (heavy)	718.3432	2
ETPAATEAPSSTPK (heavy)	697.8481	2
EKPAVTAAPK (heavy)	574.8237	2
ITIPVQTFSNLQIR (heavy)	820.4739	2

Figure S8 | Method parameters for the Parallel Reaction Monitoring experiment on Orbitrap Fusion.





	AR1	AR2	AR3	BR1	BR2	BR3	CR1	CR2	CR3
AR1	1.000	0.999	0.999	0.993	0.991	0.992	1.000	0.999	0.999
AR2	0.999	1.000	1.000	0.994	0.990	0.993	0.999	0.999	1.000
AR3	0.999	1.000	1.000	0.994	0.990	0.993	0.999	0.999	1.000
BR1	0.993	0.994	0.994	1.000	0.997	0.999	0.991	0.991	0.993
BR2	0.991	0.990	0.990	0.997	1.000	0.999	0.990	0.990	0.989
BR3	0.992	0.993	0.993	0.999	0.999	1.000	0.991	0.991	0.992
CR1	1.000	0.999	0.999	0.991	0.990	0.991	1.000	1.000	0.999
CR2	0.999	0.999	0.999	0.991	0.990	0.991	1.000	1.000	0.999
CR3	0.999	1.000	1.000	0.993	0.989	0.992	0.999	0.999	1.000

Figure S10 | (A) The gradient used for a 2-hour separation through liquid chromatography. (B) Correlation analysis of the technical replicates (R1, R2, R3) of three different biological pools of plasma samples (Sample A, B and C).

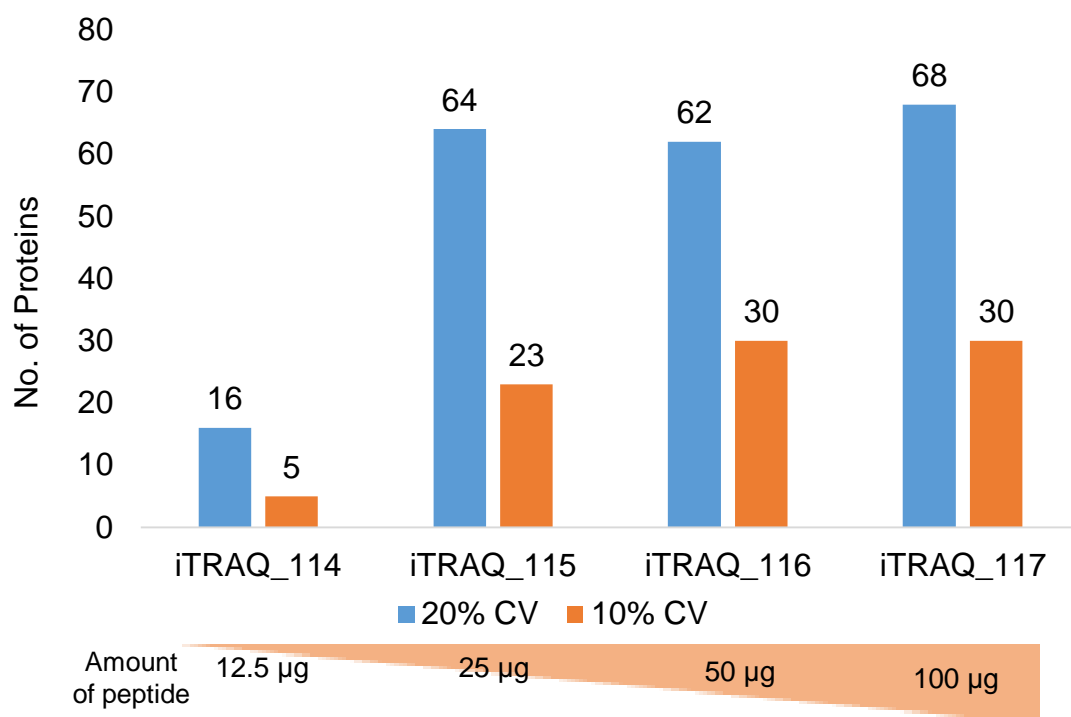


Figure S11 | The total no. proteins which has a coefficient of variation of less than 20% and 10% in each of the iTRAQ 4-plex labels- 114, 115, 116, and 117 after applying 1% FDR. The number of labeled peptides varied across the iTRAQ reagents.

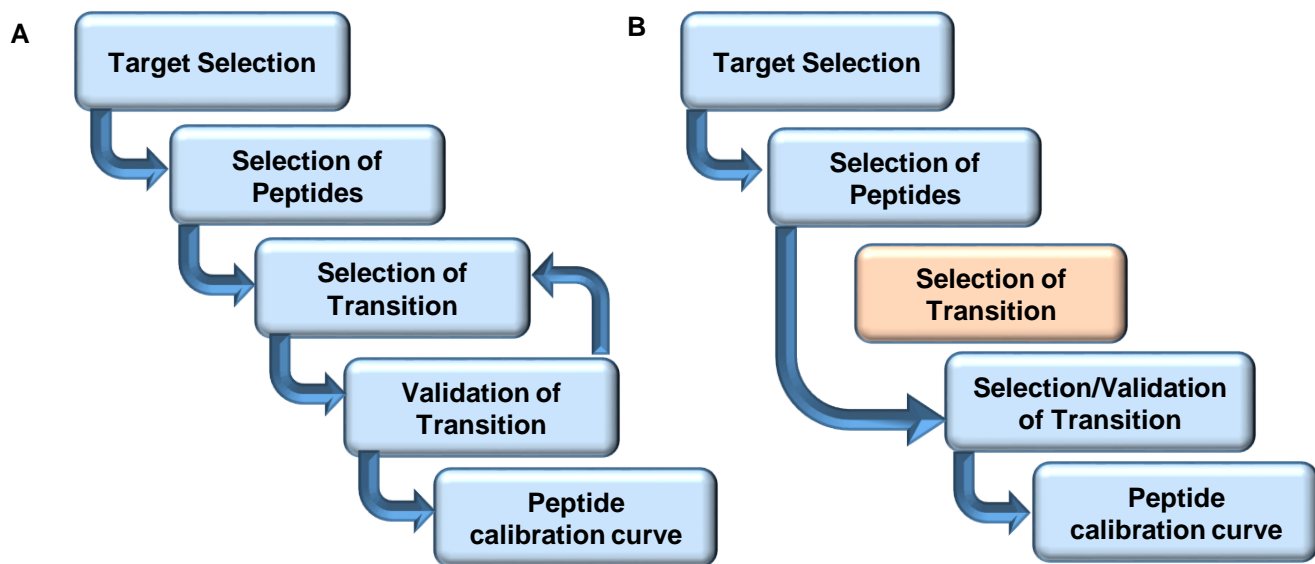


Figure S12 | Targeted proteomics using MS-based approaches. (**A**, **B**) Workflow for Multiple Reaction Monitoring (MRM), this approach consider the transitions of the peptide (**A**) and Parallel Reaction Monitoring (PRM), this approach consider only selection of peptides (**B**). It is independent of transitions.

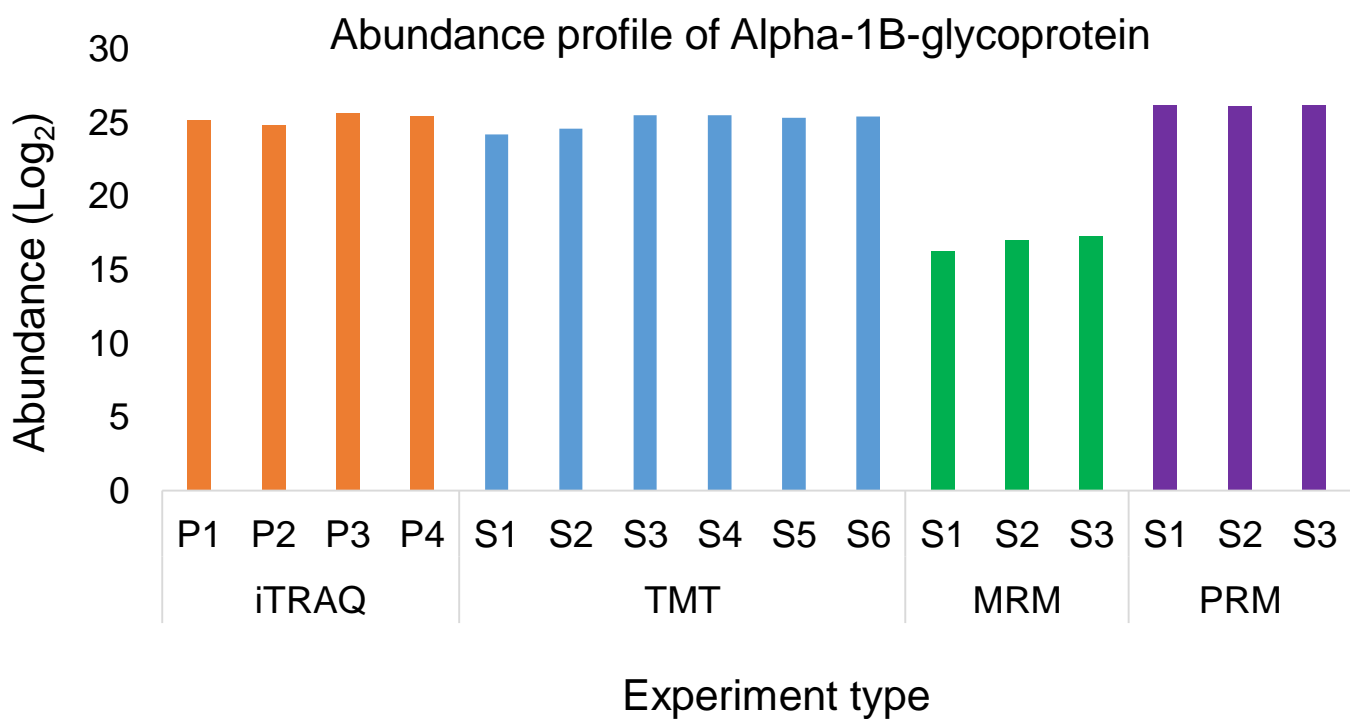


Figure S13 | The abundance profile of alpha-1B-glycoprotein in the pooled samples (iTRAQ experiment) and individual samples (TMT, MRM, and PRM experiments) using different proteomic techniques. The y-axis represents the abundance in Log₂, and the x-axis represents samples used in iTRAQ, TMT, MRM, and PRM experiments. The protein abundance of alpha-1B-glycoprotein is the average abundance of three peptides (R.SGLSTGWTQLSK.L, R.CEGIPDVTPELLR.E, and R.TPGAAANLELIFVGPQHAGNYR.C) in case of MRM and PRM experiments. P: Pooled sample, S: individual sample.

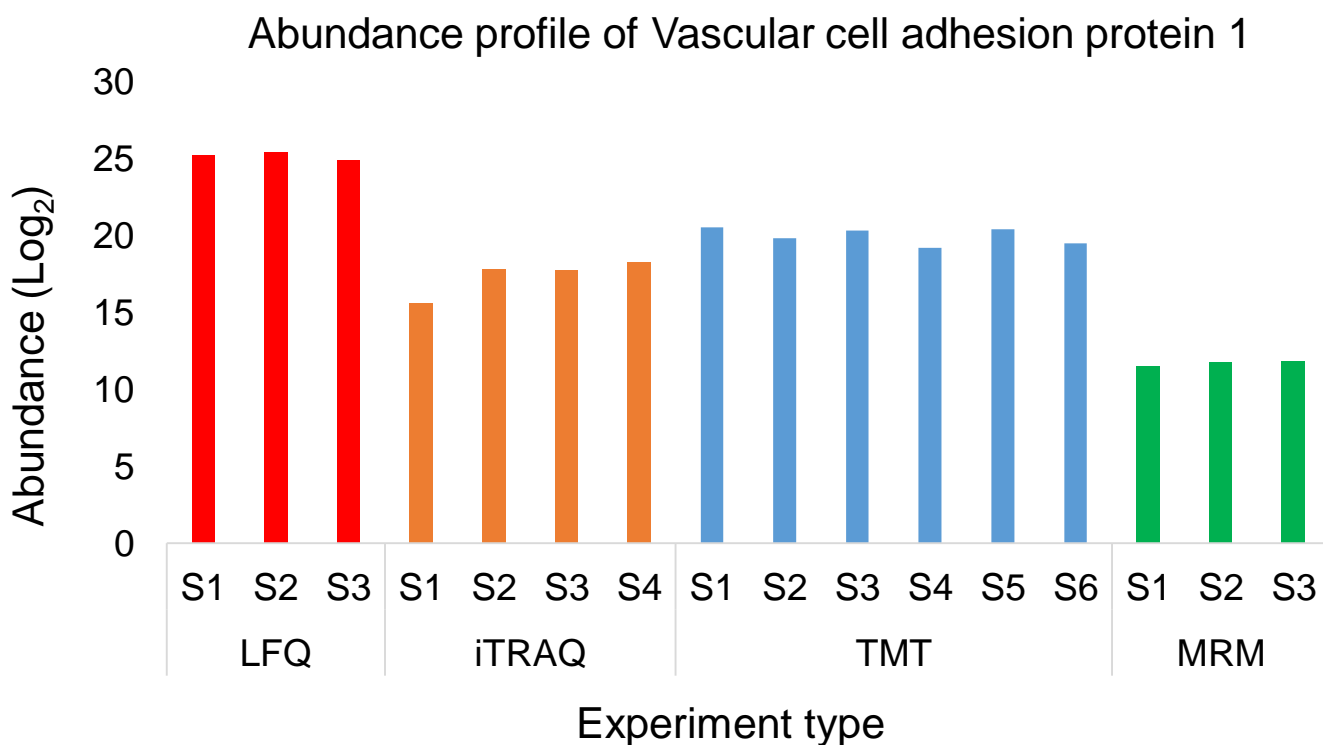


Figure S14 | The abundance profile of vascular cell adhesion protein 1 in label-free quantitation (LFQ), iTRAQ-4plex, TMT-6plex, and MRM experiments. The y-axis represents the abundance in Log_2 , and the x-axis represents samples used in LFQ, iTRAQ-4plex, and TMT-6plex experiments. S: Plasma sample