Basic Information

OMB Control #0693-0033

Expiration Date: 06/30/2019

1. Name of participant (optional):

* 2. Title/Position

* 3. Number of people in laboratory

◯ 5 or under ◯ 5 to 10 ◯ 10 to 15 ◯ over 15

* 4. Type of institution (select those that apply)

☐ Academia ☐ Core Facility ☐ Other

☐ Industry ☐ Government

5. Laboratory PI name (if same as above, fill in see above)

* 6. Name of Institution

* 7. Location

About the Laboratory

OMB Control #0693-0033

Expiration Date: 06/30/2019

* 8. How long has your laboratory been performing lipidomics?

- ◯ < 1 year
- ◯ 1 to 5 years
- ◯ 5 to 10 years
- ◯ > 10 years

* 9. Approximately how many lipid samples does your laboratory analyze in a month?

- ◯ < 50
- ◯ 50 to 100
- ◯ 100 to 500
- ◯ > 500

* 10. Approximately how many lipidomics manuscripts does your laboratory publish per year?

- ◯ 0
- ◯ 1 to 3
- ◯ 3 to 5
- ◯ > 5

* 11. What kind of lipid applications do you typically work on in your laboratory (select those that apply)?

- ☐ Clinical and medical science
- ☐ Biomarker discovery
- ☐ Drug development/discovery
- ☐ Toxicology
- ☐ Food science
- ☐ Forensics
- ☐ Environmental science
- ☐ Plant science
- ☐ Natural products
- ☐ Other (please specify)

* 12. What kind of sample matrices does your laboratory analyze for lipidomics (select those that apply)?

- [ ] plasma
- [ ] serum
- [ ] urine
- [ ] tissues
- [ ] cells
- [ ] feces
- [ ] saliva/sweat/tears
- [ ] dried blood spots
- [ ] breast milk
- [ ] food
- [ ] plant materials
- [ ] Other (please specify)

* 13. What strategies (if any) does your laboratory employ for enhancing/monitoring lipid stability (select those that apply)?

- [ ] antioxidant addition
- [ ] use of inhibitors
- [ ] use of internal/recovery standards
- [ ] flash freezing
- [ ] sample preparation performed on ice
- [ ] use of heat treatment
- [ ] derivatization
- [ ] no specific strategies employed
- [ ] Other (please specify)

* 14. What kind of separation technique does your laboratory use in tandem with mass spectrometry for lipidomics (select those that apply)?

- [ ] ion mobility
- [ ] shotgun/direct infusion
- [ ] high performance liquid chromatography
- [ ] ultra-high performance liquid chromatography
- [ ] direct analysis (ex., DART, DESI)
- [ ] gas chromatography
- [ ] Other (please specify)

15. If chromatography, what type of column(s) does your laboratory use for lipidomics?

* 16. What kind of instruments does your laboratory use for the above mentioned methods (select those that apply)?

- [ ] Orbitrap
- [ ] Quadrupole Time-of-Flight
- [ ] Triple Quadrupole
- [ ] Fourier Transform Ion Cyclotron Resonance
- [ ] Ion Trap
- [ ] Nuclear Magnetic Resonance
- [ ] Flame Ionization Detector
- [ ] Other (please specify)

* 17. What data acquisition methods does your laboratory incorporate for targeted studies (select those that apply)?

- [ ] neutral loss scans
- [ ] parent ion scans
- [ ] product ion scans
- [ ] single/selected reaction monitoring
- [ ] we only apply untargeted approaches
- [ ] Other (please specify)

* 18. What data acquisition methods does your laboratory incorporate for untargeted studies (select those that apply)?

- [ ] accurate mass
- [ ] data dependent low-resolution MS/MS
- [ ] data dependent high-resolution MS/MS
- [ ] data independent MS/MS
- [ ] we only employ targeted approaches
- [ ] Other (please specify)

* 19. If you incorporate a high-resolution mass spectrometer, at what mass resolving power do you analyze your lipid extracts (answer N/A if you only use a low-resolution mass spectrometer)?

* 20. What lipid categories do you routinely measure in your laboratory (select those that apply)?

- [ ] Fatty Acyl Lipids
- [ ] Glycerolipids
- [ ] Glycerophospholipids
- [ ] Sphingolipids
- [ ] Sterol Lipids
- [ ] Prenol Lipids
- [ ] Saccharolipids
- [ ] Polyketides
- [ ] Other (please specify)

* 21. For untargeted lipidomics experiments, what lipid extraction does your laboratory employ (select those that apply)?

- [ ] Bligh-Dyer
- [ ] Folch
- [ ] MTBE (Matyash)
- [ ] Supercritical Fluid Extraction
- [ ] Solid Phase Extraction
- [ ] We do not perform untargeted lipidomics experiments
- [ ] Other (please specify)

* 22. If you use LC-MS, what software does your laboratory employ for peak picking/processing (select all that apply)?

- [ ] Manual (Xcalibur, MassHunter, MassLynx, other)
- [ ] MZmine
- [ ] XCMS
- [ ] LipidSearch
- [ ] MS-DIAL
- [ ] Lipidyzer
- [ ] SimLipid
- [ ] Sieve
- [ ] Progenesis QI
- [ ] Compound Discoverer
- [ ] We do not use LC-MS
- [ ] Other (please specify)

* 23. What software does your laboratory employ for lipid identification (select all that apply)?

- [ ] Manual (visual inspection)
- [ ] LipidSearch
- [ ] Lipidyzer
- [ ] SimLipid
- [ ] Alex
- [ ] LipidXplorer
- [ ] MS-LAMP
- [ ] LIMSA
- [ ] LOBSTAHS
- [ ] Lipid Data Analyzer
- [ ] LipidQA
- [ ] Lipid-Pro
- [ ] Greazy
- [ ] LipidBlast
- [ ] LipidPioneer
- [ ] mzCloud
- [ ] LipidMatch
- [ ] Other (please specify)

* 24. What lipid databases do you use (select those that apply)?

- [ ] Japan's LipidBank
- [ ] LIPID MAPS
- [ ] LipidBlast
- [ ] European Lipidomics Initiative
- [ ] SwissLipids
- [ ] LipidHome
- [ ] Cyberlipid
- [ ] SphinGOMAP
- [ ] mzCloud
- [ ] NIST Mass Spectrometry Database
- [ ] Other (please specify)

* 25. What software does your laboratory employ for lipid quantification (select those that apply)?

- [ ] Manual
- [ ] LipidSearch
- [ ] Lipidyzer
- [ ] SimLipid
- [ ] Other (please specify)
- [ ] Sieve
- [ ] TraceFinder
- [ ] Progenesis QI

* 26. What software does your laboratory employ for lipid quality control and statistics (select those that apply)?

- [ ] MetaboAnalyst
- [ ] Orange
- [ ] S-PLUS
- [ ] SPSS
- [ ] JMP
- [ ] NCSS
- [ ] Excel
- [ ] Tableau
- [ ] GraphPad Prism
- [ ] R-tools
- [ ] TraceFinder
- [ ] Statistica
- [ ] PLS_Toolbox
- [ ] MATLAB
- [ ] PSPP
- [ ] Origin
- [ ] Stata
- [ ] Analyze-it
- [ ] Galaxy toolbox
- [ ] Minitab
- [ ] SYSTAT
- [ ] Other (please specify)

Lipid Quantitation

OMB Control #0693-0033

Expiration Date: 06/30/2019

* 27. What type of quantitation do you perform in your laboratory?

- [ ] absolute
- [ ] relative
- [ ] semi-quant
- [ ] not interested in quantitation of lipids

* 28. Is absolute quantitation something that could be important to your laboratory?

- ( ) Yes
- ( ) No

* 29. On average, how many lipid internal standards do you use per lipid class?

( ) 1 ( ) 2 ( ) 3 or more

* 30. What type of internal standards does your laboratory most often employ (select those that apply)?

- [ ] odd-chain
- [ ] deuterated
- [ ] Isotopic Ratio Outlier Analysis
- [ ] low fatty acyl carbon chain (12:0 or less)
- [ ] carbon-13 labeled
- [ ] Other (please specify)

* 31. Do you make your own lipid internal standard mix or buy pre-made mixtures?

- ( ) We make our own internal standard mixtures
- ( ) We buy pre-made internal standard mixtures
- ( ) We do both

* 32. What lipids do you find most challenging to quantitate (select those that apply)?

- [ ] free/total fatty acids
- [ ] cholesterol
- [ ] cholesteryl esters
- [ ] triacylglycerols
- [ ] diacylglycerols
- [ ] ceramides
- [ ] sphingomyelins
- [ ] eicosanoids
- [ ] bile acids
- [ ] lysophosphatidylcholines
- [ ] lysophosphatidylethanolamines
- [ ] phosphatidylcholines
- [ ] phosphatidylethanolamines
- [ ] phosphatidylglycerols
- [ ] phosphatidylinositols
- [ ] phosphatidylserines
- [ ] phosphatidic acids
- [ ] Other (please specify)

* 33. Does your laboratory employ relative response factors (RRFs) for these lipid categories (select those that apply)?

- [ ] Fatty acyl lipids
- [ ] Glycerolipids
- [ ] Glycerophospholipids
- [ ] Sphingolipids
- [ ] Sterols
- [ ] All of the above
- [ ] We do not employ RRFs
- [ ] Other (please specify)

* 34. How does your laboratory treat multiple adducts per lipid (select those that apply)?

- [ ] sum them
- [ ] average them
- [ ] use the most intense for each ionization mode
- [ ] report individual adducts (no further processing)
- [ ] Other (please specify)

* 35. When processing lipid data, does your laboratory use peak height or peak area for quantitation?

- ( ) peak height
- ( ) peak area

* 36. How does your laboratory normalize your quantitative lipid values (select those that apply)?

- [ ] total protein
- [ ] DNA
- [ ] cell count
- [ ] dry weight
- [ ] wet weight
- [ ] TIC
- [ ] normalize by sum of feature values
- [ ] probabilistic quotient normalization
- [ ] no normalization
- [ ] Other (please specify)

Reference Material/Quality Control

OMB Control #0693-0033

Expiration Date: 06/30/2019

* 37. Do you have written standard operating procedures (SOPs) in your laboratory, and if so, what aspects do the SOPs cover (select those that apply)?

- [ ] instrument calibration/maintenance
- [ ] data processing
- [ ] sample collection
- [ ] monitoring lipid stability
- [ ] sample extraction
- [ ] assessment of data quality/quality control
- [ ] sample storage
- [ ] we do not have SOPs in our laboratory
- [ ] instrument operation
- [ ] Other (please specify)

* 38. Has your laboratory adopted the proposed shorthand annotation style for lipid structures at the fatty acyl level (doi:10.1194/jlr.M033506), when the *sn1* and *sn2* position of the fatty acyl chains is unknown (e.g., PC 16:0_18:1)?

- ( ) Yes
- ( ) No

* 39. What types of quality control (QC) samples does your laboratory use in analytical measurements for lipidomics?

- [ ] no QC materials
- [ ] pooled samples (matrix-matched)
- [ ] Certified Reference Materials (CRMs)
- [ ] solvent blanks
- [ ] pooled samples (not matrix-matched)
- [ ] extraction blanks
- [ ] NIST Standard Reference Materials (SRMs)
- [ ] Other (please specify)

40. For question 35, state whether the QC material you employ is commercially available or made in-house. For commercially available answers, please specify the material name.

* 41. What does your laboratory use QCs, SRMs, or CRMs for (select those that apply)?

- [ ] Establishing metrological traceability
- [ ] Method validation (method variance)
- [ ] Technical variance
- [ ] Calibration
- [ ] Establish trueness of result
- [ ] We don't use QCs, SRMs, or CRMs
- [ ] Value assignment of secondary reference material
- [ ] Other (please specify)

* 42. If your laboratory uses commercially available QC materials (ex. NIST SRMs), please indicate below; however, if your laboratory does not use commercially available reference materials, indicate why below?

- [ ] we use commercially available QCs
- [ ] don't know about them
- [ ] don't see value
- [ ] too expensive
- [ ] correct matrix not available
- [ ] Other (please specify)

* 43. What type of reference material would be of most interest to your laboratory?

- ( ) Complex biological matrix
- ( ) Lipid internal standard mixture
- ( ) Lipid standard mixture
- ( ) Spiked standards in a complex biological matrix

* 44. What types of complex biological reference materials would you like to see provided?

- [ ] plasma
- [ ] cells
- [ ] breast milk
- [ ] serum
- [ ] feces
- [ ] food
- [ ] urine
- [ ] saliva/sweat/tears
- [ ] plant materials
- [ ] tissues
- [ ] dried blood spots
- [ ] not interested in reference materials
- [ ] Other (please specify)

* 45. Do you validate your project sample measurements with:

- [ ] repeated extractions of a sample (with analysis)
- [ ] repeated instrument analysis of a sample
- [ ] sent to outside laboratory
- [ ] use a complimentary approach to confirm
- [ ] Other (please specify)
- [ ] reviewing measurements of a previously described quality control sample run in the same batch
- [ ] test set
- [ ] no validation process employed

* 46. About how long does your laboratory store extracted lipidomics samples before you discard?

- ( ) Less than a day
- ( ) One day to less than a week
- ( ) One week to less than a month
- ( ) One month to less than 6 months
- ( ) 6 months to a year
- ( ) Greater than a year

47. What temperature(s) does your laboratory store lipid extracts at (select those that apply)?

- [ ] room temperature
- [ ] refrigerated (2-4 C)
- [ ] freezer (-20 C)
- [ ] Other (please specify)
- [ ] freezer (-80 C)
- [ ] liquid nitrogen

* 48. Does your laboratory store your lipid data in a repository? If yes, where?

Other Questions

OMB Control #0693-0033

Expiration Date: 06/30/2019

* 49. What do you perceive as the biggest challenge in the lipidomics community (select those that apply)?

- [ ] lack of standardization of methods/protocols within the community
- [ ] lack of standards
- [ ] software/data handling
- [ ] lipid annotation
- [ ] quantitation
- [ ] over reporting/false positives
- [ ] lack of lipid centric training/workshops
- [ ] Other (please specify)

* 50. Has your laboratory ever participated in an interlaboratory comparison study or ring trial?

- ( ) Yes
- ( ) No

* 51. Would your laboratory be interested in participating in a future NIST interlaboratory study?

- ( ) Yes
- ( ) No

* 52. Do you feel there are enough opportunities and/or lipidomics conferences per year to present lipidomics studies?

- ( ) Yes
- ( ) No

* 53. Would you be interested in attending or presenting at a Gordon Research Conference focused on the measurement science of lipidomics and metabolomics?

- ( ) Attending
- ( ) Presenting
- ( ) No interest

54. Additional comments?

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OMB Control No. 0693-0033

Expiration Date: 06/30/2019