

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

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* 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)?

- | | | |
|---|---------------------------------------|--|
| <input type="checkbox"/> Clinical and medical science | <input type="checkbox"/> Toxicology | <input type="checkbox"/> Environmental science |
| <input type="checkbox"/> Biomarker discovery | <input type="checkbox"/> Food science | <input type="checkbox"/> Plant science |
| <input type="checkbox"/> Drug development/discovery | <input type="checkbox"/> Forensics | <input type="checkbox"/> Natural products |
| <input type="checkbox"/> Other (please specify) | | |

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

- | | |
|---|---|
| <input type="checkbox"/> plasma | <input type="checkbox"/> saliva/sweat/tears |
| <input type="checkbox"/> serum | <input type="checkbox"/> dried blood spots |
| <input type="checkbox"/> urine | <input type="checkbox"/> breast milk |
| <input type="checkbox"/> tissues | <input type="checkbox"/> food |
| <input type="checkbox"/> cells | <input type="checkbox"/> plant materials |
| <input type="checkbox"/> feces | |
| <input type="checkbox"/> Other (please specify) | |

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

- | | |
|---|--|
| <input type="checkbox"/> antioxidant addition | <input type="checkbox"/> sample preparation performed on ice |
| <input type="checkbox"/> use of inhibitors | <input type="checkbox"/> use of heat treatment |
| <input type="checkbox"/> use of internal/recovery standards | <input type="checkbox"/> derivatization |
| <input type="checkbox"/> flash freezing | <input type="checkbox"/> no specific strategies employed |
| <input type="checkbox"/> Other (please specify) | |

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

- | | | |
|--|---|--|
| <input type="checkbox"/> ion mobility | <input type="checkbox"/> high performance liquid chromatography | <input type="checkbox"/> direct analysis (ex., DART, DESI) |
| <input type="checkbox"/> shotgun/direct infusion | <input type="checkbox"/> ultra-high performance liquid chromatography | <input type="checkbox"/> gas chromatography |
| <input type="checkbox"/> 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 Fourier Transform Ion Cyclotron Resonance Flame Ionization Detector
- Quadrupole Time-of-Flight Ion Trap
- Triple Quadrupole Nuclear Magnetic Resonance
- Other (please specify)

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

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

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

- accurate mass data independent MS/MS
- data dependent low-resolution MS/MS we only employ targeted approaches
- data dependent high-resolution MS/MS
- 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)?

- | | | |
|---|--|---|
| <input type="checkbox"/> Fatty Acyl Lipids | <input type="checkbox"/> Sphingolipids | <input type="checkbox"/> Saccharolipids |
| <input type="checkbox"/> Glycerolipids | <input type="checkbox"/> Sterol Lipids | <input type="checkbox"/> Polyketides |
| <input type="checkbox"/> Glycerophospholipids | <input type="checkbox"/> Prenol Lipids | |
| <input type="checkbox"/> Other (please specify) | | |

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

- | | | |
|---|---|--|
| <input type="checkbox"/> Bligh-Dyer | <input type="checkbox"/> MTBE (Matyash) | <input type="checkbox"/> Solid Phase Extraction |
| <input type="checkbox"/> Folch | <input type="checkbox"/> Supercritical Fluid Extraction | <input type="checkbox"/> We do not perform untargeted lipidomics experiments |
| <input type="checkbox"/> Other (please specify) | | |

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

- | | | |
|---|------------------------------------|--|
| <input type="checkbox"/> Manual (Xcalibur, MassHunter, MassLynx, other) | <input type="checkbox"/> MS-DIAL | <input type="checkbox"/> Progenesis Q1 |
| <input type="checkbox"/> MZmine | <input type="checkbox"/> Lipidzyer | <input type="checkbox"/> Compound Discoverer |
| <input type="checkbox"/> XCMS | <input type="checkbox"/> SimLipid | <input type="checkbox"/> We do not use LC-MS |
| <input type="checkbox"/> LipidSearch | <input type="checkbox"/> Sieve | |
| <input type="checkbox"/> Other (please specify) | | |

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

- | | | |
|---|--|---------------------------------------|
| <input type="checkbox"/> Manual (visual inspection) | <input type="checkbox"/> MS-LAMP | <input type="checkbox"/> Greazy |
| <input type="checkbox"/> LipidSearch | <input type="checkbox"/> LIMSA | <input type="checkbox"/> LipidBlast |
| <input type="checkbox"/> Lipidyzer | <input type="checkbox"/> LOBSTAHS | <input type="checkbox"/> LipidPioneer |
| <input type="checkbox"/> SimLipid | <input type="checkbox"/> Lipid Data Analyzer | <input type="checkbox"/> mzCloud |
| <input type="checkbox"/> Alex | <input type="checkbox"/> LipidQA | <input type="checkbox"/> LipidMatch |
| <input type="checkbox"/> LipidXplorer | <input type="checkbox"/> Lipid-Pro | |
| <input type="checkbox"/> Other (please specify) | | |

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

- | | |
|---|--|
| <input type="checkbox"/> Japan's LipidBank | <input type="checkbox"/> LipidHome |
| <input type="checkbox"/> LIPID MAPS | <input type="checkbox"/> Cyberlipid |
| <input type="checkbox"/> LipidBlast | <input type="checkbox"/> SphinGOMAP |
| <input type="checkbox"/> European Lipidomics Initiative | <input type="checkbox"/> mzCloud |
| <input type="checkbox"/> SwissLipids | <input type="checkbox"/> NIST Mass Spectrometry Database |
| <input type="checkbox"/> Other (please specify) | |

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

- | | |
|---|--|
| <input type="checkbox"/> Manual | <input type="checkbox"/> Sieve |
| <input type="checkbox"/> LipidSearch | <input type="checkbox"/> TraceFinder |
| <input type="checkbox"/> Lipidyzer | <input type="checkbox"/> Progenesis Q1 |
| <input type="checkbox"/> SimLipid | |
| <input type="checkbox"/> Other (please specify) | |

* 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

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* 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)?

- | | | |
|---|--|--|
| <input type="checkbox"/> free/total fatty acids | <input type="checkbox"/> sphingomyelins | <input type="checkbox"/> phosphatidylethanolamines |
| <input type="checkbox"/> cholesterol | <input type="checkbox"/> eicosanoids | <input type="checkbox"/> phosphatidylglycerols |
| <input type="checkbox"/> cholesteryl esters | <input type="checkbox"/> bile acids | <input type="checkbox"/> phosphatidylinositols |
| <input type="checkbox"/> triacylglycerols | <input type="checkbox"/> lysophosphatidylcholines | <input type="checkbox"/> phosphatidylserines |
| <input type="checkbox"/> diacylglycerols | <input type="checkbox"/> lysophosphatidylethanolamines | <input type="checkbox"/> phosphatidic acids |
| <input type="checkbox"/> ceramides | <input type="checkbox"/> phosphatidylcholines | |
| <input type="checkbox"/> 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 use the most intense for each ionization mode
- average them 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

dry weight

normalize by sum of feature values

DNA

wet weight

probabilistic quotient normalization

cell count

TIC

no normalization

Other (please specify)

Reference Material/Quality Control

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* 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)?

- | | |
|---|---|
| <input type="checkbox"/> instrument calibration/maintenance | <input type="checkbox"/> data processing |
| <input type="checkbox"/> sample collection | <input type="checkbox"/> monitoring lipid stability |
| <input type="checkbox"/> sample extraction | <input type="checkbox"/> assessment of data quality/quality control |
| <input type="checkbox"/> sample storage | <input type="checkbox"/> we do not have SOPs in our laboratory |
| <input type="checkbox"/> instrument operation | |
| <input type="checkbox"/> 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?

- | | | |
|---|---|---|
| <input type="checkbox"/> no QC materials | <input type="checkbox"/> pooled samples (matrix-matched) | <input type="checkbox"/> Certified Reference Materials (CRMs) |
| <input type="checkbox"/> solvent blanks | <input type="checkbox"/> pooled samples (not matrix-matched) | |
| <input type="checkbox"/> extraction blanks | <input type="checkbox"/> NIST Standard Reference Materials (SRMs) | |
| <input type="checkbox"/> 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)?

- | | |
|---|--|
| <input type="checkbox"/> Establishing metrological traceability | <input type="checkbox"/> Method validation (method variance) |
| <input type="checkbox"/> Technical variance | <input type="checkbox"/> Calibration |
| <input type="checkbox"/> Establish trueness of result | <input type="checkbox"/> We don't use QCs, SRMs, or CRMs |
| <input type="checkbox"/> Value assignment of secondary reference material | |
| <input type="checkbox"/> 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?

- | | | | |
|--|--|--|--|
| <input type="checkbox"/> we use commercially available QCs | <input type="checkbox"/> don't know about them | <input type="checkbox"/> don't see value | <input type="checkbox"/> too expensive |
| <input type="checkbox"/> correct matrix not available | | | |
| <input type="checkbox"/> Other (please specify) | | | |

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

- | | |
|---|---|
| <input type="radio"/> Complex biological matrix | <input type="radio"/> Lipid internal standard mixture |
| <input type="radio"/> Lipid standard mixture | <input type="radio"/> Spiked standards in a complex biological matrix |

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

- | | | |
|---|---|--|
| <input type="checkbox"/> plasma | <input type="checkbox"/> cells | <input type="checkbox"/> breast milk |
| <input type="checkbox"/> serum | <input type="checkbox"/> feces | <input type="checkbox"/> food |
| <input type="checkbox"/> urine | <input type="checkbox"/> saliva/sweat/tears | <input type="checkbox"/> plant materials |
| <input type="checkbox"/> tissues | <input type="checkbox"/> dried blood spots | <input type="checkbox"/> not interested in reference materials |
| <input type="checkbox"/> Other (please specify) | | |

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

- | | |
|---|--|
| <input type="checkbox"/> repeated extractions of a sample (with analysis) | <input type="checkbox"/> reviewing measurements of a previously described quality control sample run in the same batch |
| <input type="checkbox"/> repeated instrument analysis of a sample | <input type="checkbox"/> test set |
| <input type="checkbox"/> sent to outside laboratory | <input type="checkbox"/> no validation process employed |
| <input type="checkbox"/> use a complimentary approach to confirm | |
| <input type="checkbox"/> Other (please specify) | |

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

- | | |
|---|---|
| <input type="radio"/> Less than a day | <input type="radio"/> One month to less than 6 months |
| <input type="radio"/> One day to less than a week | <input type="radio"/> 6 months to a year |
| <input type="radio"/> One week to less than a month | <input type="radio"/> Greater than a year |

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

- | | |
|---|--|
| <input type="checkbox"/> room temperature | <input type="checkbox"/> freezer (-80 C) |
| <input type="checkbox"/> refrigerated (2-4 C) | <input type="checkbox"/> liquid nitrogen |
| <input type="checkbox"/> freezer (-20 C) | |
| <input type="checkbox"/> Other (please specify) | |

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

Other Questions

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

- | | |
|--|---|
| <input type="checkbox"/> lack of standardization of methods/protocols within the community | <input type="checkbox"/> quantitation |
| <input type="checkbox"/> lack of standards | <input type="checkbox"/> over reporting/false positives |
| <input type="checkbox"/> software/data handling | <input type="checkbox"/> lack of lipid centric training/workshops |
| <input type="checkbox"/> lipid annotation | |
| <input type="checkbox"/> 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?

Notwithstanding Statement

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