

OMB Control #0693-0033 – NIST Generic Clearance for Program Evaluation Data Collection

The Next NIST Interlaboratory Comparison Exercise for Lipidomics and Metabolomics

Colleagues,

Over the past several years, the National Institute of Standards and Technology (NIST) has been initiating efforts to harmonize measurement within the omics communities. One effort, in particular, was the NIST Interlaboratory Comparison Exercise for Lipidomics, which was constructed of 31 laboratories who made lipidomic measurements on Standard Reference Material (SRM) 1950 Metabolites in Frozen Human Plasma and the SRM 2378 series Fatty Acids in Frozen Human Serum.

As the NIST Interlaboratory Comparison Exercise for Lipidomics concludes, here are some highlights of the exercise:

- Over 330 lipids have calculated consensus means (with associated uncertainties) in SRM 1950, which can now be used to benchmark lipid concentrations across the lipidomics community.

- A manuscript focused on examining SRM 1950 (accepted to JLR, each participant is a co-author)

- NIST IR 8185 available (all consensus mean data in both graphical and tabular form for SRM 1950, available free of charge). <http://nvlpubs.nist.gov/nistpubs/ir/2017/NIST.IR.8185.pdf>

- Manuscript and IR in preparation for examination of SRM 2378 series

- Manuscript focused on method/data trends and publishing the data are also in progress

- Follow-up 54-question lipidomics survey (125 respondents), covering methodology, quantitation, standard operating procedures, quality control, and reference materials, has been written into a manuscript and is currently in co-author review for publication

- We aim to repeat this study design for the metabolome (see invitation in survey if interested in participating)

Since this exercise is concluding, we are gearing up efforts to initiate the next community-wide comparison exercise. We have decided, based on community discussion, lack of available tissue QC materials, and the follow-up lipidomics survey results, that the next interlaboratory study will tackle the development of new omics-based Reference Materials (RMs). Specifically, we want to focus on creating prototype tissue materials that are applicable to multiple omics platforms (e.g., lipidomics, metabolomics, and proteomics). The goal will be to make a large number of cryogenically pulverized, homogenous tissue aliquots (~1000), which we will use to

perform the next interlaboratory exercise (we will target both the lipidomics and metabolomics communities during this round). Expected outcomes of exercise below:

- Calculated consensus means and uncertainties for several lipids and metabolites in the tissue RGMs

- Compare submitted data across all aspects of the lipidomic/metabolomic workflows, including use of internal standard/quantitation, sample extraction, chromatography, instrumentation, and data analysis/processing.

- The remaining lot of tissue aliquots will be made available free of charge to the omics community to allow laboratories to continue investigating the material (providing us with valuable feedback) and encourage the laboratories to utilize these tissue RMs in their QC activities (we just ask you keep us updated on use, e.g., publications).

- We will use the information we receive to help develop/create the most optimal omics-based tissue Standard Reference Materials (SRMs).

If you are interested in participating in the next interlaboratory comparison exercise (for laboratories that measure lipids, metabolites, and/or both), please fill out the survey (link below, ~ <10 min). The survey is being used to 1) let us know if you want to participate in these interlaboratory activities (and which activities), 2) define some of the details of our prototype tissue RMs, and 3) gauge your interest in other activities we aim to implement over the coming year. Note that we will include all participants as co-authors in resulting manuscripts from the interlaboratory exercises.

<https://www.surveymonkey.com/r/PJMSHFS>

Thank you for your interest in these activities.

PS. If you do not wish to participate in these activities and want to be removed from these emails, please let me know, so I do not include you in follow-up emails.