Lipidomics Sample Collection and Tracking Form for Clinical Study < study id >

Date, Signature _____ Patient-ID _____ Sample-ID[1] _____

Collection	Date: _____ Time ____:____ *Collection window: preferably between 08:00 and 10:00 h to minimize diurnal variation* Participant fasted[2] (≥ 12 h): ☐ Yes / ☐ No If no, fasted for _____ h
Collection Tubes	1) ☐ discard tube[3] (fill only ~ 1mL) 2)[4] ☐
Post-Draw Handling *From draw until centrifugation: max. 120 minutes* *At 4 °C or in ice water!* [5]	☐ Gently invert tubes 8-10x times ☐ Place tubes immediately in ice water or a cooling rack (4°C)
Centrifugation [6]	☐ Centrifuge tubes, Time ____:____ < 2,000 - 3,000 g> *for 10 minutes (4 °C recommended)*
After Centrifugation *Total time from centrifugation until freezing < 1 h* *Avoid aspirating to close to blood cell pellet (very high risk of platelet "contamination" of plasma)*	☐ Place samples back in ice water or a cooling rack (4°C, from end of spin until plasma transfer) ☐ Process plasma into transfer tubes, homogenize, and aliquot:[7] <EDTA-Plasma>: <n> * <y> mL , mark incomplete filling with "<x>" <x>
Storage [8]	☐ If possible: flash-freeze samples with liquid or gaseous N_2 ☐ Store at –80 °C, Time____:____ ☐ If unavoidable, store at –20 °C, Time____:____ *for as short as possible*
Sample Handover *Always ship samples on dry ice* *Notify receiving facility in advance* *Avoid arrival on Fridays or weekends*	☐ Plasma handed over on Date_____ Time of arrival ____:____ Delivered by (Name)_____ Handed to (Name)_____ Arrival condition: ☐ frozen, Tempt [°C] _____ ☐ thawed or at room temperature
Notes *(e.g. under-fill, hemolysis, processing delay, check sample labels,…)*	

See backside for footnotes and general notes

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General Notes:

Standard Lipidomics covers the abundant lipid classes including:

acylcarnitines, (glycosyl-) ceramides, cholesterol and cholesterol esters, diglycerides, ether-bound phospholipids (LPC O, LPE O, PC O, PC P, PE O, PE P), free fatty acids, lysophospholipids (LPC, LPE, LPI, LPG), Phospholipids (PC, PE, PI, PG), sphingomyelins, triglycerides

The following parameters should be standardized for each study:

- tourniquet application time
- venipuncture site
- brand and type of blood collection tubes and other consumables: ensure consistency across all study sites
- test consumables in advance (chemical resistance, contamination, analytical noise, etc.)
- prefer EDTA tubes due to extensive pre-analytical data for this matrix
- tube collection order
- uniform sample labels using solvent-resistant cryo-labels (resistant to –80 °C or liquid nitrogen at –196 °C)
- sample mixing and centrifugation protocols (define G-force, temperature, duration, brake use, etc.)
- maintain samples chilled at all times
- incident reporting and documentation (underfills, hemolysis, lipemia, events, delays), should be accessible to all study personnel
- for long-term storage (for years), use internal-thread polypropylene cryovials with O-ring screw-caps for aliquots
- thaw stored samples at 4 °C with standardized mixing; avoid repeated freeze-thaw cycles; mark any refrozen samples

Footnotes:

1) Sample IDs must be unique for each sample, time point and patient. It can also be called kit ID (ID for all materials prepared in package for each individual sampling). IDs should start with a letter and not leading zeros to minimize data entry errors.
2) Fasting means that only water is allowed to be consumed in the period before sample collection.
3) First, draw blood in a discard (waste) tube to avoid tissue factor contamination and discard it.
4) Specify the tube vendor, anticoagulant or specific tube name, and fill volume in the protocol. Use tubes with ≥ 2 mL except for pediatric studies.
5) Use an ice-water slurry (ice and water in an insulated container, more ice than water) for better and more stable temperature control than ice alone. When available, use specialized cooled storage devices.
6) Choose a fixed centrifugation force between 2000 – 3000 x g (less will likely result in platelet contamination).
7) Choose a fixed aliquot volume (100–1000 µL) and set the number of aliquots on the first page, e.g. 3*0.5 mL
   Consider: accidental thawing (especially at low volumes), avoid freeze-thaw cycles, thaw time (especially for large volumes), pipetting precision.
   Mark incompletely filled tubes.
8) Use a consistent storage protocol. Store aliquots at –80 °C or in liquid nitrogen. Avoid storage at –20 °C due to temperature fluctuations and frequent openings that can cause accidental thawing. Check whether the -20°C freezer has a (heating-based) self-defrosting function (regular defrost cycles!).

Example for labels: