

Parkinson's Progression Markers Initiative (PPMI)



Parkinson's
Progression
Markers
Initiative

Biospecimen Collection, Processing, and Shipment Manual of Procedures

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1.0 ABBREVIATIONS

BL	Baseline
CSF	Cerebrospinal Fluid
DNA	Deoxyribonucleic Acid
EDC	Electronic Data Capture
EDTA	Ethylene Diamine Tetra-acetic Acid
IATA	International Air Transport Association
IU	Indiana University
LONI	Lab of Neuro Imaging
LP	Lumbar Puncture
PD	Parkinson's Disease
PPMI	Parkinson's Progression Markers Initiative
RBC	Red Blood Cells
RCF	Relative Centrifugal Force
RNA	Ribonucleic Acid
RPM	Revolutions Per Minute
US DOT	United States Department of Transfer

2.0 BIOREPOSITORY INFORMATION

2.1 Biorepository Contacts

2.1.1 Indiana University Study Support

Indiana University business hours are from 8 AM to 5 PM US Eastern Time, Monday through Friday.

Sample Shipment Mailing Address

PPMI Biorepository
Indiana University School of Medicine
351 W. 10th Street, TK-217
Indianapolis, IN, 46202

Contacts

General PPMI Contact Information

Phone: 1-317-274-5744

International Phone: (00+1) 317-274-5744

Email: ppmibio@iu.edu

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Core Leader

Jan Hamer, BS, PMP, CCRP

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Study Coordinator

Phone: 317-278-1166

Email: caschu@iu.edu

Sarah McQuillen, BS

Study Specialist

Phone: 317-278-3131

Email: saealexa@iu.edu

2.1.2 BioRep Study Support

BioRep business hours are from 8 AM to 7 PM Europe Central Time, Monday through Friday.

BioRep can accommodate Saturday 8AM to 12PM when necessary.

Sample Shipment Mailing Address

BioRep Srl
c/o DIBIT2 Palazzina San Michele Via Olgettina 60
20132 Milano – Italy

Contacts

Paola Casalin
Project Manager
Phone: +39 02 58029768
After Hours: +39 348 0716024
Fax: +39 02 58018471
Email: ppmi@biorep.it

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Molecular Biology Laboratory Manager
Phone: +39 02 58029725
After Hours: +39 348 0716025
Fax: +39 02 58018471
Email: ppmi@biorep.it

2.1.3 Tel Aviv Study Support

Sample Shipment Mailing Address

6 Weizmann St. (The Genetic Institute – R&D)
Tel Aviv 64239, Israel

Contacts

Mali Gana-Weisz
Phone: 972-3-6947271, 972-3-6973628
Fax: 972-3-6973628
Email: maligw@tlvmc.gov.il

2.2 Holiday Schedules

Please note that courier service providers may observe a different set of holidays. Verify shipping dates with your courier prior to any holiday. Weekend/holiday delivery must be arranged in advance with biorepository staff. Individual collection site questions should be directed toward the respective repository.

Frozen samples must be shipped Monday – Wednesday only.

2.2.1 Holiday Observations – United States

Holiday
New Year's Day
Martin Luther King, Jr Day
Memorial Day
Juneteenth
Independence Day (observed)
Labor Day
Thanksgiving
Friday after Thanksgiving
Christmas Day

Please note that between December 24th and January 2nd Indiana University will be open for essential operations ONLY. Normal operations will resume on January 2nd. **If possible, biological specimens for submission to Indiana University should NOT be shipped between December 24th and January 2nd.** If samples are collected during this period and cannot be shipped, please store at -80°C and ship on dry ice to Indiana University AFTER January 1.

2.2.2 Holiday Observations – Canada

Holiday
New Year's Day
15 th February
Good Friday
Victoria Day
Quebec National Day
Canada Day
Civic Holiday
Remembrance Day
Christmas Day
Boxing Day

2.2.3 Holiday Observations – Europe

Holiday
New Year's Day
6 th January
Easter
Easter Monday
25 th April
1 st May
2 nd June
15 th August
1 st November
7 th and 8 th December
25 th and 26 th December

2.2.4 Holiday Observations – Tel Aviv

Holiday
Purim
Passover
Memorial Day
Independence Day
Shavuot
Rosh Hashanah
Yom Kippur
Sukkot
Chanukah

3.0 SPECIMEN COLLECTION KITS, SHIPPING KITS, AND SUPPLIES

3.1 LabCorp Drug Development Clinical Lab Collection Kits

Clinical lab supplies will be provided to sites by LabCorp Drug Development and will include all materials needed for collecting and shipping clinical blood samples (this does not include dry ice for screening and baseline labs). These samples will be shipped to LabCorp Drug Development after collection.

3.2 LabCorp Drug Development Resupply

Automatic Resupply: LabCorp Drug Development will anticipate the number of kits needed at each site and resupply based on the number of complete kits that have been shipped back to LabCorp Drug Development. Please note that this service can result in extra kits being supplied to the sites to ensure appropriate kits quantities are on hand.

Sites are responsible for independently monitoring inventory and supply status (expiration date, damage, etc.). Should additional supplies be needed, a minimum of 10 working days is required for kit resupply. Delivery times may vary in extended delivery areas. Please refer to the LabCorp Drug Development Lab Manual or contact LabCorp Drug Development with questions.

3.3 Research Biospecimen Collection Kits and Supplies

Research Specimen Collection Kits will be provided by Indiana University (IU). IU provides most materials needed for biospecimen collection. Materials and equipment not provided by Indiana University are listed in the tables below.

Research Kits will include collection tubes, specimen storage containers, and tube labels with pre-printed study information. IU also provides shipping supplies necessary for sending samples back to the PPMI biorepository.

Table 3.3.1 Materials Provided by Site

Dry Ice	Crushed Ice
Alcohol Prep Pads	Gauze Pads
Bandages and Steri-Strips	Butterfly Needles
Tourniquets	Tube Racks (2 mL to 10 mL)
Gloves	Sharps Bin and Lid
Pipettes and Pipette Tips	Lidocaine for LP (Non-US Sites Only)
Lidocaine for skin biopsy (if performing)	

BioRep also provides shipping materials for sites shipping to their facility (see contact information in [Section 2.1.2](#)).

Table 3.3.2 Equipment Provided by Site

4°C Refrigerated Centrifuge	Room Temperature Centrifuge
-80°C Freezer	4°C Refrigerator

3.4 Research Biospecimen Collection Kit Contents

Each Research Specimen Collection Kit provides the necessary supplies to collect samples from one subject at one study visit. **Do not replace or supplement any kit components provided by Indiana University unless MJFF/Indiana University has approved the substitution.**

See [Appendix E](#) for visit-specific kit contents.

Note: IU Supplemental Kits provide extra collection materials to sites. Supplemental Kit contents may be used in the event a kit component needs replaced.

3.5 Automatic Kit and Label Distribution

After an enrolled subject has completed a BL visit, subsequent longitudinal collection kits are automatically sent to sites. The subject's baseline visit date is collected from the EDC and used to calculate their projected visit schedule. This determines when automatic kits are distributed to the site. Kits will arrive at least 15 days prior to the

start of the 90-day study visit window. Sites may still order kits and labels on demand through the kit ordering module [Appendix F](#) in the event of an unscheduled visit, lost labels, etc.

3.6 Kit and Label Ordering on Demand

Sites must order BL visit kits through the kit ordering module. Kits should be ordered with as much advance notice as possible to ensure all necessary supplies can be prepared and delivered before the visit.

Sites may request kits and labels at any time. Refer to the sample collection schedule ([Section 4.0](#)) to verify which kits are needed for a particular visit.

See [Appendix F](#) for details.

3.7 Assessments

Indiana University will provide sites with paper copies of cognitive assessments including the Benton Line Judgment Orientation test, the Hopkins Verbal Learning test, the Boston Naming Test, and the University of Pennsylvania Smell Identification Test (UPSIT).

Site staff may request additional assessments through the kit ordering module.

4.0 SAMPLE COLLECTION SCHEDULE

4.1 Collection Schedule Table

Visit	BL	V02	V04	V05	V06	V08	V10	V12	V13	V14	V15	V16	V17	V18	V19	V20
Month	0	6	12	18	24	36	48	60	72	84	96	108	120	132	144	156
Study Arm																
HC, PD	*				*		*									
Prodromal	*				*		*									
Study Visit Kit 1 (Blood for: RNA, plasma, buffy coat, serum, and whole blood. CSF, Urine)																
Study Visit Kit 2 (Blood for: RNA, plasma, buffy coat, serum, and whole blood. Urine)																

* Includes Skin Biopsy

4.2 Skin Biopsy

4.2.1 Single Punch (Frozen Collection) – [Appendix R](#)

For EU, Tel-Aviv, and African sites, a single punch skin biopsy should be collected from:

- 1) Subjects transitioning from the previous PPMI schedule of activities to the current PPMI schedule of activities at the first feasible post-transition visit

- 2) Newly enrolled PPMI subjects at BL, V06, and V10.

4.2.2 Double Punch (Frozen & Fixed Collections) – [Appendix S](#)

US/Canadian sites will collect double punch skin biopsies from newly enrolled, HC, idiopathic PD and prodromal subjects. Collections will occur at BL, V06, and V10. Sites must have Amendment 2 approval before executing this collection.

5.0 SAMPLE COLLECTION

- See [Appendix G](#) for an overview of the visit-specific sample collection.
- See [Appendix K](#) for Whole Blood Collection with PAXgene™ RNA Tube Collection Instructions.
- See [Appendix L](#) for Whole Blood Collection for Plasma and Buffy Coat Isolation Collection Instructions.
- See [Appendix M](#) for 6ml EDTA Tube Whole Blood Collection Instructions.
- See [Appendix N](#) for Whole Blood Collection for Serum Isolation Collection Instructions.
- See [Appendix O](#) for Urine Sample Collection Instructions.
- See [Appendix P](#) for CSF Sample Collection Instructions.
- See [Appendix R](#) for Single Punch Skin Biopsy Sample Collection Instructions.
- See [Appendix S](#) for Double Punch Skin Biopsy Sample Collection Instructions.
- See [Appendix Y](#) for Whole Blood Sub-Study Samples Collection Instructions
- See [Appendix Z](#) for Prodromal Screening Visit Blood Collection Instructions

6.0 SAMPLE PROCESSING

- See [Appendix K](#) for Whole Blood Collection with PAXgene™ RNA Tube Processing Instructions.
- See [Appendix L](#) for Whole Blood Collection for Plasma and Buffy Coat Isolation Processing Instructions.
- See [Appendix M](#) for 6ml EDTA Tube Whole Blood Processing Instructions.
- See [Appendix N](#) for Whole Blood Collection for Serum Isolation Processing Instructions.
- See [Appendix O](#) for Urine Sample Processing Instructions.
- See [Appendix P](#) for CSF Sample Processing Instructions.
- See [Appendix R](#) for Single Punch Skin Biopsy Sample Processing Instructions.
- See [Appendix S](#) for Double Punch Skin Biopsy Sample Processing Instructions.
- See [Appendix Y](#) for Whole Blood Sub-Study Samples Collection Instructions
- See [Appendix Z](#) for Prodromal Screening Visit Blood Collections Instructions

7.0 PACKAGING AND SHIPPING INSTRUCTIONS

Important Notes

Include a sample set for only one subject per shipping carton. This allows space for enough dry ice to keep samples frozen during transit.

Ship frozen samples Monday through Wednesday only.

Ship ambient samples Monday through Thursday only.

7.1 Shipping to Indiana University

US Sites:

Please refer to [Appendix C](#) for detailed instructions regarding frozen sample shipment.

Please refer to [Appendix T](#) for detailed instructions regarding biopsy sample shipment.

Canada Sites:

Please refer to [Appendix V](#) for detailed instructions regarding frozen sample shipment.

Please refer to [Appendix X](#) for detailed instructions regarding biopsy sample shipment.

7.2 Shipping to BioRep

Please refer to [Appendix D](#) for detailed instructions regarding frozen sample shipment.

8.0 SAMPLE QUALITY CHECKS AND FEEDBACK TO SITES

For each sample collected, the recipient biorepository monitors sample shipment, count, and condition. Sites must strive to collect the requested amount of each fluid as they are able. Samples must be packed well with enough dry ice to avoid a thawing event while in transit. If any issues or nonconformances are identified, the recipient biorepository will complete a Nonconformance Report ([Appendix J](#)) to provide feedback to the site.

Issues of concern that may impact sample collection, processing, or future analyses will also be escalated to the PPMI Steering Committee for review.

9.0 DATA QUERIES AND RECONCILIATION

A predetermined dataset pertaining to the collection of each sample must be entered into the study EDC on the day of sample collection to accurately capture sample processing details. The data captured will be used to complete sample data reconciliation and provide information essential to future analyses.

IU will collaborate with the LONI to reconcile information captured in the EDC database with data from samples accessioned at IU. Any discrepant information will be queried.

Data queries may include:

- Apparent missing samples at the recipient biorepository and/or corresponding data.
- Incorrect samples collected and shipped to the recipient biorepository.
- Damaged or incorrectly prepared samples.
- Unlabeled samples, samples labeled with incomplete information, or mislabeled samples.
- Discrepant information between the IU Sample Form and the information available in the EDC.

10.0 APPENDICES

Please see applicable appendices for information on sample collection, kit components and ordering, nonconformance, and shipping.

APPENDIX A: RATE OF CENTRIFUGE WORKSHEET

Please complete and email to the PPMI Biorepository at ppmibio@iu.edu. The PPMI Biorepository team will calculate and return a correct RPM. This must be noted in the Site PPMI Biologics Manual.

Submitter Information

Name:

Site:

Email:

Centrifuge Information

Please answer the following questions about your centrifuge:

Centrifuge Type

Fixed Angle Rotor:

Swing Bucket Rotor:

Radius of Rotation (mm):

Determine the centrifuge's radius of rotation (in mm) by measuring distance from the center of the centrifuge spindle to the bottom of the device when inserted into the rotor (if measuring a swing bucket rotor, measure to the middle of the bucket).

$$RPM = \sqrt{\frac{RCF}{r \times 1.118}} \times 1,000$$

Calculating RPM from G-Force:

RCF = Relative Centrifugal Force (G-Force)

RPM = Rotational Speed (revolutions per minute)

R = Centrifugal radius in mm = distance from the center of the turning axis to the bottom of centrifuge

Comments:

Please send this form to the PPMI Biorepository team at ppmibio@iu.edu

APPENDIX C: PPMI FROZEN SHIPPING INSTRUCTIONS – USA

Preparing Frozen Sample Packaging/Shipment to Indiana University

Samples Shipped on Dry Ice:

- Frozen whole blood in 3 mL plastic EDTA tubes
- Frozen whole blood in PAXgene™ RNA tubes
- Frozen plasma in 2 mL polypropylene tubes
- Frozen serum in 2 mL polypropylene tubes
- Frozen buffy coat in 2 mL polypropylene tube
- Frozen urine in 15 mL conical tube
- Frozen CSF in 2 mL polypropylene tubes
- Frozen tissue in a 2mL polypropylene tube

IMPORTANT!

FROZEN SAMPLES MAY BE SHIPPED MONDAY-WEDNESDAY ONLY!
Only ONE set of samples may be shipped in a single package.

1. Contact UPS® to confirm service is available and schedule package pickup.
2. Notify Indiana University of shipment by e-mailing ppmibio@iu.edu (preferred) or faxing (317-321-2003) a copy of the completed Sample Record Summary and Shipment Notification Form ([Appendix B](#))
3. Place all frozen 2 mL aliquot vials in the provided cardboard cryobox. Label the outside of the cryobox with the subject ID and visit number.
4. Place the cryobox into a clear plastic biohazard bag with the absorbent sheet and seal according to the instructions on the bag.



5. Insert frozen EDTA, PAXgene™, and urine tubes into the provided bubble wrap pouch. To avoid broken or cracked tubes, it is advised to package the bubble wrapped tubes with additional padding.
6. Place the bubble-wrapped tubes into the second clear plastic biohazard bag with the absorbent sheet and seal according to the instructions on the bag
7. Place approximately 2-3 inches of dry ice in the bottom of the Styrofoam-lined shipping carton.
8. Place the biohazard bags containing the cryobox and tubes into the Styrofoam-lined shipping carton, on top of the dry ice. Please ensure that the cryobox is placed so that the cryovials are upright in the shipping container.



9. Fill the remaining space in the shipping carton with dry ice, ensuring ice surrounds the bag and reaches the top of the carton, as shown below:



10. Replace the lid on the Styrofoam carton, place the completed Sample Record Summary and Shipment Notification Form on top of the carton, and close and seal the outer cardboard shipping carton with packing tape.

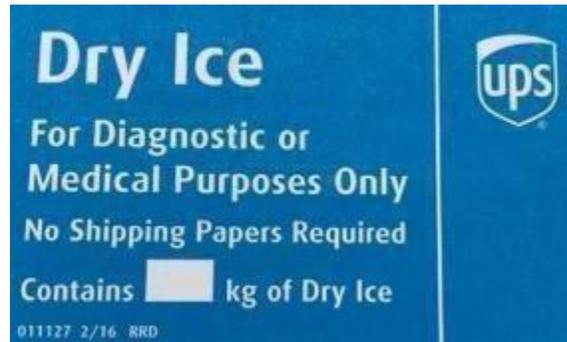
IMPORTANT!

Failure to complete the required fields on the UPS® Dry Ice label may result in UPS® rejecting or returning your package.

11. To Ship:

- a. Log in to the Indiana University UPS® portal at (<https://kits.iu.edu/ups>). Click on the Shipping drop down menu and choose Shipping and Rating.
- b. Choose your study from the Study Group drop down menu. Click on the magnifying glass icon to search for your site in the address book and click the select button to populate your site's shipping address into the label.
- c. Enter the weight of the package in the Package Weight field (enter the weight of dry ice in Dry Ice Weight field). It is important that the weight of dry ice entered in this field matches the weight on the dry ice label.
- d. Click on the blue Pickup Request button, fill out the pickup information needed, and click Save.
- e. Click the ship button and print the air waybill.
- f. Place the printed waybill in the clear sleeve, peel the back off and stick to the carton, and place the package at the UPS® pickup location as indicated on the Pickup Request fields or at an already established UPS® pickup location at your site.
- g. Complete the UPS Dry Ice Label (blue sticker) with the following information:

- i. Net Weight of dry ice in kg



- h. Do not cover any part of this label with other stickers, including pre-printed address labels.
- i. Apply all provided warning labels to the outside of the package, taking care not to overlap labels.
- j. Hold packaged samples in a -80°C freezer until the time of UPS® pickup.

APPENDIX D: PPMI FROZEN SHIPPING INSTRUCTIONS – EUROPE, AFRICA

Preparing Frozen Sample Packaging/Shipment to BioRep

Samples Shipped on Dry Ice:

- Frozen whole blood in 3 mL plastic EDTA tubes
- Frozen whole blood in PAXgene™ tubes
- Frozen plasma in 2 mL polypropylene tubes
- Frozen serum in 2 mL polypropylene tubes
- Frozen buffy coat in 2 mL polypropylene tube
- Frozen urine in 15 mL conical tube
- Frozen CSF in 2 mL polypropylene tubes
- Frozen tissue in a 2mL polypropylene tube

IMPORTANT!

FROZEN SAMPLES MAY BE SHIPPED MONDAY-WEDNESDAY ONLY!
Only ONE set of samples may be shipped in a single package.

1. Contact BioRep to coordinate shipping via DHL, Marken, or other courier.
2. Notify BioRep of shipment by emailing ppmi@biorep.it (preferred) or faxing (+39 02 58018471) a copy of the completed Sample Record Summary and Shipment Notification Form ([Appendix B](#)).
3. Place the cryobox into a clear plastic biohazard bag with the absorbent sheet.
4. Seal according to the instructions on the bag.



5. Insert frozen EDTA, PAXgene™, and urine tubes into the provided bubble wrap pouch. To avoid broken or cracked tubes, it is advised to package the bubble wrapped tubes with additional padding.
6. Place the bubble-wrapped tubes into the second clear plastic biohazard bag with the absorbent sheet and seal according to the instructions on the bag.
7. Place approximately 2-3 inches of dry ice in the bottom of the Styrofoam-lined shipping carton.
8. Place the biohazard bags containing the cryobox and tubes into the Styrofoam-lined shipping carton, on top of the dry ice. Please ensure that the cryobox is placed so that the cryovials are upright in the shipping container.



9. Fill the remaining space in the shipping carton with dry ice, ensuring ice surrounds the bag and reaches the top of the carton, as shown below:



10. Replace the lid on the Styrofoam carton, place the completed Sample Record Summary and Shipment Notification Form on top of the carton, and close and seal the outer cardboard shipping carton with packing tape.

11. Complete the Class 9 UN1845 Dry Ice label (black and white diamond) with the following information:

- a. Shipper name and Return Address
- b. Net weight of dry ice in kg
- c. Consignee name and address: BioRep Srl, c/o DIBIT2 Palazzina San Michele, Via Olgettina 60, 20132, Milano – Italy



12. Do not cover any part of this label with other stickers, including pre-printed address labels.

13. Apply all provided warning labels and the completed air waybill to the outside of the package, taking care not to overlap labels.

14. Hold packaged samples in a -80°C freezer until the time of shipment pickup.

APPENDIX E: KIT COMPONENTS

Study Visit Kit 1 – RNA, Plasma, Buffy Coat, Whole Blood, Serum, Urine, CSF

Quantity	Item
1	5-tube bubble pouch
1	Cryobox
22	Cryogenic vials (2 mL) – 3 red cap, 4 purple cap, 15 clear cap
1	Lumbar puncture tray – Lidocaine (for US sites only)
1	Medication transfer filter straw (for Lidocaine)
6	Screw-top centrifuge tubes (15 mL)
1	Screw-top centrifuge tubes (50 mL)
1	Shipping container for dry ice shipments
1	Specimen cup
2	PAXgene™ tube (2.5 mL)
1	Purple-top EDTA tube (10 mL)
2	Purple-top EDTA tube (3 mL)
1	Red-top serum tube (10 mL)
1	Transfer pipette
2	Plastic biohazard bag with absorbent sheets
1	Warning label packet
1	UPS® or FedEx® shipping pouch
1	Shipping instruction sheet

Study Visit Kit 2 – RNA, Plasma, Buffy Coat, Whole Blood, Serum, Urine

Quantity	Item
1	5-tube bubble pouch
1	Cryobox
7	Cryogenic vials (2 mL) – 3 red cap, 3 purple cap, 1 clear cap
4	Screw-top centrifuge tubes (15 mL)
1	Shipping container for dry ice shipments
1	Specimen cup
2	PAXgene™ tube (2.5 mL)
1	Purple-top EDTA tube (10 mL)
2	Purple-top EDTA tube (3 mL)
1	Red-top serum tube (10 mL)
1	Transfer pipette
2	Plastic biohazard bag with absorbent sheets
1	Warning label packet
1	UPS® or FedEx® shipping pouch
1	Shipping instruction sheet

Skin Biopsy Visit Kit (Single Punch Protocol)

Quantity	Kit Component
1	Sterile drape
1	Tweezers
2	Gauze pads
2	Alcohol prep pads
1	Scissors
1	Skin biopsy punch tool with plunger
1	Gelfoam sterile compressed sponge
1	Vaseline ointment packet
1	Coverlet adhesive dressing
1	Transparent film dressing
1	Biohazard Bag
1	Cryobox
1	Low binding cryovial tube (2mL)

Skin Biopsy Visit Kit (Double Punch Protocol)

Quantity	Kit Component
1	Sterile drape
1	Tweezers
2	Gauze pads
2	Alcohol prep pads
1	Scissors
2	Skin biopsy punch tools with plungers
1	Gelfoam sterile compressed sponge
1	Vaseline ointment packet
1	Coverlet adhesive dressing
1	Transparent film dressing
1	Low binding cryovial tube (2mL)
1	Tissue specimen storage container, pre-filled with 10% buffered formalin
1	Tissue cassettes
2	Sponges
2	Cold packs – REFRIGERATE AT 4° UPON RECEIPT
2	Plastic biohazard bag with absorbent sheets
1	Cryobox
1	Warning label packet
1	UPS® or FedEx® shipping pouch

Supplemental Kit Components

Quantity	Item
10	5-tube bubble pouches
5	Cryoboxes
50	Cryogenic vials 2 mL with red caps
50	Cryogenic vials 2 mL with purple caps
50	Cryogenic vials 2 mL with clear caps
5	Needles – Sprotte spinal with introducer
5	Medication transfer filter straws (for Lidocaine)
30	Screw-top centrifuge tubes (15 mL)
5	Screw-top centrifuge tubes (50 mL)
5	Specimen cups
10	PAXgene™ tube (2.5 mL)
5	Purple-top EDTA tubes (10 mL)
10	Purple-top EDTA tubes (3 mL)
5	Red-top serum tubes (10 mL)
5	Transfer pipettes
5	Plastic biohazard bags with absorbent sheets
5	Warning label packets
5	UPS® or FedEx® shipping pouch

Supplemental Skin Biopsy Kit Components

Quantity	Item
1	Needle driver
1	Suture pack
4	Cold packs – REFRIGERATE AT 4° UPON RECEIPT
2	Skin biopsy punch tools with plunger
2	Sterile forceps
2	Gauze sponges
1	Sterile scissors
1	Coverlet adhesive dressings
1	Sterile drapes
2	Gelfoam sterile compressed sponges
5	Vaseline ointment packets
5	Transparent film dressings
6	Alcohol prep pads
3	Tissue specimen storage containers, pre-filled with 10% buffered formalin
4	Tissue cassettes
4	Cassette sponges
4	Cryoboxes
4	Low binding cryovial tube (2mL)
4	Plastic biohazard bag with absorbent sheets
4	Warning label packet
4	UPS® or FedEx® shipping pouch
4	Shipping instruction sheet

APPENDIX F: KIT ORDERING MODULE

- Upon site startup, each site will receive one Supplemental Kit filled as well as an initial supply of three (3) study visit kits with labels.
- Sites are responsible for monitoring kit supplies. Kits, extra supplies, and paper assessments must be ordered through the “electronic kit ordering” module. Site coordinators should periodically check their stock of kits and supplemental supplies and order replacements as needed. Expiration dates should be monitored as well.
- Orders placed through the kit module will ship within three to five (3-5) business days; please provide as much notice as possible when ordering.
- To order kits or supplies, visit <http://kits.iu.edu/ppmi>.

To complete a kit order via the PPMI Kit Ordering Module:

The screenshot shows the PPMI Kit Request System interface. At the top right, there is a 'Resize font' option. The main form is titled 'PPMI Kit Request System' and contains several sections:

- PPMI Site:** A green header section with a dropdown menu showing '018'. A blue arrow points to this dropdown with a callout box that says 'Verify contact information and update if necessary.'
- Site 018 - University of Pennsylvania:** A section containing contact information for Rachael Purri, including address, phone number, and email. A blue arrow points to this section with a callout box that says 'Select your Site Number from the drop-down list.'
- Is the contact name above correct?:** A section with radio buttons for 'Yes' and 'No', and a 'reset' button.
- Is the shipping address above correct?:** A section with radio buttons for 'Yes' and 'No', and a 'reset' button.
- Kit and Supply items:** A section with checkboxes for 'Study Visit Kit', 'Supplemental Kit', 'Extra Supplies', and 'Labels Only'.

At the bottom of the form is a 'Submit' button.

APPENDIX G: SAMPLE COLLECTION INFORMATION

1. Sample Collection

The following Research Samples will be collected at PPMI study visits:

- Serum, plasma, and buffy coat suitable for proteomic, metabolomic, and other analyte studies
- Whole blood
- Cerebrospinal fluid
- Urine
- Skin biopsy

If a sample is not obtained at a visit, this should be recorded in the study database and a reason should be provided.

Subjects should be fasting prior to CSF and biofluid collections. If fasting isn't possible, the suggested low-fat diet options may be used. See [Appendix Q](#).

When a visit includes SPECT imaging and biospecimen collection, all biospecimens MUST be collected prior to SPECT tracer injection.

Otherwise, biospecimens should be collected after a minimum of 6 hours post SPECT injection.

2. Sample Collection Volumes

Sample Type	Amount
Whole Blood for RNA	2 x 2.5 mL
Whole Blood for Plasma & Buffy Coat	10 mL
Whole Blood for Serum	10 mL
Whole Blood	2 x 3 mL
Urine	10 – 15 mL
CSF	15 – 20 mL
Skin Biopsy	skin punches ~ 3mm and 3 mm deep. 1 biopsy collected at EU, Tel-Aviv, and African sites. 2 biopsies collected at US and Canadian sites.

3. Blood Collection – Order of Draw

Tubes should be filled in the following order:

1. 2 x 2.5 ml PAXgene™
2. 1 x10 ml EDTA Purple Top for Plasma and Buffy Coat
3. 2 x 3 ml EDTA Purple Top for Whole Blood
4. 1 x 10 ml Serum Determination Red Top
5. General clinical lab tubes (REFER TO LABCORP DRUG DEVELOPMENT LAB MANUAL)

4. **General Clinical Labs**

General clinical labs (LabCorp Drug Development kits), if collected, should be drawn after all research labs have been collected. Please refer to the LabCorp Drug Development Manual for detailed instructions on collection and shipment of blood samples to LabCorp Drug Development.

5. **Video List**

Training videos are available to assist with PPMI specimen processing, aliquoting, and shipping processes. Please contact the repository at ppmibio@iu.edu for more information.

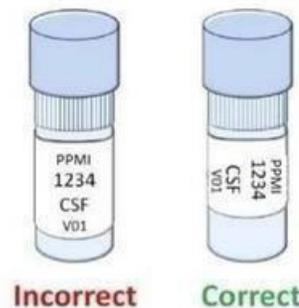
APPENDIX H: SAMPLE LABELING INFORMATION

Labeling Samples

To ensure the label adheres properly and remains on the tube:

- Place labels on ALL collection and aliquot tubes BEFORE sample collection, sample processing, or freezing. This should help to ensure the label properly adheres to the tube before exposure to moisture or different temperatures.
- Place label horizontally on the tube (wrapped around sideways if the tube is upright) and just below the ridges of the aliquot tubes (see attached labeling diagram). There is enough space on the aliquot tube for the label to be placed without overlapping the ridges.
- Take a moment to ensure the label is completely adhered to each tube. It may be helpful to roll the tube between your fingers after applying the label.

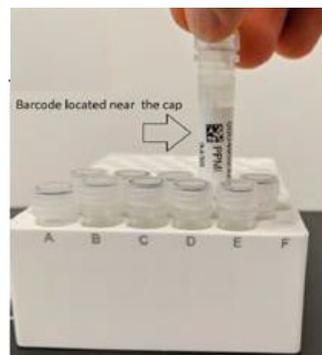
ALIQUOT TUBE LABELING DIAGRAM



Label Orientation

To ensure the label adheres properly and remains on the tube:

- Place labels with barcode near the cap as pictured below.
- Barcodes are scanned via robotic system and must be oriented properly.



APPENDIX I: FILLING ALIQUOT TUBE

Filling Aliquot Tubes with Biofluid (Plasma, Buffy Coat, Serum, and CSF)

To assist in the preparation and aliquoting of specimens, colored caps are used for the aliquot tubes. The chart below summarizes the correspondence between cap color and type of aliquot, if used.

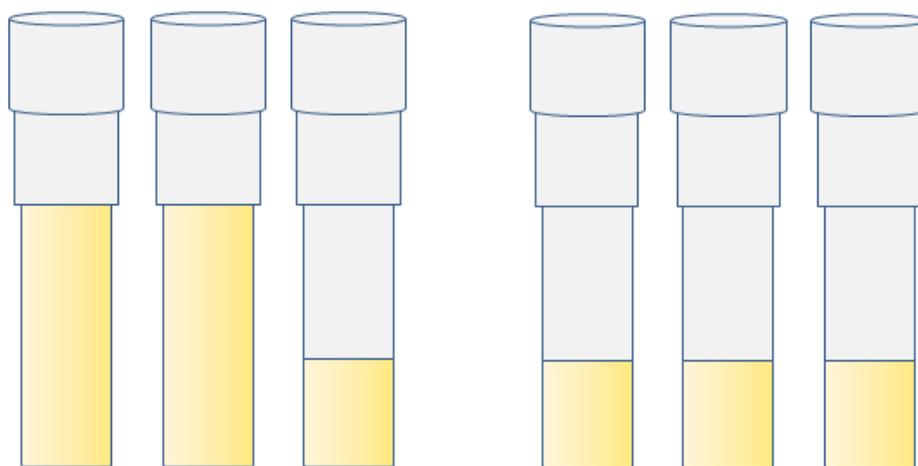
Cap Color	Specimen Type
Purple	Plasma
Purple	CSF for local lab
Red	Serum
Clear	CSF
Clear	Buffy coat

To ensure that the biorepository receives enough of the specimen for processing and storage, and to avoid cracking of the tubes prior to shipment, each aliquot tube should be filled to 1.5 milliliters (see picture, right) after processing is completed (refer to detailed processing instructions per specimen type below). A 1.5 mL aliquot will reach the bottom of the ridged section of the cryovial as shown. Over-filled tubes may burst once frozen, resulting in loss of specimen.

If there is biologic material remaining that will not fill a subsequent aliquot tube to 1.5 mL, that remaining amount should be sent in a partially filled aliquot tube.

All collected material should be shipped to the biorepository. After processing, aliquot the recommended volume (1.5 mL) into as many aliquot tubes as available sample will allow.

For example, if 3.7 mL of total specimen is obtained, fill 2 cryovials with 1.5 mL each, and one additional cryovial with the remaining 0.7 mL specimen volume (see example below).



YES

NO

APPENDIX J: SAMPLE SUBMISSION NONCONFORMANCE REPORT

Repository Name: IU

Subject ID:

Site #:

Received Date:

Visit Type:

Submission Type: Ambient Frozen

Shipping Issues Noted:

- Shipment notification not received.
- Submission form not included in package, incomplete, or inaccurate.
- Samples shipped for weekend or holiday delivery.
- Samples packaged improperly.
- Samples received damaged.
- Frozen submission received thawed.
- Samples received outside of shipment window.
- Other: _____

Sample Collection Issues Noted:

- Submitted in non-standard tube(s).
- Unlabeled or mislabeled tube(s).
- Low volume received.
- Sample discolored.
- Frozen improperly.
- Other: _____

Details/Comments:

APPENDIX K: WHOLE BLOOD COLLECTION WITH PAXgene™ RNA TUBE

See collection schematic on following pages



1. **CRITICAL STEP:** Store PAXgene™ RNA Tubes at room temperature, 64°F - 77°F (18°C to 25°C) before use.
2. **CRITICAL STEP:** The PAXgene™ RNA Tubes should be the drawn first during the blood collection procedure (before CBC, plasma, etc.).
3. Place “RNA” collection tube labels on the PAXgene™ Tubes prior to blood draw (per [Appendix H](#)).
4. Using a blood collection set and a holder, collect blood into the **first of the two** PAXgene™ RNA Tubes using site recommended procedure for standard venipuncture technique.

The following techniques can be used to prevent possible backflow:

- a. Place donor’s arm in a downward position.
 - b. Hold tube in a vertical position, below the donor’s arm during blood collection.
 - c. Release tourniquet as soon as blood starts to flow into tube.
 - d. Make sure tube additives do not touch stopper or end of the needle during venipuncture.
5. Allow at least 10 seconds for a complete blood draw to take place. **Ensure that the blood has stopped flowing into the tube before removing the tube from the holder.** The vacuum within the PAXgene™ RNA Tube is designed to draw 2.5 mL of blood into the tube.
 6. **CRITICAL STEP:** Immediately after blood collection, gently invert/mix (180 degree turns) the PAXgene™ RNA Tube 8-10 times.
 7. Repeat steps 4 – 6 to collect a second PAXgene™ RNA Tube.
 8. **CRITICAL STEP:** Incubate the PAXgene™ RNA Tubes upright at room temperature, 64°F - 77°F (18°C to 25°C) for 24 hours.
 9. Record time and date of draw in the study database.

10. After 24 hours at room temperature, place the two PAXgene™ RNA Tubes upright in a wire or plastic test tube rack and transfer the rack into a -80°C freezer. **DO NOT** store/freeze samples in a solid Styrofoam test tube holder.

Note: If blood is drawn on a Friday and the samples will not be accessible on Saturday, transfer tubes into the -80°C freezer as late as possible on Friday. Samples must sit at room temperature for a minimum of 2 hours.

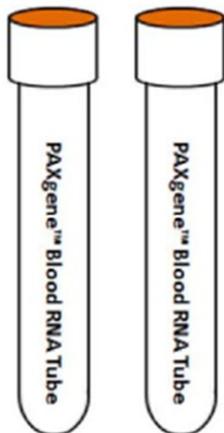
11. Keep the PAXgene™ RNA Tubes at -80°C until packed for shipment on dry ice. Samples should be shipped within two weeks of collection, following the instructions in [Appendix C](#) (US sites shipping to IU), [Appendix D](#) (sites shipping to BioRep), or [Appendix V](#) (Canadian sites shipping to IU).

12. Enter remaining sample collection data into the study database.

Collection Schematic: Whole Blood Preparation (2.5 ml PAXgene™ Tube)

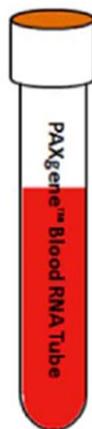


Step One



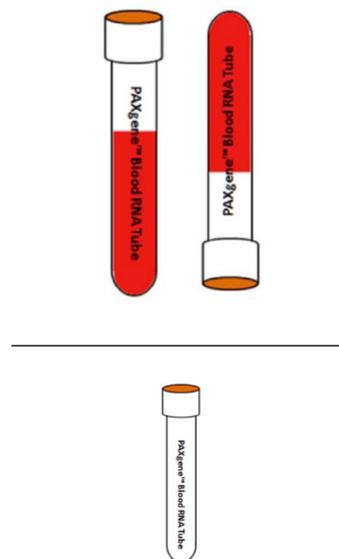
- Store tubes at room temperature.
- Label tubes with pre-printed subject labels prior to blood draw.

Step Two



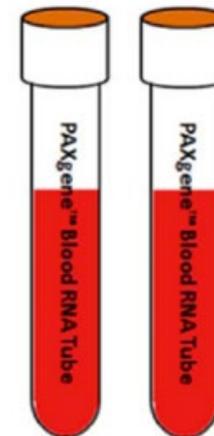
- Collect blood into one PAXgene™ Tube.
- Allow blood to flow for at least 10 seconds.
- Ensure blood flow into tube has stopped before ending collection.

Step Three



- Immediately after blood draw, invert tube 8-10 times to mix sample.
- Repeat Steps 2-3 for each collection tube (2 total).

Step Four



- After 24 hours incubation at room temperature, store upright at -80°C in a wire rack until shipment

APPENDIX L: WHOLE BLOOD COLLECTION FOR PLASMA/BUFFY COAT ISOLATION

See collection schematic on following pages



1. **CRITICAL STEP:** Store 10 mL EDTA Tubes at room temperature, 64°F - 77°F (18°C to 25°C) before use.
2. Complete labeling prior to blood draw (per [Appendix H](#)).
 - a. Place pre-printed “PLASMA” tube label on the 10 mL EDTA Tube, 15 mL centrifuge Tube, and the purple capped 2 mL aliquot tubes.
 - b. Place pre-printed “BUFFY COAT” tube label on the clear capped 2 mL aliquot tube.

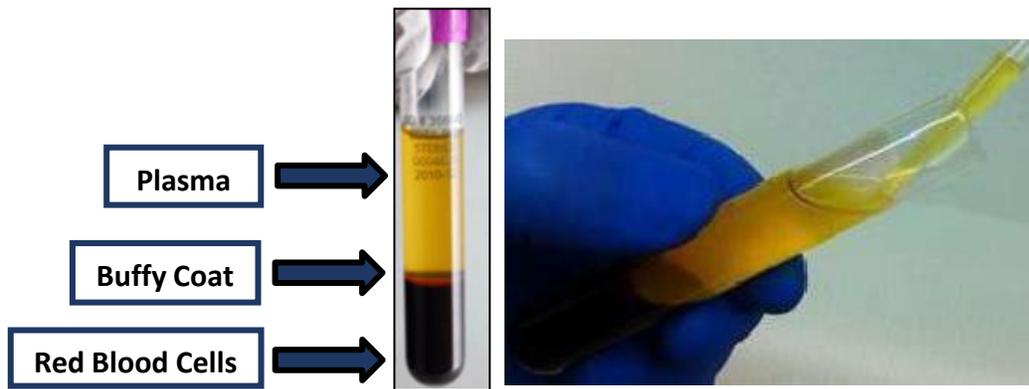


3. Using a blood collection set and a holder, collect blood into the 10 mL EDTA Tube using site recommended procedure for standard venipuncture technique.

The following techniques can be used to prevent possible backflow:

- a. Place donor's arm in a downward position.
 - b. Hold tube in a vertical position, below the donor's arm during blood collection.
 - c. Release tourniquet as soon as blood starts to flow into tube.
 - d. Make sure tube additives do not touch stopper or end of the needle during venipuncture.
4. Allow at least 10 seconds for a complete blood draw to take place. **Ensure that the blood has stopped flowing into the tube before removing the tube from the holder.** The vacuum within the 10 mL EDTA Tube is designed to draw 10 mL of blood into the tube.
 5. **CRITICAL STEP:** Immediately after blood collection, gently invert/mix (180 degree turns) the 10 mL EDTA Tube 8-10 times.
 6. Record time and date of draw in the study database.

7. Within 30 minutes of collection, centrifuge balanced 10 mL EDTA Tube at **4°C for 15 minutes at 1500 x g**. It is critical that the tubes be centrifuged at the appropriate speed to ensure proper separation. For assistance, see [Appendix A](#).
8. While centrifuging, record the time of centrifuge start in the study database.
9. Transfer the separated plasma into the 15mL centrifuge tube. This should be completed at room temperature.
 - a. While aliquoting, tilt the tube and place the pipette tip along the lower side of the tube wall to ensure the buffy coat and packed red blood cells at the bottom of the collection tube are not agitated. See picture below.



10. Mix the plasma gently by inverting the 15 mL centrifuge tube 3-4 times.
11. Pipette 1.5 mL of plasma from the 15 mL centrifuge tube into each "PLASMA" labeled 2 mL aliquot tube. This collection should yield, on average, 4.5 mL of blood plasma, for a total of 2-3 aliquot tubes per subject. Seal each aliquot tube with a purple cap.



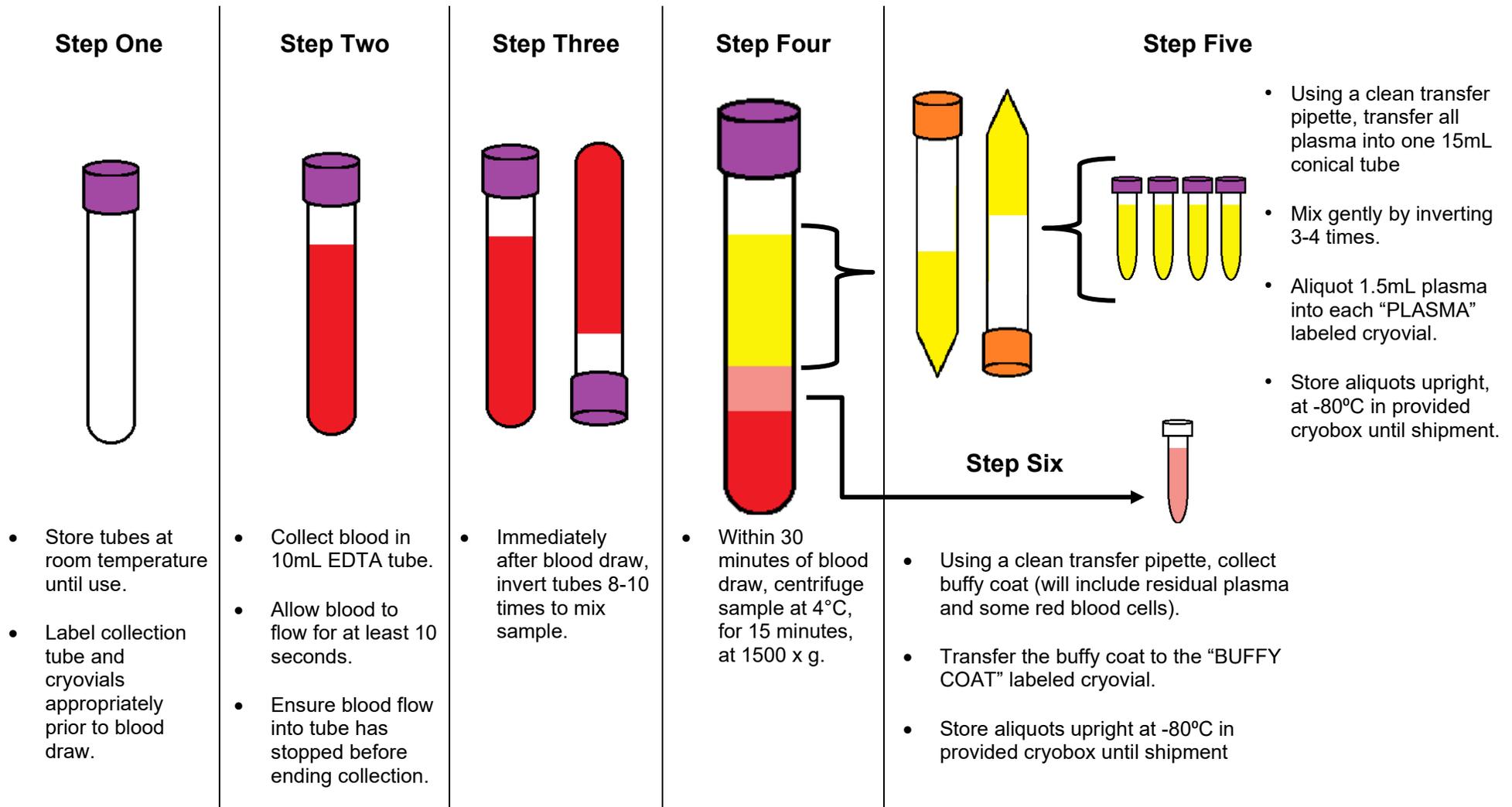
Note: When pipetting plasma from the plasma tube into the 15 mL centrifuge tube, be very careful to pipette the plasma top layer only, leaving the buffy coat and the red blood cell layers

12. Using a clean transfer pipette (micropipette preferred), transfer the buffy coat layer (shown above) into the "BUFFY COAT" labeled aliquot tube. Seal the aliquot tube with a clear cap. Residual plasma and RBCs may also be collected during this isolation process.
13. Within 60 minutes of sample collection, freeze and store samples at -80°C. Samples should be frozen and stored upright. A cryobox is provided for this purpose.



14. Discard the used 10 mL EDTA Tube and 15 mL centrifuge tubes according to site guidelines for disposing of biomedical waste.
15. Enter remaining sample collection data into the study database.
16. Samples should be shipped within two weeks of collection, following the instructions in [Appendix C](#) (US sites shipping to IU), [Appendix D](#) (sites shipping to BioRep), or [Appendix V](#) (Canadian sites shipping to IU).

Collection Schematic: Plasma and Buffy Coat Preparation (10 mL Purple Top Tube)



APPENDIX M: WHOLE BLOOD COLLECTION (3ML EDTA TUBE)

*Going forward, these 2, 3ml EDTA collection tubes will be used **in place of** the 1, 6ml EDTA collection tube.*

See collection schematic on following pages



1. **CRITICAL STEP:** Store 3 mL EDTA Tubes at room temperature, 64°F - 77°F (18°C to 25°C) before use.
2. Complete labeling prior to blood draw (per [Appendix H](#)).
 - a. Place pre-printed "WBLD" tube label on the 3 mL EDTA Tubes.



3. Using a blood collection set and a holder, collect blood into the 3 mL EDTA Tubes using site recommended procedure for standard venipuncture technique.

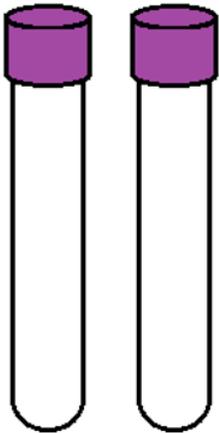
These techniques can be used to prevent possible backflow:

- a. Place donor's arm in a downward position.
 - b. Hold tube in a vertical position, below the donor's arm during blood collection.
 - c. Release tourniquet as soon as blood starts to flow into tube.
 - d. Make sure tube additives do not touch stopper or end of the needle during venipuncture.
4. Allow at least 10 seconds for a complete blood draw to take place. **Ensure that the blood has stopped flowing into the tube before removing the tube from the holder.** The vacuum within the 3 mL EDTA Tube is designed to draw 3 mL of blood into the tube.
 5. **CRITICAL STEP:** Immediately after blood collection, gently invert/mix (180 degree turns) the 3 mL EDTA tube 3 - 4 times.
 6. Repeat steps 3-5 for the second 3 mL EDTA tube.
 7. Record time and date of draw in study database.
 8. Immediately transfer tubes to a -80°C Freezer. The samples should be frozen and stored upright in a wire or plastic test tube rack.
 9. Transfer the rack into a -80°C freezer. **DO NOT** store/freeze samples in a solid Styrofoam test tube holder.

10. Enter remaining sample collection data into the study database.
11. Keep the 3 mL EDTA Tubes at -80°C until packed for shipment on dry ice.
12. Samples should be shipped within two weeks of collection, following the instructions in [Appendix C](#) (US sites shipping to IU), [Appendix D](#) (sites shipping to BioRep), or [Appendix V](#) (Canadian sites shipping to IU).
13. Record time and date of draw in the study database.

Collection Schematic: Whole Blood Collection and Preparation (2x3mL EDTA Purple Top Tube)

Step One



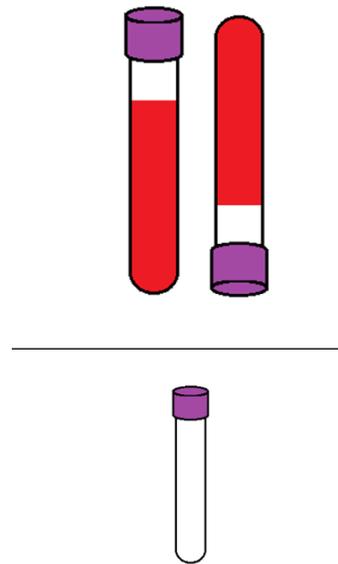
- Store tubes at room temperature.
- Label tubes with pre-printed "WBLD" labels prior to blood draw.

Step Two



- Collect blood into one 3mL EDTA tube
- Allow blood to flow for at least 10 seconds.
- Ensure blood flow into tube has stopped before ending collection.

Step Three



- Immediately after blood draw, invert tube 3-4 times to mix sample.
- Repeat steps 2-3 for each collection tube (2 total).

Step Four



- Immediately following inversion, store samples upright at -80°C in a wire or plastic rack until shipment

APPENDIX N: WHOLE BLOOD COLLECTION - SERUM DETERMINATION PROCESSING

See collection schematic on following pages

1. **CRITICAL STEP:** Store Serum Determination Tubes at room temperature, 64°F - 77°F (18°C to 25°C) before use.
2. Place pre-printed "SERUM" tube label on the Serum Determination Tube, 15 mL centrifuge Tube, and the red capped 2 mL aliquot tubes. Complete labeling prior to blood draw (per [Appendix H](#)).

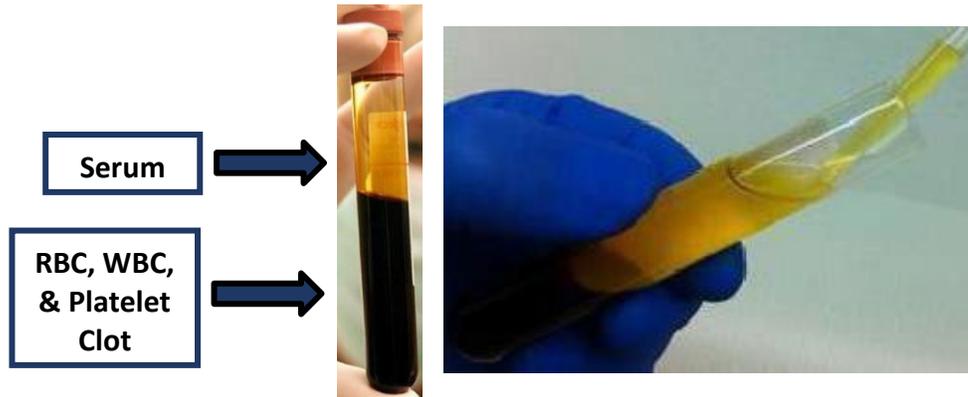


3. Using a blood collection set and a holder, collect blood into the Serum Determination Tube using site recommended procedure for standard venipuncture technique.

The following techniques can be used to prevent possible backflow:

- a. Place donor's arm in a downward position.
 - b. Hold tube in a vertical position, below the donor's arm during blood collection.
 - c. Release tourniquet as soon as blood starts to flow into tube.
 - d. Make sure tube additives do not touch stopper or end of the needle during venipuncture.
4. Allow at least 10 seconds for a complete blood draw to take place. **Ensure that the blood has stopped flowing into the tube before removing the tube from the holder.** The vacuum within the Serum Determination Tube is designed to draw 10 mL of blood into the tube.
 5. **CRITICAL STEP:** Immediately after blood collection, gently invert/mix (180 degree turns) the Serum Determination Tube 8-10 times.
 6. **CRITICAL STEP:** Allow blood to clot at room temperature for at least 15 minutes.
 7. Record time and date of draw in the study database.
 8. Within 60 minutes of collection (after 15 minutes of clotting at room temperature) centrifuge balanced Serum Determination Tube at **4°C for 15 minutes at 1500 x g**. It is critical that the tubes are centrifuged at the appropriate speed to ensure proper separation. For assistance, see [Appendix A](#).

9. While centrifuging, record the time of centrifuge start in the study database.
10. Transfer the separated serum into the 15mL centrifuge tube. This should be completed at room temperature.
 - a. While aliquoting, tilt the tube and place the pipette tip along the lower side of the tube wall to ensure the clot at the bottom of the collection tube is not agitated. See picture below.



11. Mix the serum gently by inverting the 15 mL centrifuge tube 3-4 times.
12. Pipette 1.5 mL of serum from the 15 mL centrifuge tube into each "SERUM" labeled 2 mL aliquot tube. This collection should yield, on average, 4.5 mL of serum, for a total of 2-3 aliquot tubes per subject. Seal each aliquot tube with a red cap.
 
13. Within 60 minutes of sample collection, freeze and store samples at -80°C. Samples should be frozen and stored upright. A cryobox is provided for this purpose.
14. Discard the used Serum Determination Tube and 15 mL centrifuge tube according to site guidelines for disposing of biomedical waste.
15. Enter remaining sample collection data into the study database.
16. Samples should be shipped within two weeks of collection, following the instructions in [Appendix C](#) (US sites shipping to IU), [Appendix D](#) (sites shipping to BioRep), or [Appendix V](#) (Canadian sites shipping to IU).



COLLECTION SCHEMATIC: SERUM PREPARATION (10 ML RED TOP TUBES)

Step One



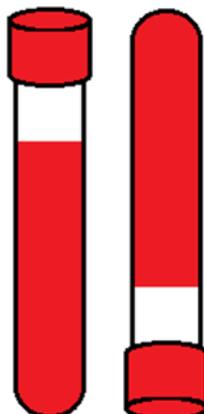
- Store tubes at room temperature until use.
- Label collection tube and cryovials appropriately prior to blood draw.

Step Two



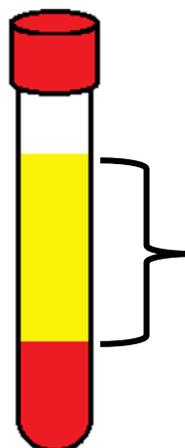
- Collect blood in 10mL Serum tube.
- Allow blood to flow for at least 10 seconds.
- Ensure blood flow into tube has stopped before ending collection.

Step Three



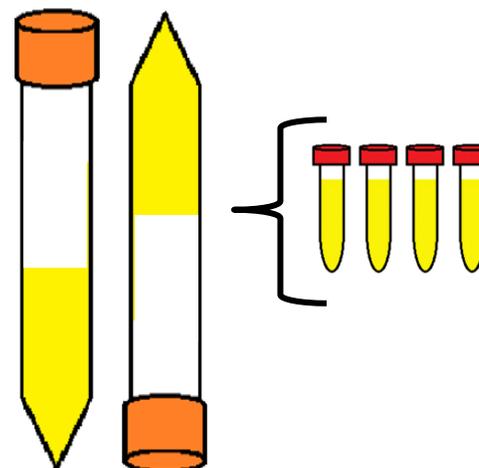
- Immediately after blood draw, invert tubes 8-10 times to mix sample.

Step Four



- Allow blood to clot at room temperature for at least 15 minutes.
- Within 60 minutes of blood draw, centrifuge sample at 4°C, for 15 minutes, at 1500 x g.

Step Five



- Using a clean transfer pipette, transfer all serum into one 15mL conical tube.
- Mix gently by inverting 3-4 times.
- Aliquot 1.5mL serum into each "SERUM" labeled cryovial.
- Store aliquots upright, at -80°C in provided cryobox until shipment.

APPENDIX O: Urine Collection and Processing Procedures

1. Label one urine collection cup and two 15 mL centrifuge tubes prior to collection with a pre-printed "URINE" label.



2. Ask study subject to collect a urine specimen in the collection cup. Urine should be collected midstream and should remain as sterile as possible.
3. Pour urine specimen into one labeled 15 mL centrifuge tube, ensure the tube is at least half full (7.5 mL). Cap the centrifuge tube with the included screw-cap.
4. Within 30 minutes of collection, centrifuge the tube **at 4°C, for 15 minutes, at 2500 x g** to remove sediment and cells. For assistance, see [Appendix A](#).
 - ❖ While centrifuging, record the time of centrifuge start in the study database.
5. Using a clean transfer pipette, carefully transfer supernatant from the 15 mL processing centrifuge tube into the second, labeled, 15 mL conical tube.
6. Firmly cap with the included screw cap.
7. Discard the original processing tube per your institution's guidelines.
8. Place the labeled tube upright in dry ice or at -80°C and allow the sample to freeze completely.
9. Within 60 minutes of sample collection, freeze and store samples at -80°C. Samples should be frozen and stored upright.
10. Enter remaining sample data into the study database.
11. Samples should be shipped within two weeks of collection, following the instructions in [Appendix C](#) (US sites shipping to IU), [Appendix D](#) (sites shipping to BioRep), or [Appendix V](#) (Canadian sites shipping to IU).

COLLECTION SCHEMATIC: Urine Collection and Processing

Step One



- Label 15ml centrifuge tube with pre-printed "URINE" label.
- Write the corresponding subject sample identification number on the urine collection cup.
- Subject provides sample
- Record date and time of sample collection

Step Two



- Pour approximately 10mL of urine specimen into one 15mL centrifuge tube.
- Ensure pre-printed label is attached to 15mL centrifuge tube.

Step Three



- Within 30 minutes of sample collection, centrifuge sample at 4°C, for 15 minutes, at 2500 x g.
- Record temperature of centrifuge and time of centrifugation.

Step Four



- Using a clean transfer pipette, transfer 15ml of supernatant from the centrifuged tube into a new, labeled, 15ml conical tube.
- Secure transferred sample with the orange screw cap.

Step Five

DRY
ICE

- Place urine aliquot upright in dry ice and allow the sample to completely freeze.
- Within 60 minutes of collection, freeze and store samples upright at -80°C.
- Record time sample was placed in freezer.

APPENDIX P: DETAILED CSF SAMPLE PROCESSING PROCEDURE

CSF is processed at Room Temperature [64⁰F – 77⁰F (18°C – 25°C)].

A portion of the CSF must be sent to your clinical lab and analyzed within 4 hours of collection.

1. Place a pre-printed “CSF” label on the 15 mL centrifuge tubes and 2 mL cryovial aliquot tubes (per [Appendix H](#)).
 - a. Prepare at least 10 aliquot tubes based on the collection of 15-20 mL of CSF.
2. Pre-cool labeled aliquot tubes by placing on wet ice prior to the procedure.
3. Perform lumbar puncture using the atraumatic technique.
4. Collect CSF into syringes (if a noticeably blood tap, discard the first 1-2 mL). Note: Beside LP should be performed at the L1-S1 interspace, as distal as possible. Fluoroscopy-guided LP is preferably performed at L3-L4 but may occur at L2-L3 if considered safe, at the discretion of the radiologist.
5. After the LP has begun and fluid is being collected, take the first 1-2 mL of CSF from the first syringe and place in the CSF labs tube (PURPLE TOP).
 - a. Send this sample to the local lab for routine diagnostic tests. Do not freeze this sample. Send at room temperature to local clinical lab for basic CSF analysis.

NOTE: Sample must be analyzed within 4 hours of collection.

1. Cell count (erythrocytes first)
 2. Total protein
 3. Glucose
6. Collect an additional 15-20 mL of CSF and transfer to the labeled 15 mL conical polypropylene tubes at room temperature. Mix gently by inverting 3-4 times. Record the time of draw (once collection is complete) into the study database.
 7. Within 15 minutes of collection, spin the remaining CSF sample down **at 2000 x g** for **10 minutes at room temperature**, 64°F – 77°F (18°C to 25°C). For assistance, see [Appendix A](#).
 8. While centrifuging, record the time of centrifuge start in the study database.

9. Using a clean transfer pipette, transfer CSF from both 15 mL conical tubes into a 50 mL conical tube, leaving debris undisturbed at the bottom of the 15 ml tubes.
10. Gently invert the 50 mL conical tube 3-4 times to mix the sample.
11. Using a pipette (micropipette preferred), transfer 1.5 mL of supernatant directly into the labeled, pre-cooled, 2 mL CSF aliquot tubes. This will yield, on average, 10-14 aliquot tubes per subject. Use more aliquot tubes if needed. **Do not discard any CSF.** Seal each aliquot tube with a clear cap.
12. Within 60 minutes of CSF collection, freeze aliquoted samples on dry ice and stored at -80°C until they are prepared for shipment on dry ice.
 - a. Samples should be frozen at -80°C and stored upright. A cryobox is provided for proper storage purposes.
13. Complete the remainder of the sample data entry into the study database.

NOTE:

If both gravity and suction collection techniques are used, defer to entering suction in the EDC.

14. Samples should be shipped within two weeks of collection, following the instructions in [Appendix C](#) (US sites shipping to IU), [Appendix D](#) (sites shipping to BioRep), or [Appendix V](#) (Canadian sites shipping to IU).

See Collection Schematic Below for additional detail

CSF Collection Preparation

Setting up an LP:

1. On an overbed table, remove the contents of the LP kit from the outer plastic packaging, leaving the contents wrapped in their sterile drape. Leave everything wrapped until the person performing the LP is seated and begins examining the subject.
2. Feel the outside of the LP kit (still wrapped) to determine which end contains the spongy swabs. Turn this end toward the person performing the LP and begin unwrapping the kit.
3. Touch only the outside of the paper wrapper. When you grab an edge to unfold it, touch only the folded under portions of the outside of the wrapper. Also, don't let the outside of the wrapper touch any part of the inside. If you touch any part of the paper wrapper, or if any non-sterile object or outside of the wrapper touches any part of the inside of the wrapper, discard the kit and start over. If you are in doubt as to whether something touched the inside of the paper wrapper, throw the kit away and start over.

Maintaining the sterile field

1. Keep in mind that there is usually a lot of staff in the room during an LP, and a big part of assisting with the LP is keeping the field sterile—keeping people away from it and reminding them to be careful around it. If anyone touches the inside of the paper wrapper or any part of the contents of the kit, throw away the kit away and start over. If you are in doubt as to whether someone touched the kit, throw it away and start over. Also, you are the monitor for whether the person performing the LP has broken sterility usually by touching something not sterile with a sterile gloved hand. Feel free to speak up and inform people if need be. Be assertive.

Tips for Clinicians Performing Lumbar Puncture

**Optimizing patient comfort and minimizing the risk of adverse events.*

1. Talk the patient through the procedure so that there are no surprises.
2. Use of a Sprotte 24g atraumatic spinal needle and careful technique are optimal for reducing post-LP headache risk. A pencil point spinal needle such as Spinocan 22g or 24g may also be used.
3. Use of medication transfer filter straw is required to decrease any chance of microscopic glass particles from breaking of the glass ampule. Guidance is provided in the document: *Filter Straw Directions for Use*. File may be found in Florence under Biologics and LabCorp Manuals, Documents
4. Use adequate local anesthesia. Use the 25g 1/2" needle and inject lidocaine to

raise a skin wheal. Then, inject lidocaine using the pattern of a square—first the center, and then to all 4 corners. If the subject is thin, do not insert the deep infiltration needle OR the spinal introducer all the way. Use only about 2/3 of their length (to prevent entering the subarachnoid space with anything other than the 24g pencil point spinal needle).

5. Increasing fluid intake immediately after LP is helpful.
6. Be sure to give post-LP care instructions verbally to the subject (see below).

Post-LP Care Instructions

- Advise the subject to refrain from exertion (e.g., exercise, housework, gardening, lifting, sexual activity, or any other strenuous activities) for 24 hours after the LP.
- Advise the subject to continue with increased fluid intake.

Mild to Moderate headache after a lumbar puncture

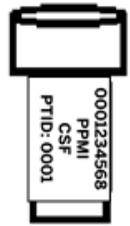
- Mild to Moderate headache following lumbar puncture usually resolves within 3-4 days.
- Treatment of Mild to Moderate headache
- Limit physical activity as much as possible.
- Oral fluids and caffeine are helpful. Drinking a can of Mountain Dew soft drink (for example) is preferable to coffee, which has some diuretic activity.
- Acetaminophen (e.g., Tylenol) should be used for symptomatic relief. If a subject cannot tolerate acetaminophen, ibuprofen should be used. Avoid aspirin. If these do not relieve the headache, Tylenol with codeine or an equivalent could be considered.

Severe headache after a lumbar puncture

- If the headache becomes severe, posturally sensitive (relieved by supine posture), or is accompanied by nausea, vomiting, tinnitus, and/or visual disturbances, the subject should contact the site study staff for further instruction per standard clinical care.

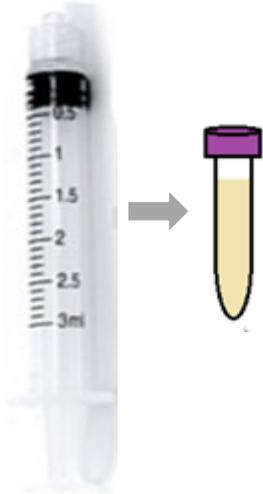
COLLECTION SCHEMATIC: CSF COLLECTION AND PREPARATION

Step One



- Label all cryovials and conical tubes with pre-printed PPMI CSF labels prior to collection.
- *Pre-chill all labeled cryovials on wet ice.*

Step Two



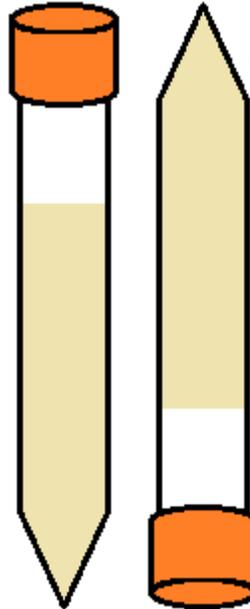
- Collect CSF into the 3mL luer lock syringe.
- Dispense 1-2mL into the purple capped cryovial.
- Send to local lab for testing.

Step Three



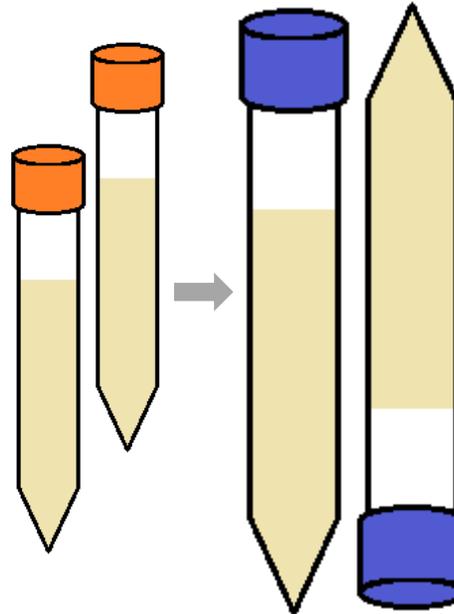
- Collect CSF into the 6mL luer lock syringe.
- Collect 15-20mL total, including the amount sent for local lab testing.
- Transfer the CSF to 15mL conical tubes.

Step Four



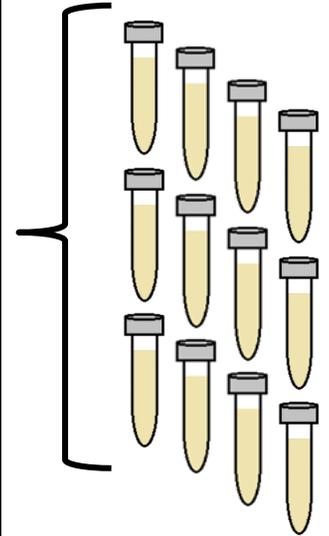
- Immediately after collection, gently invert the 15mL conical tubes 3-4 times to mix the sample.
- Within 15 minutes of collection, centrifuge sample at room temperature, for 10 minutes, at 2000 x g.

Step Five



- Using a clean transfer pipette, transfer all CSF into one 50mL conical tube, leaving debris in the bottom of the 15mL tubes.
- Gently invert the 50mL conical tube 3-4 times to mix the sample.

Step Six



- Aliquot 1.5mL into each clear capped "CSF" cryovial.
- Store CSF aliquots upright, at -80°C in provided cryobox until shipment.

APPENDIX Q: LOW-FAT DIET MENU SUGGESTIONS

Due to the interference of lipid content in blood and CSF specimens collected for biomarker evaluation in the PPMI study, it is **strongly advised that CSF and biofluid samples be collected after an 8 hour fast (no food or drink except fluids such as water, tea, black coffee)**. If fasting is not achievable, a subject should be on a low-fat diet for at least 8 hours prior to blood collection.

Below is a list of suggested sample menus that could be consumed prior to blood collection. These lists are not all inclusive and sites should use their best judgement in this process.

<u>Sample Breakfast Items:</u>	<u>Sample Lunch Items:</u>
<ul style="list-style-type: none"> • Dry whole wheat toast • Poached egg white or egg substitute • Plain oatmeal or other whole grains topped with fresh or dried fruit • Dry cereal • Fruit salad • Clear tea or coffee • Fruit or vegetable juice 	<ul style="list-style-type: none"> • Turkey breast sandwich on whole wheat bread with Lettuce, Tomato, and Mustard • Plain pasta with plain marinara sauce • Assorted vegetables (steamed or raw) and green salads • Steamed chicken breast - lean, without skin • Clear broth with vegetables and pasta • Fruit salad, Flavored gelatin • Clear beverages
<p>For all suggestions above, avoid:</p> <ul style="list-style-type: none"> • Oils • Butter • Dressings • Cheese • Avocado • Red Meats • Nuts • Granola • Milk • Cream 	

Low-Fat Diet Menu Suggestions

Additional foods to avoid prior to blood and CSF collection:

Avoid: All fats and nuts such as:

- Butter
- Cream
- Bacon fat
- Lard
- All oils
- All margarine
- All margarine
- All nuts
- Peanut butter
- Coconut
- Whole seeds such as pumpkin and sunflower

Avoid: All milk and dairy products such as:

- All cheese
- All whole milk products
- All products containing cheese
- Cheese spreads such as cream cheese
- Sour cream
- All ice cream
- Milk chocolate
- Yogurts

Avoid: High fat prepared foods and foods naturally high in fat:

- All red meats or meats containing fat such as pork
- Fatty meats such as:
 - Luncheon meats
 - Organ meats
 - Bacon
- Fatty fish such as:
 - Salmon
 - Mackerel
- Salad dressing and mayonnaise
- Buttered, au gratin, creamed, or fried vegetables
- Fried Foods
- Fried snacks such as:
 - Chips
 - Crackers
 - French Fries
- Gravies and sauces
- Baked goods and Frosting

APPENDIX R: SKIN BIOPSY COLLECTION – SINGLE PUNCH

Note: The Single Punch Protocol is intended for EU, Tel Aviv, and African sites. This may also be used by US and Canadian sites should a patient refuse a second biopsy. US and Canadian sites are to otherwise follow the Double Punch protocol.

Frozen skin biopsy samples may be shipped on dry ice and packaged with other frozen samples (plasma, serum, etc.) **Frozen samples should not be shipped on Thursday or Friday.**

1. Skin Biopsy Supplies

The skin biopsy kit contains the items listed in the table below, which will be used to perform the skin punch biopsy procedure. Check the dates of expiration. Place coldpacks in the refrigerator upon arrival to chill them. Note that sutures and needle drivers will be provided in each site's supplemental supplies and should be on hand and ready in case they are necessary for this procedure.

1.1. Punch Biopsy Kit Components

Quantity	Kit Component
1	Sterile drape
1	Tweezers
2	Gauze pads
2	Alcohol prep pads
1	Scissors
2	Skin biopsy punch tool with plunger
1	Gelfoam sterile compressed sponge
1	Vaseline ointment packet
1	Coverlet adhesive dressing
1	Transparent film dressing
1	Low protein binding cryovials (2mL)
1	Cryobox
1	Biohazard Bag

1.2. Setting Up the Kit

1.2.1. On an overbed table, remove the contents of the kit from the outer packaging, leaving all sterile contents wrapped in their packaging. Leave everything wrapped until the person performing the biopsy is seated and begins examining the subject.

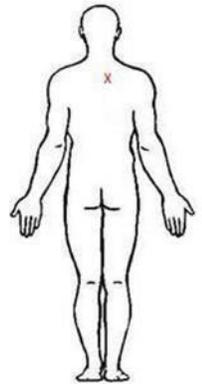
1.2.2. Open the sterile kit components, touching only the outside of the wrapper. Don't let the outside of the wrapper touch any part of the inside.

1.3. Skin Sample Collection

There will be one skin biopsy obtained from the cervical paravertebral region at approximately the C8 level (see figure below). This single biopsy will be frozen, dry, in a 2mL cryovial.

1.3.1. Pre-collection Steps – Preparation of Patient

- 1.3.1.1. Prepare patient for procedure per institution guidelines.
- 1.3.1.2. Before biopsies are collected, the volunteer will be screened and complete the informed consent for the skin biopsy procedure. The doctor will explain the study, and the volunteer will have an opportunity to ask questions. Once this discussion is complete, the volunteer is ready for the biopsy procedure.



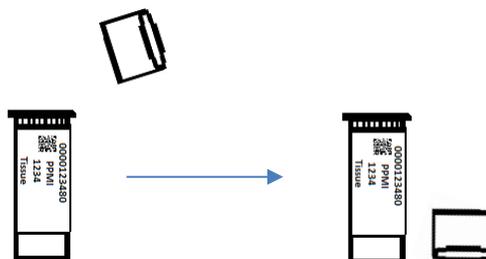
1.3.2. Preparation Steps – Cryovial for Frozen Tissue Collection

- 1.3.2.1. Prior to procedure, label the cryovial with a pre-printed “TISSUE” label.



- 1.3.2.2. Record the cryovial barcode label number on the Sample Record Summary and Shipment Notification Form ([Appendix B](#)) for frozen tissue.

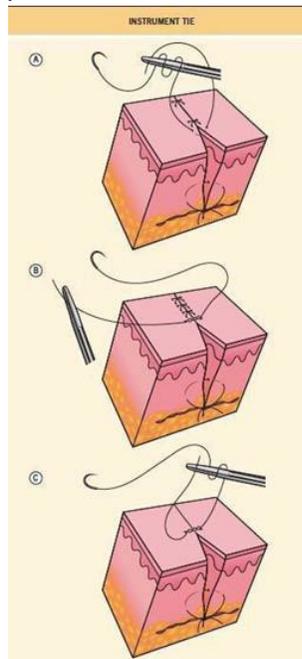
- 1.3.2.3. Open the cryovial and place cryovial lid to the side in a sterile location.



1.3.3. Biopsy Collection Procedure

- 1.3.3.1. Ensure that the biopsy site has been properly sterilized with alcohol wipes. A punch biopsy is a clean procedure, not a sterile procedure, and therefore, sterile gloves and gown are not required. Wearing safety glasses is recommended.
- 1.3.3.2. Anesthetize the area by injecting Lidocaine with epinephrine solution (Lidocaine HCL 1% with epinephrine 1:100,000) just under the epidermis (subepidermally) using a 3-cc syringe just prior to the biopsy. The injection should continue until a “bleb” or small bubble forms under the skin (approximately 3 mm in diameter). The injection will burn slightly (much like a bee sting) due to a pH difference between the skin and the solution. Injecting slowly decreases the burning sensation. The burning will subside quickly, and the site will become numb. It is acceptable to massage the area.
- 1.3.3.3. After the Lidocaine injection, the area anesthetized may be marked using a pen if helpful to the individual completing the biopsy. The area to be biopsied should be checked to ensure the skin is properly anesthetized. This can be tested by gently pressing the needle to the area. If the patient experiences neither pain nor sharp sensation, the area is ready to be biopsied. Experiencing a pressure sensation is normal, but there should be no pain. If the area requires more anesthesia, another injection of Lidocaine solution is made with a new syringe.
- 1.3.3.4. Using a sterile 3 mm skin punch, place the punch perpendicular to the skin, in the paravertebral C8 region, within 4 cm of the midline. Apply constant downward pressure while twirling the punch tool between the thumb and index finger, rotating clockwise and counterclockwise until the blade has pierced the epidermis of the skin and the metal part of the punch tool is buried (there will be a “give” once the punch reaches the subcutaneous fat). Once the tool has reached the lowest point, lift the tool straight up.
- 1.3.3.5. Depress the plunger to remove the specimen. Forceps may be needed to remove the specimen. If the specimen remains connected at the level of the subcutaneous fat, it may be necessary to cut at the base of the specimen to remove it. Do not try to tear a specimen that remains connected, as it may damage the specimen. Using a punch with a plunger should help to ensure that the epidermis is not crushed or damaged during the process.
- 1.3.3.6. **CRITICAL STEP:** Place the specimen directly into the prepared “TISSUE” cryovial and close the cryovial cap securely.

- 1.3.3.7. To restore hemostasis, hold pressure with gauze for approximately 30 seconds. Wipe any excess blood with a sterile 2x2 gauze to expose the site. Pack biopsy site with GelFoam. Apply the Vaseline ointment to the bandage and cover biopsy site. This can be reinforced with gauze and tape if necessary. If the biopsy site is oozing, apply a pressure bandage by applying Vaseline to small gauze and then apply Tegaderm. Other closure options include using a steri-strip and transparent film dressing closure system. In most cases, suturing a wound will not be necessary. Placing a suture can be considered if the wound base is still oozing after packing with GelFoam. To place a suture, grip the needle using the forceps approximately $\frac{1}{2}$ to $\frac{1}{3}$ of the distance between the suture attachment and the tip of the needle. Place the needle point perpendicular to the skin surface 2 mm away from the wound edge, then turn the wrist to exit the skin on the opposite side of the wound, again, 2 mm from the wound edge. To tie the suture, hold the needle holder parallel to the axis of the wound and at the center of the wound.
- 1.3.3.8. Wrap the free end of the suture twice around the holder, then grasp the free end and pull through, tightening the knot. Repeat with just looping around the needle holder once for repeat knots. Tie 3 knots (see figure below)



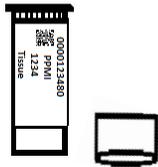
- 1.3.3.9. The study coordinator will be responsible for completing the processing of the tissue once collected using the procedures described in detail below.
- 1.3.3.10. Be sure to give post care instructions verbally to the subject as found in the Operations Manual. A follow-up call will be placed by the study coordinator 2-3 days after the procedure to assess for adverse events.

1.4. Single Punch Biopsy Processing

- 1.4.1. A single punch skin biopsy will be collected from either the right or left side of the paravertebral C8 region within 4 cm of the midline. After collection, the biopsy was placed in the "TISSUE" labeled 2mL cryovial. The cryovial lid was closed securely. Barcode for the 2mL cryovial has been recorded on the appropriate form ([Appendix B](#)).
- 1.4.2. **CRITICAL STEP:** Place the cryovial in the provided cryobox and freeze at -80°C as soon as possible. Record Time Frozen on the Appendix B. Store at -80°C until shipped to repository on dry ice.
- 1.4.3. Place a follow-up call to the subject 2-3 after the procedure to assess for adverse events.

COLLECTION SCHEMATIC: SINGLE PUNCH BIOPSY COLLECTION AND PREPARATION

Step One



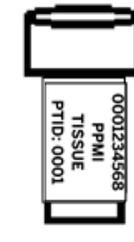
- Label 2mL cryovial with pre-printed "TISSUE" label.
- Remove lid from 2mL cryovial. Set aside in a sterile location.

Step Two



- Using standard punch biopsy procedures, collect one biopsy from the paravertebral C8 region approximately 3mm in diameter and 3mm deep.
- Record time of biopsy collection.

Step Three



- Place the biopsy into the 2mL cryovial.
- Close the 2mL cryovial securely.

Step Four



- As soon as possible after collection, store samples upright in the provided cryobox, at -80°C.
- Record time sample was placed in freezer on sample form.
- Ship according to site appropriate Frozen Shipping Appendix

APPENDIX S: SKIN BIOPSY COLLECTION – DOUBLE PUNCH

US AND CANADA SITES ONLY

Frozen skin biopsy samples may be shipped on dry ice and packaged with other frozen samples (plasma, serum, etc.) **Frozen samples should not be shipped on Thursday or Friday.**

Formalin Fixed skin biopsy samples must be shipped on the day of collection and received at the biorepository the day after collection. **Biopsy collections should not be performed or shipped on Fridays.**

In cases where only one skin biopsy is collected, sites should prioritize processing per the Frozen Tissue Preparation instructions below.

1. Skin Biopsy Supplies

The double punch skin biopsy kit contains the items listed in the table below, which will be used to perform the skin punch biopsy procedure. Check the dates of expiration of all kit components before use. Place coldpacks in the refrigerator upon arrival to chill them. Note that sutures and needle drivers will be provided in each site's supplemental supplies and should be on hand and ready in case they are necessary for this procedure.

1.1. Double Punch Biopsy Kit Components

Quantity	Kit Component
1	Sterile drape
1	Tweezers
2	Gauze pads
2	Alcohol prep pads
1	Scissors
2	Skin biopsy punch tool with plunger
1	Gelfoam sterile compressed sponge
1	Vaseline ointment packet
1	Coverlet adhesive dressing
1	Transparent film dressing
1	Low binding 2mL cryovial
1	Cryobox
2	Biohazard Bags
1	Tissue specimen storage container, pre-filled with 10% buffered formalin
1	Tissue cassette
2	Sponges
2	Cold packs

1.2. Setting Up the Kit

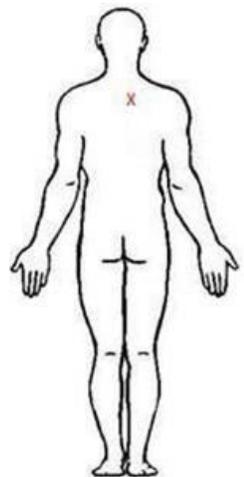
- 1.2.1. On an overbed table, remove the contents of the kit from the outer packaging, leaving all sterile contents wrapped in their packaging. Leave everything wrapped until the person performing the biopsy is seated and begins examining the subject.
- 1.2.2. Open the sterile kit components, touching only the outside of the wrapper. Don't let the outside of the wrapper touch any part of the inside of the kit.

1.3. Skin Sample Collection

Two skin biopsies will be obtained from the cervical paravertebral region at approximately the C8 level (see figure below). One biopsy will be frozen, dry, in a 2mL cryovial. The second biopsy will be placed in formalin. Where two biopsies are attempted but only one is collected, sites should process the single biopsy as a Frozen Tissue Collection.

1.3.1. Pre-collection Steps – Preparation of Patient

- 1.3.1.1. Prepare patient for procedure per institution guidelines.
- 1.3.1.2. Before the biopsies are collected, the volunteer will be screened and complete the informed consent for the skin biopsy procedure. The doctor will explain the study, and the volunteer will have an opportunity to ask questions. Once this discussion is complete, the volunteer is ready for the biopsy procedure.

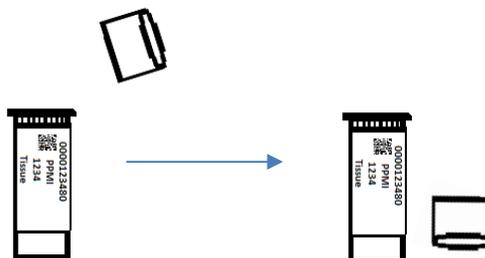


1.3.2. Preparation Steps – Cryovial for Frozen Tissue Collection

- 1.3.2.1. Prior to the procedure, label the cryovial with a pre-printed "TISSUE" label.

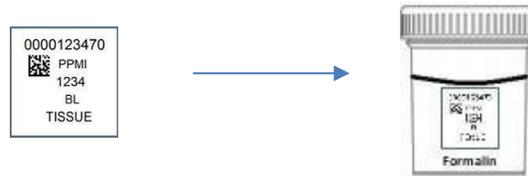


- 1.3.2.2. Record the cryovial barcode label number on the Sample Record Summary and Shipment Notification Form ([Appendix B](#)).
- 1.3.2.3. Open the cryovial and place cryovial lid to the side in a sterile location.



1.3.3. Preparation Steps – Container and Cassette for Fixed/Formalin Tissue Collection

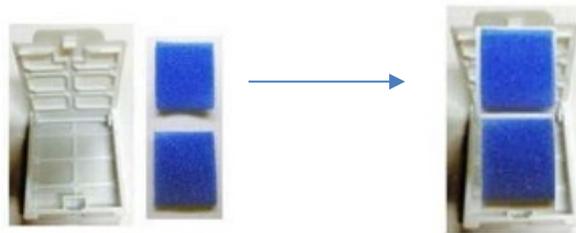
1.3.3.1. Prior to the procedure, label the tissue container with the Subject ID and “TISSUE” Label



1.3.3.2. Refrigerate cold packs at 4°C for 24 hours before use

1.3.3.3. Record the barcode label number from the cassette on the Sample Record Summary and Shipment Notification Form ([Appendix U](#)) for tissue in Formalin

1.3.3.4. Place the sponges on the top and bottom sections of the cassette.

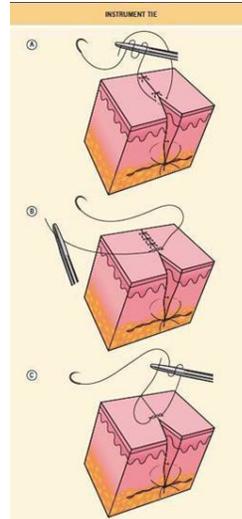


1.3.4. Biopsy Collection Procedure

- 1.3.4.1. Ensure that the biopsy site has been properly sterilized with alcohol wipes. A punch biopsy is a clean procedure, not a sterile procedure, and therefore, sterile gloves and gown are not required. Wearing safety glasses is recommended.
- 1.3.4.2. Anesthetize the area by injecting Lidocaine with epinephrine solution (Lidocaine HCL 1% with epinephrine 1:100,000) just under the epidermis (subepidermally) using a 3-cc syringe just prior to the biopsy. The injection should continue until a “bleb” or small bubble forms under the skin (approximately 3 mm in diameter). The injection will burn slightly (much like a bee sting) due to a pH difference between the skin and the solution. Injecting slowly decreases the burning sensation. The burning will subside quickly, and the site will become numb. It is acceptable to massage the area. Both biopsy sites can be anesthetized at the same time.
- 1.3.4.3. After the Lidocaine injection, the area anesthetized may be marked using a pen if helpful to the individual completing the biopsy. The area to be biopsied should be checked to ensure the skin is properly anesthetized. This can be tested by gently pressing the needle to the

area. If the patient experiences neither pain nor sharp sensation, the area is ready to be biopsied. Experiencing a pressure sensation is normal, but there should be no pain. If the area requires more anesthesia, another injection of Lidocaine solution is made with a new syringe.

- 1.3.4.4. Using a sterile 3 mm skin punch, place the punch perpendicular to the skin, in the paravertebral C8 region, within 3 cm of the midline. Apply constant downward pressure while twirling the punch tool between the thumb and indexfinger, rotating clockwise and counterclockwise until the blade has pierced theepidermis of the skin and the metal part of the punch tool is buried (there will be a “give” once the punch reaches the subcutaneous fat). Once the tool has reached the lowest point, lift the tool straight up.
- 1.3.4.5. Depress the plunger to remove the specimen. Forceps may be needed to remove the specimen. If the specimen remains connected at the level of the subcutaneous fat, it may be necessary to cut at the base of the specimen to remove it. Do not try to tear a specimen that remains connected, as it may damage the specimen. Using a punch with a plunger should help to ensurethat the epidermis is not crushed or damaged during the process.
- 1.3.4.6. **CRITICAL STEP:** Place the specimen directly into the prepared “TISSUE” cryovial and close the cryovial cap securely.
- 1.3.4.7. To restore hemostasis, hold pressure with gauze for approximately 30 seconds. Wipe any excess blood with a sterile 2x2 gauze to expose the site. Pack biopsy site with GelFoam. Apply the Vaseline ointment to the bandage and cover biopsy site. This can be reinforced with gauze and tape if necessary. If the biopsy site is oozing, apply a pressure bandage by applying Vaseline to small gauze and then apply Tegaderm. Other closure options include using a steri-strip and transparent film dressing closure system. In most cases, suturing a wound will not be necessary. Placing a suture can be considered if the wound base is still oozing after packing with GelFoam. To place a suture, grip the needle using the forceps approximately $\frac{1}{2}$ to $\frac{1}{3}$ of thedistance between the suture attachment and the tip of the needle. Place the needle point perpendicular to the skin surface 2 mm away from the wound edge, then turn the wrist to exist the skin on the opposite side of the wound, again, 2 mm from the wound edge. To tie the suture, hold the needle holder parallel to the axis of the wound and at the center of the wound.
- 1.3.4.8. Wrap the free end of the suture twice around the holder, then grasp the free end and pull through, tightening the knot. Repeat with just looping around theneedle holder once for repeat knots. Tie 3 knots (see figure below)



- 1.3.4.9. Collect a second biopsy 3 cm above or below the original collection site on the same side of the midline and following the same procedure.
- 1.3.4.10. Place the second biopsy directly into the sponge-lined cassette.
- 1.3.4.11. **CRITICAL STEP:** Close the cassette securely by bringing the lid down onto the bottom and snapping it.
- 1.3.4.12. The study coordinator or appointed site personnel will be responsible for completing the processing of the tissue once collected using the procedures described in detail below.
- 1.3.4.13. Be sure to give post care instructions verbally to the subject as found in the Operations Manual. A follow-up call will be placed by the study coordinator 2-3 days after the procedure to assess for adverse events.

1.4. Double Punch Biopsy Processing

- 1.4.1. Two punch skin biopsies will be collected from either the right or left side of the paravertebral C8 region within 3 cm of the midline. After collection, the first biopsy is placed in the "TISSUE" labeled 2mL cryovial. The cryovial lid is closed securely. The second biopsy is placed on the bottom section of a sponge-lined cassette. The cassette is securely snapped shut. Barcodes for both the 2mL cryovial and the cassette have been recorded on the appropriate form ([Appendix B](#) and [Appendix U](#), respectively).
- 1.4.2. **CRITICAL STEP:** Place the cryovial in the provided cryobox and freeze at -80°C as soon as possible. Record Time Frozen on the [Appendix B](#). Store at -80°C until shipped to repository on dry ice.
- 1.4.3. **CRITICAL STEP:** Submerge the cassette into the formalin-filled container as soon as possible. Record Time placed in Formalin on the [Appendix U](#).

- 1.4.4. Place Formalin Container in a refrigerator until shipment (shipment should occur day of collection).
- 1.4.5. Ship the formalin-fixed biopsy samples to the repository at 4°C according to [Appendix U](#) (US sites shipping to IU) or [Appendix X](#) (Canadian sites shipping to IU) **on the day of collection**.
- 1.4.6. Place a follow-up call to the subject 2-3 after the procedure to assess for adverse events.

NOTE: 10% formalin solutions contain 3-4% formaldehyde and are not regulated for transport by air or highway according to the US DOT and IATA regulations. However, please follow all guidelines dictated by your institution for packaging and shipping formalin-fixed tissue samples.

COLLECTION SCHEMATIC: DOUBLE PUNCH SKIN BIOPSY COLLECTION AND PREPARATION

Step One



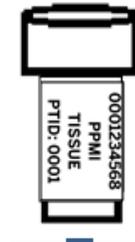
- Label 2mL cryovial and Formalin Container with pre-printed "TISSUE" label.
- Label Formalin Container with Subject ID.
- Remove lid from 2mL cryovial. Set aside in a sterile location.

Step Two



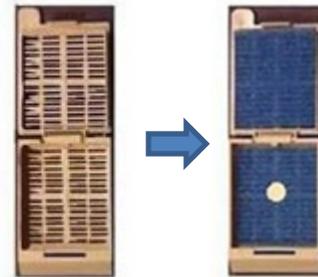
- Using standard punch biopsy procedures, collect two biopsies from the paravertebral C8 region approximately 3mm in diameter and 3mm deep.
- Record time of biopsy collection.

Step Three



- Place one biopsy into the 2mL cryovial.
- As soon as possible after collection, store samples upright in the provided cryobox, at -80°C.
- Record time placed in freezer on the sample form.
- Ship according to site appropriate Frozen Shipping Appendix.

Step Four



- Open the pre-labeled cassette and place the blue sponges into the top and bottom of the cassette.
- Record the cassette label numbers on the appropriate form.
- Place a biopsy into the cassette.
- If rinsing the punch to is required to release the biopsy, use a saline solution.

Step Five



- As soon as possible after collection, close cassette securely and submerge in the provided formalin cup.
- Record time placed in formalin on Appendix W.
- Close Formalin cup securely and store at 4°C until shipment.
- Ship on day of collection according to Appendix T procedures.

APPENDIX T: PPMI BIOPSY SHIPPING INSTRUCTIONS - USA

Preparing Cold Pack Biopsy Sample Packaging/Shipment to Indiana University

Samples Shipped on Cold Pack:

- Skin biopsy sample – 1 tissue cassette in Formalin filled container

IMPORTANT!

**REFRIGERATE COLD PACKS AT 4°C 24 HOURS BEFORE
USE. COLLECT AND SHIP BIOPSY SAMPLES **MONDAY-THURSDAY****

1. Contact UPS® to confirm service is available and schedule package pickup.
2. Notify Indiana University of shipment by e-mailing ppmibio@iu.edu (preferred) or faxing (317-321-2003) a copy of the completed Sample Record Summary and Shipment Notification Form ([Appendix B](#))
3. Ensure that tissue containers are completely and properly sealed:
 - 3.1. Insert a large absorbent sheet into a biohazard bag (both provided)
 - 3.2. Place a tissue container, with cassette inside, into the bag.
 - 3.3. Seal the biohazard bag completely.
4. Insert two cold packs into the ambient shipping container provided. Insert the specimen container into the shipping container. If necessary, add paper toweling or other material as padding.
5. Replace the lid on the Styrofoam carton, place the completed Sample Record Summary and Shipment Notification Form on top of the carton, and close and seal the outer cardboard shipping carton with packing tape.
6. To Ship:
 - 6.1. Log in to the Indiana University UPS® portal at (<https://kits.iu.edu/ups>). Click on the Shipping drop down menu and choose Shipping and Rating.
 - 6.2. Choose your study from the Study Group drop down menu. Click on the magnifying glass icon to search for your site in the address book and click the select button to populate your site's shipping address into the label.
 - 6.3. Enter the weight of the package in the Package Weight field (leave the Dry Ice Weight field blank).

- 6.4. Click on the blue Pickup Request button, fill out the pickup information needed, and click Save.
- 6.5. Click the blue ship button and print the air waybill. An automatic notice will be sent to UPS® to pick up your package. If you receive an email from UPS® stating it is too late in the day to schedule a pick-up, you will need to make other arrangements to get the package to UPS®.
- 6.6. Peel the backing from the clear sleeve and attach to the package. Place the printed waybill in the clear sleeve and place the package at your dedicated UPS® pickup location or drop the package off at a UPS® store or drop box.
7. Apply all provided warning labels to the outside of the package, taking care not to overlap labels.
8. Hold packaged samples in a 4°C refrigerator until the time of UPS® pickup.
9. Ship the samples to Indiana University on the day of collection.

NOTE: 10% formalin solutions contain 3-4% formaldehyde and are not regulated for transport by air or highway according to the US DOT and IATA regulations. However, please follow all guidelines dictated by your institution for packaging and shipping formalin-fixed tissue samples.

APPENDIX U: SAMPLE FORM – Formalin Fixed Skin Biopsy (US and Canada)

PPMI Sample Record Summary and Shipment Notification Form – Skin Biopsy

Site:

Site Investigator:

Coordinator:

Telephone:

Email:

Instructions: **Ship skin biopsy samples Monday – Thursday ONLY.** This form must be completed for all biorepository sample shipments. Notify the recipient repository (e-mail preferred) prior to shipment using the contact information below. Place a copy of the completed form in the shipment box and retain a copy for site record. The site will be contacted if any sample/form issues are noted upon receipt.

<u>Completed by Submitter/Site</u>			<u>Completed by Biorepository</u>
List Subject ID that corresponds to pre-printed labels.			
Subject ID #	Visit	Gender	Notation of problems

Cassette Label #:	
Time placed in formalin*:	

Date Shipped:

Tracking #:

IMPORTANT!

BEFORE SHIPPING, E-MAIL (PREFERRED) OR FAX A COPY OF THE COMPLETED FORM TO THE BIOREPOSITORY:

Indiana University
ppmibio@iu.edu
 Phone: 317-274-5744

APPENDIX V: PPMI FROZEN SHIPPING INSTRUCTIONS – CANADA

Preparing Frozen Sample Packaging/Shipment to Indiana University

Samples Shipped on Dry Ice:

- Frozen whole blood in 6 mL plastic EDTA tube
- Frozen whole blood in PAXgene™ RNA tubes
- Frozen plasma in 2 mL polypropylene tubes
- Frozen serum in 2 mL polypropylene tubes
- Frozen buffy coat in 2 mL polypropylene tube
- Frozen urine in 15 mL conical tube
- Frozen CSF in 2 mL polypropylene tubes
- Frozen Tissue in 2mL polypropylene tubes

IMPORTANT!

FROZEN SAMPLES MAY BE SHIPPED MONDAY-WEDNESDAY ONLY
Only ONE set of samples may be shipped in a single package.

1. Contact FedEx® to confirm service is available and schedule package pickup.
2. Notify Indiana University of shipment by e-mailing ppmibio@iu.edu (preferred) or faxing (317-321-2003) a copy of the completed Sample Record Summary and Shipment Notification Form ([Appendix B](#))
3. Place all frozen 2 mL aliquot vials in the provided cardboard cryobox. Label the outside of the cryobox with the subject ID and visit number.
4. Place the cryobox into a clear plastic biohazard bag with the absorbent sheet and seal according to the instructions on the bag.

5. Insert frozen EDTA, PAXgene™, and urine tubes into the provided bubble wrap pouch. To avoid broken or cracked tubes, it is advised to package the bubble wrapped tubes with additional padding.
6. Place the bubble-wrapped tubes into the second clear plastic biohazard bag with the absorbent sheet and seal according to the instructions on the bag.
7. Place approximately 2-3 inches of dry ice in the bottom of the Styrofoam-lined shipping carton.

8. Place the biohazard bags containing the cryobox and tubes into the Styrofoam-lined shipping carton, on top of the dry ice. Please ensure that the cryobox is placed so that the cryovials are upright in the shipping container.



9. Fill the remaining space in the shipping carton with dry ice, ensuring ice surrounds the bag and reaches the top of the carton, as shown below:



10. Replace the lid on the Styrofoam carton, place the completed Sample Record Summary and Shipment Notification Form on top of the carton, and close and seal the outer cardboard shipping carton with packing tape.

IMPORTANT!

Failure to complete the required fields on the FedEx® Dry Ice label may result in FedEx® rejecting or returning your package.

11. To ship, Complete the FedEx® return air waybill with the following information:
 - a. **Section 1, From:** Enter the date, coordinator name, phone number, and complete address.
 - b. **Section 2, To:** This information will be preprinted with PPMI's return address and phone number.
 - c. **Section 3, Shipment Information:** Total Packages, Weight, and Box Dimensions are required. Be consistent between this International FedEx® return airbill and the International Commercial Invoice. Do not declare the value of the shipment to be over \$2,500. This would require additional paperwork (a Shipper's Export Declaration form).
 - d. **Section 4, Express Package Services:** Please ensure FedEx® Intl. Priority is checked. (Pictured)



- e. **Section 5, Packaging:** Please select "Other".

- f. **Section 6a, Special Handling and Delivery Signature Options:** Ensure that under “Does this shipment contain dangerous goods?” that the boxes for “Yes, Shipper’s Declaration not required” and “Dry Ice” are checked. Enter the number of packages (1) x the net weight of dry ice in kg.
 - g. **Section 6b Broker Selection:** leave blank.
 - h. **Section 7, Payment:** Verify that “Recipient” is checked and that this section is completed with PPMI’s FedEx® account number. Duties and Taxes will also be billed to the recipient.
 - i. **Section 8, Required Signature:** This section must be signed by the sender or department representative.
12. Peel the backing from the clear sleeve and attach to the package. Place the printed waybill in the clear sleeve and place the package at your dedicated FedEx® pickup location or drop the package off at a FedEx® store or drop box.
13. Complete the Class 9 UN 1845 Dry Ice label (black and white diamond) with the following information:
 - a. Coordinator name and return address
 - b. Net weight of dry ice in kg
 - c. Consignee name and address:

PPMI Biorepository
IU School of Medicine
351 W. 10th Street TK 217
Indianapolis, IN 46202-4118 USA
 - d. Do not cover any part of this label with other stickers, including pre-printed address labels.
14. Apply all provided warning labels to the outside of the package, taking care not to overlap labels.
15. Hold packaged samples in a -80°C freezer until the time of FedEx® pickup.
16. International Commercial Invoice (See [Appendix W](#))
 - a. The International Commercial Invoice must be completed and placed with the International return airway bill. Include **ONE** original and **THREE** copies of this completed form with the FedEx® return airway bill.
 - b. Complete **Shipped From** with coordinator name, address, and any additional contact information.
 - c. Confirm **Shipped To**, “**Consignee**” with the shipping address information:

PPMI Biorepository
IU School of Medicine
351 W. 10th Street TK 217
Indianapolis, IN 46202-4118 USA

- d. Complete **Number of Packages** and **Shipping Weight** to match the information recorded within the International FedEx® return air waybill.
- e. Immediately below the shipping weight is a section asking for the Country of Origin, Description of Goods, Quantity, Unit Price, and Total Price. Please be as detailed as possible within this section (example pictured below).

COUNTRY OF ORIGIN & PROVINCE, IF CANADA PAYS D'ORIGINE ET PROVINCE, SI CANADA	DESCRIPTION OF GOODS DESCRIPTION DES MARCHANDISES	QUANTITY QUANTITE	UNIT PRICE PRIX UNITAIRE	TOTAL PRICE PRIX TOTAL
Canada, Vancouver	Non-Infectious, non-contagious, human Plasma and Buffy Coat sample	1 Box (11 Aliquots)	100.00	100.00

- f. Tally the **Total Price** for all goods included in the shipment in the last column. Reminder: the total price/value of the shipment should not exceed \$2,500.
- g. Complete the final section with a signature.
- h. All specimens should be sent to the address above via **FedEx® International Priority**.
- i. Use FedEx® tracking to ensure the delivery occurs as scheduled and is received by the PPMI biorepository.

APPENDIX X: PPMI BIOPSY SHIPPING INSTRUCTIONS – CANADA

Preparing Cold Pack Biopsy Sample Packaging/Shipment to Indiana University

Samples Shipped on Cold Pack:

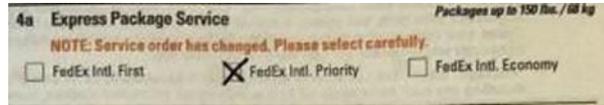
- Skin biopsy sample – 1 tissue cassette

IMPORTANT!
REFRIGERATE COLD PACKS AT 4°C BEFORE USE
COLLECT AND SHIP BIOPSY SAMPLES MONDAY-THURSDAY ONLY

Two components are necessary for international shipments: Section A. International FedEx® Return Air Waybill Section B. International Commercial Invoice
--

Section A

1. Contact FedEx® to confirm service is available and schedule package pickup.
2. Notify Indiana University of shipment by e-mailing ppmibio@iu.edu (preferred) or faxing (317-321-2003) a copy of the completed Sample Record Summary and Shipment Notification Form ([Appendix U](#)).
3. Ensure that tissue containers are completely and properly sealed. Insert a large absorbent sheet into a biohazard bag (both provided) and place a tissue container, with cassette inside, into the bag and seal it.
4. Insert two cold packs into the ambient shipping container provided. Insert the specimen container(s) into the shipping container. If necessary, add paper toweling or other material as padding.
5. Replace the lid on the Styrofoam carton, place the completed Sample Record Summary and Shipment Notification Form on top of the carton, and close and seal the outer cardboard shipping carton with packing tape.
6. To ship, Complete the FedEx® return air waybill with the following information:
 - a. **Section 1, From:** Enter the date, coordinator name, phone number, and complete address.
 - b. **Section 2, To:** This information will be preprinted with PPMI's return address and phone number.
 - c. **Section 3, Shipment Information:** Total Packages, Weight, and Box Dimensions are required. Be consistent between this International FedEx® return airbill and the International Commercial Invoice. Do not declare the value of the shipment to be over \$2,500. This would require additional paperwork (a Shipper's Export Declaration form).
 - d. **Section 4, Express Package Services:** Please ensure FedEx® Intl. Priority is checked. (Pictured)



- e. **Section 5, Packaging:** Please select “Other”.
 - f. **Section 6, Special Handling and Delivery Signature Options:** Leave Blank
 - g. **Section 7, Payment:** Verify that “Recipient” is checked and that this section is completed with PPMI’s FedEx® account number. Duties and Taxes will also be billed to the recipient.
 - h. **Section 8, Required Signature:** This section must be signed by the sender or department representative.
7. Peel the backing from the clear sleeve and attach to the package. Place the printed waybill in the clear sleeve and place the package at your dedicated FedEx® pickup location or drop the package off at a FedEx® store or drop box.

Section B

- 8. International Commercial Invoice (See [Appendix W](#))
 - a. The International Commercial Invoice must be completed and placed with the International return airway bill. Include **ONE** original and **THREE** copies of this completed form with the FedEx® return airway bill.
 - b. Complete **Shipped From** with coordinator name, address, and any additional contact information.
 - c. Confirm **Shipped To**, “**Consignee**” with the shipping address information:

PPMI Biorepository
 IU School of Medicine
 351 W. 10th Street TK 217
 Indianapolis, IN 46202-4118 USA

- d. Complete **Number of Packages** and **Shipping Weight** to match the information recorded within the International FedEx® return air waybill.
- e. Immediately below the shipping weight is a section asking for the Country of Origin, Description of Goods, Quantity, Unit Price, and Total Price. Please be as detailed as possible within this section (example pictured below).

<small>COUNTRY OF ORIGIN & PROVINCE, IF CANADA PAYS D'ORIGINE ET PROVINCE, SI CANADA</small>	<small>DESCRIPTION OF GOODS DESCRIPTION DES MARCHANDISES</small>	<small>QUANTITY QUANTITE</small>	<small>UNIT PRICE PRIX UNITAIRE</small>	<small>TOTAL PRICE PRIX TOTAL</small>
Canada, Vancouver	Non-Infectious, non-contagious, human Plasma and Buffy Coat sample	1 Box (11 Aliquots)	100.00	100.00

- f. Tally the **Total Price** for all goods included in the shipment in the last column. Reminder: the total price/value of the shipment should not exceed \$2,500.
- g. Complete the final section with a signature.

- h. Hold packaged samples in a 4°C refrigerator until the time of FedEx® pickup.
- i. Ship the samples to Indiana University on the day of collection.

NOTE: 10% formalin solutions contain 3-4% formaldehyde and are not regulated for transport by air or highway according to the US DOT and IATA regulations. However, please follow all guidelines dictated by your institution for packaging and shipping formalin-fixed tissue samples.

APPENDIX Y: SUB-STUDY: PPMI Whole Blood 010 (WB010) Protocol

1. Specimen Collection Kits

Research specimen collection kits will be provided by the IU PPMI Biorepository. These materials include (5) sodium heparin (NaHep), green-top collection tubes, and supplies necessary for ambient sample shipment.

1.1. Kit Contents

Collection kits contain the supplies listed in the table below. One kit includes supplies to collect WB010 samples from a single subject's visit. Do not replace or supplement any of the kit components with your own supplies unless you have received approval from MJFF Leadership. Please store all kits at room temperature until use.

WB010 Blood Kit

5	NaHep (Green-Top) Blood Collection Tube (10 ml)
1	Plastic biohazard bag with absorbent sheet
1	Small IATA shipping box
2	8oz Cold Pack
1	Aqui-Pak 6 tube absorbent pouch
1	UN3373 Biological Substance Category B label
1	Fragile Shipping Label
1	UPS return airbill pouch

Additional or supplemental supplies available upon request

1.2. Kit Supply to Study Sites

Five WB010 Collection Kits will be automatically distributed to a site once they have received IRB approval to engage in sub-study activities. Following this initial shipment, sites will be responsible for ordering and maintaining a sufficient supply of sub-study kits. We advise sites to keep a supply of this kit available. Be sure to check supplies and order additional materials before supplies are exhausted or expired.

Please go to <http://kits.iu.edu/ppmi> to request additional kits and follow the prompts to request the desired supplies.

Allow **two weeks** for kit orders to be processed and delivered.

WB010 Sample Collection

Important Note

Sample shipments must be expedited to the Indiana University lab and sample delivery must occur within 24 hours of sample collection.

Schedule courier pickup immediately following sample collection.

1. **CRITICAL STEP:** Store (5) 10 mL NaHep tubes at room temperature, 64°F - 77°F (18°C to 25°C) before use.
2. **CRITICAL STEP:** Store 8oz Cold Packs in refrigerator, ~4°C, 24 hours before use.
3. Place pre-printed "PBMC" tube label on each 10 mL NaHep Tube. Complete labeling prior to blood draw (per [Appendix H](#)).
4. Using a blood collection set and a holder, collect blood into the 10 mL NaHep tubes using site recommended venipuncture procedure.

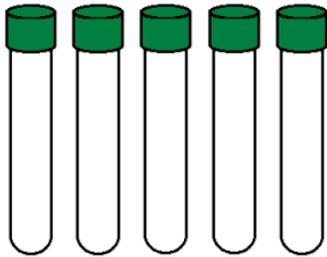
0001234567
 PPMI
90001
V01
PBMC

The following techniques can be used to prevent possible backflow:

- a. Place donor's arm in a downward position.
 - b. Hold tube in a vertical position, below the donor's arm during blood collection.
 - c. Release tourniquet as soon as blood starts to flow into tube.
 - d. Make sure tube additives do not touch stopper or end of the needle during venipuncture
5. Allow at least 10 seconds for a complete blood draw to take place.
 6. **Ensure that the blood has stopped flowing into the tube before removing the tube from the holder.** The tube is designed to draw 10 mL of blood.
 7. Immediately after blood collection, gently invert/mix (180 degree turns) the NaHep tube 8 to 10 times.
 8. Repeat Steps 4-7 for the remaining collection tubes (5 total).
 9. Complete the WB010 eCRF at https://ppmi.iu.edu/wb010_crf
 10. A copy of the WB010 eCRF will be emailed to the address provided. This form should be printed and included in the sample shipment.

Collection Schematic: Sub-Study: WB010 (5, 10ml NaHep Green-Top Tubes)

Step One



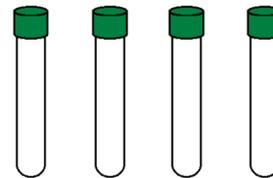
- Store tubes at room temperature.
- Refrigerate cool pack at ~4°C for at least 24 hours ahead of shipment.
- Label tubes prior to blood draw.

Step Two



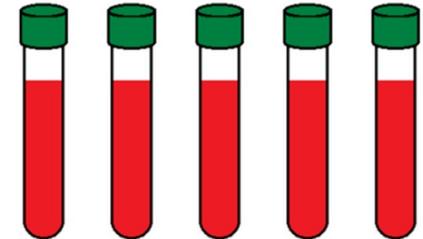
- Collect blood in sodium heparin (NaHep) tube.
- Allow blood to flow for at least 10 seconds.
- Ensure blood flow into tube has stopped before ending collection.

Step Three



- Immediately after blood drawn, invert tubes 8-10 times to mix samples.
- Repeat Steps 4-7 for each collection tube (5 total).

Step Four



- Place filled tubes in insulated shipper per WB010 sample packaging guidelines.
- Schedule for shipment as soon as possible.

WB010 Packaging and Shipping

*****Important Note*****
AMBIENT SAMPLES MUST BE SHIPPED MONDAY-THURSDAY ONLY!

Immediately following sample collection, schedule a UPS pickup:

1. Navigate to the Indiana University UPS® Shipping Portal at <https://kits.iu.edu/ups>
2. Click on the Shipping drop down menu and choose Shipping and Rating.
3. Choose your study from the Study Group drop down menu.
4. Click on the magnifying glass icon to search for your site in the address book and click the select button to populate your site's shipping address into the label.
5. Enter the weight of the package in the Package Weight field (leave the Dry Ice Weight field blank).
6. Click on the blue Pickup Request button, fill out the pickup information needed, and click Save.
7. Click the blue "Ship" button and print the air waybill.
8. Fix the air waybill to the exterior of the cardboard shipping container.

Prepare Samples for Shipment:

1. Place the 5 filled and labeled NaHep (green-top) tubes in the slotted absorbent pad and place into the plastic biohazard bag with absorbent sheet.
2. Remove as much air as possible from the plastic biohazard bag and seal according to the directions printed on the bag.
3. Place biohazard bag with the NaHep tubes into the shipper along with cooled refrigerant packs.
4. Print and place a copy of the PPMI WB010 Sample and Shipment Notification Form on top of the cooler lid.
5. Close the shipping box and tape securely shut.



6. Label the outside of the cardboard box with the enclosed UN3373 (Biological Substance Category B) label and the “Fragile” label.



7. Hold packaged samples until UPS pickup or place in the site identified UPS pickup location.
8. Periodically check to confirm package is retrieved by UPS – **it is critical that these samples are shipped the same day they are collected.**

APPENDIX Z: PRODROMAL SCREENING VISIT BLOOD COLLECTION: WHOLE BLOOD COLLECTION (TWO 3ML EDTA TUBES)

These tubes should only be used for the collection at a Prodromal Screening Visit

See collection schematic on following pages



1. Store the two 3 mL EDTA Tubes at room temperature, 64°F - 77°F (18°C to 25°C) before use.

2. Complete labeling prior to blood draw as described below:

a. Place one **Specimen Label** on each of the 3 mL EDTA Tubes (2 tubes):

 PPMI BIO 0000001234 WBLD Kit #: 300001 SC 

Kit Number

b. **PLEASE NOTE:** These Specimen Labels include a “Kit Number” in place of a PPMI ID.

- A kit number connects all samples collected from one participant at one visit.
- A kit number is used in place of a PPMI ID when the PPMI ID cannot always be identified in advance of the visit.
- **It will be critical to record this kit number on the visit Sample Form (Appendix B) and in the Research Samples CRF in EDC for each Prodromal Screening Visit**

c. Using a fine point sharpie, fill in the **Participant ID Label** with this participant’s PPMI ID number.

d. Place one **Participant ID Label** on each of the 3 mL EDTA Tubes:

PPMI ID: <hr/>

e. Example of labeled 3mL EDTA Tubes:



3. Using a blood collection set and a holder, collect blood into the 3 mL EDTA Tubes using site

recommended procedure for standard venipuncture technique.

These techniques can be used to prevent possible backflow:

- a. Place donor's arm in a downward position.
 - b. Hold tube in a vertical position, below the donor's arm during blood collection.
 - c. Release tourniquet as soon as blood starts to flow into tube.
 - d. Make sure tube additives do not touch stopper or end of the needle during venipuncture.
4. Allow at least 10 seconds for a complete blood draw to take place. **Ensure that blood has stopped flowing into the tube before removing the tube from the holder.** The vacuum within the 3 mL EDTA Tube is designed to draw 3 mL of blood into the tube.
 5. Immediately after blood collection, gently invert/mix (180 degree turns) the 3 mL EDTA tube 3 - 4 times.
 6. Repeat steps 3-5 for the second 3 mL EDTA tube.
 7. Record time and date of draw in study database.
 8. Immediately transfer tubes to a -80°C Freezer. The samples should be frozen and stored upright in a wire or plastic test tube rack. **DO NOT** store/freeze samples in a solid Styrofoam test tube holder.
 9. Enter remaining sample collection data (i.e., kit number, date and time of draw) into the study database.
 10. Keep the 3 mL EDTA Tubes at -80°C until packed for shipment on dry ice.
 11. Samples should be shipped with the completed Sample Form documenting the kit number used (Appendix B) within two weeks of collection, following the instructions in [Appendix C](#) (US sites shipping to IU), [Appendix D](#) (sites shipping to BioRep), or [Appendix X](#) (Canadian sites shipping to IU).
 12. Samples can be shipped in batches of ~10 screening visits or with one patient visit.