

# BioSEND

Biospecimen Exchange for Neurological Disorders

## PREVENT ALL ALS Study

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BIOSPECIMEN COLLECTION & PROCESSING

# Overview

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1. Specimen uniformity and quality
2. Site Equipment
3. Procedures
  - Kit Contents and Ordering
  - Sample Labelling
  - Sample Collection and Processing
  - Shipping Samples
  - Non-Conformance
4. Contact Information

# Specimen Uniformity and Quality

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GENERAL REMINDERS

# Specimen Standardization and Quality

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Most biomarkers are sensitive to *time* and *temperature*

- Standardization of processing across sites is key
- All frozen specimens must be processed and frozen within two hours
- Ambient PBMC must be shipped to BioSEND same day as collection
- Reference the *BioSEND Biomarker Specimen Collection, Processing, and Shipment Manual* as needed
- Do not replace or supplement any kit components without first receiving approval from BioSEND/NINDS

Questions? Email [biosend@iu.edu](mailto:biosend@iu.edu)

# Site Consumables and Equipment

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*Sites will need to supply the following items:*

- Gloves
- Alcohol wipes
- Butterfly needles
- Tourniquet
- Gauze pads
- Bandages
- Microcentrifuge tube rack
- Sharps bin and lid
- Crushed ice
- Pipettes and pipette tips
- Centrifuge capable of 1500 RCF (x g)
- -80°C Freezer
- Dry ice

# Procedures

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MAINTAINING SPECIMEN UNIFORMITY AND QUALITY

# Biospecimen Collection Protocol- Symptomatic Participants

Sample Type & Volume	Visit 1 Screening, Day 0 (Clinic)	Visit 2 120 ± 30 days (Remote)	Visit 3 240 ± 30 days (Remote)	Visit 4 365 ± 60 days (Clinic)	Visit 5 360 ± 30 days (Remote)	Visit 6 480 ± 30 days (Remote)	Visit 7 730 ± 60 days (Clinic)	Visit 8 600 ± 30 days (Remote)	Visit 9 720 ± 30 days (Remote)	Visit 10 1095 ± 60 days (Clinic)
Plasma aliquots, 0.5ml	20	20	20	20	20	20	20	20	20	20
Serum aliquots, 0.5ml	20	20	20	20	20	20	20	20	20	20
Buffy Coat	2	2	2	2	2	2	2	2	2	2
Whole Blood, 3ml	2	2	2	2	2	2	2	2	2	2
RNA Paxgene	1	-	-	-	-	-	-	-	-	-
PBMC, 10ml	1	-	-	-	-	-	-	-	-	-
CSF aliquots, 0.5ml (optional, on-site visits only)	30	-	-	30	-	-	30	-	-	30

# Kit Contents and Ordering

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- All sites will be sent a Supplemental Kit with their first kit shipment
  - Contains extra blood collection tubes, processing supplies, and LP needles
  - May be used to replace items in study visit kits
- Study Visit Kits should be ordered as soon as visits are planned
  - Contains collection, processing, and shipping supplies specific to each visit
  - Includes barcoded labels
  - The supplies/labels in each study visit kit are intended for that visit only



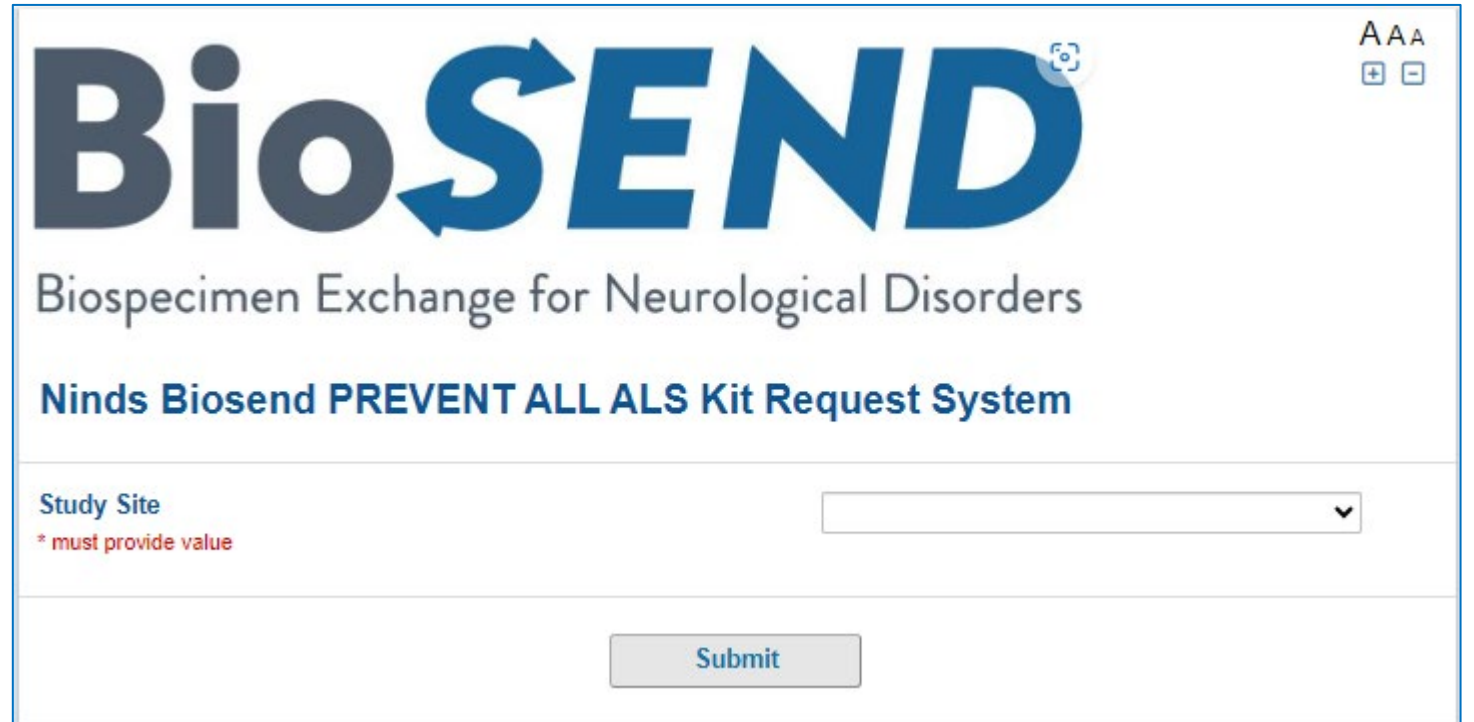
# Kit Contents and Ordering – REDCap Survey

<https://redcap.link/preventalls>

Order kits online through the Kit Request Module for:

- Blood Kits
- CSF Kits
- Extra Supplies

Please provide as much notice as possible when ordering kits and/or supplies.



The screenshot shows the BioSEND logo at the top, with the text "Biospecimen Exchange for Neurological Disorders" below it. Underneath is the title "Ninds Biosend PREVENT ALL ALS Kit Request System". There is a dropdown menu labeled "Study Site" with a red asterisk and the text "\* must provide value" below it. A "Submit" button is located at the bottom right of the form area.

**BioSEND**  
Biospecimen Exchange for Neurological Disorders  
**Ninds Biosend PREVENT ALL ALS Kit Request System**

Study Site

\* must provide value

Submit

# Kit Contents and Ordering: Confirm Site Info

PREVENT ALL ALS Kit Request Module

<b>Study Site</b> <small>* must provide value</small>	Indiana Univers	Select your site from the drop-down list
<b>Indiana University School of Medicine</b> Carolyn Dunifon Dept. of Medical & Molecular Genetics 351 West 10th Street, TK-318 Indianapolis, IN 46202-3002 (317) 274-5751 cdunifon@iu.edu		Verify contact information and update if needed
<b>Is the contact name above correct?</b> <small>* must provide value</small>	<input type="radio"/> Yes <input checked="" type="radio"/> No	reset
<b>New Contact Name</b> <small>* must provide value</small>	Claire Wegel	
<b>Is the shipping address above correct?</b> <small>* must provide value</small>	<input type="radio"/> Yes <input type="radio"/> No	reset
<b>Is the e-mail address above correct?</b> <small>* must provide value</small>	<input type="radio"/> Yes <input type="radio"/> No	reset
<b>Is the phone number above correct?</b> <small>* must provide value</small>	<input type="radio"/> Yes <input type="radio"/> No	reset

# Kit Contents and Ordering: Kit Types

## PREVENT ALL ALS Kit Request Module

- Kits are not specific to a subject or time point. After collection, sites will indicate the subject and time point to which BioSEND should link the samples.
- CSF processing kits are ordered independently of blood kits
- All specimen labels (including CSF) will be included in the Blood Collection Kit. If CSF is not collected at a visit, you may discard these extra labels

<b>Kit Type</b> <b>**Please allow two weeks for shipment**</b> <i>* must provide value</i>	<input checked="" type="radio"/> Blood Collection Kit
	<input type="radio"/> Shipping Kit
	<input type="radio"/> YourBio Kit
	<input type="radio"/> CSF Kit
	<input type="radio"/> Extra Supplies
	Please specify in comments if you need kits before the standard two week shipment time.
<b>Blood Collection Kit Quantity</b> <i>* must provide value</i>	<input type="text" value="1"/>
<b>Comments</b>	<div style="border: 1px solid #ccc; height: 100px; width: 100%;"></div> <span style="float: right;">Expand</span>

# Kit Contents and Ordering: Kit Breakdown

PREVENT ALL ALS Kit Request Module

Comments

**Blood Collection Kit**

**Blood Collection Kit Contents:**

- 2 - EDTA tube (10ml), plastic
- 1- RNA Paxgene tube (10ml)
- 1- NaHep PBMC tube (10ml)
- 2- Red-top Serum tube (10ml) plastic
- 2 - EDTA tube for whole blood (3ml)
- 6 - Purple-capped cryovial (Sarstedt), 2ml
- 2 - Clear-capped cryovial (Sarstedt), 2ml
- 6 - Red-capped cryovial (Sarstedt), 2ml
- 2 - Disposable transfer pipette (3ml)

- 1 - 25-Slot Cryobox
- 3 - Bubble sleeves for tubes
- 30 - Cryohold specimen labels-- Kit numbers

Expand

Kit contents of selected kit will appear at the bottom of the page

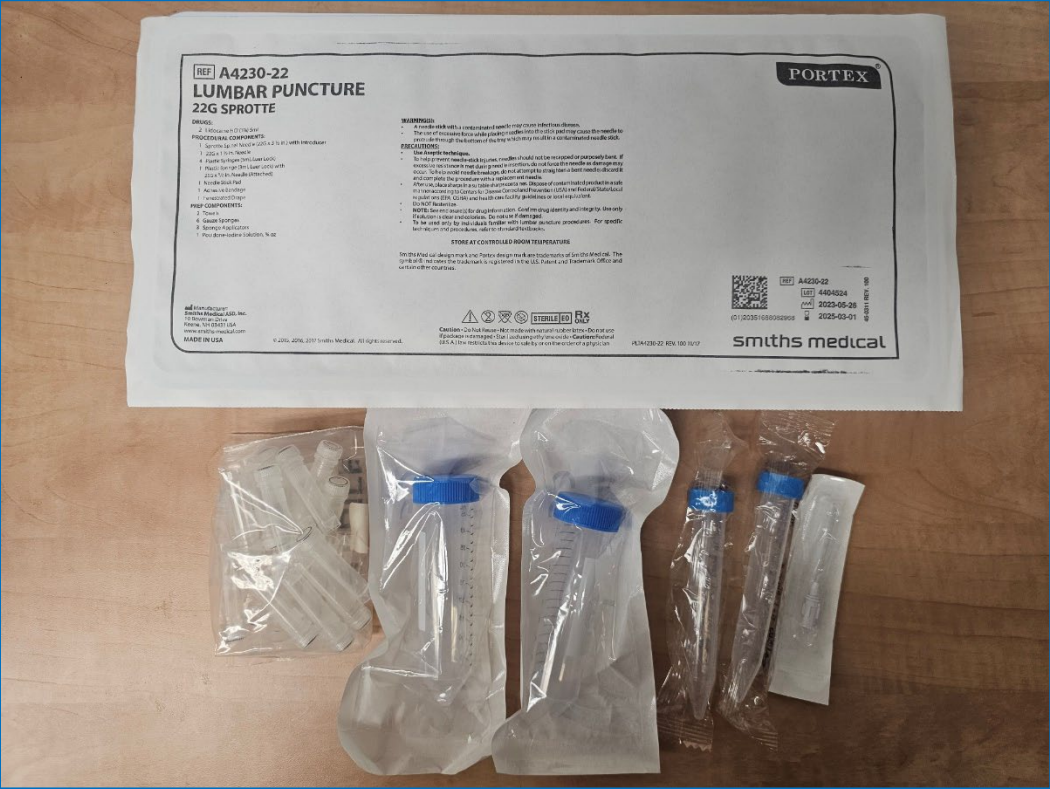
# Kit Contents and Ordering: Blood Kits



Yellow kit bags will be used for PREVENT kits to help distinguish PREVENT kits from ASSESS kits

# Kit Contents and Ordering: CSF Kits

CSF:



LP Tray:



# Collection Volumes

Total blood and CSF volumes

Sample Type	Amount
Whole Blood for Serum	20 ml
Whole Blood for PBMC	10 ml
Whole Blood for Plasma and Buffy Coat	20 ml
Whole Blood for Banking	6 ml
Whole Blood for RNA	2.5 ml
Cerebrospinal Fluid	15 ml

# Kit and Supply Ordering

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- Click “Submit” to send order to BioSEND; staff will confirm receipt of your order
- Please allow two week turn-around time for kit shipments
- If urgent request needed, please note date needed by in comments and email BioSEND. We cannot guarantee urgent orders, but we will do our best to accommodate.
- BioSEND will send confirmation of shipment and tracking number when supplies ship



# Sample Labelling: Example Labels

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## Labels are provided by Indiana University

- Please check that all samples are properly labelled to ensure correct identification by IU
- If do not have enough labels to complete a visit, please contact IU *immediately*
- Note that you will have extra labels. If you do not need the extra labels, please dispose of them.
- Labelling the tubes during processing prevents sample mix-ups

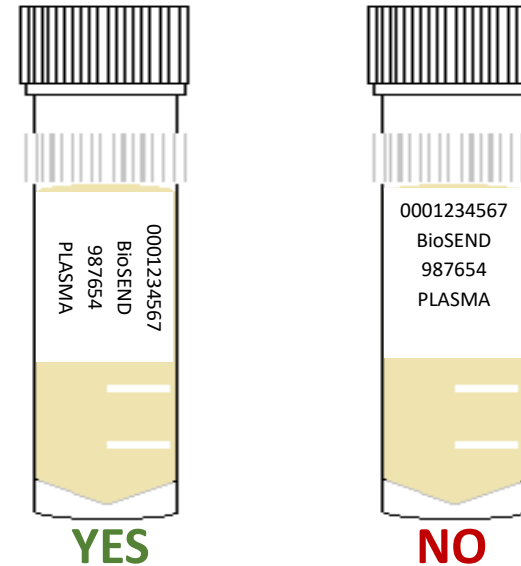


# Sample Labelling: Label Placement

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Please...

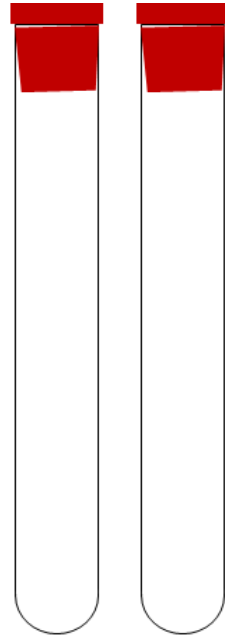
- Label all collection and aliquot tubes before cooling, collecting, processing, or freezing samples
- Label only 1 subject's tubes at a time to avoid mix-ups
- Wrap the label around the tube horizontally - label position is important for all tube types
- Make sure the label is completely adhered by rolling between your fingers



# Sample Collection and Processing

Blood Tube Draw Order

2 x 10ml Serum tubes



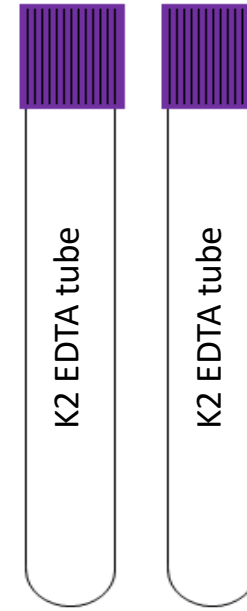
1

1 x 10ml NaHep tube for PBMC



2\*

2 x 10ml EDTA tubes



3

2 x 3ml EDTA tube



4

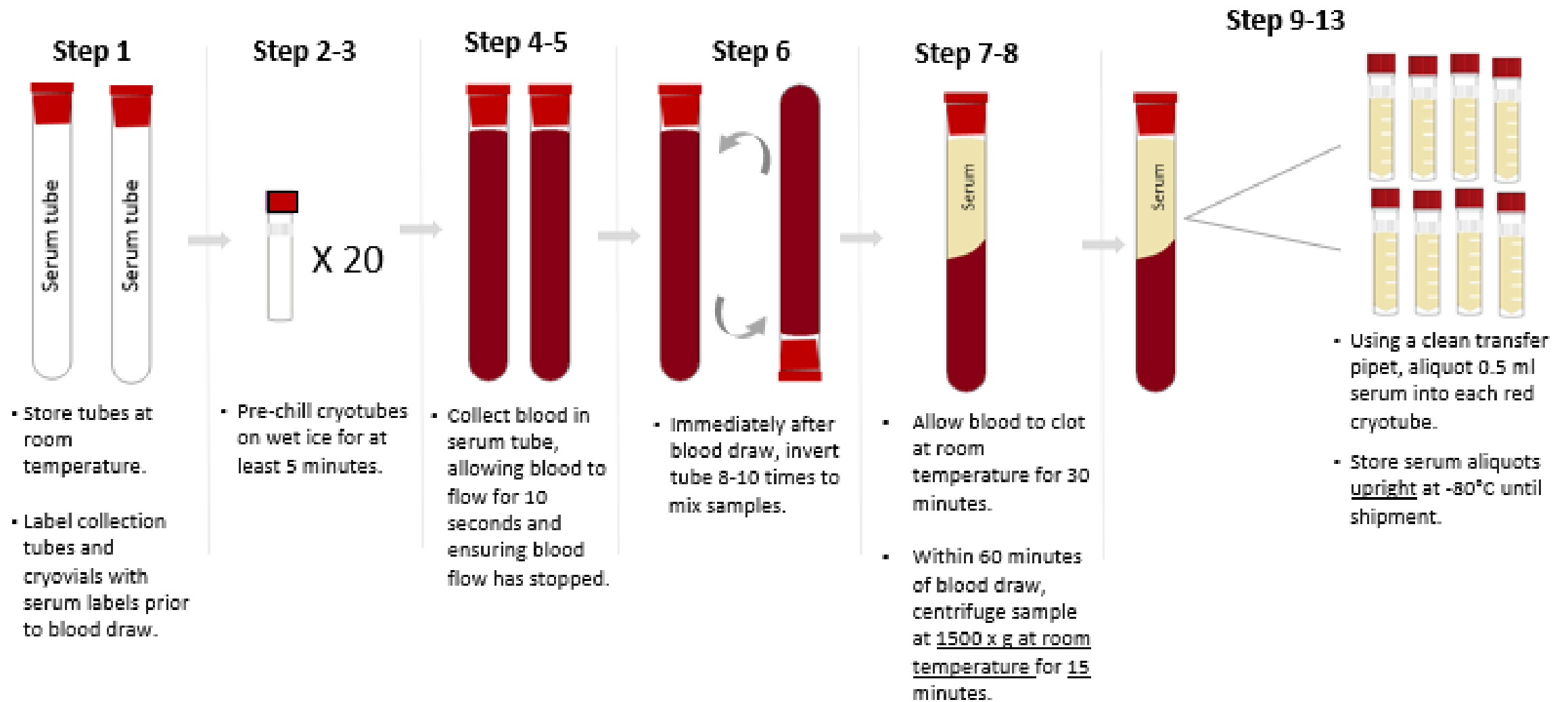
1 x 2.5ml PAXGene®



5\*

*\*Collected at Screening Visit only*

# Sample Collection and Processing: Serum



# Sample Collection and Processing: PBMCs

## Step 1-2



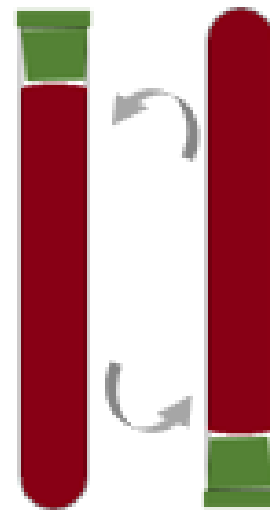
- Store tube at room temperature prior to use.
- Label tubes with preprinted PBMC label prior to blood draw.

## Step 3-4



- Collect blood in Sodium Heparin tube, allowing blood to flow for 10 seconds and ensuring blood flow has stopped.

## Step 5



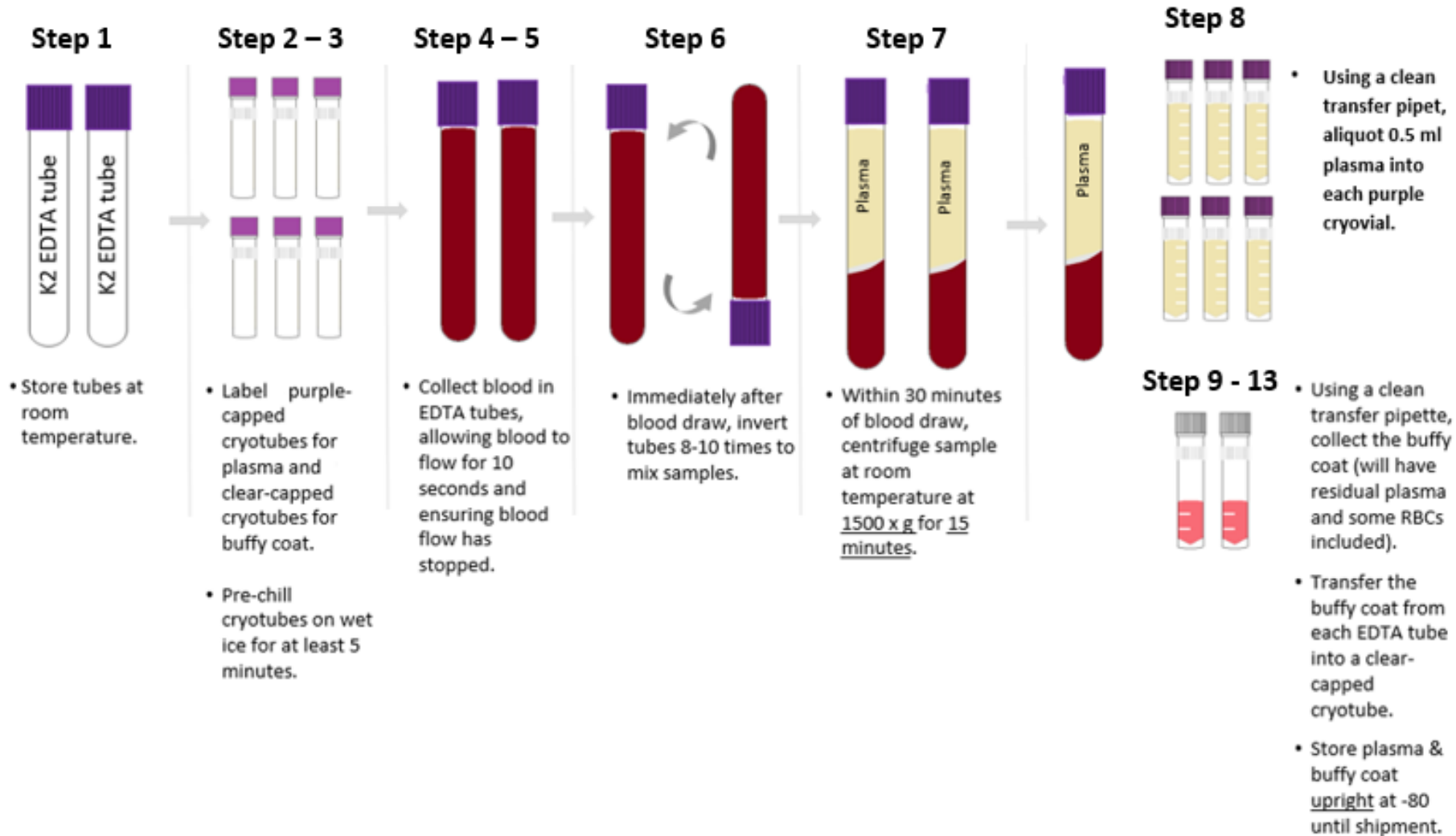
- Immediately after blood draw, invert tubes 8-10 times to mix samples.

## Step 6-7



- Store tubes at room temperature until shipment.
- ***Must be shipped ambient to IU on day of blood draw!***

# Sample Collection and Processing: Plasma & Buffy Coat



# Sample Collection and Processing: Whole Blood

## Step One



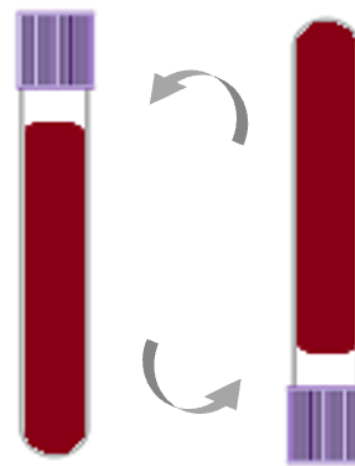
- Store tubes at room temperature.
- Label tubes with preprinted WBLD label prior to blood draw.

## Step Two



- Collect blood into both 3ml EDTA tubes, allowing blood to flow for 10 seconds and ensuring blood flow has stopped.

## Step Three



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

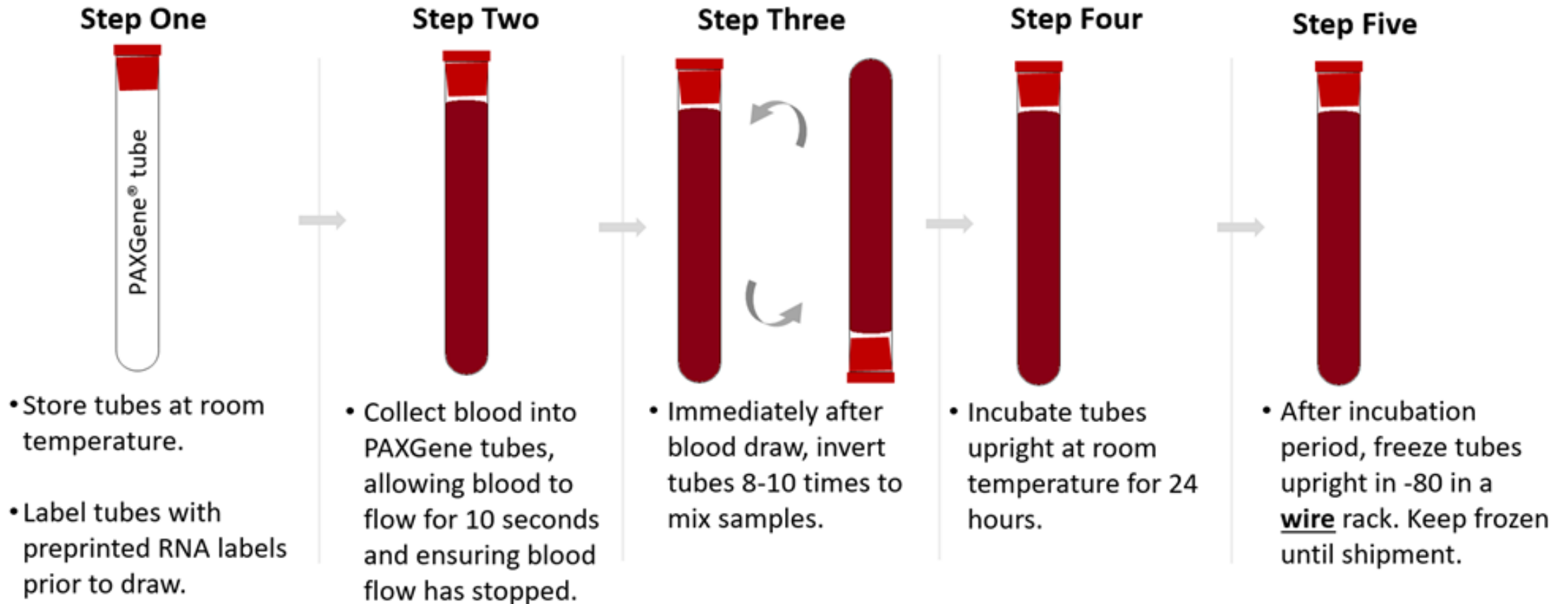
## Step Four



- Transfer to  $-80^{\circ}\text{C}$ . Store upright and keep frozen until shipment to BioSEND.

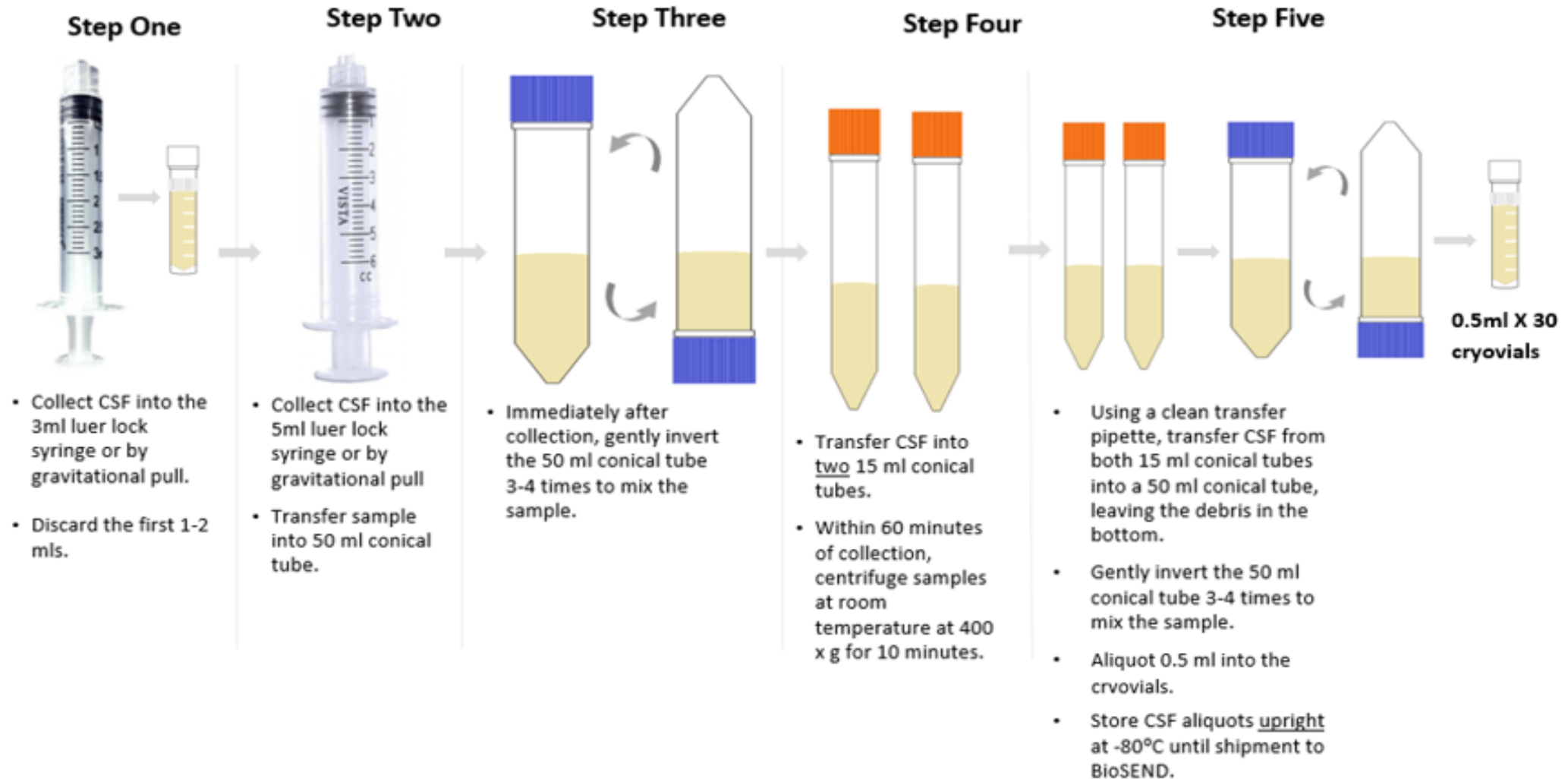
# Sample Collection and Processing: Whole Blood RNA

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# Sample Collection and Processing: CSF

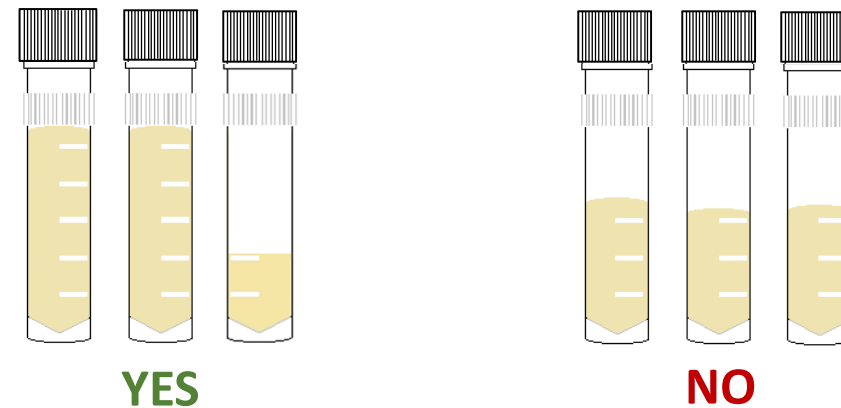


# Sample Collection and Processing: Aliquots

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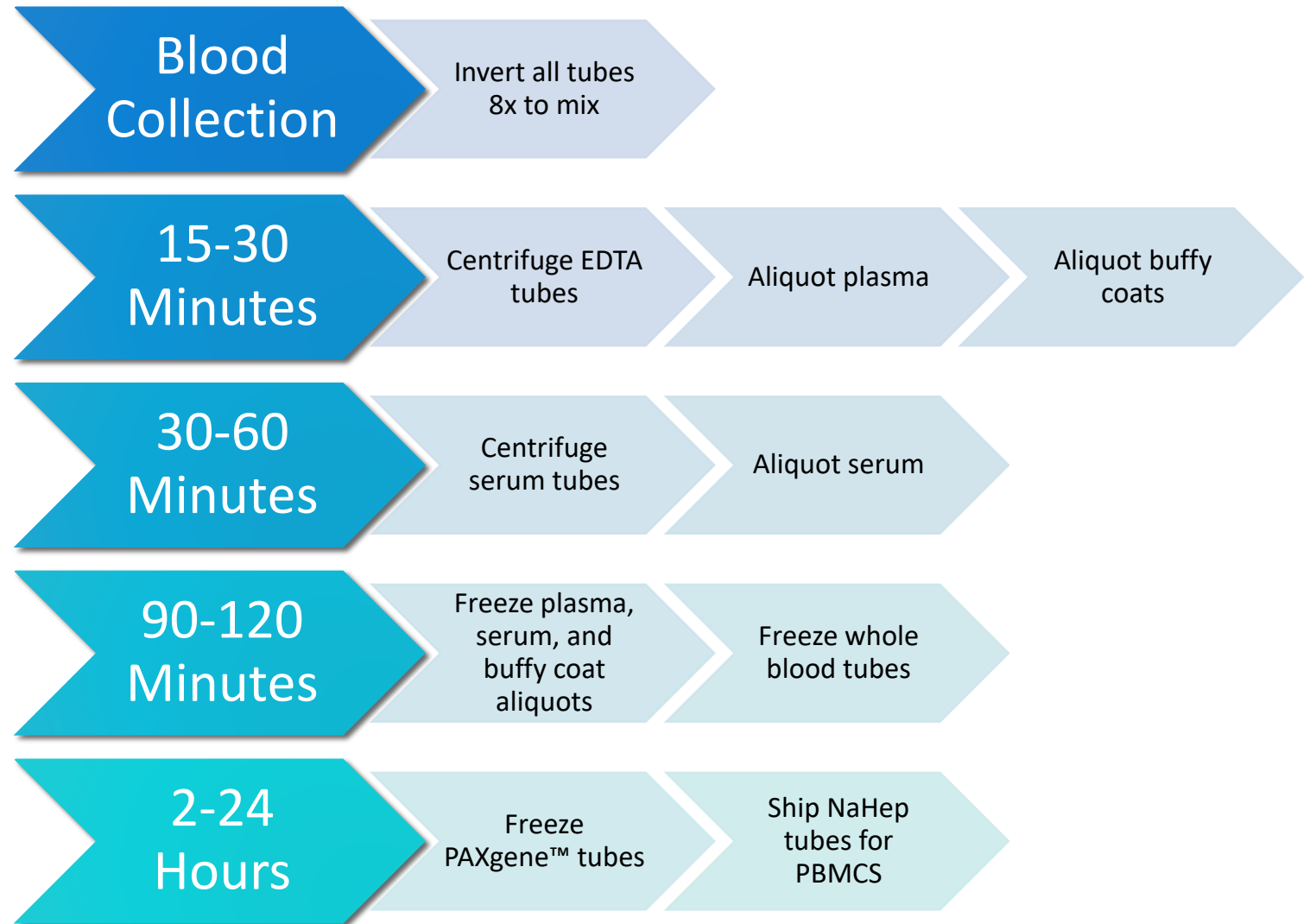
Filling biomarker serum, plasma, and CSF aliquots:

- In the event of a low volume draw, please generate as many standard-sized (0.5ml) plasma, serum and CSF. Fewer standard sized aliquots (with potentially one residual aliquot) is preferable to more aliquots with non-standard volume.
- Over-filled vials may burst in freezer!
- Ship ALL material to IU, even if final vial is less than standard volume



# Sample Collection and Processing: Timeline

Timeline for blood processing



# Sample Collection and Processing: Issue #1

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## Troubleshooting Blood Collection

### Issue #1: Tube with little/no vacuum

- Always check expiration date on the tube before beginning blood draw and discard expired tubes
- Store tubes at “room temperature” – extreme temperature can affect vacuum
- Keep extra vacutainer tubes from supplemental kit nearby during blood draw to replace “bad” tubes
- If this is a frequent occurrence, report tube type and lot number to IU.

# Sample Collection and Processing: Issue #2

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## Troubleshooting Blood Collection

### Issue #2: Hemolyzed serum and/or plasma caused by incorrect collection

Cause: Blood Collection Methods	Corrective Action
Improper venipuncture site	Draw from median cubital, basilic, and cephalic veins from antecubital region of arm
Prolonged tourniquet use	Tourniquet should be released after no more than 1 min, excessive fist clenching should be avoided
Not allowing alcohol to dry on skin before venipuncture	Without touching, allow the venipuncture site to air dry
Use of too large/small bore needle resulting in excess force applied to blood	Avoid using too small/large needle. Needle size dependent on the subject's physical characteristics & amount of blood to be drawn. Most commonly used sizes are 19 – 23.
Pulling/pushing plunger too fast while drawing/transferring blood	Avoid drawing the syringe plunger too forcefully when collecting blood
Ensure all blood collection assemblies are fitted securely, to avoid frothing	

For more information, visit: [http://www.bd.com/vacutainer/pdfs/techtalk/TechTalk\\_Jan2004\\_VS7167.pdf](http://www.bd.com/vacutainer/pdfs/techtalk/TechTalk_Jan2004_VS7167.pdf)

# Sample Collection and Processing: Issue #2 continued

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## Troubleshooting Blood Collection

### Issue #2: Hemolyzed serum and/or plasma caused by incorrect processing

Cause: Sample Processing Methods	Corrective Actions
Vigorous mixing/shaking	Gently invert blood collection tube when mixing additive with specimen, follow guidelines in Biologics Manual regarding number of times to invert each type of tube
Not allowing serum to clot for recommended time	Serum tubes without clot activator should be allowed to clot for 60 min in a vertical position
Exposure to excessive heat or cold	Keep samples at ambient temperature until processing
Prolonged contact of serum/plasma with cells	Do not store uncentrifuged samples beyond recommended time

For more information, visit: [http://www.bd.com/vacutainer/pdfs/techtalk/TechTalk\\_Jan2004\\_VS7167.pdf](http://www.bd.com/vacutainer/pdfs/techtalk/TechTalk_Jan2004_VS7167.pdf)

# Sample Collection and Processing Form

Direct Link:

<https://redcap.link/PREVENTSampleForm>

First page captures basic subject and visit information

# BioSEND

Biospecimen Exchange for Neurological Disorders

Please complete the Specimen Collection and Processing Form, below.

Returning?

AAA



Page 1 of 2

Study Site



Email address of staff member completing this form

*Note: A copy of the completed sample form and the shipping manifests will be sent to this address.*

ALL ALS Subject ID:

8 characters remaining

Subject's biological sex (used for DNA quality control)



Visit



IU Kit Number





6 characters remaining

Next Page >>

Save & Return Later

# Sample Collection and Processing Form

Second page captures processing information. Protocol instructions, such as centrifugation rate, are pre-populated.

Blood Collection and Processing	
Date of venipuncture blood collection	<input type="text"/>  Today M-D-Y
Time of venipuncture blood collection	<input type="text"/>  Now H:M Use 24 Hour clock
1. SERUM (red-top tubes, 10 mL)	
Was blood collected and processed for SERUM?	<input checked="" type="button" value="Yes"/> <input type="button" value="No"/> reset
Time of SERUM tube centrifugation	<input type="text"/>  Now H:M Use 24 Hour clock
Duration of SERUM tube centrifugation	<input type="text" value="15"/> minutes
Rate of SERUM tube centrifugation	<input type="text" value="1500"/> x g
Temperature of SERUM tube centrifugation	<input type="text" value="4"/> degrees Celsius
Total volume of SERUM collected	<input type="text"/> mL
Number of SERUM aliquots created for BioSEND	<input type="text"/> Each aliquot should be 1.5 mL
Time SERUM aliquots were placed in freezer	<input type="text"/>  Now H:M Use 24 Hour clock



# Sample Collection and Processing Form

PDF form of responses will be emailed to you. Print a copy and include with shipment.

## PREVENT ALL ALS Frozen Shipping Manifest

Please verify/update the information below. When you click the "Submit" button below, a PDF copy of the Frozen Shipping Manifest will be emailed to you for Subject [subj\_id].

Please print a copy of that document and include it in the Kit #[kit\_num] shipping container.

Study Site:

ALL ALS Subject ID:

\_\_\_\_\_

Visit:

V1  
 V2  
 V3  
 V4  
 V5  
 V6  
 V7

IU Kit Number:

\_\_\_\_\_

Date of blood collection:

\_\_\_\_\_

### SERUM

Number of SERUM aliquots shipped:

\_\_\_\_\_

### PLASMA EDTA

Number of PLASMA EDTA aliquots shipped:

\_\_\_\_\_

Number of BUFFY COAT aliquots shipped:

\_\_\_\_\_

### WHOLE BLOOD

Number of Whole Blood tubes shipped:

\_\_\_\_\_

# Sample Collection and Processing Form

Submission of the Shipping Manifest portion of the form serves as shipment notification to BioSEND

- Must be completed prior to shipment
- If samples are shipped and not received, BioSEND will follow-up with courier. It is recommended that sites also track shipment to ensure safe delivery

# Shipping Samples: Ambient

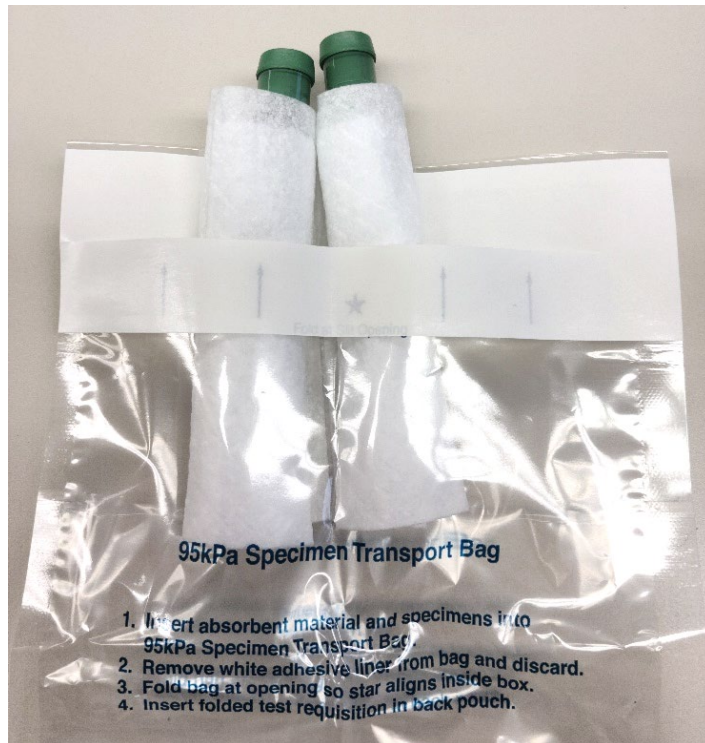
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## Packing and Shipping Ambient Samples

- Whole blood for PBMCs ships at ambient temperature
- Ship ambient samples **only** Monday through Thursday
- Ship on **same day** of collection
- Only ship one subject's specimens in each shipping carton (unless otherwise instructed)

# Shipping Ambient Samples

## Packing and Shipping Ambient Samples



# Shipping Frozen Samples: Tips

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## Packing and Shipping Frozen Samples

- All serum, plasma, buffy coat, RNA, whole blood and CSF samples ship frozen on dry ice
- Frozen samples should be shipped **only** Monday through Wednesday
- Always fill carton to **top** with dry ice
- Do not pack shipment until the day of pickup



Class 9 Dry Ice Label should not be covered with other stickers and must be completed, or UPS will reject/return your package!

# Shipping Samples

Packing and Shipping Frozen Samples

Shipper's Declaration not Required.

Dry Ice amount must be in kilograms.

Note: 2 lbs. = 1 kg.

Airwaybills / airbills must have the following:  
1. Dry Ice; 9; UN 1845  
2.  $\frac{\text{Number}}{\text{(Number pkgs)}} \times \frac{\text{wt}}{\text{(wt)}} \text{ Kg}$

Net weight of dry ice in kg

Dry Ice  kg.

Your name & address

Shipper's Name and Address

UN 1845

Consignee Name and Address

IU information and address

9

06426 1/01 RRD

The diagram shows a Class 9 Dry Ice Label template. It features a central diamond shape with a dashed border and a solid border. Inside the diamond, there are several vertical bars of varying heights. The label includes text for shipper's declaration, dry ice amount requirements, and airwaybill information. Red arrows point to specific fields: 'Net weight of dry ice in kg' points to the 'Dry Ice' field; 'Your name & address' points to the 'Shipper's Name and Address' field; and 'IU information and address' points to the 'Consignee Name and Address' field. The label also contains the hazard code 'UN 1845' and the hazard class '9'.

# Shipping Samples: Frozen

Do not ship more than 4 biohazard bags in a single shipper (equivalent to two subject-visits).

- Allows room for dry ice to keep samples frozen in transit
- Minimizes loss in the rare but unfortunate event of courier issues



# Shipping Samples – UPS: <https://kits.iu.edu/UPS>

The screenshot shows the shipping interface for the Indiana University School of Medicine. The header includes the IU logo and the text "INDIANA UNIVERSITY SCHOOL OF MEDICINE". Below the header, the text "and Affiliated Biorepositories" is displayed. The interface is divided into two main sections: "Ship From" and "Shipment Information".

**Ship From Section:**

- Search for address: A search bar with a magnifying glass icon and a "Clear" button.
- Code: Input field.
- Company: Icahn School of Medicine - Mt. Sinai
- Contact: Kenny Persaud
- Address 1: 1425 Madison (Icahn Building)
- Address 2: Icahn L4 39
- Address 3: Input field.
- City: New York
- State/Province: NY
- Postal Code: 10029
- Country/Territory: United States

**Shipment Information Section:**

- Study Group: SSBC (dropdown menu)
- Weight: 20 LB (input field and dropdown menu)
- Dry Ice Weight: 10 LB (input field and dropdown menu)
- Description of Return: Biologic Specimens
- Pickup Request: A blue button.

**Annotations:**

- "Search for address": A dashed box around the search bar with a blue arrow pointing to it.
- "Choose Study": A dashed box around the "Study Group" dropdown with a blue arrow pointing to it.
- "Enter weight": A dashed box around the "Weight" and "Dry Ice Weight" input fields with a blue arrow pointing to them.
- "Schedule Pickup": A dashed box around the "Pickup Request" button with a blue arrow pointing to it.
- "Click 'Ship'": A dashed box around the "Ship" button at the bottom right with a blue arrow pointing to it.

**Buttons:**

- Clear (blue button)
- Pickup Request (blue button)
- Reset (blue button)
- Ship (blue button)



# Shipping Samples via UPS

IU UPS ShipExec Shipping Portal

- Print out UPS air waybill
- Ensure all elements (barcode, return address, etc.) printed clearly
- Fold and insert UPS air waybill into clear plastic sleeve on package

JOHN SMITH  
INDIANA UNIVERSITY  
410 WEST 10TH STREET  
INDIANAPOLIS IN 46202

2 LBS

1 OF 1

RS

SHIP TO:

SCHOOL OF MEDICINE  
317-278-2694  
INDIANA UNIVERSITY  
TK 217  
351 W 10TH ST  
INDIANAPOLIS IN 46202



IN 461 9-01



UPS NEXT DAY AIR

1

TRACKING #: 1Z 976 R8W 84 3985 8595



BILLING: P/P  
DESC: Biological Specimens  
RETURN SERVICE

Reference No. 1: 4087277

XOL 20.03.09 NV45 83.0A 12/2019



# Shipping Samples: Closures

Date	Holiday
January 1	New Year's Day
3 <sup>rd</sup> Monday in January	Martin Luther King, Jr Day
4 <sup>th</sup> Monday in May	Memorial Day
June 19	Juneteenth (observed)
July 4	Independence Day (observed)
1 <sup>st</sup> Monday in September	Labor Day
4 <sup>th</sup> Thursday in November	Thanksgiving
4 <sup>th</sup> Friday in November	Friday after Thanksgiving
December 25	Christmas

Please also consider weather when shipping. UPS will post service updates on their webpage. Reach out to BioSEND if you are unsure if it is safe to ship.

# Non-Conformance

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Non-conformance to standard procedures may reduce the utility of the biospecimens:

- Not processing serum/plasma within 2 hours of collection allows for breakdown of certain proteins and small molecules
- Over/under centrifuging changes plasma, serum, CSF composition



# Non-Conformance Reporting con't

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Most common non-conformance issues:

- Shipment notification not sent
- Samples shipped for weekend/holiday delivery
- Sample form incomplete/inaccurate
- Low volume
- Unlabeled or mislabeled tube(s)
- Sample hemolysis



# Non-Conformance and Inventory Reporting

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Most common non-conformance issues:

- BioSEND will notify sites directly of any issues upon receipt
- BioSEND will email sites a monthly inventory report of all samples received from that site to date
- ***If you are experiencing issues, please reach out to us for help! It is much easier to prevent an issue before sample collection & shipment than trying to fix it after the fact***

# Contacts

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## Indiana University

General Questions/Shipment Notifications:

[biosend@iu.edu](mailto:biosend@iu.edu)

317-278-6158

Request kits:

<https://redcap.link/preventallals>