Receiving DNA DB Collection Kits and Sample Plate Preparation

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1 INTRODUCTION

The FDDU may receive three types of collection kits: a buccal collection kit; a liquid blood collection kit, which contains a liquid blood tube; or a finger stick collection kit, which contains dried bloodstain card(s).

2 SCOPE

These procedures apply to DNA personnel who perform sample receipt or check in, submission management, plate creation, plate preparation, and/or punch collection kits/DNA samples received by the Federal DNA Database Unit (FDDU).

3 EQUIPMENT

3.1 Equipment/Materials

- General Laboratory Supplies
- STACS™ Database (STACS-DB) Software (Sample Tracking and Control Solutions [STACS DNA Inc.] part of InVita Healthcare Technologies), version 6.9 or above
- Barcode printer with appropriately sized labels (2.0" x 0.5" or equivalent)
- Barcode Scanner (Honeywell or equivalent)
- 96-Well Sample (MicroAmp) Plates (aka PCR Plate) (Applied BioSystems or equivalent)
- Plate Sealer, microplate (Agilent PlateLoc or equivalent) with heat seal
- Optical Adhesive Covers (Applied BioSystems or equivalent)
- RFID Tags, Reader and software (VISI-TRAC RFID or equivalent)
- Bloodstain card (Whatman® FTA® Genecard or equivalent)
- Sample storage pouches (Fitzco or equivalent)
- Tecan Robotic Workstation (Plate Preparation)
- Tecan EVOware Software, version 2.8 or higher
- Punch Instrument (BSD600-Duet, BSD 600Plus, or equivalent)

3.2 Reagents

- SwabSolution™ Kit (Promega)
- Prep-N-Go Buffer (Applied Biosystems)
- Water, Reagent Grade (VWR or equivalent)
- Buffer, Low TE (aka TEKnova DNA Suspension Buffer) (Fisher Scientific or equivalent)
- Bleach, 3% (molecular grade or equivalent)

4 STANDARDS AND CONTROLS

Two Combo controls (aka Negative) and two Blood/Buccal Internal Standard (BIS) controls are included on each amplification plate.

The BIS is prepared as described in the DNA QA procedure for reagents (i.e., BIO-103) and is added to the plate during the sample punch procedure. These controls will be interpreted according to the criteria in the applicable FDDU Procedure (i.e., BIO-315).

5 SAMPLING

A reasonable assumption of homogeneity can be made for database samples; therefore, any sampling (i.e., punch) will be considered representative of the entire sample.

6 PROCEDURE

6.1 Receipt of Sample Collection Kits

FDDU collection kits are received by the FBI Laboratory generally via US Postal Service Business Reply Mail and delivered to the FDDU by FBI Laboratory mailroom personnel or picked up from the mailroom by FDDU personnel.

A. Using STACS-DB, record kits received by the FDDU by scanning the FDDU collection kit barcode affixed to the collection kit. If necessary, barcodes may be hand-entered.

    1. If kits are not logged into STACS-DB on the same day as received, the date received should be recorded on a collection kit, batch, or bin, as appropriate, until they are logged into STACS-DB.

    2. When all received kits have been scanned each batch or bin of kits, as appropriate, should be labeled with the date received.

B. Proceed to **Check In and Barcoding** or place the FDDU collection kits in storage. Store kits containing buccal or dried bloodstain samples at room temperature and kits containing blood tubes refrigerated.

6.2 Check In and Barcoding of Collection Kits

Retrieve kits to be checked in. Kits are generally processed in order of the date received. Each person performing the check in procedures must only open one kit at a time and process the kits individually.

A. Scan the FDDU collection kit barcode. Inspect the kit for integrity issues (e.g. damaged packaging or lacking a tamper-evident seal). Integrity issues may result in a kit being marked as unacceptable.

B. Open the collection kit.

    1. Each standard collection kit must contain the following:
        - FDDU Sample(s) (e.g., buccal collection device, blood sample in an EDTA vacutainer tube, dried bloodstain card(s)).

- Completed FD-936 form.

2. Each electronic data collection kit must contain the following:
   - FDDU Sample(s) (e.g., buccal collection device).
   - Completed FD-936 form (if applicable). A hardcopy FD-936 may be included in the electronic data collection kit, but is not required.

3. If applicable, compare the collection device/card barcode(s) and/or subject name/alternate unique identification number (e.g., FBI#, SSN, Alien#, BOP#, FINS#) on the FD-936 to the corresponding sample. This may be performed visually and/or automated with STACS-DB. A mismatch between the FD-936 and the sample may result in the kit being marked as unacceptable.

C. STACS-DB may auto-populate the following fields; however, the user may manually enter or change the entries, if necessary.
   - Contributor Type
   - Submitting Agency
   - Specimen Nature
   - Count

D. Determine if the kit is deemed acceptable.
   - If not, select a reason from the pull-down menu.
   - If an applicable reason is not available in the pull-down menu, “Other” may be selected and the reason entered in the appropriate field.
   - Check in and barcoding is completed for all kits; however, unacceptable kits will be evaluated according to applicable FDDU Procedure (i.e. BIO-302).

E. Additional information may be entered into the comment field, if necessary.

F. Upon completion of the sample check in, STACS-DB prints a set of barcodes.
   - Place the appropriate barcode labels on the FD-936 (if applicable) and each sample.
   - Scan the barcodes affixed to the FD-936 and/or the respective sample(s). STACS-DB verifies the scanned barcodes.

G. Place a RFID tag on each sample.

H. Scan the STACS-DB barcodes and the RFID tags to associate them in STACS-DB.

NOTE: If necessary, the RFID software may be used to associate the sample(s) to the RFID tag(s).

I. Place the sample(s) (e.g., buccal cards, blood cards, buccal cassettes) into a sample storage pouch for storage. Place blood tubes in the designated storage location.

J. Collection devices (if provided) may be properly discarded following check in of the collection kit.

Repeat above steps to check in each additional kit.

K. Place all packaged samples into an appropriate storage container (e.g., box or plastic sleeve) labeled with an RFID container tag.

L. Verify the contents of each storage container using an RFID reader. If necessary, resolve any discrepancies regarding the inventory of the container.

M. Place each storage container containing barcoded samples into storage at room temperature. Place each storage container containing barcoded blood tubes into refrigerated storage. If applicable, store the FD-936 forms in a designated area.

6.3 Blood Spotting

The FDDU occasionally receives liquid blood samples, which must be manually dried onto a bloodstain card (e.g., FTA Genecard) prior to initiating the DNA analysis procedure.

A. Prior to spotting a liquid blood sample, the corresponding FTA card must be labeled with the appropriate STACS-DB barcode and RFID tag.

B. Retrieve each blood tube from refrigerated storage and allow to come to room temperature. Invert the blood tube several times before processing.

C. Scan the matching STACS-DB barcodes affixed to the blood tube and FTA card.

D. Spot approximately 50 µl of the liquid blood onto each circle on the FTA card in a laminar flow hood.

E. Discard the liquid blood tube in the appropriate biohazard container.

F. Allow the bloodstain card to dry for approximately 1 hour.

G. Place the bloodstain card and a desiccant pouch into a sample storage pouch.

H. Place all packaged bloodstain cards into an appropriate storage container labeled with an RFID container tag.

I. Place each storage container containing barcoded bloodstain cards into storage at room temperature or in a freezer.

6.4 Plate Creation

All accepted samples are available for processing based on the selection of the plate type and amplification kit. Once a plate type and amplification kit is selected, the sample(s) are available to be selected/assigned to a plate and processed in the laboratory.

A. Select and gather the appropriate samples to be allocated to the plate.

B. STACS-DB may prompt the user to populate the following field as appropriate:
   - Plate Cycle Number – 26 or 28

C. Upon completion of plate creation, STACS-DB prints out unique plate barcodes. Place each barcode accordingly, on the PCR plate and support base.

D. Scan the barcodes affixed to both the PCR plate and support base. STACS-DB verifies the scanned barcodes.

6.5 Plate Preparation

Refer to DNA Procedure Introduction (BIO-100) for applicable laboratory quality assurance and cleaning instructions.

A. Select appropriate plates to be processed and indicate whether the plate preparation process will be done manually or using a Robotic Workstation . If using the Tecan Robotic Workstation, load the plates onto the instrument deck.

B. Scan the barcodes affixed to each plate and the reagent(s) required for the selected scenario. If using a Robotic Workstation, scan the instrument, click process in STACS-DB and follow prompts from the associated software.

C. Add appropriate anti-static reagent to the plate(s).

   1. GlobalFiler Express (FTA Paper) - Add 3µl of DNA Suspension Buffer (Low TE Buffer). This combination may be performed manually or using a Robotic Workstation.

   2. GlobalFiler Express (Non-FTA Paper) - Add 3µl of Prep-N-Go Buffer. This combination may be performed manually or using a Robotic Workstation.

   3. GlobalFiler Express (FTA Paper and Non-FTA Paper) – Add 3µl of SwabSolution. This combination may be performed manually or using a Robotic Workstation.

D. Select whether the plate preparation process was successful, failed, or aborted. Comments and observations should be entered for plates with process failed or aborted results.

6.6 Punch

A. Ensure necessary cleaning procedures are performed on the punch instrument prior to use.

B. Select a created plate.

1. Scan and punch the samples or controls into each of the allocated wells on the punch instrument in the order displayed in STACS-DB.

NOTE: When punching samples on a BSD, ensure that the required "Cleaning Strike(s)" will be placed in between each sample by using the appropriate designation in the BSD Configuration file. Punch the "cleaning sample(s)" (e.g., clean FTA card, clean filter paper) when prompted.

C. Upon completion of punching a plate:
- Visually inspect the plate to verify its integrity.
- Indicate the result as successful, failed, or aborted.
- Comments and observations must be entered for plates with process failed results.

D. Cover successfully punched plates and transfer them to the laboratory for processing.

7 LIMITATIONS

Only the following combinations are approved for sample processing:

Sample Type	Plate Prep	Punch Size	Amplification Kit	Amplification Cycles
Blood (FTA)	3ul of DNA Suspension Buffer (Low TE)	1.2mm	GlobalFiler Express	26 or 28
Buccal (FTA)	3µl of DNA Suspension Buffer (Low TE)	1.2mm	GlobalFiler Express	26 or 28
	3µl of SwabSolution	1.2mm	GlobalFiler Express	26

Buccal (Non-FTA)	3µl of Prep-N-Go Buffer	1.2mm	GlobalFiler Express	26 or 28
	3µl of SwabSolution	1.2mm	GlobalFiler Express	26

8 SAFETY

All FDDU samples that contain blood are considered potentially infectious regardless of the perceived status of the source individual or the age of the material. All FDDU personnel who work with such material will refer to the FBI Laboratory Safety Manual for personal safety information and proper disposal of the chemical and biohazardous waste.

9 REFERENCES

Sample Tracking and Control Solutions [STACS DNA Inc.] part of InVita Healthcare Technologies. *STACS™ Database (STACS-DB) User's Guide.*

Symbol Technologies Inc. *Symbol Barcode Reader User's Guide*.

Zebra Technologies International. *Zebra Barcode Printer User's Guide*.

BSD600-Duet Semi-Automated Dried Sample Punch Instrument Operator Guidelines (BSD Robotics)

10 REVISION HISTORY

Revision	Issue Date	Changes
00	02/04/2022	Reformatted FDDU 301-9 into new template and assigned new Doc ID. Removed ID Direct and added info pertaining to electronic data collection kits.