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**BACKGROUND**: The Center for Human Phenomic Science (CHPS) has specimen processing areas on each of their three patient care units 1) Perelman Center for Advanced Medicine (PCAM) 4 South, 2) Ravdin 6NE at the Hospital of the University of Pennsylvania (HUP), and 3) the Andrew Mutch building located on the Penn Presbyterian Medical Center (PPMC) campus. Additionally, CHPS has a -80C freezer located on Dulles 1 in the Penn Medicine Biobank at HUP. For purposes of this document, all these areas will be referred to as "laboratories". When refrigerators and freezers are mentioned in this document, these refer to units that store research biospecimens, not food or medicine. The terms research "biospecimens" and "samples" are used interchangeably.

**PURPOSE:** To define the proper conduct in a laboratory and the use, maintenance, and/or monitoring of lab equipment at the locations described above.

SCOPE: CHPS staff and Clinical Study Teams (CSTs)

# **RESOURCES**:

Penn EHRS Policy: Lab Coat, Gloves and Safety Eyewear Policy

Penn EHRS Standard Operating Procedure (SOP): Cryogens and Dry Ice

HUP Environment of Care Medical Equipment Management Plan (Available upon request)

# **PROCEDURE**:

# I. Lab Safety

- a. Orientation
  - i. All CST members who enter or work in a CHPS lab must receive a lab orientation from a CHPS staff member.
- b. Personal Protective Equipment (PPE)
  - All CHPS staff and CST members must follow institutional and national regulatory standards for lab safety including the use of PPE. Those manipulating biospecimens must, at minimum, wear a lab coat, goggles, and gloves. Closed-toed shoes are required. Shorts and sandals are prohibited. Please see Penn Environmental Health & Radiation Safety (EHRS) policy linked above for more information.

- c. Chemical Inventory
  - i. Any chemicals being used in the laboratory, including reagents used to process biospecimens, must be reported to the CHPS Nurse Manager. They will then be added to a Chemical Inventory List that is required to be maintained by the hospital.

### II. Lab Storage

- a. No CST-owned items may be stored in any CHPS lab without written permission from the CHPS Nurse Manager.
- b. CST-owned items stored in the laboratory will be removed and/or discarded if they do not meet institutional and/or national regulatory requirements.

# III. Refrigerators and Freezers

- a. Use
  - i. Refrigerators and freezers can only be used for research samples for CHPS-approved protocols.
  - ii. CHPS does not provide long-term storage of samples. CHPS provides short-term storage only (up to two weeks).
  - iii. All refrigerators and freezers are regularly inspected and kept clean and free of obstructions. No boxes or supplies may be placed on top of the units.
  - iv. All biospecimens requiring refrigerator or freezer storage must be placed in an appropriately labeled box/container and stored in an upright position. Appropriate labelling for the box/container includes the:
    - 1. Principal Investigator's Last Name
    - 2. CHPS #
    - 3. Either Patient Name or Subject ID.
    - 4. For example, the front of the box should read:



- v. A CHPS staff member must be present when a refrigerator or freezer is opened.
- vi. No food, beverages, or medications can be stored in the laboratory refrigerators or freezers.

## b. Monitoring

- i. CHPS staff are responsible for monitoring the status of the refrigerators and freezers.
- Refrigerators and freezers are electronically monitored by the TempTrak System. Temperature readings are captured every 15 minutes. If there is a temperature excursion greater than 30 minutes, CHPS staff are notified by the system via text messaging so that the issue can be investigated and/or addressed.
- iii. Daily temperature readings are manually documented Monday through Friday on the CHPS Refrigerator/Freezer temperature log.

#### c. Maintenance

- i. Penn Medicine's Clinical Engineering (CE) department performs preventative maintenance (PM) on the -80C freezers on a yearly basis. Inspection labels with dates are placed on each unit.
- ii. All laboratory refrigerators and freezers are under a yearly maintenance contract with Scientific Apparatus Services, Incorporated (SAS). SAS performs PM inspections every four months. Repairs are done on an as-needed basis.
- iii. The -80 and -20C freezers are defrosted on a yearly basis as part of a routine maintenance program to prevent excessive frosting and poor cooling. More frequent defrosting may occur on an as-needed basis.

#### d. Storage Capacity

i. CHPS keeps extra refrigerator and freezer storage capacity to perform defrosting maintenance or in the event of a refrigerator/freezer malfunction. All samples are transferred to the extra storage unit prior to defrosting maintenance, or immediately in the event of a unit malfunction.

### IV. Centrifuges

- a. CHPS has both room temperature and cold centrifuges.
  - i. All centrifuges receive preventative maintenance by both CE and SAS.
    - 1. PM by CE occurs yearly and is labelled accordingly.
      - 2. PM by SAS occurs every 4 months.
  - ii. Cold centrifuges are calibrated yearly by CE.
- b. Centrifuges can only be used for research samples for CHPS-approved protocols.
- c. All centrifuges are repaired on an as-needed basis.
- d. CHPS staff are the only personnel who can manipulate the rotors of the centrifuge. If a CST member needs a rotor to be changed out or adjusted, they must seek help from the CHPS staff.

	PM by <b>SAS</b>	PM by CE	Calibration by SAS	Calibration by CE
Refrigerators				
-20C Freezers				
-80C Freezers				
Room Temperature			$\checkmark$	
Centrifuges				
Cold Centrifuges	$\checkmark$		$\checkmark$	$\checkmark$

### V. Specimen Scale

a. The specimen scale does not require scheduled preventative maintenance and is labelled accordingly.

### VI. Pipettes

- a. Most pipettes utilized in CHPS laboratories are single-use and disposable.
- b. Non-disposable pipettes are calibrated yearly by Gateway Scientific and labelled accordingly.

### VII. Dry Ice

- 1. The CHPS unit does not maintain a supply of dry ice. Dry ice coolers are available for use at the PCAM 4 South and Andrew Mutch locations, however individual investigators are required to obtain dry ice and ensure that it is delivered to the correct CHPS location.
- 2. The EHRS SOP on dry ice must be followed on the CHPS unit: Cryogens and Dry Ice
  - a. There are many hazards associated with dry ice including burns, asphyxiation, fire hazards, formation of liquid oxygen, pressure hazards, and facility damage.
  - b. If there is a dry ice spill, do not attempt to clean it up. Leave the area immediately and call EHRS at 215-898-4453. Evaporation of dry ice can displace the oxygen in the room and create an oxygen-deficient environment, which may result in death.

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