SOP Title:	**Procedure for Verified Decontamination of Equipment and Surfaces Prior to Decommissioning, Downgrading Biosafety Level, Relocation, or Repair**	SOP No.	**9**
		Revision	**0**
Effective Date:	**5/18/2022**	Page	**1 of 4**

Purpose: This standard operating procedure (SOP) describes verified decontamination of laboratory equipment that has been used with biological agents, including recombinant/synthetic nucleic acids. Surface decontamination methods described in this document are appropriate and required for downgrading the biosafety level of a space and for laboratory equipment used with or exposed to biological materials prior to the equipment's relocation, decommissioning/disposal, or transport for authorized repair. Individual biosafety protocols detail the routine disinfection that must be performed when actively conducting biosafety work.

References:
NIH Guidelines: https://osp.od.nih.gov/wp-content/uploads/NIH_Guidelines.pdf

Biosafety in Microbiological and Biomedical Laboratories (BMBL) 6th Ed.:
https://www.cdc.gov/labs/pdf/SF__19_308133-A_BMBL6_00-BOOK-WEB-final-3.pdf

Conditions: Lab work associated with microbiological agents has been performed in the space and/or using the equipment. The space is to be downgraded to a lower or no BSL level or the equipment is to be relocated, decommissioned, disposed of, or sent for repair.

Procedures:

Disinfecting agents

The disinfecting agents employed must be EPA-registered and known to be effective against any and all agents that were manipulated in the space.

If a chlorine-based disinfectant is used, it must be subsequently wiped with water followed by 70% alcohol (ethanol or isopropanol) to ensure damaging chlorine residues aren't left behind.

Removable equipment components like refrigerator or incubator shelves can be disinfected by autoclaving at >121°C if they can tolerate the heat treatment.

UV light alone is not a sufficient disinfecting agent for the applications covered by this SOP.

Safety

A minimum level of PPE consisting of gloves, safety glasses, and clean lab coat must be worn. During the disinfecting process, the PPE will protect the person and then prevent contaminating the space or reagents during the cleanliness verification.

Disinfecting Process

Clean out all reagents, items and microbiological agents and from the equipment and/or lab space. Store or dispose of the materials properly.

Unplug all electrical equipment.

Defrost refrigerators/freezers if necessary.

Liberally apply the disinfectant to all surfaces including benches, incubators, refrigerators and freezers, centrifuges, shakers, vortex mixers, door, drawer and cabinet handles, sinks, facets, and reusable biohazard containers. Allow at least 10min of contact time or as recommended by the disinfectant manufacturer.

When disinfecting biosafety cabinets, the interior must be empty, the blower on, and the plenum drain valve under the front of the cabinet closed. The disinfectant must be applied liberally to the work surface, beneath the work surface and grill, back wall, and sides. Do not spray the ceiling or the HEPA filter may be damaged. The external surfaces of the biosafety cabinet must also be wiped down with disinfectant. Following appropriate contact time, 10 min or that recommended by the disinfectant manufacturer, all metal surfaces must be wiped with water followed by 70% ethanol or isopropanol. Once all surfaces have dried, the blower can be turned off.

Computers or other electronic equipment must be wiped with a cloth containing disinfectant. Do not spray disinfectant directly onto keyboards or other delicate electronic equipment.

Depending on the specific organisms used, it may be advisable to disinfect surfaces multiple times before proceeding to the cleanliness verification.

<u>Cleanliness Verification</u>

To confirm that the decontamination process was effective, a verification procedure must be developed*, approved by the IBC, and performed. Developing the verification procedure requires identifying an appropriate media that would support growth of the previously used organisms if present. A swab control, environmental control, and a positive control must also be employed. To minimize potential for contamination, the swab and environmental controls should be established before entering the affected space. The positive control should be the organism in question, but a surrogate can be used if the subject organism is no longer available. Using aseptic techniques including placing racks with media tubes on clean pads or paper towels, frequent glove changes, and glove disinfection, predetermined locations in the lab and on the equipment must be swabbed, placed in the appropriate media, and incubated. Locations must include frequently used and touched surfaces like door and faucet handles,

BSC sash, light switches, sinks, benches, vacuum handles, keyboards, reusable biohazard container. As far as practicable each swab should attempt to cover a 5x5cm amount of surface area using wiping motions that are horizontal and vertical and rolling the applicator tip (if used). Based on the anticipated organism growth and that of the positive control, turbidity or other characteristic of organism growth for the media containing the swabs must be observed and recorded at 24-hour intervals.

If organism growth is identified in given locations, the disinfection and verification procedures must be repeated in those locations until no growth is observed for the time period previously established for the specific organism(s).

Once the process is complete, a detailed report describing the disinfection and verification, including identities of all personnel involved, description and photos of swab locations, incubation conditions, and all iterations of disinfection/verification that were required must be prepared and submitted to the IBC for final approval.

*Members of the IBC will work with researchers to develop and successfully execute their verification plans.