Carnegie Mellon University Environmental Health & Safety FIRE | LAB | WORK	**Environmental Health and Safety Standard Operating Procedure for Live Human Coronavirus OC43**
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Revision Number: 1	**Prepared by:** EHS

1. Purpose

Carnegie Mellon University has developed this guideline for the purpose of providing guidance for researchers to work safely with live human coronavirus OC43.

2. Scope

This document applies to all CMU faculty, staff and students who will work with live human coronavirus OC43.

3. Background

Human coronaviruses (HCoVs) are pathogens that cause upper respiratory tract infections and have neuroinvasive abilities. Common human coronaviruses, including types 229E, NL63, OC43 and HKU1, usually cause mild to moderate upper-respiratory tract illnesses, like the common cold. Most humans get infected with one or more of these viruses at some point in their lives. The information applies to common human coronaviruses and **should not be confused with** coronavirus disease 2019 (formerly referred to as 2019 Novel Coronavirus).

4. Modes of Transmission

In the laboratory setting, common human coronaviruses may be transmitted through:

a. Droplet exposure of the mucous membranes of the eye, nose and/or mouth,
b. Inhalation of infectious aerosols, and
c. Ingestion.

5. Containment Level

Work with live human coronavirus OC43 must be conducted using Biological Safety Level 2 (BSL-2) practices and procedures as identified by Carnegie Mellon University's Institutional Biological Safety Committee (IBC).

6. Approval

Experiments using live human coronavirus OC43 require the approval from the Biosafety Officer before initiation. In addition, all recombinant DNA work must be registered with the IBC.

7. Facility Considerations

The Principal Investigator must designate a laboratory that fulfills the requirements as outlined in the CDC/NIH publication Biosafety in Microbiological and Biomedical Laboratories for Biological Safety Level 2 Laboratories. It is preferable that the facility be an inner laboratory with two doors between the Biological Safety Cabinet and the hallway. Air must flow from the hallway to the laboratory (negative to the hallway) and all air exhausted outside the building, not recirculated. Environmental Health and Safety (EHS) can evaluate the negative pressure status of the laboratory.

8. Engineering Controls

The following engineering controls MUST be used when using live human coronavirus OC43:

a. Certified Class II Biological Safety Cabinets for all procedures that are likely to generate splashes and aerosols.
b. Sealed centrifuge rotors and/or safety cups.
c. Vacuum lines equipped with an in-line HEPA filter as well as a primary and secondary vacuum flash containing a 10% bleach solution.

9. Administrative Controls

The following administrative controls MUST be used when using live human coronavirus OC43:

a. Work with live human coronavirus OC43 should only be carried out by trained personnel that are directed by a competent scientist.
b. Access to the laboratory must be limited when the agent is in use.
c. The laboratory must be posted with Carnegie Mellon University's Biohazard signage.
d. Standard Operating Procedures (SOPs) for the planned procedures must be written and shall be present in the laboratory at all times.
e. All persons involved with the handling and administration of live human coronavirus OC43 must receive Carnegie Mellon University's Biosafety training. Personnel can register for training by visiting the EHS training index.
f. All persons must be informed of the risks of working with live human coronavirus OC43 and should consult with their physician in the event they are an immunocompromised individual.
g. Wash hands before and after experimental procedures.

h. Disinfect work surfaces before and after experimental procedures.

10. Personal Protective Equipment

The following personal protective equipment MUST be worn when using live human coronavirus OC43:

a. Nitrile gloves (consider double-gloving depending on the procedures being performed).
b. Laboratory coat.
c. Safety goggles.

11. Special Handling Procedures

The following special handling procedures MUST be followed when using live human coronavirus OC43:

a. Specimens or containers of live human coronavirus OC43 may not be removed from the laboratory for experimental purposes unless they are transported in a sealable, secondary container.
b. If you need to aerate cultures, it must be done slowly and in a manner that minimizes the potential for aerosol creation. This action must be carried out in a class II biological safety cabinet.
c. When pouring and pipetting samples, it must be done gently and slowly and must be carried out in a Class II biological safety cabinet.
d. Extra precautions must be taken when using sharps. Appropriate substitutes for sharp items must be used whenever they are available. Use plastic aspiration pipettes instead of glass Pasteur pipettes.
e. For aspiration procedures, use a plastic vacuum flask with a second vacuum flask connected to it as a backup, with non-collapsible tubing capable of withstanding pressure and disinfection. To the second vacuum flask, attach a hydrophobic and a HEPA filter (or combination filter) to ensure that nothing is aspirated into the house vacuum system. These 3 items must be attached in series from the vacuum source in the hood or a vacuum pump.

12. Decontamination Procedures

All work surfaces must be disinfected with a 1:10 solution of bleach before work is initiated, once work is completed and at the end of the work day. (Note: A 10- minute contact time is required for decontamination.)

13. Waste Disposal Procedures

The following waste disposal procedures MUST be followed when using live human coronavirus OC43:

a. Non-Sharp Waste- All cultures, stocks and cell culture materials must be disposed of in a double red bag-lined biohazard box.

b. Sharps Waste- All needles, syringes, razors, scalpels, Pasteur pipettes and pipette tips must be disposed of in an approved, puncture resistant sharps container. Sharps containers must not be filled more than 2/3 of their capacity.
c. Liquid Waste- All liquid waste contaminated or potentially contaminated with using live human coronavirus OC43 must be disinfected with a 1:10 bleach solution before disposal via sanitary sewer. Liquid waste containers must be stored in secondary containment that is capable of containing the entire volume of liquid in the event of a spill.

14. Injury/Incident Procedures

In the event of an injury or incident involving live human coronavirus OC43, the following procedures must be followed:

a. Eye or Mucous Membrane Exposure from Splash or Aerosols- rinse for a minimum of 15 minutes using eye wash and report the incident to your supervisor immediately. Report to UPMC Presbyterian for evaluation following an exposure.
b. Skin Contamination- Wash affected areas with soap and water and report the incident to your supervisor immediately. Report to UPMC Presbyterian for evaluation following an exposure.
c. Needlestick and/or Sharps Exposure- Wash affected areas with soap and water and report the incident to your supervisor immediately. Report to UPMC Presbyterian for evaluation following an exposure.

Note: All incidents must be reported within 24 hours by completing the Injury/Illness Report.

15. Spill Response Procedures

The following procedures MUST be followed when cleaning up a spill involving live human coronavirus OC43:

a. Stop, notify others and isolate the area.
b. Put on appropriate PPE (lab coat, gloves, eye and face protection).
c. Remove glass/lumps with forceps or scoop if applicable and place into a rigid, puncture-resistant container.
d. Place paper towels soaked in bleach directly on the spill and let soak for 20 minutes.
e. Wipe up area with paper towels or other absorbent material and discard materials in a biohazard waste container.
f. Continue wiping area with paper towels or other absorbent material soaked in bleach until the spill area is completely cleaned.
g. Discard all materials in a biohazard waste container.
h. Remove personal protective equipment and wash hands thoroughly.

16. Revisions

Date	Documented Changes	Initials
1/14/2021	Updated Format and Accessibility Update	MAS
3/11/2025	Updated BMBL link	MAS

For additional questions or concerns please contact safety@andrew.cmu.edu.