

Recommended biosafety precautions with primary human material due to COVID-19

For samples not known to be infected with SARS-CoV-2



Due to COVID-19 becoming more prevalent in the country and around the world, and as more data becomes available on asymptomatic transfer of the virus, the MIT EHS Biosafety Program is recommending the following precautions while handling all primary human material. Primary human material is defined as materials coming directly from humans. This can include cells, unfixed tissues, bodily fluids (blood, saliva, respiratory secretions, urine, etc.), stool samples, sewage, etc. Respiratory secretions, lung tissue, gastrointestinal tissue, and fecal samples pose a higher risk of potentially containing SARS-CoV-2 (the virus that causes COVID-19).

All human materials must be amended into your lab's biological research registration before project initiation. If you plan to work with samples from patients that have tested positive for COVID-19, these samples must be inactivated prior to arriving at MIT. You must contact your DLC's Biosafety Officer for a risk assessment and to amend your biological research registration.

Follow universal precautions at BL2 containment with additional precautions:

- All work with viable samples or procedures that can generate aerosols/droplets must be done in a biosafety cabinet.
- Minimize sharp use where possible.
- Centrifuges should have rotary cups with lids to prevent exposure due to leaks or broken tubes during centrifugation.
- Rotary cups surface should be disinfected and the cups opened inside the biosafety cabinet.
- High-speed cell sorting must have an aerosol management system or be performed inside a biosafety cabinet or HEPA filtered enclosure.
- Sonication must be performed inside a biosafety cabinet, fume hood, or enclosure.

Required Personal Protective Equipment (PPE):

- Double gloving is recommended.
- Lab coat (disposable lab coat or wrap-around gown recommended)
- Safety glasses.
- Face shield (for procedures that can generate splashes).
- For procedures that **cannot** be done in a biosafety cabinet, please contact your DLC's Biosafety Officer for a risk assessment.
- PPE must be removed or exchanged before leaving the lab.
 - PPE should be dedicated to primary human materials lab work.

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- Clean PPE should be donned when leaving the lab for lower containment lab spaces or spaces that are not using primary human material.

PPE removal (doffing):

- Remove outer gloves in biosafety cabinet and dispose as biowaste.
- Remove face shield and dispose or disinfect.
- Disinfect glove with 70% ethanol.
- Remove safety glasses and disinfect (avoid touching face with gloves).
- Remove lab coat.
- Remove inner gloves and dispose as biowaste.
- Wash hands with soap and water for 20-30 seconds.

Handwashing:

- Turn on faucet.
- Rinse hands for 5-10 seconds.
- Apply soap to all surfaces, between fingers, and finger nails.
- Lather for 10-20 seconds.
- Rinse and scrub all surfaces for 5-10 seconds to remove soap.
- Dry hands and turn off faucet with paper towel.
- Apply moisturizer if necessary.

Hand sanitizer:

- Sanitizer should not be used as a replacement for washing hands with soap and water; sanitizer does not kill all microbes, and should only be used in cases where soap and water are not available.
- Sanitizer must contain 60% or greater alcohol content (commercial sanitizers contain this level).
- Saturate hands with sanitizer.
- Rub sanitizer into all surfaces (palms, fingers, between fingers, and fingernails) until skin is dry.

Biosafety cabinet (BSC) rules:

- Preparation:
 - Allow BSC to run for 2-3 minutes before use.
 - Don PPE:
 - Lab coat, safety glasses, double gloves.

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- Ensure cuffs of gloves are tucked beneath or over lab coat cuff to cover wrists (no exposed skin should enter chamber).
- Disinfect BSC chamber and work surfaces for sterility (typically 70% ethanol).
- Gather equipment/supplies and disinfect surfaces for sterility (typically 70% ethanol).
- During work:
 - Collect **all** biowaste inside the biosafety cabinet in a biowaste container lined with a plastic bag.
 - Bring items into and out of the BSC chamber using slow, inward and outward movements to prevent disruption of the air curtain; avoid quick or side-to-side movements.
 - Do not block front or back grills.
 - Equipment/supplies must be at least 1 inch away from back grills.
 - Other lab occupants should avoid walking past the BSC while it is in use.
- After work:
 - Remove outer gloves, dispose as biowaste, and replace with a fresh pair.
 - Disinfect item surfaces as they leave the BSC.
 - Disinfect any liquid waste inside the BSC.
 - Disinfect BSC work surfaces.
 - Tie bag containing solid waste and disinfect the outside of bag before disposal in the biowaste box.
 - Remove gloves and dispose as biowaste.
 - Wash hands for 20-30 seconds with soap and water.

Disinfection of work surfaces:

- Wear appropriate PPE.
 - Use an appropriate disinfectant; this can include:
 - fresh 10% solution of household bleach
 - an EPA-registered disinfectant such as PREempt, quatricide, or sklar.
- Note: 70% ethanol is not an appropriate disinfectant for human materials work as it is not OSHA approved.**
- Ensure work surfaces are saturated with disinfectant.
 - Wait appropriate contact time (5-10 minutes); quick evaporating disinfectants such as ethanol may need to be applied more than once.
 - Rinse with 70% ethanol or sterile water to remove residual disinfectant and avoid corrosion of equipment and work surfaces.

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- Remove PPE and wash hands for 20-30 seconds with soap and water.

Shipping or transporting primary human material samples:

- Human samples can continue to be shipped and transported as Biologic Substance, Category B, UN3373.
- Anyone shipping or transporting samples must have appropriate shipping training (EHS000250 Shipping Biohazardous Material training).
- International shipments may require an import permit – check with your recipient.

Receiving primary human material samples:

- Before handling:
 - Wear appropriate PPE.
 - Wipe the outer bag and primary container with disinfectant.
- Samples from International sources may require a CDC import permit; for more information, check with the CDC (<https://www.cdc.gov/cpr/ipp/index.htm>).

Emergency Response — Injury/Exposure:

- Secure any additional hazards.
- Immediately take care of yourself:
 - **Cuts or skin exposure:** wash with soap and water and rinse/scrub for 5-10 minutes.
 - **Eyes:** use eye wash and flush for 15 minutes (lukewarm/room temperature water can be used if an eye wash is unavailable).
- Contact someone in the area (PI, supervisor, EHS rep, colleague) to report the incident.
- Call MIT Medical Urgent Care at 617-253-1311 for guidance and to schedule a visit; MIT Medical will evaluate and discuss any testing or treatment options.
- Supervisor or designee must report the injury to EHS within 24 hours through Atlas; for details see our [EHS page](#).

Emergency Response — Spill Clean-up:

- Secure additional hazards and assess situation:
 - Spill outside BSC:
 - Hold breath and evacuate room.
 - Post signage to alert users and keep people out of lab.
 - Wait 30 minutes for aerosols to settle.
 - Notify EHS if assistance is needed.
 - After 30 minutes, don PPE and clean up spill as below.

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- Spill inside BSC:
 - Keep BSC running.
 - Disinfect and replace any PPE that was contaminated.
 - Clean spill as noted below.
- PPE should include lab coat, double gloves, and safety glasses **or** face shield and safety glasses.
- Cover spill with paper towels.
- Saturate spill area with disinfectant starting from outer areas and working inward in a circular manner.
- Wait 10 minutes.
- Pick up spill material with tongs and dispose in biowaste box or biosharps container (if sharps or broken glass were present).
- Disinfect area surfaces to remove any residual contamination.
- Wait 10 minutes, collect paper towels, and dispose as biological waste.
- For sensitive surfaces:
 - Rinse with 70% ethanol or sterile water.
 - Dispose of paper towels as biowaste.
- Remove gloves.
- Wash hands with soap and water for 30 seconds.