Conducting Research with COVID-19 Samples or SARS-CoV-2 virus

Research with COVID-19 samples or SARS-CoV-2 virus requires Institutional Biosafety Committee (IBC) approval prior to start of work. Outlined here are the appropriate biosafety levels based on the sample type and proposed work practices.

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<th>Sample Collection</th>
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<th>BSL-3</th>
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| Collection of samples from suspected or confirmed COVID-19 patients must be performed following all required Infection Control Procedures established for UCSD Medical Centers. | The following materials or procedures are examples that require BSL-2 facility and work practices:  
  - Fixed specimens or samples  
  - Staining and microscopic analysis of fixed smears  
  - Examination of bacterial cultures  
  - Molecular analysis of extracted nucleic acid preparations  
  - Using automated instruments and analyzers (if aerosol containment is a feature)  
  - Performing electron microscopic studies with glutaraldehyde-fixed grids  
  - Work with synthetically generated SARS-CoV-2 nucleic acids which lack a means of cellular entry. | The following materials or procedures are examples that require BSL-2 facility and BSL-3 work practices:  
  - Aliquoting and/or diluting specimens  
  - Inoculating bacterial or mycological culture media for culture of organisms other than SARS-CoV-2.  
  - Performing diagnostic tests that do not involve propagation of viral agents in vitro or in vivo  
  - Nucleic acid extraction procedures involving potentially infected specimens (human or animal).  
  - precipitation or membrane filtration  
  - Preparation and chemical-or heat-fixing of smears for microscopic analysis  
  - Respiratory samples and secretions  
  - FACs--non-fixed samples  
  - Inactivated viruses/antigens  
  - Work with ANY sample where procedure may produce an aerosol | • Virus isolation in cell culture and initial characterization of viral agents recovered in cultures of SARS-CoV-2 specimens  
• High Speed Cell Sorting  
• Inactivation by validated methods before transfer of inactivated samples outside BSL-3 |
| **Primary & Secondary Barriers and PPE**  
  - PPE: Gown, gloves, surgical mask or N95, eye protection, face shield | **Primary & Secondary Barriers and PPE**  
  - PPE: single gloves, gown/lab coat, eye protection  
  - BSCs, if available, are properly maintained and certified  
  - Mechanical ventilation systems that provide an inward flow of air without recirculation to spaces outside of the laboratory  
  - A method for decontaminating all laboratory wastes should be available in the facility. Surface decontamination at every step using EPA List N disinfectants and contact times. | **Primary & Secondary Barriers and PPE**  
  - PPE: double gloves, lab coat, eye protection with side shields.  
  - All samples are opened inside the BSC in case of spills/leakage.  
  - Surface decontamination at every step using EPA List N disinfectants and contact times. | **Administrative Controls**  
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  - PPE: Gown, gloves, surgical mask or N95, eye protection, face shield |
| **Laboratory Practices and Technique**  
  - Good (Standard) Microbiological Practices  
  - Access to the laboratory is restricted when work is being conducted  
  - All procedures in which infectious aerosols or splashes may be created are conducted in Class II Type A1, or A2 Biosafety Cabinets (BSCs) or other physical containment equipment.  
  - Use safety cups whenever possible to avoid exposure to aerosols. | **Laboratory Practices and Technique**  
  - Follow all BSL-2 requirements  
  - All work with samples must occur within a BSC or in equipment where sample is in sealed container. All exceptions must be approved by the IBC prior to start of work.  
  - Use screw cap tubes and replace glass with plastics  
  - When working in the BSC, minimize removal of hands from cabinet and remove/dispose outer glove before removing hands  
  - Disinfect pipettes before disposal using 10% bleach prior to disposal as biohazard waste | **Administrative Controls**  
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  - Completion of Aerosol Transmissible Disease Training through UC Learning Center  
  - Laboratory personnel have lab-specific training in handling pathogenic agents  
  - Mandatory reporting of laboratory exposures to occupational health | **Administrative Controls**  
  - Centrifuge blood specimens in safety cups or sealed rotor, loaded and unloaded in a BSC  
  - All waste is collected and disposed as biohazard waste | **Primary & Secondary Barriers and PPE**  
  - PPE: Gown, gloves, surgical mask or N95, eye protection, face shield |

**Clinical Trials**

COVID-19 clinical trials involving the following will require approval by the IBC prior to start of work:

- Recombinant or synthetic nucleic acids
- Patient samples processed in a research lab