



# SARS-CoV-2 Biosafety and Biocontainment Research Guide

	Activities/Materials Examples	IBC-Related Actions	Biosafety Requirements
<p><b>BSL-3</b> Lab research activities involving the handling of the SARS-CoV-2 virus or aerosol-generating procedures with viable clinical specimens or tissues known to contain the virus</p>	<ul style="list-style-type: none"> <li>• Virus isolation in cell culture</li> <li>• Initial characterization of viral agents recovered in cultures of SARS-CoV-2</li> <li>• Processing of large volume specimens known to contain the virus</li> <li>• FACS/High Speed Cell Sorting</li> </ul>	<ul style="list-style-type: none"> <li>• Restricted activity. Contact Biosafety Officer (BSO) directly for information.</li> </ul>	<ul style="list-style-type: none"> <li>• Operational BSL-3 lab with personnel who have completed BSL-3 lab training through a recognized program and have been deemed proficient by experienced BSL-3 laboratorians in conjunction with the BSO and BSL-3 Facility Director.</li> </ul>
<p><b>BSL-2 with Enhancements</b> Aerosol-generating lab activities with viable/unfixed clinical specimens from known or strongly suspected COVID+ individuals</p>	<ul style="list-style-type: none"> <li>• Centrifugation, vortexing or pipetting of viable clinical specimens (i.e. blood components, nasal swabs, sputum) collected from known or strongly suspected infected patients for research purposes.</li> <li>• Concentration of environmental samples known or suspected to contain infectious virus or viral RNA (i.e untreated wastewater)</li> </ul>	<ul style="list-style-type: none"> <li>• Submit IBC protocol or amendment including any permits, SOPs and associated IRB protocols through NUgrant.</li> </ul>	<ul style="list-style-type: none"> <li>• Facilities &amp; biocontainment practices will be commensurate with those outlined in the UNL Biosafety Guidelines and the EHS SOPs on Biocontainment Levels, Working in a Biosafety Cabinet, Autoclave Operation and Use.</li> </ul>
<p><b>BSL-2</b> Lab research activities with materials that <u>only</u> involve direct handling of <u>non-viable/fixed</u> clinical specimens from COVID+ individuals</p>	<ul style="list-style-type: none"> <li>• Using automated instruments and analyzers</li> <li>• Staining and microscopic analysis of fixed smears</li> <li>• Examination of bacterial cultures</li> <li>• Pathologic examination and processing of formalin-fixed or otherwise inactivated tissues</li> <li>• Molecular analysis of extracted nucleic acid preparations</li> <li>• Final packaging of specimens for transport</li> <li>• Using inactivated specimens, such as specimens in nucleic acid extraction buffer</li> <li>• Performing electron microscopic studies with glutaraldehyde-fixed grids</li> </ul>	<p>If activities will be carried out in a UNL lab research space, then submit an IBC amendment or new protocol including the following details:</p> <ul style="list-style-type: none"> <li>• What materials will be received and from whom (if recombinant or pathogen-related synthetic RNA/DNA, detail the genetic elements and how they will be used)</li> <li>• What activities will take place, for what purpose, and for how long</li> <li>• Where the activities will take place</li> <li>• Who will be doing the work</li> <li>• Identify any aerosol-generating procedures (centrifugation, sonication, etc.) and what measures will be taken to contain aerosols (i.e., carrying out procedures in a biosafety cabinet).</li> </ul>	<p>UNL research labs and associated activities that need to carry out activities under BSL-2 conditions need the following:</p> <ul style="list-style-type: none"> <li>• An approved registration with the IBC</li> <li>• Personnel who have completed EHS biosafety training and the PI/lab supervisor has documented their proficiency at carrying out technical procedures under BSL-2 conditions.</li> <li>• Lab space that is: <ul style="list-style-type: none"> <li>○ restricted access and physically separated from carpeted areas and food/drink areas;</li> <li>○ free of fabric furniture, plants and animals not associated with research;</li> <li>○ equipped with and handwashing sink in the space and an eyewash in close proximity;</li> <li>○ equipped with a method for biowaste decontamination;</li> <li>○ equipped with a BSC, centrifuge with sealed rotors or any other containment equipment as determined through biorisk assessment.</li> </ul> </li> </ul>
<p><b>Risk assessment grid based on:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">CDC's FAQ about Laboratory Biosafety and SARS-CoV-2</a></li> <li>• <a href="#">CDC/NIH Biosafety in Microbiological and Biomedical Laboratories, 5th ed.</a></li> <li>• <a href="#">ABSA "Considerations for Handling Potential SARS-CoV-2 Samples"</a></li> </ul>			