

UNMC SARS-CoV-2 (COVID-19) Research Laboratory Biosafety Guidelines¹

Assigned Biosafety Level	Research Activities with Known or Likely Infected Specimens from Humans or Animal Models	Key Biosafety Elements
BSL-3/ABSL-3	<ul style="list-style-type: none"> • Storage and laboratory work with seed stocks, working stocks, or specimens² with the intent to grow or use live virus at UNMC. <ul style="list-style-type: none"> - Virus isolation, characterization, and/or expansion - Ship viral cultures or isolates as Category A, UN2814, infectious substance, affecting humans³ • Use of live SARS-CoV-2 virus in functional assays: <ul style="list-style-type: none"> - Plaque/Focus Forming Unit assays - Serologic virus capture/binding assays - Therapeutic MIC assays • Use of live SARS-CoV-2 virus in animals 	<p>Restricted activity. Contact the Biosafety Officer or Associate Biosafety Officers for additional information. PI and personnel must have access to the facility, BSL-3 training, and project approval from the BSL-3/ABSL-3 Facility Director. SARS-CoV-2 is considered a Risk Group 3 pathogen⁴</p>
BSL-2 with enhanced precautions	<ul style="list-style-type: none"> • Processing, aliquoting, or preparing specimens² for research use and storage. • Preparation of chemical- or heat-fixed specimens² for microscopic analysis • Nucleic acid extraction of specimens² for molecular analysis • Preparation of inactivated specimens for other laboratory assessments • Performing diagnostic tests with respiratory samples that <u>do not</u> involve activities with the potential to propagate the virus • Inoculating bacterial or mycological culture media • Work with inactivated viral lysate 	<p>Meet BSL-2 Requirements below, PLUS:</p> <ul style="list-style-type: none"> • Wear the following PPE: surgical mask (blood)/N-95 or PAPR (respiratory secretions), double gloves, impervious closed-front gown, eye protection or face shield. • Perform all sample manipulations in a BSC • Must use sealed centrifuge rotors or samples cups • Do not use sharps (unless absolutely necessary) • Restricted access to the lab and samples
BSL-2	<ul style="list-style-type: none"> • Molecular analysis of already extracted nucleic acid preparations • Analysis of specimens² that have been inactivated by a method approved by UNMC Institutional Biosafety Committee (IBC). • Final packaging of specimens² already in a sealed, decontaminated primary container for transport to collaborating laboratories for additional analyses • Specimens² from suspected or confirmed cases should be transported as UN3373, "Biological Substance, Category B" • Pathologic/microscopic examination of fixed specimens² (e.g., formalin-fixed tissues or glutaraldehyde-fixed grids). • FACS – fixed cells/samples • Serological analysis of serum or plasma or urinalysis 	<ul style="list-style-type: none"> • <u>An approved IBC protocol¹</u> detailing the materials handled, procedures performed, aerosol-generating procedures, location of work, waste handling procedures, and personnel involved. • The laboratory must meet requirements as outlined in IBC-19 Policy. • Good (Standard) Microbiological Practices⁵ • Conduct all procedures with the potential to generate aerosols in a BSC • Use centrifuge safety cups whenever possible • Ensure personnel have completed biosafety training and PI/lab supervisor must document their proficiency at working under BSL-2 conditions

¹ All research-related activities involving SARS-CoV2 must be covered by an IBC protocol

² Specimens are defined as, but not limited to, blood, tissues, feces, sputum, mucosal swabs, or washes/secretions collected from any species.

³ For assistance with required import and export regulations, please contact the [Export Control Office](#).

⁴ The [NIH recommends](#) that IBCs consider SARS-CoV-2 a RG3 pathogen as a starting point for risk assessments and biocontainment

⁵ PPE: single gloves, gown/lab coat, eye protection, (surgical mask)