UNMC SARS-CoV-2 (COVID-19) Research Laboratory Biosafety Guidelines[1]

Assigned Biosafety Level	Research Activities with Known or Likely Infected Specimens from Humans or Animal Models	Key Biosafety Elements
BSL-3/ABSL-3	• Storage and laboratory work with seed stocks, working stocks, or specimens[2] with the intent to grow or use live virus at UNMC. - Virus isolation, characterization, and/or expansion • Use of live SARS-CoV-2 virus in functional assays: - Plaque/Focus Forming Unit assays - Serologic virus capture/binding assays - Therapeutic MIC assays • Use of live SARS-CoV-2 virus in animals	Restricted activity. • Contact a Biosafety Officer for additional information • The BSL-3/ABSL-3 Facility Director must assess and approve PI and personnel access to the facility, BSL-3 training, and proposed projects • SARS-CoV-2 is considered a Risk Group 3 pathogen[4]
BSL-2	• Processing, aliquoting, or preparing specimens[2] for research use and storage • Preparation of chemical- or heat-fixed specimens[2] for microscopic analysis • Nucleic acid extraction of specimens[2] for molecular analysis • Preparation of inactivated specimens for other laboratory assessments. • Performing diagnostic tests with respiratory samples that do not involve activities with the potential to propagate the virus • Inoculating bacterial or mycological culture media • Work with inactivated viral lysate • Molecular analysis of already extracted nucleic acid preparations • Analysis of specimens[2] that have been inactivated by a method approved by UNMC Institutional Biosafety Committee (IBC) • Pathologic/microscopic examination of fixed specimens[2] (e.g., formalin-fixed tissues or glutaraldehyde-fixed grids) • FACS – fixed cells/samples • Serological analysis of serum or plasma or urinalysis	• Must have an approved IBC protocol[1] detailing the materials handled, procedures performed, aerosol-generating procedures, location of work, waste handling procedures, and personnel involved • The laboratory space must meet BSL2 requirements as determined by an inspection UNMC BSL2 Laboratory Inspection Checklist • Wear PPE as determined by a detailed risk assessment • Good (Standard) Microbiological Practices • Conduct all procedures with the potential to generate aerosols in a BSC • Do not use sharps (unless absolutely necessary) • Restricted access to the lab and samples • Use centrifuge safety cups whenever possible • Ensure personnel have completed biosafety training • PI/lab supervisor must document their proficiency at working under BSL-2 conditions

Shipping and Transport: Patient specimens from suspected or confirmed cases should be transported as UN3373, “Biological Substance Category B”. Viral cultures or propagated isolates may be classified as Category B. However, certain variants may be subject to Category A based on factors considered such as circulation of the variant in the population of the areas the material are to be transported from and to.[3] WHO Working definitions and primary actions for SARS-CoV-2 variants

[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

Resources: WHO Laboratory biosafety guidance related to SARS-CoV-2 (COVID-19)
CDC’s Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with COVID-19
CDC/NIH Biosafety in Microbiological and Biomedical Laboratories, 6th ed.

Questions about Laboratory Biosafety? Email: UNMC Biosafety
UNMC Vice Chancellor for Research Institutional Biosafety Committee

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