# SARS-CoV-2 (COVID-19) Research Laboratory Biosafety Guidelines

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<th>Research Activities with Known or Likely Infected Specimens from Humans or Animal Models</th>
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| • Storage and laboratory work with seed stocks, working stocks or specimens¹ with the intent to grow or use live virus at Duke.  
  • Virus isolation, characterization and/or expansion  
  • Viral cultures or isolates should be transported as Category A, UN2814, "infectious substance, affecting humans" ²  
• Use of live SARS-CoV-2 virus in functional assays:  
  • Plaque/Focus Forming Unit assays  
  • Serologic virus capture/binding assays  
  • Therapeutic MIC assays  
  • Live cell sorting with intact virus  
• Use of live SARS-CoV-2 virus in animal  
• Processing, aliquoting or preparing specimens¹ for research use and storage  
• Preparation of chemical- or heat-fixed specimens¹ for microscopic analysis  
• Nucleic acid extraction of specimens¹ for molecular analysis  
• Preparation of inactivated specimens for other laboratory assessments  
• Performing diagnostic tests (e.g. serology) that do not involve activities with the potential to propagate virus  
• Inoculating bacterial or mycological culture media  | BSL-3/ABSL³ | Gregory D. Sempowski, Ph.D.,  
Director, Duke Regional Biocontainment Laboratory  
Duke Human Vaccine Institute  
Phone: 919-684-4386  
greg.sempowski@duke.edu  
https://shared-resources.dhvi.duke.edu/rbl |
| • Molecular analysis of already extracted nucleic acid preparations  
• Analysis of specimens¹ that have been inactivated by a method approved by Duke Biological Safety.  
• Final packaging of specimens¹ already in a sealed, decontaminated primary container for transport to collaborating laboratories for additional analyses  
  • Specimens from suspected or confirmed cases should be transported as UN3373, "Biological Substance, Category B  
• Pathologic/microscopic examination of fixed specimens¹ (e.g. formalin-fixed tissues or glutaraldehyde-fixed grids).  
• Routine staining and microscopic analysis of fixed smears  
• Routine examination of bacterial and mycological cultures  | BSL-2 with enhancements⁴ | Antony Schwartz, Ph.D., SM(NRCM), CBSP(ABSA)  
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https://www.safety.duke.edu/biological-safety |

*Please note that all proposed research with SARS-CoV-2 (COVID-19) requires review by the Biological Safety Division of OESO and will require approval of a Standard Operating Procedure (SOP) for the research. In addition, some research will also require approval by the Institutional Biosafety Review Committee (IBRC) and/or the Institutional Biosafety Committee (IBC), which will be coordinated by Biological Safety Division, biosafety@dm.duke.edu.*

¹Specimens are defined as, but not limited to, blood, serum, plasma, tissues, feces, urine, sputum, mucosal swabs or washes/secretions collected from any species.

²For assistance with required import permits and export licenses contact Duke Office of Export Controls (export@duke.edu; 919-613-6800).

³Animal Biosafety Level-3 (ABSL-3)

⁴Required Enhancements to standard BSL-2:
- Any procedure with the potential to generate aerosols or droplets (e.g. vortexing, cell sorting, ELISA plate washing) will be performed in a certified Class II Biological Safety Cabinet (BSC). BSC must be decontaminated with an EPA approved disinfectant for coronavirus.  
- Personnel will wear a closed front gown, face shield and double pair of gloves.  
- Centrifugation of specimens must be performed using sealed centrifuge rotors or sample cups.  
- The use of sharps should be eliminated wherever possible.