

Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)

CHARACTERISTICS	
<i>Background and Morphology</i>	SARS-CoV-2, also known as 2019-nCoV, is a β Coronavirus of group 2B with at least 70% similarity in genetic sequence to SARS-CoV. SARS-CoV-2 is a Coronavirus responsible for causing the outbreak of Coronavirus disease first detected in December 2019 (COVID-19).
<i>Growth Conditions</i>	Serial passage in 5–6-week-old mice. In vitro propagation in Vero cells.

<i>Government of Canada</i>	https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/severe-acute-respiratory-syndrome-coronavirus-2.html
<i>WHO guidelines</i>	https://www.who.int/emergencies/diseases/novel-coronavirus-2019
<i>Emory guidelines</i>	EHS-462, Laboratory Biosafety Guidelines for Working with SARS-CoV-2

HEALTH HAZARDS	
<i>Host Range</i>	Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats, and bats. Analysis of the genetic tree of the SARS-CoV-2 indicated it originated in bats, but whether the virus jumped directly from bats or there was an intermediary animal host is not yet known.
<i>Modes of Exposure</i>	Inhalation and contact with contaminated surfaces. Person-to-person happens among close contacts (about 6 feet), spread is thought to occur mainly via respiratory droplets produced when an infected person coughs or sneezes.
<i>Signs and Symptoms</i>	Illnesses have ranged from people with mild symptoms to people being severely ill and dying. Symptoms can include, but are not limited to fever, cough, shortness of breath.
<i>Infectious Dose</i>	The human infectious dose of SARS-CoV-2 is unknown. Based on non-human primate research, the best estimate of the human infectious dose via the inhalation route is 36-179 viral particles.
<i>Incubation Period</i>	2-14 days

CONTAINMENT	
<i>BSL2</i>	Processing of human samples potentially infected with SARS-CoV-2; research activities with SARS-CoV-2 associated specimens (non-viral/non-culture work).
<i>BSL2+/ABSL2+</i>	<ul style="list-style-type: none"> Laboratory/Animal containment level for viral or culture work: BSL2/ABSL2 with enhanced practices. BSL2+/ABSL2+ means level 2 containment with level 3 practices. N95 is required.

MEDICAL PRECAUTIONS / TREATMENT	
<i>Vaccines / Prophylaxis</i>	<p>Currently recommended COVID-19 vaccines in the US are manufactured by Pfizer-BioNTech, Moderna and Novavax.</p> <p>Prophylaxis consisting of a monoclonal antibody cocktail specific for the SARS-CoV-2 spike protein has been authorized in some jurisdictions for moderately to severely immunocompromised individuals who may not respond adequately to SARS-CoV-2 vaccines, and for individuals for whom such vaccines are contraindicated.</p>
<i>Diagnosis & Treatment</i>	<p>Real-Time Reverse Transcriptase (RT)-PCR for use with upper and lower respiratory specimens.</p> <p>Treatment may include the antiviral remdesivir, oxygen therapy, airway management, steroids, and the management of septic shock, depending on disease severity, in addition to the management of co-infection.</p>
<i>Surveillance</i>	COVID-19 is a reportable disease in the USA
<i>Emory Requirements</i>	Report all exposures. Complete the health questionnaire and follow occupational health requirements if exposure were to occur.

SPILL PROCEDURES	
<i>Small</i>	Notify others working in the lab. Allow aerosols to settle. Don appropriate PPE. Cover the area of the spill with paper towels and apply an EPA-approved disinfectant, working from the perimeter towards the center. Allow 30 minutes of contact time before disposal and cleanup of spill materials.
<i>Large</i>	Contain the spill, notify and evacuate others in the area, then contact Emory's Biosafety Officer (404-357-1821) or the EHSO Spill Response Team (404-727-2888).

EXPOSURE PROCEDURES					
<i>Mucous membrane</i>	Flush eyes, mouth, or nose for 15 minutes at an eyewash station.				
<i>Other Exposures</i>	Wash area with soap and water for 15 minutes.				
<i>Seek Medical Attention</i>	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">7:30 am - 4:00 pm (OHS): 404-686-8587</td> <td style="width: 50%;">After Hours: APP On Call 404-686-5500, PIC# 50464</td> </tr> <tr> <td>Needle Stick: EUH (404-686-8587) EUHM (404-686-2352)</td> <td>ENPRC: Contact ENPRC Safety Office</td> </tr> </table>	7:30 am - 4:00 pm (OHS): 404-686-8587	After Hours: APP On Call 404-686-5500, PIC# 50464	Needle Stick: EUH (404-686-8587) EUHM (404-686-2352)	ENPRC: Contact ENPRC Safety Office
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<i>Reporting</i>	Immediately report incidents to supervisor. Accidents/Exposures must be reported in H.O.M.E. via HR Self-Service portal. Emory HR website > Self-Service > Workplace Health > Report				

LABORATORY HAZARDS	
<i>Laboratory Acquired Infections (LAIs)</i>	No LAIs have been reported for SARS-CoV-2. However, four LAIs have been reported for SARS-CoV.
<i>Sources</i>	SARS-CoV-2 RNA has been detected in upper and lower respiratory tract specimens, blood, stool.

VIABILITY	
<i>Disinfection</i>	Routine cleaning and disinfection procedures using EPA-registered disinfectants is appropriate, including 10% bleach. Follow manufacturer's recommendations for use – dilution (i.e., concentration), contact time, and care in handling.
<i>Inactivation</i>	Suspected to be inactivated by heat (60°C for 30 minutes) and UV radiation (60 minutes)
<i>Survival Outside Host</i>	It is not known how long the SARS-CoV-2 survives on surfaces, preliminary information suggests the virus may survive a few hours or more on dry inanimate surfaces.

SUPPLEMENTAL REFERENCES	
<i>CDC BMBL</i>	Biosafety in Microbiological and Biomedical Laboratories, 6th Edition
<i>CDC guidelines</i>	https://www.cdc.gov/covid/index.html https://www.cdc.gov/vaccines/covid-19/info-by-product/index.html

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
<i>Minimum PPE Requirements</i>	<ul style="list-style-type: none"> Lab coat, gloves, closed-toed shoes, eye protection with side shield, and face shield if there is a risk of splashes or aerosolization. Enhanced practices require the use of disposable fluid resistant gown in addition to the lab coat, double gloves and N95 respirator [Annual fit testing is required per Emory's Respiratory Protection Program].
<i>Additional Precautions</i>	All procedures involving live virus or samples potentially infected should be conducted in a biological safety cabinet (BSC). Hand hygiene should be performed as the last step in doffing PPE and before exiting the facility. The use of needles, syringes, and other sharp objects must be approved by the Biosafety office. Waste must be autoclaved before disposal through Emory's approved vendor.