

## **Biological Agent Reference Sheet (BARS)**

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**BIOLOGICAL AGENT REFERENCE SHEET**
**Severe Acute Respiratory Syndrome (SARS) Associated Coronavirus (SARS-CoV)**

CHARACTERISTICS	
<i>Morphology</i>	Family Coronaviridae. Genus Coronavirus, 80-140 nm in diameter, single-stranded, linear, non-segmented, positive-sense RNA Virus.
<i>Growth Conditions</i>	SARS-CoV has been cultured in vitro using human airway epithelial cells.

HEALTH HAZARDS	
<i>Host Range</i>	Humans, raccoon dog, and Chinese ferret badgers. Experimental hosts include non-human primates, ferrets, hamsters, guinea pigs, mice, rats. Bats may be a potential reservoir.
<i>Modes of Transmission</i>	Close person-to-person contact by inhalation of infected respiratory droplets; mucous membrane splash to eye(s), nose or mouth; contaminated surface –to-mouth/ nose/ eye.
<i>Signs and Symptoms</i>	High fever (>100.4°F), chills, rigors, headache, malaise, myalgia, mild respiratory symptoms. Most patients develop pneumonia. 10% to 20% of individuals develop diarrhea.
<i>Infectious Dose</i>	Unknown
<i>Incubation Period</i>	Generally 2-7 days, can be up to 10 days

MEDICAL PRECAUTIONS / TREATMENT	
<i>Prophylaxis</i>	None available
<i>Vaccines</i>	None available
<i>Treatment</i>	Supportive care
<i>Surveillance</i>	Monitor and report symptoms. Laboratory confirmation is done via detection of any of the following by a validated test, with confirmation in a reference laboratory: Serum antibodies to SARS-CoV in a single serum specimen or a fourfold rise in neutralizing antibody titer taken upon admission and 28 days afterward. RT-PCR-based and ELISA based methods are also available for detection of viral RNA.
<i>Emory Requirements</i>	If possible, before working with either live SARS-CoV or clinical specimens known to contain SARS-CoV, laboratory personnel should have a baseline serum sample. Report all incidents.

LABORATORY HAZARDS	
<i>Laboratory Acquired Infections (LAIs)</i>	Accidental infection has occurred in laboratory personnel while performing viral propagation. No LAI has been reported in personnel performing diagnostic assays. There have not been any known cases of SARS reported anywhere in the world since 2004.
<i>Sources</i>	Unknown

SUPPLEMENTAL REFERENCES	
<i>Canadian MSDS</i>	<a href="http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/sars-sras-eng.php">http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/sars-sras-eng.php</a>
<i>CDC guidelines</i>	<a href="http://www.cdc.gov/sars/index.html">http://www.cdc.gov/sars/index.html</a>
<i>WHO Guidelines</i>	<a href="http://www.who.int/csr/resources/publications/WHO_DS_CSR_ARO_2004_1/en/">http://www.who.int/csr/resources/publications/WHO_DS_CSR_ARO_2004_1/en/</a>

CONTAINMENT	
<i>BSL2</i>	BSL2 facilities with BSL2 practices should be used for handling respiratory secretions, stool, or tissues for procedures performed in microbiology or pathology

	labs.
<i>BSL3/ABSL3</i>	Biosafety Level 3 facilities, equipment, and operational practices are recommended for SARS-CoV propagation in cell culture and initial characterization of viral agents recovered in cultures of SARS specimens. Inoculation of animals for potential recovery of SARS-CoV from samples, research studies involving animal inoculation for characterization of putative SARS agents must be performed in ABSL-3 facilities.

SPILL PROCEDURES	
<i>Small</i>	Notify others working in the lab. Allow aerosols to settle. Don appropriate PPE. Cover 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>	For assistance, contact Emory's Biosafety Officer (404-727-8863), the EHSO Office (404-727-5922), or the Spill Response Team (404-727-2888)

EXPOSURE PROCEDURES					
<i>Mucous membrane</i>	Flush eyes, mouth or nose for 15 minutes at eyewash station.				
<i>Other Exposure</i>	Wash area with soap and water for 15 minutes.				
<i>Reporting</i>	Immediately report incident to supervisor, complete an employee incident report in PeopleSoft.				
<i>Medical Follow up</i>	<table border="0"> <tr> <td><b>7am-4pm (OIM):</b> EUH (404-686-7941) EUHM (404-686-7106) WW (404-728-6431)</td> <td><b>After Hours:</b> OIM NP On Call 404-686-5500 PIC# 50464</td> </tr> <tr> <td><b>Needle Stick (OIM):</b> EUH (404-686-8587) EUHM (404-686-2352)</td> <td><b>Yerkes:</b> Maureen Thompson Office (404-727-8012) Cell (404-275-0963)</td> </tr> </table>	<b>7am-4pm (OIM):</b> EUH (404-686-7941) EUHM (404-686-7106) WW (404-728-6431)	<b>After Hours:</b> OIM NP On Call 404-686-5500 PIC# 50464	<b>Needle Stick (OIM):</b> EUH (404-686-8587) EUHM (404-686-2352)	<b>Yerkes:</b> Maureen Thompson Office (404-727-8012) Cell (404-275-0963)
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VIABILITY	
<i>Disinfection</i>	Household bleach, ice-cold acetone, 70% ethanol, paraformaldehyde, and glutaraldehyde
<i>Inactivation</i>	Heat (60°C for 30 minutes), UV radiation
<i>Survival Outside Host</i>	4 days in stool samples with an alkaline pH, > 7 days in respiratory secretions at room temperature, for at least 4 days in undiluted urine and human serum at room temperature, up to 9 days in suspension, 60 hours in soil/water, more than a day on hard surfaces such as glass and metal and 6 days in dried state.

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
<i>Minimum PPE Requirements</i>	At minimum, personnel are required to don gloves, closed toed shoes, lab coat, and appropriate face and eye protection prior to working with SARS-CoV. Risk assessment may dictate the additional use of respiratory protection (N95 mask).
<i>Additional Precautions</i>	All procedures that may produce aerosols, or involve high concentrations or large volumes should be conducted in a biological safety cabinet (BSC). The use of needles, syringes, and other sharp objects should be strictly limited. Additional precautions should be considered with work involving animals or large scale activities.