

CHARACTERISTICS

Synonym or Cross Reference	RSV
Disease	Worsening of symptoms which could lead to severe infections such as bronchiolitis, an inflammation of the small airways in the lung, and pneumonia, an infection of the lungs.
Morphology	Classified as a member of the genus Pneumovirus in the family Pneumoviridae. The viral genome consists of a linear, single-stranded, negative-sense, non-segmented RNA (~15.2 kb). RSV lacks haemagglutinin and neuraminidase activity. Virus particles are enveloped and pleomorphic, occurring as irregular spherical particles that are 100 to 350 nm in diam., and as long filamentous fibers that are 60 to 200 nm in diam. and 10 µm in length.
Zoonosis	None

RISK GROUP & CONTAINMENT REQUIREMENTS

ABSL2	For all procedures utilizing infected animals.
BSL-2	All procedures must be performed in a BSC, unless otherwise approved and stated in lab-specific manual. If oncogenic transgenes are used, the containment level should be raised to BSL-2+
Risk Group 3	Agents that are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are often available.

LABORATORY HAZARDS

Primary Hazards	Close contact with someone who is infected via secretions from coughing and sneezing or touching objects such as toys or doorknobs that have the virus on them
Sources	Samples described in IBC protocol.
Lab Acquired Infections (LAIs)	One case of laboratory-acquired infection with RSV was reported before 1976. In a review of laboratory-acquired infections in Canada from 2016 to 2021, RSV was not identified.

PERSONAL PROTECTIVE EQUIPMENT

Additional Precautions	Additional PPE may be required depending on lab-specific SOPs and IBC Protocol.
Minimum PPE Requirements	Lab coat, disposable gloves, safety glasses, closed toed shoes, long pants.

SPILL PROCEDURES

Large	Immediately notify all lab personnel and clear the area. Remove any contaminated PPE/clothing before exiting the lab. Lock all entry doors, post warning signage, and deny entry. Call DPS (213-740-4321) and ask to notify EH&S. Inform the PI and/or Lab Manager/Supervisor as soon as possible.
Small	Notify all lab personnel lab. Remove contaminated PPE and don new PPE. Cover spill area with absorbent material and add fresh 1:10 bleach:water. Allow 20 minutes (or as directed) contact time. After 20 minutes, clean up and dispose of materials.

VIABILITY

Disinfection	Use 10 % dilution of household bleach (minimum 0.3% sodium hypochlorite) for 20 to 30 minutes, or an acceptable time approved by IBC and EH&S.
Survival Outside Host	RSV is very vulnerable to environmental changes, particularly temperature and humidity. It is sensitive to high and low temperatures and to drying (i.e., low humidity levels). It loses up to 90% infectivity at room temperature after 48 hours and up to 99% at 1°C after 7 days. The optimal pH is 7.5. It may survive for about 3 to 30 hours on nonporous surfaces at room temperature. RSV can be recovered from countertops for up to 7 hours, from rubber gloves for 5 hours, from cloth material for 2 hours, and from skin for up to 20 minutes. Survival times decrease slightly in higher temperature environments.

HEALTH HAZARDS

Host Range	Humans. Various animal species have been experimentally infected with RSV, including cotton rats, mice, ferrets, guinea pigs, hamsters, marmosets, lambs, and nonhuman primates.
Incubation Period	Incubation period for RSV infection ranges from 2 to 8 days. RSV is shed during the period of active disease and can continue for over 20 days after clinical recovery.
Infectious Dose	The infectious dose for RSV is > 160 - 640 viral units, administered through intranasal spray, as listed by NIH.
Modes of Transmission	Direct contact with infectious secretions (via fomites) and/or large particle aerosols. RSV is communicable during the period of active disease, and for as long as a month after. It is not readily transmitted from person-to-person, since significant and prolonged contact is required with infected individuals.
Signs and Symptoms	RSV usually causes mild cold-like signs and symptoms. These include: congested or runny nose, dry cough, low-grade fever, sore throat, sneezing, and headache.

EXPOSURE PROCEDURES

Medical Follow-up	Visit USC’s designated healthcare provider. Bring a copy of this PSDS.
Mucous Membrane	Flush eyes for 5-10 minutes at eyewash station.
Other Exposures	Immediately wash affected area with soap and water for 15 minutes.
Reporting	Immediately report incident to supervisor, notify EH&S, and complete Manager’s Report.

MEDICAL PRECAUTIONS/TREATMENT

Prophylaxis	Palivizumab is a humanized monoclonal antibody that is administered intramuscularly to high-risk infants for RSV infection. Aerosolized ribavirin may be administered to immunocompromised patients with severe illness and can be used in combination with palivizumab prophylactic treatment.
Surveillance	There are four main laboratory techniques for diagnosing RSV, including virus cultures, serology, immunofluorescence and/or antigen detection, and nucleic acid-based tests. Rapid diagnostic techniques for viral antigen detection, including immunofluorescent-antibody assay, optical immunoassay, enzyme immunoassay, and chromatographic immunoassay are preferred as most are commercially available, easy to perform and produce rapid results. Direct fluorescent antibody testing is useful in high-risk patients and produces a rapid response, however, the sensitivity decreases in adult patients. Nucleic acid tests (such as RT-PCR) are generally more sensitive.
Treatment	See Prophylaxis above.
USC Requirements	Immediately report any exposures to Environmental Health & Safety.
Vaccines	No vaccine is currently available; however, there are several vaccines being developed. The Novavax vaccine has completed Phase II clinical trial. There are five subunit vaccines in Phase I trials and one in a Phase II trial.

REFERENCES

BMBL <a href="http://tiny.cc/cdc-bmb1">http://tiny.cc/cdc-bmb1</a>	CDC <a href="https://www.cdc.gov/">https://www.cdc.gov/</a>
NIH Guidelines <a href="http://tiny.cc/nih-bio-secure">http://tiny.cc/nih-bio-secure</a>	Virginia Tech <a href="http://tiny.cc/vt-psds">http://tiny.cc/vt-psds</a>
Montana State University <a href="http://tiny.cc/msu-psds">http://tiny.cc/msu-psds</a>	American Lung Association <a href="https://www.lung.org/lung-health-diseases/lung-disease-lookup/rsv/learn-about-rsv">https://www.lung.org/lung-health-diseases/lung-disease-lookup/rsv/learn-about-rsv</a>