

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

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## BIOLOGICAL AGENT REFERENCE SHEET

### *Mycobacterium tuberculosis* (TB)

CHARACTERISTICS	
<i>Morphology</i>	Gram positive rods, non-spore forming, non-motile, slightly curved, forming strands and cords, acid-fast staining bacteria with a very thick and lipid rich cell walls
<i>Growth Conditions</i>	Aerobic and slow-growing

HEALTH HAZARDS	
<i>Host Range</i>	Primarily found in humans but has been seen in cattle, non-human primates, and domestic mammals.
<i>Modes of Transmission</i>	Spread through aerosols produced when coughing or sneezing. Transmission only occurs from active TB. 90% of those infected with <i>M. tuberculosis</i> have latent TB.
<i>Signs and Symptoms</i>	Nausea, weakness, fatigue, prolonged cough, chest pain, rapid weight loss, fever, night sweats, hemoptysis (blood in sputum)
<i>Infectious Dose</i>	ID <sub>50</sub> < 10 bacilli
<i>Incubation Period</i>	Disease can develop within months or remain latent until later in life.

MEDICAL PRECAUTIONS / TREATMENT	
<i>Prophylaxis</i>	For persons latently infected with TB Isoniazid is primarily used. Exposure without infection (reactive skin test) is typically not treated unless the person is immunocompromised or pregnant.
<i>Vaccines</i>	Licensed attenuated live vaccine (BCG) not generally recommended in the US.
<i>Treatment</i>	Antibiotics are available. Examples: Isoniazid, Rifampin, Pyrazinamide
<i>Surveillance</i>	PPD skin test, chest x-ray if positive
<i>Emory Requirements</i>	PPD skin test required every six months. Test offered at Employee Health Services (404-686-8589).

LABORATORY HAZARDS	
<i>Laboratory Acquired Infections (LAIs)</i>	Incidence of tuberculosis in laboratory workers working with <i>M. tuberculosis</i> is three times higher than those not working with agent. Fourth most commonly reported LAI.
<i>Sources</i>	May be present in sputum, gastric lavage fluids, CSF, urine, animal bedding, tissues, and accidental needlesticks. Bacilli may also survive heat fixed smears and may be aerosolized during manipulation of liquid and frozen cultures.

SUPPLEMENTAL REFERENCES	
<i>Canadian MSDS</i>	<a href="http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/tuber-eng.php">http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/tuber-eng.php</a>
<i>BMBL: 5<sup>th</sup> Edition</i>	<a href="http://www.cdc.gov/OD/ohs/biosfty/bmb15/BMBL_5th_Edition.pdf">http://www.cdc.gov/OD/ohs/biosfty/bmb15/BMBL_5th_Edition.pdf</a>
<i>CDC TB Guidelines</i>	<a href="https://www.cdc.gov/tb/topic/laboratory/default.htm">https://www.cdc.gov/tb/topic/laboratory/default.htm</a>

CONTAINMENT REQUIREMENTS	
<i>BSL-2</i>	Non-aerosol producing procedures with clinical samples known or thought to contain <i>M. tuberculosis</i> . Aerosol producing procedures with clinical samples performed in BSC.
<i>BSL-3</i>	Manipulation and propagation of cultures of <i>M. tuberculosis</i> .
<i>ABSL-2+</i>	Animal studies involving guinea pigs or mice since they do not produce droplet nuclei.
<i>ABSL-3</i>	Animal studies involving non-human primates.

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 registered tuberculocidal disinfectant, working from the perimeter towards the center. Allow 30 minutes of contact time before disposal and cleanup of spill materials.
<i>Large</i>	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 Exposures</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>	<i>7am-4pm (OIM):</i> EUH (404-686-7941) EUHM (404-686-7106) WW (404-728-6431)	<i>After Hours:</i> OIM NP On Call 404-686-5500 PIC# 50464
	<i>Needle Stick (OIM):</i> EUH (404-686-8587) EUHM (404-686-2352)	<i>Yerkes:</i> Maureen Thompson Office (404-727-8012) Cell (404-275-0963)

VIABILITY	
<i>Disinfection</i>	A list of EPA-approved disinfectants for <i>M. tuberculosis</i> are available online: <a href="https://www.epa.gov/sites/production/files/2015-09/documents/list_b_tuberculocide.pdf">https://www.epa.gov/sites/production/files/2015-09/documents/list_b_tuberculocide.pdf</a> Examples: Vesphene, Lysol Trigger Disinfectant Spray
<i>Inactivation</i>	Moist heat (121°C for a minimum of 15 minutes)
<i>Survival Outside Host</i>	Guinea pig carcasses (49 days), carpet (70 days), dust (90-120 days), manure (45 days), paper book (105 days) sputum in a cool and dark location (6-8 months), clothing (45 days)

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 <i>M. tuberculosis</i> . Additional PPE may be required depending on lab specific SOPs.
<i>Additional Precautions</i>	Due to the modes of transmission, respirators may be required when working with <i>M. tuberculosis</i> . Fit testing and training is required annually per Emory's Respiratory Program: <a href="http://www.ehso.emory.edu/content-manuals/RespiratoryProtectionProgram.pdf">http://www.ehso.emory.edu/content-manuals/RespiratoryProtectionProgram.pdf</a>