

Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET

Hepatitis B virus (HBV)

CHARACTERISTICS	
<i>Morphology</i>	Partially double-stranded DNA, 42-47 nm diameter, enveloped, Hepadnaviridae; lipoprotein coat contains the Hepatitis B surface antigen (HBsAg)
<i>Growth Conditions</i>	Cell culture (PLC/PRF/5 human hepatoma cell line)

HEALTH HAZARDS	
<i>Host Range</i>	Humans are the only known natural host. Some NHP can be experimentally infected.
<i>Modes of Transmission</i>	Sharing needles, syringes, or other drug-injection equipment, sexual contact, mother to baby at birth.
<i>Signs and Symptoms</i>	Two major forms: asymptomatic infection and symptomatic hepatitis. Symptoms of acute infection include fever, fatigue, anorexia, abdominal discomfort, nausea and vomiting, arthralgias, jaundice, gray-colored bowel movements. Case definition includes: acute (mostly asymptomatic, or with mild to severe hepatitis, seroconversion to positive HBsAg), chronic (persistence of HBsAg for more than 6 months, increased risk for developing chronic liver disease), or perinatal (transmission from mother to child). Most persons with acute disease recover with no lasting liver damage; acute illness is rarely fatal, while 15%–25% of chronically infected persons develop chronic liver disease, including cirrhosis, liver failure, or liver cancer.
<i>Infectious Dose</i>	Unknown
<i>Incubation Period</i>	Usually 45-160 days; average 120 days

MEDICAL PRECAUTIONS / TREATMENT	
<i>Prophylaxis</i>	Hepatitis B immunoglobulin (HBIG)
<i>Vaccines</i>	The following single-antigen vaccines and combination vaccines are currently licensed and available in the United States: Single-antigen vaccines: Engerix-B® and Recombivax HB®. Combination vaccines: Pediarix®, and Twinrix®
<i>Treatment</i>	Supportive treatment is an option for acute HBV infection in patients who spontaneously clear the infection. Antiviral therapy is available for severe acute and chronic infections
<i>Surveillance</i>	Serology: <u>HBsAg</u> (person is infectious), HBV surface antibody- <u>anti-HBs</u> - (recovery and immunity from HBV infection, or successful vaccination against HBV). Molecular diagnosis using PCR is also available.
<i>Emory Requirements</i>	Report all incidents. OSHA requires that personnel working with human samples or other potentially infectious materials (OPIMs) receive the three doses of HBV vaccine and demonstrate HBV antibody titers.

LABORATORY HAZARDS	
<i>Laboratory Acquired Infections (LAIs)</i>	HBV infection is one of the most frequently reported laboratory-acquired infections via needle stick or other sharp instrument injury
<i>Sources</i>	HBsAg-positive blood and blood products, body fluids, and any unfixed tissue or organ

SUPPLEMENTAL REFERENCES	
<i>Canadian PHAC</i>	http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/hepatitis-b-eng.php
<i>CDC</i>	http://www.cdc.gov/hepatitis/hbv/
<i>WHO</i>	http://www.who.int/mediacentre/factsheets/fs204/en/

CONTAINMENT	
<i>BSL2</i>	Biosafety level 2 practices and containment for activities utilizing infectious body fluids and tissues
<i>ABSL2</i>	Work with 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 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 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>	7am-4pm (OIM): EUH (404-686-7941) EUHM (404-686-7106) WW (404-728-6431)
	After Hours: OIM NP On Call 404-686-5500 PIC# 50464
	Needle Stick (OIM): EUH (404-686-8587) EUHM (404-686-2352)
	Yerkes: Maureen Thompson Office (404-727-8012) Cell (404-275-0963)

VIABILITY	
<i>Disinfection</i>	10% fresh sodium hypochlorite (household bleach), 70% ethanol
<i>Inactivation</i>	Sensitive to heat; stable at pH 2.4 for up to 6 hours (some infectivity is lost); HBsAg not destroyed by UV of blood products; stable for years at -70° C
<i>Survival Outside Host</i>	Survives in dried blood for long periods (weeks), stable on environmental surfaces for a least 7 days at room temperature.

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 Hepatitis B virus. Additional PPE may be required depending on lab specific SOPs.
<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.