

Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET

Hepatitis E Virus (HEV)

CHARACTERISTICS		SUPPLEMENTAL REFERENCES		
<i>Morphology</i>	<p><i>Hepatitis E virus (HEV)</i> is a non-enveloped, positive-sense, single-stranded RNA virus in <i>Hepeviridae</i> family, genus <i>Hepevirus</i>, 27–34 nm diameter. There are four HEV genotypes: Genotype 1 in Africa and Asia, Genotype 2 in Mexico and West Africa, Genotype 3 as isolated cases in developed countries, and Genotype 4 in China and Taiwan.</p>	<i>CDC</i>	<p>https://www.cdc.gov/hepatitis/hev/index.htm <a href="https://www.cdc.gov/biosafety/publications/bmbl5/bmbl5_sect_viii_e.pdf#x2013; E: Viral Agents [PDF - 413 KB]">https://www.cdc.gov/biosafety/publications/bmbl5/bmbl5_sect_viii_e.pdf#x2013; E: Viral Agents [PDF - 413 KB]</p>	
<i>Growth Conditions</i>	PLC/PRF/5 human hepatoma or A549 human lung adenocarcinoma cell lines	<i>Public Health Agency of Canada</i>	https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/hepatitis-e-virus.html	
		<i>World Health Organization</i>	http://www.who.int/mediacentre/factsheets/fs280_jun2014/en/	
HEALTH HAZARDS		CONTAINMENT		
<i>Host Range</i>	Genotypes 1 and 2: human; Genotypes 3 and 4: human, pig, boar, deer. NHPs, non-inbred white mice and Wistar rats can be experimentally infected.	<i>BSL2/ABSL2</i>	Follow biosafety level 2 practices and containment for activities utilizing HEV, or HEV-infected feces, blood, or other tissues.	
<i>Modes of Transmission</i>	Fecal-oral (feces-contaminated drinking water); food-borne (consumption of uncooked/ undercooked shellfish, pork or deer meat); blood-borne (blood transfusions); mother to baby immediately before and after birth; person-to-person (uncommon)		Animal biosafety level 2 practices and containment are recommended for activities using naturally or experimentally infected NHPs or other animal models that may shed the virus.	
<i>Signs and Symptoms</i>	HEV causes acute sporadic and epidemic viral hepatitis. The ratio of symptomatic to asymptomatic Hepatitis E (HE) ranges from 1:2 to 1:13. When symptoms occur, they last 1-2 weeks and include jaundice, anorexia, enlarged tender liver, abdominal pain, nausea and vomiting, and fever. Pregnant women are at greater risk of obstetrical complications and death, with 10-30% mortality rate among pregnant women in the third trimester. Sporadically, HEV Genotype 3 mainly affect older men (>40 years) and immunocompromised individuals.	SPILL PROCEDURES		
<i>Infectious Dose</i>	Unknown	<i>Small</i>	Notify others working in the lab. Allow aerosols to settle. Don appropriate PPE. An EPA-registered disinfectant should be used to remove contaminating matter from surfaces (e.g., of bench tops and equipment). All decontamination litter and other disposable materials should be autoclaved.	
<i>Incubation Period</i>	15-60 day (average 40 day). HEV has been detected in stool from one week prior to symptom onset up to 30 days after onset of jaundice. Chronically infected persons (exclusively HEV Genotype 3 infections of immunocompromised) shed virus as long as infected.	<i>Large</i>	For assistance, contact Emory's Biosafety Officer (404-727-8863), or the EHSO Spill Team (404-727-2888)	
MEDICAL PRECAUTIONS / TREATMENT		EXPOSURE PROCEDURES		
<i>Prophylaxis</i>	None	<i>Mucous membrane</i>	Flush eyes, mouth or nose for 15 minutes at eyewash station.	
<i>Vaccines</i>	None	<i>Other Exposures</i>	Wash area with soap and water for 15 minutes.	
<i>Diagnosis & Treatment</i>	Infections of HEV are not clinically distinguishable from other types of acute viral hepatitis. No serologic tests have been approved by the FDA. Diagnosis of HEV infection is based on detection of IgM and IgG antibodies against the virus, or detection of HEV RNA in blood or stool. Hepatitis E is self-limiting and usually resolves on its own without treatment. Patients are typically advised to rest and get adequate nutrition and fluids. Hospitalization is sometimes required in severe cases and should be considered for pregnant women.	<i>Reporting</i>	Immediately report incident to supervisor, complete an employee incident report using 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)
<i>Surveillance</i>	Monitor for symptoms of disease.	VIABILITY		
<i>Emory Requirements</i>	Report all incidents using PeopleSoft	<i>Disinfection</i>	Susceptible to 1% sodium hypochlorite, 2% glutaraldehyde, formaldehyde	
LABORATORY HAZARDS		<i>Inactivation</i>	Inactivated by heat (60°C for 30 minutes), UV and gamma irradiation.	
<i>Laboratory Acquired Infections</i>	No cases of laboratory-acquired infections have been reported to date.	<i>Survival Outside Host</i>	Does survive outside the host	
<i>Sources</i>	Potential sources include feces and sera from infected NHPs or humans	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 HEV-infected samples. 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 done in a BSC.	