**Agent Summary: Hepatitis B Virus**

**Agent Information:**

* Hepatitis B virus (HBV) is a DNA virus belonging to the Hepadnaviridae family of viruses.
* The genome of HBV is 3.2 kb in size and has 4 open reading frames on the minus DNA strand that encode the envelope proteins, core and e antigens, the virus polymerase, and the hepatitis B x protein. Replication occurs in differentiated adult human hepatocytes and in differentiated liver cell lines (e.g., HepG2) via reverse transcription of a greater than genome length RNA intermediate.
* HBV is bloodborne and can readily infect open wounds and mucus membranes of susceptible individuals. Such individuals may develop a subclinical infection or a bout of acute, resolving hepatitis. Roughly 5-10% of acutely infected adults develop a chronic virus infection (70% of the time) or chronic liver disease which may begin as hepatitis, and then progress to fibrosis, cirrhosis and finally hepatocellular carcinoma.
* There are an estimated 300 million HBV carriers worldwide, with 887,000 deaths each year. While a vaccine to prevent HBV exists, lifelong treatment with nucleoside analogs is needed for those who are chronically infected. Treatment helps keep HBV under control, but presently, there is no cure.
* Signs and symptoms of hepatitis B appear 1-4 months post-infection and vary from mild to severe. These may include abdominal pain, dark urine, fever, joint pain, loss of appetite, nausea and vomiting, weakness and fatigue, and jaundice.
* It is transmitted by IV drug abuse, unprotected sex, and from exposure to human body fluids from infected individuals. It is also transmitted from infected mother to newborn.
* Diagnosis is by detection of hepatitis B surface antigen in the blood by ELISA and HBV DNA in the blood by PCR.
* Licensed recombinant vaccines against hepatitis B are available and are highly recommended for laboratory personnel.
* Importation of this agent requires CDC and/or USDA importation permits. Domestic transport of this agent may require a permit from USDA APHIS VS.
* Universal Precautions are used when handling all human blood and body fluids.
* This potential risk requires BSL2 containment and BSL3 practice. For HBV, SOP #3.0 will be followed. Use personal protective equipment as described in SOP #3.0.

**References:**

1. [Biosafety in Microbiological and Biomedical Laboratories-6th Edition (BMBL 6). U.S. Department of Health and Human Services, CDC, NIH](https://www.cdc.gov/labs/pdf/CDC-BiosafetyMicrobiologicalBiomedicalLaboratories-2020-P.pdf)
2. [OSHA Bloodborne Pathogens Standard (29 CFR 1910.1030). U.S. Department of Labor.](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10051&p_table=STANDARDS)

Enter the following information:

1. Name of the Principal Investigator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­\_\_\_\_\_\_
2. Applicable IBC protocol number(s) (approved or submitted): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. List the laboratory work locations (Building/room[s]) for HBV, a BSL2 agent:

* Procedures: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Storage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. List the animal facility building/room(s) for HBV, ABSL2 containment:

* Procedures: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Housing:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*Note: confirm with ULAR that the rooms listed above are suitable for ABSL2 animals.

1. Date of Agent Summary form completion: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_