

Herpes B Virus Information for Labs Handling Non-Human Primate tissues, organs, body fluids, or cells

Labs handling tissues, organs or cells from [macaque species](#) should be familiar with the risk of B virus infection, exposure prevention measures, and special post-exposure first aid measures.

B virus infection is caused by the zoonotic agent *Macacine herpesvirus* (formerly *Cercopithecine herpesvirus 1* [CHV-1], an alphaherpesvirus commonly found among macaques—a genus of Old World monkeys that serve as the natural host. B virus is also commonly referred to as herpes B, monkey B virus, herpesvirus simiae, and herpesvirus B. For more information on macaque species refer to:

<http://www2.gsu.edu/~wwwvir/VirusInfo/macaque.html>

The B virus is commonly found among the macaque monkeys, including rhesus macaques, pig-tailed macaques, and cynomolgus monkeys, any of which can harbor latent B virus infection and appear to be natural hosts for the virus. Monkeys infected with B virus usually have no or only mild symptoms, but in humans the infection can be fatal.

Most commonly, transmission of B virus infection occurs by animal bites or scratches, however, transmission can also occur from direct or indirect contact of broken skin or mucous membranes with infected monkey tissues or fluids. The ocular, oral, or genital secretions of monkeys, as well as nervous tissue and spinal fluid of monkeys, are potentially infectious. Primary cell cultures derived from macaque kidneys are also a potential source of virus. Exposure to peripheral blood from monkeys has not been reported to cause infection in humans. Cases of B virus infection have been reported after exposure to monkey cell cultures and to central nervous system tissue. There is often no apparent evidence of B virus infection in the animals or their cells and tissues, making it imperative that all suspect exposures be treated according to recommended standards.

Reported cases of infection in humans are very rare; however when it does occur, the infection can result in severe neurologic impairment or fatal encephalomyelitis if the patient was not treated soon after exposure. Since the identification of the virus in 1932, there have only been 31 documented human infections by B virus, 21 of which were fatal. Most of these infections have resulted from animal bites or scratches or from percutaneous inoculation with infectious materials. However, in 1997 a researcher died from B virus infection following a mucosal splash exposure (see [Fatal Cercopithecine herpesvirus 1 \(B virus\) Infection Following a Mucocutaneous Exposure and Interim Recommendations for Worker Protection](#). *Morbidity and Mortality Weekly Report* 1998). There have been no reported cases where prompt first aid with wound or exposure site cleansing was performed and no cases where cleaning and post exposure prophylaxis were done.

Prevention

Labs handling macaque tissues, organs or cells should always follow universal precautions and assume that all specimens are infected. BSL-2 practices and facilities are suitable for all activities involving the use or manipulation of tissues, cells, blood, or serum from macaques with appropriate personal protective equipment. Appropriate personal protective equipment, such as gloves, gowns, safety goggles, and face masks/shields, should be used to prevent skin and face exposures. Proper sharps precautions should be followed to prevent

needlestick injuries. Refer to the Exposure Control Plan for Animal Primary Cells/Tissues in your lab's Biosafety Information On-Line (BIO) application for additional safety instructions.

With the substantial increase in the use of macaque models for research (e.g., HIV), the number of potential human exposures to B virus has increased concomitantly. This has led to the publication of guidelines, which have been updated several times, by expert panels of virologists, veterinarians, and physicians—the [Recommendations for Prevention of and Therapy for Exposure to B virus \(*Cercopithecine Herpesvirus 1*\)](#) in *Clinical Infectious Diseases*, 2002.

There are no vaccines available for prevention of B virus infection. Diligence in the recognition of possible exposures, followed by recommended first aid and rapid diagnosis of B virus infection, are the keys to controlling human B virus infection.

IMMEDIATE cleaning is of the utmost importance in preventing infection with Herpes B virus. The most critical period for the prevention of B virus infection and other infections is during the first few minutes after an exposure occurs. Both the adequacy and the timeliness of wound or mucosa cleansing are the most important factors for reducing the risk of infection.

Labs handling herpes B virus or macaque tissues should have a post-exposure first aid kit containing first aid instructions and povidone-iodine or chlorhexidine solution (pre-packaged povidone-iodine or chlorhexidine scrub brushes are available). All staff handling macaque tissues should be trained in post-exposure first aid measures and know the location of the post-exposure first aid kit.

Post-Exposure First Aid Instructions for macaque species tissue, organ, or cells:

Eye or Mucous Membrane Exposures: Immediately irrigate with large amounts of water (using the eye wash station) for a minimum of 15 – 20 minutes. If reaching the nearest eye-washing station requires a delay of more than a few minutes, then a kit that contains a 1-L bag of sterile saline should be available at the work site.

Skin Exposures: Immediately wash and scrub thoroughly with povidone-iodine, chlorhexidine, or detergent soap for a minimum of 15 – 20 minutes, flushing with large amounts of running water.

After cleansing the exposed area, seek immediately obtain post-exposure medical evaluation to determine if antiviral medication is needed. If the exposure requires antiviral medication, it should be given soon after potential exposure to virus (preferably within the first few hours after exposure) but only after first aid has been provided and cleansing has been done. Refer to BLINK for reporting and medical treatment instructions:

<http://blink.ucsd.edu/safety/occupational/reporting.html>

References

Biosafety in Microbiology and BioMedical Laboratories (BMBL) 5th Edition:
http://www.cdc.gov/biosafety/publications/bmb15/BMBL5_sect_VIII_e.pdf

Centers For Disease Control: <http://www.cdc.gov/herpesbvirus/index.html>

Nation B Virus Resource Center: <http://www2.gsu.edu/~wwwvir/>