

GUIDELINES FOR WORKING SAFELY WITH ZIKA VIRUS IN THE LABORATORY

INTRODUCTION

The UCLA Institutional Biosafety Committee (IBC) has developed this document to address emerging health and safety concerns associated with Zika virus research being conducted at UCLA. The IBC has conducted a risk assessment and has determined that working with Zika virus is similar to working with other enveloped viruses that are not transmitted by the airborne route, such as Human Immunodeficiency Virus (HIV) and Hepatitis C Virus (HCV). The IBC has determined that this research may be conducted safely and responsibly at Biosafety Level 2 (BSL2) with following the precautions included below.

AGENT-SPECIFIC INFO

Zika virus (ZIKV) is a member of the *Flaviviridae* family, genus *Flavivirus*, and Spondweni group. The virus is lipid enveloped and icosahedral, with non-segmented, single stranded, positive-sense RNA genome.

Symptoms: Zika virus symptoms include a rash with red bumps on a flat red patch of skin, fever, body aches, pink eye, and joint pains. Around 80% of people infected with Zika do not develop any symptoms. 20% of people who develop symptoms will start 3-14 days after infection and last several days to 1 week on average. Less than 1% of adults infected with Zika virus will die of the illness.

Transmission: Zika is carried *Aedes aegypti* mosquito, although other *Aedes* species (*A. albopictus*) can transmitted through mosquito bites. Cases have been reported where Zika virus has been transmitted:

- by sexual contact
- from mother to child during childbirth. No cases have been reported of infection through breast milk, but it is a possibility.
- through blood transfusion
- And via lab-associated needle stick. In the laboratory, infection through aerosol/droplet-producing procedures is also possible.

Association with birth defects: During Zika outbreaks, mostly in Brazil 2014-2016 and elsewhere, a higher rate of infants born with birth defects was observed where mothers infected with Zika virus during pregnancy. Zika infection in mothers can lead to miscarriage, infants born with microcephaly, and infants that do not survive long after birth.

Association with Guillain-Barré syndrome: Guillain-Barré syndrome (GBS) is a rare illness of the nervous system where a person's own immune system damages the nerve cells, causing muscle weakness, and sometimes, paralysis. The Brazil Ministry of Health has reported an increased number of people with GBS who have been infected with Zika virus. CDC is working with Brazil to study the possibility of a link between Zika virus and GBS.

Treatment: Currently, there is no treatment for Zika virus infection, no vaccine is available, and

no post-exposure prophylaxis is available.

Personal Health Considerations and Precautions

- *Female (XX)*: Until the association between Zika virus infection and birth defects, including congenital microcephaly, is better understood, pregnancy should be considered a significant factor in risk assessment for individuals working with Zika virus. The involvement of pregnant individuals or individuals who are planning to become pregnant should be minimized for studies with Zika virus.
- *Males (XY)*: It has been shown that Zika virus can be transmitted sexually, although the time period is not established yet. Individuals with partners who are pregnant or are considering pregnancy should be aware of the risk associated with sexual transmission of Zika virus. Males who have a potential exposure risk to Zika virus should be advised to wear condoms if sexually active.

Personnel should consult with UCLA Occupational Health Facility <http://ohs.uclahealth.org/> or their personal physician if they have any questions or concerns related to their personal health status and the risks described above.

Laboratory Precautions:

The UCLA Institutional Biosafety Committee (IBC) requires BSL2 containment for handling Zika Virus. This involves the following:

- Inactivation of the virus: 70% (v/v) ethanol for surface inactivation, 10% bleach v/v for liquid cultures, and other common disinfectants may be approved by the IBC.
- Disposal of all solid waste into the biohazard/medical waste stream.
- Standard laboratory PPE, including lab coat, gloves, and eye protection.
- Work inside of a biosafety cabinet to keep all infectious material contained, including surface decontamination of all materials that are brought into and taken out of the biosafety cabinet.
- No open containers of Zika virus should be handled outside of a BSC.
- BSL2 and Zika virus specific training for personnel.
- Access to the lab should be restricted to lab members only when Zika virus work is active. Post signage to alert others to the active work with Zika Virus.
- An Integrated Pest Management (IPM) Program must be in place for all locations where Zika Virus will be handled. This should include efforts to ensure mosquitos are not allowed in the lab. If mosquitos are seen inside the building and near the lab report to biosafety@ehs.ucla.edu as soon as noticed.

Reporting Exposures and Potential Exposures

Following a research-related exposure or potential exposure to Zika virus (either in the laboratory or in the field), consult a physician, OHF, and report the exposure to the Biosafety Hotline:

Testing that is typically done to confirm infection can include:

- rRT-PCR on serum and urine **AND**
- IgM antibody on serum

REQUIRED APPROVALS

Please contact biosafety@ehs.ucla.edu for assistance with obtaining the appropriate approvals.

1. UCLA IBC approval, submit a BUA or amendment in [SafetyNet](#) describing the work involving Zika Virus, before work begins.
2. A CDC Import/Transport Permit is required if:
 - you will be importing the virus or virally-infected materials into the U.S., or
 - you will be obtaining the virus or virally-infected materials from someone else in the U.S. who imported these into the U.S. **AND** the original importer's CDC import permit restricted subsequent transfer of the materials as a term of their permit.
 - The CDC Import Permit regulations are found at 42CFR Part 71.54, and information on obtaining a [CDC Import Permit](#).
3. A USDA permit is required if:
 - you will be importing arthropods (infected or uninfected) that could serve as vectors for Zika virus transmission into the U.S., or
 - you will be importing virally-infected specimens or cultures containing animal cells, tissues or animal products (including FBS, porcine trypsin) into the U.S., or
 - you will be transferring the materials in (a) or (b) above from someone else who imported these materials into the U.S.
 - Guidance on the requirements for USDA Permits for specimens associated with Zika virus is available [via the internet](#); via Email at OV@aphis.usda.gov; by phone at 301-851-3300, option 3; and by FAX at 301-734-3652.

REFERENCES

Zika Virus

<http://www.cdc.gov/zika/>

CDC Guidance for Laboratories working with Zika Virus

<https://www.cdc.gov/zika/laboratories/index.html>

Zika Travel Health Notices

<http://wwwnc.cdc.gov/travel/notices>

Zika and Pregnancy

<http://www.cdc.gov/zika/pregnancy/index.html>

<http://www.cdc.gov/zika/hc-providers/index.html>