

# Zika Virus

Last update – Nov 2017

## CHARACTERISTICS

### Morphology

Zika virus (ZIKV) is an icosahedral, single-stranded, non-segmented, positive-sense RNA virus containing a lipid envelope. It is a member of the *Flaviviridae* family.

## HEALTH HAZARDS

### Host Range

Humans and NHPs; mice and other rodents under some circumstances; non-pathogenic for hamster, guinea pig or rabbit.

### Modes of Transmission

ZIKV is primarily transmitted by infected *Aedes* mosquitoes. May be transmitted by direct contact with blood or other bodily fluids from infected persons. Perinatal, in utero transmission events have been reported. Sexual transmission has been documented and transmission may be possible by blood transfusion.

### Clinical manifestations

About 1 in 5 people infected with ZIKV become ill. Most common symptoms are fever, rash, joint pain, conjunctivitis, muscle pain and headache. Illness is usually mild, symptoms lasting several days to a week. Mortality <1%. ZIKV infection during pregnancy may cause microcephaly, eye damage and/or vision impairment of the fetus. There is a higher incidence of Guillian-Barré syndrome in areas with Zika outbreaks.

### Infectious Dose

Unknown

### Incubation Period

Ranges between 2-7 days after bite of infected mosquito. Most infections remain asymptomatic (60-80%).

## LABORATORY HAZARDS

### Laboratory Acquired Infections (LAIs)

Accidental infection has occurred in laboratory personnel. Reproductive hazard. Workers at increased risk should consider enhanced precautions. Viruses from the *Flaviviridae* family have been a major cause of Laboratory Acquired Infections (LAIs). ZIKV has not been shown to be aerosol transmitted. Virion RNA may be infectious and serves as both genome and viral mRNA.

### Sources

Blood and other bodily fluids from infected persons/animals.

### Primary Laboratory Hazards

Parenteral inoculation (e.g. needle stick); direct contact of mucous membranes or broken skin with infected specimens may also be a source of hazards. Reproductive hazard. Aerosols may present hazards as well.

### Animal Research Considerations

Precautions when handling sharps or infected animals must be observed. Bedding may contain live virus.

### Risk Group

RG 2

## CONTAINMENT REQUIREMENTS

### BSL 2

For all activities involving known or potentially infected cultures or materials. Enhanced precautions are recommended where workers are at increased risk.

### ABSL 2

For all procedures utilizing infected animals and bedding.

## PERSONAL PROTECTIVE EQUIPMENT (PPE)

### Minimum PPE Requirements

Lab coat, gloves, closed-toe shoes. Face and eye protection are recommended for work with Zika virus. Additional PPE may be required depending on lab specific SOPs and workers who may be at increased risk.

### Additional Precautions

The use of needles and other sharp objects should be strictly limited.

### Laboratory Equipment

Biosafety cabinet, and centrifuge safety cups for work with virus, especially large volumes, high concentrations or procedures producing large amounts of aerosols.

## STABILITY

### Disinfection and Contact Time

Susceptible to 10% bleach for 2-5 min, and most other disinfectants.

### Inactivation

Inactivated by heat 50-60°C for at least 30 minutes.

### Survival Outside Host

Survives on surfaces for > 3 days.

## SPILL PROCEDURES

### Minor (droplets on work surface)

Cover spill with paper towels and gently pour or spray disinfectant over the towels. Allow proper contact time (see above).

### Major

Notify others working in the lab and exit the lab. Allow aerosols to settle for 30 mins. Don appropriate PPE. Cover area of the spill with paper towels or other absorbent and gently pour an EPA approved disinfectant over the towels, working from the perimeter towards the center. Allow 30 minutes of contact time before cleanup. Dispose of cleanup materials in biohazard waste.

## EXPOSURE PROCEDURES

### Mucous membranes

Flush eyes, mouth or nose for 15 minutes at eyewash station.

### Other Exposures

Wash area with soap and water for 15 minutes.

### Reporting

Immediately report to supervisor and contact the Biosafety Office (558-6182).

### Medical Follow-up

Contact UHS (584-4457 east campus | 556-2564 west campus).

## REFERENCES

### CDC

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

### OSHA/NIOSH

<https://www.osha.gov/zika>

### World Health Organization

<https://www.who.int/news-room/fact-sheets/detail/zika-virus>

### Viral Zone

[http://viralzone.expasy.org/6756?outline=all\\_by\\_species](http://viralzone.expasy.org/6756?outline=all_by_species)