



# Overview of Chikungunya virus infection

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## DESCRIPTION

Chikungunya Virus (CHIKV) is currently one of the most relevant arboviruses in public health. It belongs to the Togaviridae family and concern to the genus Alpha virus and causes rheumatoid arthritis called Chikungunya Fever (CHIKF). Chikungunya fever, an arboviral disease that is caused by Chikungunya Virus (CHIKV) and is transmitted by mosquitoes, was first recognized in epidemic form in East Africa in 1952-1953. It is characterized by a multifaceted disease that is distinguished from other arbovirus infections by severe and debilitating arthralgia, which can last for months or years in some individuals. Despite the great social and economic burden caused by CHIKV infection, there is currently no vaccine or specific antiviral drug available.

The recent outbreak has shown a change in the severity profile of the disease, in which a distinctive and severe manifestation can lead to hundreds of deaths, reinforcing the need to understand replication and pathogenic processes. CHIKF is a complex disease that results from a wide variety of cell-type infections. Although there are many *in vivo* models for studying CHIKV infection, none of them can comprehensively reproduce the disease signature observed in humans, which poses a challenge to vaccine and drug development. Therefore, understanding the capabilities and limitations of cutting-edge experimental models is essential to move forward in this field. In this context, current CHIKV describes knowledge on epidemiology, replication, pathogenesis and immunity, and also brings a critical perspective on CHIKF's.

## PATHOGENESIS

Female mosquito bites are more likely to spread the Chikungunya virus. Infected mosquitoes bite the host and infect by injecting at the skin. Infection is transmitted through fibroblasts and dermal macrophages. Virus replication initiates the

host immune response. The virus spreads rapidly through the circulatory system to the lymph nodes. Virus replication occurs in peripheral tissues and the virus is transmitted by mosquito bites. When the virus reaches the target organs (muscles, joints, liver and brain) an immune response is produced.

## IMMUNE RESPONSES TO INFECTION

The skin acts as a portal entry of the virus into the body after an infected mosquito bite, and initially it inhabits living cells such as keratinocytes, melanocytes, dendritic cells, and contributes to the spread of the virus to other target organs.

## INNATE IMMUNE RESPONSE

The natural immune response is the body's first line of defense. Monocytes, NK cells are certain blood leukocytes that provide innate immunity to various viral infections. These cells accelerate the spread of the virus because their main location is in the peripheral tissues and circulatory system. In the case of CHIKV infection both hematopoietic and nonhematopoietic cells are involved by the innate immune system.

## ADAPTIVE IMMUNE RESPONSE

Positive Immune Response Chikungunya provides protection against infection by positive immunity. It has been observed that once the anti-CHIKV immune response is established, it can completely protect the host from re-infection by CHIKV.

## SYMPTOMS

The patient's symptoms usually begin after an infected mosquito bites. Symptoms include headache, muscle aches, joint inflammation, rash, fever and joint pain. Of these, fever and arthritis are the most common symptoms of Chikungunya.

