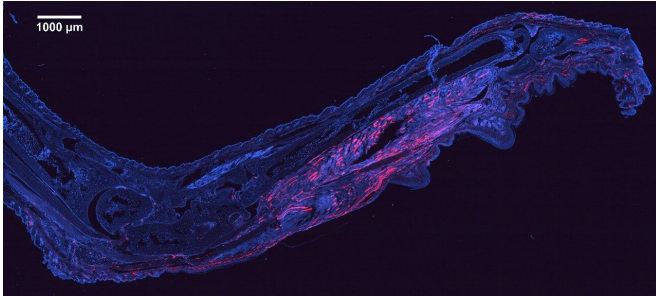


How chikungunya virus may cause chronic joint pain

29 August 2019



Representative image of frozen section of whole ankle taken at 28 days post infection from reporter mice (tdTomato mice) infected with 106 PFU CHIKV-3-Cre. Blue shows DAPI staining and red shows tdTomato. The tdTomato cells survive CHIKV infection and harbor the persistent CHIKV RNA. Scale bar represents 1000 μm. Credit: Young AR, et al. (2019)

A new method for permanently marking cells infected with chikungunya virus could reveal how the virus continues to cause joint pain for months to years after the initial infection, according to a study published August 29 in the open-access journal *PLOS Pathogens* by Deborah Lenschow of Washington University School of Medicine in St. Louis, and colleagues. According to the authors, uncovering the mechanisms for long-term disease could aid in the development of treatments and preventative measures for this incapacitating, virally induced chronic arthritis.

Chikungunya virus is spread by mosquitoes and causes severe joint and muscle pain. Approximately 30 to 60 percent of people infected with the virus continue to experience joint pain for months to years after the [initial infection](#). However, the cause of this persistent [joint pain](#) is unclear, as replicating virus cannot be detected during the chronic phase. To address this question, Lenschow and colleagues developed a reporter system to permanently mark [cells](#) infected by

chikungunya virus.

Using this system, they show in mice that marked cells surviving chikungunya virus infection are a mixture of muscle and skin cells that are present for at least 112 days after initial virus inoculation. Treatment of mice with an antibody that blocks chikungunya virus infection reduces the number of marked cells in the muscle and skin. Moreover, surviving marked cells contain most of the persistent chikungunya virus RNA. Taken together, the findings provide further evidence for musculoskeletal cells as targets of [chikungunya virus](#) infection in the acute and chronic stages of disease. According to the authors, this reporter system represents a useful tool for identifying and isolating cells that harbor chronic viral RNA in order to study the mechanisms underlying chronic disease.

"Persistent CHIKV RNA can be detected in human and animal models but no one has been able to identify where the RNA resides due to insensitive techniques," adds Lenschow. "Using our reporter system we have demonstrated that cells can survive CHIKV infection, and these cells harbor most of the persistent RNA. Since many believe that this persistent RNA contributes to chronic arthritis, this system will be a useful tool to study the mechanisms underlying chronic disease."

More information: Young AR, Locke MC, Cook LE, Hiller BE, Zhang R, Hedberg ML, et al. (2019) Dermal and muscle fibroblasts and skeletal myofibers survive chikungunya virus infection and harbor persistent RNA. *PLoS Pathog* 15(8): e1007993. doi.org/10.1371/journal.ppat.1007993

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