MONTHLY SCIENTIFIC REVIEW ON **CHIKUNGUNYA VIRUS**

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Situation at a glance

- Chikungunya is an infectious disease caused by an arbovirus, the chikungunya virus.
- Between 2010 and 2024, not a single case had been detected on the Reunion Island. Since the beginning of 2025, Reunion Island has recorded 27 000 confirmed native cases of chikungunya. Since week 11, 36 severe cases have been reported, including 16 in newborns or infants, who presented with a severe clinical condition requiring intensive care management.
- The IXCHIQ vaccine against chikungunya is now available, and the French National Authority for Health (HAS) published its recommendations on February 27, 2025.

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Scientific articles

This section presents relevant articles published on peer-reviewed scientific journals or pre-print platforms.

This week, discover breakthroughs in chikungunya surveillance, clinical description, pathogen characterization, animal and environmental research, physiopathology, therapeutic research, and vaccination.

Surveillance

Phylogenetic Analysis of Chikungunya Virus Eastern/Central/South African-Indian Ocean Epidemic Strains, 2004-2019. Lo Presti A, Argentini C, Marsili G, Fortuna C, Amendola A, Fiorentini C.

Published in Viruses on March 2025.

This study aims to investigate the phylogeographic spread and mean evolutionary rate of ECSA-IOL-CHIKV strains causing outbreaks in Italy in 2007 and 2017, to better understand where and when these outbreaks originated and CHIKV circulation. In this analysis, the CHIKV strains linked to recent epidemic waves, represented in the dataset and also including the Indian Ocean islands and the Indian subcontinent strains of the years 2004–2007, most likely originated in Kenya in 2002 (95% HPD: 2001–2004), followed by dissemination to other countries through two distinct routes: one through the Indian Ocean (Reunion, Comoros etc.) and the other through India, and subsequently from India throughout South East Asia, finally reaching Italy in the year 2007 (95% HPD: 2006–2007). This study reinforces that continued genomic surveillance, combined with phylogenetic, phylogeographic, and mutation analysis, is needed to support the monitoring of CHIKV evolution and of diversity, and that it could be useful in public health.

Clinical description

Neurodevelopmental Follow-Up in Children with Intrauterine and Perinatal Exposure to Chikungunya Virus. Pinho de Almeida Di Maio Ferreira FC, Nielsen-Saines K, Lopes Moreira ME, Dessimoni Salgado A, Pereira Costa R, de Campos SB, Zhang D, Hüning B, Einspieler C, Marschik PB, Fuller T, Brasil P.

Published in The Journal of Pediatrics on April 2025.

This study aims to investigate the effects of intrauterine and perinatal exposure to chikungunya virus (CHIKV) on neurodevelopment in infants and toddlers. The authors conducted a cohort study comparing children with intrauterine or perinatal exposure to maternal CHIKV infection with unexposed controls in Rio de Janeiro, Brazil. Abnormal neurodevelopmental results were seen in both infected and uninfected children with intrauterine or perinatal CHIKV exposure. The authors conclude that infant neurodevelopment monitoring should be considered following exposure to maternal CHIKV infection in pregnancy to facilitate early interventions and to mitigate neurodevelopmental sequelae.

Pathogen characterization

Attenuation of Chikungunya Virus by a Single Amino Acid Substitution in the nsP1 Component of a Non-Structural Polyprotein. Chamberlain J, Dowall SD, Smith J, Pearson G, Graham V, Raynes J, Hewson R.

Published in Viruses on February 2025.

In this study, the authors developed a reverse genetics system to evaluate the phenotype that resulted from the substitution of alanine, present at the P3 position in the wild-type Chikungunya virus (CHIKV) infectious clone, with valine. The A533V-mutant CHIKV induced milder disease symptoms in the C57BL/6 mouse model than the wild-type virus, in terms of severity of inflammation, length of viraemic period, and histological changes. Furthermore, the induction of type I IFN occurred more rapidly in both CHIKV-infected cell cultures and the mouse model with the mutant CHIKV.

YBX1 is required for assembly of viral replication complexes of chikungunya virus and replication of multiple alphaviruses. Li Z-Q, Zhao L-X, Wang S-Y, Hu C-Y, Wang Y-Y, Yang Y.

Published in J Virol on Fabruary 2025.

In this study, the authors performed genome-wide CRISPR/Cas9-based screens and identified Y-box binding protein 1 (YBX1) as an essential cellular factor for Chikungunya virus (CHIKV). Deficiency of YBX1 inhibited CHIKV RNA replication and impaired virus production. Upon CHIKV infection, YBX1 showed a striking re-localization to viral replication complexes (vRCs), where it co-localized with CHIKV nsP3 and dsRNA intermediates. YBX1 directly interacted with CHIKV nsP3, and mutation of the YBX1-binding motif in CHIKV nsP3 suppressed viral replication in host cells. Furthermore, YBX1 bound to viral RNA and increased the viral RNA-binding activity of CHIKV nsP3. In addition to CHIKV, YBX1 was also essential for replication of all examined alphaviruses including the prototypic alphavirus. These findings suggest that YBX1 acts as a scaffold for assembly of chikungunya vRCs and an important factor for replication of multiple alphaviruses.

Animal and environmental research

Biochemical and physiological characterization of Aedes aegypti midgut chymotrypsin. Ramirez AG, Isoe J, Serafim MSM, Fong D, Le MA, Nguyen JT, Burata OE, Lucero RM, Spangler RK, Rascón AA Jr.

Published in Sci Rep on March 2025.

This study focused on characterizing the activity profile and role of Ae. aegypti chymotrypsin (AaCHYMO). The authors performed knockdown studies resulted in elimination and significant reduction of chymotrypsin-like activity in blood fed midgut extracts, while in vitro fluorescent and blood protein digestion assays revealed important substrate specificity differences. Interestingly, knockdown of AaCHYMO did not impact fecundity, indicating the presence of an intricate network of proteases working collectively to degrade blood proteins. Further, knockdown of the ecdysone receptor (EcR) led to a decrease in overall AaCHYMO expression and activity in the mosquito, which may play an important regulatory role. Understanding the role of AaCHYMO and other understudied midgut proteases will aid in validating these enzymes as potential targets for the development of inhibitors and a new vector control strategy.

Physiopathology

Transcriptomic insights into early mechanisms underlying post-chikungunya chronic inflammatory joint disease. Ramundo MS, da Fonseca GC, Ten-Caten F, Gerber AL, Guimarães AP, Manuli ER, Côrtes MF, Pereira GM, Brustolini O, Cabral MG, Dos Santos Lázari C, Brasil P, da Silveira Bressan C, Nakaya HI, Paranhos-Baccalà G, Vasconcelos ATR, Sabino EC.

Published in Sci Rep on February 2025.

In this study, the authors conducted a comprehensive proteomic analysis across various organs in rodent and nonhuman primate models to investigate Chikungunya virus' impact on organs beyond joints and muscles and to identify key host factors involved in its pathogenesis. This study revealed significant similarities and differences between the two species, in organ-specific viral load, histopathology, immunity, and metabolism. Their findings demonstrated that both species exhibited similar innate immune activation across multiple organs, such as the upregulation of type I interferon-related proteins like ISG15, which emerged as a potential supportive diagnostic target for Chikungunya virus. Additionally, the RLR (RIG-I-like receptors) signaling pathway was identified as a promising anti- Chikungunya virus strategy. Finally, this research underscores the need for appropriate animal models in Chikungunya virus studies.

The role of autoantibodies in post-chikungunya viral arthritis disease severity. Ansah-Dico S, Heckler I, Premazzi Papa M, Sucerquia Hernández A, Mejía JF, Tritsch SR, Mendoza-Torres E, Encinales L, Bonfanti AC, Proctor AM, Wells JM, Hernández DD, Pretelt Gazabon JM, Pulido MG, Castiblanco-Arroyave SC, Simmens SJ, Lynch R, Chang AY-h.

Published in Microbiol Spectr on April 2025.

In this study, the authors investigated the molecular mechanisms underlying the Post-Chikungunya Chronic Inflammatory Joint Disease (pCHIKV-CIJD) development by analyzing RNA transcripts, including small RNAs, of whole blood from CHIKV-infected patients. By comparing patients who evolved to pCHIKV-CIJD with those who did not, they identified molecular signatures associated with chronification in acute and post-acute disease phases. Notably, LIFR, an immune receptor that enhanced IL-6 transcription, was down-regulated in the acute phase of pCHIKV-CIJD patients, while its inhibitor, hsa-miR-98-5p, was up-regulated in these individuals. These findings provide insights into the early molecular mechanisms involved in the chronification and highlight potential targets for further studies.

Therapeutic research

Combinations of approved oral nucleoside analogues confer potent suppression of alphaviruses in vitro and in vivo [Preprint]. Verwimp S, Wagoner J, Arenas EG, De Coninck L, Abdelnabi R, Hyde JL, Schiffer JT, White JM, Matthijnssens J, Neyts J, Polyak SJ, Delang L.

Published in bioRxiv on March 2025.

In this study, the authors evaluated combinations of three approved oral directly acting antiviral (DAA) drugs (sofosbuvir (SOF), molnupiravir (MPV) and favipiravir (FAV)) against CHIKV, Semliki Forest virus (SFV), Sindbis virus (SINV), and Venezuelan Equine Encephalitis virus (VEEV) in vitro and in vivo. In human skin fibroblasts, synergistic antiviral effects were observed for the drug combinations MPV + SOF and FAV + SOF against CHIKV, and for FAV + SOF against SFV. In human liver Huh7 cells, the combinations of FAV + MPV conferred additive to synergistic activity against VEEV and SINV strains, while SOF synergized with FAV against SINV strains. In a mouse model of CHIKV arthritis, MPV improved CHIKV-induced foot swelling and reduced systemic infectious virus titers. In summary, combining approved oral nucleoside analogs confers potent suppression of multiple alphaviruses in vitro and in vivo with enhanced control of viral genetic evolution in the face of antiviral drug pressure.

Vaccination

Cross-neutralizing activity of the chikungunya vaccine VLA1553 against three prevalent chikungunya lineages. Kosulin K, Brasel TL, Smith J, Torres M, Bitzer A, Dubischar K, Buerger V, Mader R, Weaver SC, Beasley DWC, Hochreiter R.

Published in Emerg Microbes Infect on December 2024.

In the context of vaccine development against the Chikungunya virus (CHIKV), the authors assessed the cross-protective efficacy of VLA1553—a vaccine recently approved for the prevention of chikungunya disease—against the three main CHIKV lineages: East/Central/South African, West African, and Asian. Using sera collected from participants in a randomized Phase 3 clinical trial (NCT04546724) conducted in adults, they demonstrated that VLA1553 elicits neutralizing activity against all three lineages. These findings support the potential of VLA1553 as a key intervention to mitigate the global burden of chikungunya.

Chikungunya virus virus-like particle vaccine safety and immunogenicity in adults older than 65 years: a phase 3, randomised, double-blind, placebo-controlled trial. Tindale LC, Richardson JS, Anderson DM, Mendy J, Muhammad S, Loreth T, Tredo SR, Ramanathan R, Jenkins VA, Bedell L, Ajiboye P.

Published Lancet on March 2025.

In this phase 3, randomised, double-blind, placebo-controlled, parallel-group trial, adults aged 65 years and older received a single intramuscular dose of Vimkunya (previously chikungunya virus virus-like particle vaccine) or placebo at ten sites in the USA. Safety was assessed up to 183 days after dose administration in all participants. Vimkunya induced a protective seroresponse in 149 (82%) of 181 participants (95% CI 76·1-87·2) at day 15, in 165 (87%) of 189 participants (81·8-91·3) at day 22, and in 139 (76%) of 184 participants (68·9-81·2) at day 183. Most adverse events were grade 1 or 2 in severity and of short duration. No vaccine-related serious adverse events or deaths occurred.

Safety and immunogenicity of an adjuvanted chikungunya virus virus-like particle (CHIKV VLP) vaccine in previous recipients of other alphavirus vaccines versus alphavirus vaccine-naive controls: an open-label, parallel-group, age-matched, sex-matched, phase 2 randomised controlled study. Patra S, Gajbhiye V, Karpe YA.

Published in Lancet Microbe on April 2025.

This study aimed to compare immunogenicity and safety of a chikungunya virus virus-like particle (CHIKV VLP) vaccine in previous recipients of heterologous alphavirus vaccines with alphavirus-naive controls in the USA. This was an open-label, parallel-group, age-matched, sex-matched, phase 2 randomised controlled trial, which was conducted at 2 clinical study sites in the USA, adults (aged 18-65 years) who had previously received an investigational Venezuelan equine encephalitis virus vaccine (previous alphavirus vaccine recipients; n=30) and sex-matched and age-matched alphavirus vaccine-naive controls (n=30) were intramuscularly administered one 40 µg dose of CHIKV VLP vaccine on day 1. the authors demonstated that CHIKV VLP vaccine was well tolerated and similarly immunogenic in both alphavirus vaccine-naive participants and previous recipients of a heterologous alphavirus vaccine. There were no significant differences in adverse events between the groups.

Relevant news

This section presents official reports from health agencies, manufacturers and press releases with reliable sources.

Chikungunya et dengue à La Réunion. Bulletin du 9 avril 2025.

Published by SPF on 9 April 2025.

Since the beginning of 2025, over 27,000 cases of chikungunya have been reported on the island. The epidemic continues to spread, with 6,289 cases detected in week 13. The outbreak is widespread and severe. Indicators related to chikungunya in primary care, emergency departments, and hospitals continue to rise. Since week 11, 36 severe cases of chikungunya have been reported, including 16 among newborns or infants presenting with severe clinical symptoms requiring intensive care management. The circulation of dengue virus currently remains low on the island, with only about thirty cases detected since the beginning of the year and a single locally acquired case reported in week 13. All cases were geographically scattered.

Chikungunya à La Réunion : semaine du 24 au 30 mars 2025

Published by ARS La Réunion on 9 April 2025.

In this epidemic context, the Prefect urges the population of Réunion to remain vigilant and emphasizes that active public participation in the implementation of preventive measures is essential to limit the spread of the virus. It remains crucial to protect oneself from mosquito bites and to continue taking protective measures even when ill, in order to avoid infecting others. Individuals at risk of developing severe forms of the disease are strongly encouraged to get vaccinated.

Generating high-quality evidence on existing vaccines for Chikungunya in response to outbreaks

Published by WHO on 8 April 2025.

This consultation will review existing vaccines, identify knowledge gaps, and discuss strategies to generate the best quality evidence for outbreak response.

IXCHIQ (Vaccin contre le chikungunya, vivant, atténué) - Chikungunya

Published by HAS on 4 April 2025.

Favorable opinion for reimbursement in 'active immunization for the prevention of disease caused by the chikungunya virus (CHIKV) in individuals aged 18 years and older. The use of this vaccine must comply with official recommendations.

Chikungunya : démarrage de la campagne de vaccination à La Réunion dès le 7 avril pour les personnes les plus à risque

Published by ARS on 4 April 2025.

In Réunion, the first phase of the free vaccination campaign against chikungunya will begin on Monday, April 7, 2025. An initial stock of 40,000 doses of the IXCHIQ® vaccine, developed by the Valneva laboratory, will be available. Individuals aged 65 and over with comorbidities will be eligible for vaccination, upon medical prescription, by a physician, a nurse, or a community pharmacist.

Call for nomination of experts to serve on the SAGE Working Group on Chikungunya Vaccines

Published by WHO on 2 April 2025.

This SAGE Working Group on Chikungunya vaccination (from now on referred to as SAGE WG) is established by the Secretariat as a resource intended to support WHO in the preparation of SAGE deliberations by reviewing and providing evidence-based information and options for policy or strategy recommendations to be decided by SAGE. This SAGE WG is tasked to work on specific issues and address critical questions on behalf of SAGE to prepare the background material and draft recommendations for SAGE.

Valneva Submits Adolescent Label Extension Application for its Chikungunya Vaccine, IXCHIQ®, to UK MHRA

Published by Valneva on 31 March 2025.

Valneva announced that it has submitted a label extension application to the Medicines and Healthcare products Regulatory Agency (MHRA) of the United Kingdom (UK) to potentially expand the use of its chikungunya vaccine, IXCHIQ®, currently approved in adults, to adolescents aged 12 to 17 years in the UK. This submission follows the recent positive opinion of the European Medicines Agency (EMA) on extension of IXCHIQ®label to adolescents in the European Union (EU).

Passage au niveau 2A du plan ORSEC : un premier cas autochtone de chikungunya confirmé à Mayotte

Published by ARS Mayotte on 26 March 2025.

The Regional Health Agency of Mayotte announces that two new cases of chikungunya have been confirmed, including one locally transmitted case. The individuals have already received medical care, and the affected areas have been disinfected. Given the various regional and environmental factors, the health authorities of the territory are urging heightened vigilance.

Guidelines and practical information

This section lists official manuals of recommendations for clinical practice or public health policy published by leading health organizations.

HAS	Utilisation du vaccin IXCHIQ dans le contexte épidémique de chikungunya dans les territoires de La Réunion et de Mayotte (2025)
CDC	Information for traveller's : Chikungunya (2024)
WHO	Guidelines on Clinical Management of Chikungunya Fever (2019)
ECDC	Guidelines for mosquito surveillance
Ministère de la Santé et de la Prévention	Recommandations nationales sur la prise en charge du chikungunya (Formes aiguës, formes persistantes) (2014)
PAHO	Preparedness and Response for Chikungunya Virus Introduction in the Americas (2011)
WHO	Guidelines for prevention and control of Chikungunya fever (2009)

Fact sheets

Transmission

CHIKV is an RNA virus from the *Alphavirus* genus, part of the *Togaviridae* family, originating in Africa. The disease's name means "the one who walks bent over," due to joint and muscle pain. There are four known clades: West African, Asian, ECSA (East/Central/South African), and IOL (Indian Ocean Lineage). The virus is mainly transmitted to humans through Aedes mosquitoes (Aedes aegypti and Aedes albopictus). Less common transmission can occur via contact with infected blood, especially in laboratory and healthcare settings (<1%). Vertical transmission from mother to child during the second trimester of pregnancy and intra-partum transmission during viremia at delivery have also been reported.

Diagnosis

For suspected cases, PCR testing should be done as soon as possible after symptoms appear (viremia lasts about 8 days). Isolated IgM antibodies require a second sample at least 10 days later to confirm seroconversion (IgG appearance). IgM presence alone does not confirm recent infection due to their prolonged persistence.

Symptoms

CHIKV infection is symptomatic in 80% of cases and typically progresses through three clinical stages: acute (day 1–21), post-acute (day 21–3 months), and chronic (beyond 3 months). Initial symptoms are non-specific (fever, headache, rash, muscle pain, and joint pain). Severe forms are more likely in patients with comorbidities, pregnant women, immunocompromised individuals, and people at extreme ages. Mortality for severe cases ranges from 0.5% to 1.3%. Chronic forms, which significantly affect quality of life, impact 20–60% of patients depending on the viral lineage and care quality.

Treatment

There is no approved specific treatment for CHIKV. Management focuses on relieving symptoms and treating rheumatologic complications.

Vaccination

IXCHIQ, developed by Valneva, is the only approved chikungunya vaccine. It is a live-attenuated vaccine given as a single intramuscular dose. It has FDA and EMA approval for individuals aged 18 and older who are not immunocompromised.

More information