MONTHLY SCIENTIFIC REVIEW
ON FILOVIRUS

The content of this document is subject to change as the health situation evolves.
All informations comes from a valid and credible source.

EDITION **Jan. 2026** No. **4**

Editors: Yoann Allier, Douae Ammour, Mathilde Certoux, Dahlia Chebbah, Vincent Cicculi, Nathan Claveau, Mario Delgado-Ortega, Sandrine Halfen, Charly Kengne, Rana Lebdy, Diana Molino, Mélanie Nguyen Marzine, Eric Rosenthal, Amandine Verga Gerard, Armelle Pasquet, et Eric D'Ortenzio, avec la participation de Marie Winter (OPEN-ReMIE).

ANRS Emerging Infectious Diseases - Paris, France

Situation at a glance

- In January 2025, two filovirus outbreaks occurred on the African continent: a Marburg virus disease outbreak in Tanzania and a Sudan virus disease outbreak in Uganda.
- On 1 September 2025, the Democratic Republic of the Congo reported an outbreak of Ebola virus disease (EVD) in Kasaï Province, in the southwest of the country. More than 53 cases were confirmed, including at least 45 deaths. The health authorities officially declared the end of the outbreak on 1 December 2025.
- In November 2025, a new Marburg outbreak occurred in Ethiopia, with 13 confirmed cases and 8 deaths as of 10 December 2025.

Scientific articles

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

2026-01-30

A Phase Ib, Placebo-controlled Randomized Clinical Trial of the Ebolavirus DNA Vaccine Candidate INO-4201 Followed by Electroporation as Booster Vaccination in Healthy, rVSVΔG-ZEBOV-GP-primed Volunteers (Boost-EBOV).

Journal: Clin Microbiol Infect

Authors: Angela Huttner, Marc-Antoine de La Vega, Cristina Boehm-Bosmani, Jean Boyer, Christiane Eberhardt, Paola Fontannaz, Elisabeth Gillespie, Sylvain Lemeille, Matthew P Morrow, Marie-Edith Nepveu-Traversy, Bonaventure Orizu, Emma L Reuschel, Romain Roth, Hiba Sharkhith, Albert J Sylvester, Pauline Vetter, Laurent M Humeau, Judith Pignac-Kobinger, Dave Liebowitz, Arnaud M Didierlaurent, Claire-Anne Siegrist, Gary P Kobinger

OBJECTIVES

Nearly a million people have received the recombinant vesicular stomatitis virus-based vaccine expressing the surface glycoprotein of Ebola virus (rVSVΔG-ZEBOV-GP), whose immune durability is unknown. We evaluated the safety and immunogenicity of the DNA vaccine candidate INO-4201 in volunteers primed with the rVSVΔG-ZEBOV-GP vaccine.

ME

See details

2025-12-01

Discovery of three small-molecule inhibitors targeting Ebolavirus genome replication and transcription.

Journal: J Gen Virol

Authors: Victoria Easton, Martin J McPhillie, John Barr, Thomas Edwards, Richard Foster, Colin Fishwick, Mark Harris

The 2013 Ebola virus (EBOV) outbreak was the largest in history. Despite recent advances in both vaccines and monoclonal antibody therapies, 12 years later, EBOV still poses a substantial threat. Previously, we published a ligand discovery pipeline combining in silico screening of compounds with a robust and rapid EBOV minigenome assay for early-stage inhibitor validation

See details

2026-01-28

Evaluation of Probenecid Against Filovirus Replication in Vero E6 Cells.

Journal: Viruses

Authors: Kendra Alfson, Ricardo Carrion, Ralph A Tripp, Chris Cirimotich, David E Martin

In human and non-human primates, filoviruses, e.g., Ebolaviruses, cause severe hemorrhagic fever for which there are few therapeutic options. While there are licensed vaccines and therapeutics for Ebola virus disease, there is no approved vaccine or treatment for other Ebola diseases. There is a need for broad-spectrum antivirals to treat Ebola virus (EBOV), Sudan virus (S

See details

2025-12-15

How endosomal PIKfyve inhibition prevents viral membrane fusion and entry.

Journal: bioRxiv

Authors: Nicholas Chow, Gustavo Scanavachi, Anand Saminathan, Tom Kirchhausen

Inhibition of PIKfyve, a lipid kinase, swells late endosomes/lysosomes, blocking fusion and entry of certain enveloped viruses (e.g., Ebola, SARS-CoV-2) by increasing membrane tension and creating an energy barrier. This effect is independent of lipid composition or virion trafficking changes, and is demonstrated through live-cell imaging and single-cell assays.

See details

2026-01-28

Tetraspanin CD9 Is a Positive Regulator of Filovirus Egress.

Journal: Viruses

Authors: Loveleena K Anand, Marija A Djurkovic, Ariel Shepley-McTaggart, Olena Shtanko, Ronald N Harty

CD9, a plasma membrane protein, positively regulates egress of EBOV and MARV. CD9 knockdown reduces viral egress, while CD9 overexpression rescues it, suggesting CD9 as a potential antiviral target.

See details

2026-01-28

Seven Strategies Implemented in Response to the 16th Ebola Virus Disease Outbreak in the Democratic Republic of Congo: Lessons Learned over a Three-Month Period.

Journal: Viruses

Authors: Dieudonné K Mwamba, Karl B Angendu, Waly Diouf, Marie-Claire Mikobi, Olive Leonard, Danny Kalala, Nella Ntumba, Deogratias Kakule, David K Kayembe, Emilia Sana, Bienvenu Kabasele, Jack Katya, Alice Montoyo, Béatrice Serra, Henriette Bulambo, John Otshudiema, Serge Kapanga, Olea Balayulu, Jeanpie Muya, Erick Kamangu, Richard Kitenge, Gaston Tshapenda, Cris Kasita, Mory Keita, Francis K Kabasubabo, John Kombe, Mathias Mossoko, Christian B Ngandu, Célestin Manianga, Gregory Moullec, Christina Zarowsky, Pierre Z Akilimali

IMS model with seven strategies effectively managed 2025 Ebola outbreak in Bulape HD, DRC, leveraging experience, TFP support, and community engagement, despite challenges.

See details

2026-01-24

Molecular characterization of Ebola virus glycoprotein V75A substitution in the 2018-2020 epidemic.

Journal: Cell

Authors: Linjin Fan, Yulong Wang, Yinghao Wang, Zequn Wang, Xiaofeng Yang, Chudan Liang, Chongguang Yang, Nan Liu, Jun Zheng, Weifang Kang, Pengfei Ye, Pei Sun, Wendi Shi, Xinyi Guo, Weijian Wu, Jian-Rong Yang, Quan Liu, Linna Liu, Jun Qian

The 2018-2020 Ebola epidemic saw the emergence of the GP-V75A substitution in the glycoprotein, enhancing infectivity and binding affinity to host receptor NPC1. This variant reduced the efficacy of NPC1-targeting treatments and neutralizing antibodies, coinciding with increased case numbers. Real-time genomic surveillance is crucial for epidemic preparedness.

See details

2026-01-16

Metabolic Basis of Post-Infectious Sequelae After Ebola Virus Disease.

Journal: medRxiv

Authors: Anna Sanford, Nell Bond, Samuel Ficenec, Charlotte Osterman, Payton Farkas, Emily Engel, Bronwyn Gunn, Donald S Grant, Robert Samuels, Kevin Zwezdaryk, John Schieffelin

EVD survivors with post-Ebola syndrome (PES) exhibit altered metabolism in multiple pathways, including tricarboxylic acid cycle, amino acid, nucleotide, and short chain fatty acid metabolism, which may contribute to immune dysfunction. These metabolites could serve as potential biomarkers for PES.

See details

2026-01-21

An mRNA vaccine encoding the Ebola virus glycoprotein induces high neutralizing antibody titers and provides strong protection against lethal infections in mouse models.

Journal: Front Immunol

Authors: Zachary R Stromberg, Elvia E Silva, Sara C Johnston, Dylan M Johnson, Dominique Hall, Emmanuel F Adjei, John A Altin, Abisola Abisoye-Ogunniyan, Travis Gollott, Wei He, Iris K A Jones, Steve Kwilas, Sean J Lund, Heather L Mead, Georgia A Nelson, Lisa Ouyang, Sandra K G Peters, Jennifer L Schwedler, Caleb Z Trecazzi, Matthew W Turner, Chunyan Ye, Steven B Bradfute, Nicholas O Fischer, Jay W Hooper, Jason T Ladner, Amy Rasley, Oscar A Negrete

An mRNA vaccine encoding Ebola virus glycoprotein (EBOV-GP) in lipid nanoparticles elicited higher IgG and neutralizing antibody titers than rVSV-EBOV-GP, targeting distinct epitopes. It fully protected mice against lethal EBOV infections, showing potential as an alternative or complementary vaccine strategy.

See details

2025-12-13

Rational design of next-generation filovirus vaccines combining glycoprotein stabilization and nanoparticle display with glycan modification.

Journal: Nat Commun

Authors: Yi-Zong Lee, Yi-Nan Zhang, Maddy L Newby, Garrett Ward, Keegan Braz Gomes, Sarah Auclair, Connor DesRoberts, Joel D Allen, Andrew B Ward, Robyn L Stanfield, Linling He, Max Crispin, Ian A Wilson, Jiang Zhu

This study presents a strategy for stabilizing and displaying filovirus glycoproteins on self-assembling protein nanoparticles (SApNPs) to enhance immune responses, demonstrating improved lymph node retention, dendritic cell presentation, and germinal center reactions in

See details

2025-12-15

Fast-acting single-dose vesicular stomatitis virus-Sudan virus vaccine: a challenge study in macaques.

Journal: Lancet Microbe

Authors: Paige Fletcher, Kyle L O'Donnell, Friederike Feldmann, Joseph F Rhoderick, Chad S Clancy, Jil A Haase, Cecilia A Prator, Brian J Smith, Bronwyn M Gunn, Heinz Feldmann, Andrea Marzi

This study evaluated the fast-acting capacity of a VSV-SUDV vaccine in naive macaques, showing that a single dose protected against lethal SUDV challenge within 1 week. Vaccinated animals exhibited robust humoral immune responses, while VSV-EBOV did not protect against SUDV, emphasizing the need for species-specific filovirus vaccines.

See details

Relevant news

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

Clinical Studies

This section presents relevant clinical trials.

2025-01-27

A Trial to Evaluate Safety, Tolerability, and Immune Responses of an Investigational Monovalent Chimpanzee Adenoviral Vectored Sudan Ebolavirus Vaccine in Healthy Adults

Status: Active not recruiting

Sponsor(s): Albert B. Sabin Vaccine Institute, Biomedical Advanced Research and Development Authority

A Phase 2, Randomized, Double-blind, Placebo-Controlled Trial to Evaluate Safety, Tolerability, and Immune Responses of an Investigational Monovalent Chimpanzee Adenoviral Vectored Sudan Ebolavirus Vaccine in Healthy Adults

See details

2024-02-09

Study to Evaluate the Recombinant VSV (rVSV)-Marburg Virus Vaccine Candidate (PHV01) in Healthy Adult Subjects

Status: Completed

Sponsor(s): Public Health Vaccines LLC, Biomedical Advanced Research and Development Authority

Phase 1 trial of rVSV-MARV-GP (PHV01) vaccine in healthy adults, assessing safety, tolerability, and immunogenicity (Marburg-specific IgG and neutralizing antibodies) via ascending doses, with 181-day follow-up.

See details

2025-02-05

Long-Term Neurologic and Neurocognitive Sequelae Following Pediatric Ebola Virus in Liberia

Status: Recruiting

Sponsor(s): National Institute of Neurological Disorders and Stroke (NINDS)

This study investigates long-term neurologic and neurocognitive effects of pediatric Ebola virus disease (EVD) in Liberia. Participants, aged under 18 during the PREVAIL III study, undergo neurologic exams, blood draws, and cognitive tests, including iPad games and pencil-and-paper puzzles. Interviews assess mood, symptoms, and functional status.

See details

2024-09-18

A Trial to Evaluate Safety, Tolerability, and Immune Responses of an Investigational Monovalent Chimpanzee Adenoviral Vectored Marburg Virus Vaccine in Healthy Adults

Status: Active not recruiting

Sponsor(s): Albert B. Sabin Vaccine Institute, Biomedical Advanced Research and Development Authority

A Phase 2, Randomized, Double-blind, Placebo-Controlled Trial to Evaluate Safety, Tolerability, and Immune Responses of an Investigational Monovalent Chimpanzee Adenoviral Vectored Marburg Virus Vaccine in Healthy Adults

See details

2025-01-28

EBOla Post-Exposure Prophylaxis

Status: Not yet recruiting

Sponsor(s): ANRS, Emerging Infectious Diseases, Alliance for International Medical Action, Centre de Recherche et de Formation en Infectiologie de Guinée (CERFIG), Medecins Sans Frontieres, Netherlands, Barcelona Institute for Global Health, University of Bordeaux, INSERM UMR S 1136, Agence Nationale de Sécurité Sanitaire de Guinée (ANSS), National Institute for Biomedical Research DRC, Cheikh Anta Diop University, Senegal, PACCI Program, The PANdemic preparedness plaTform for Health and Emerging infectious Response, University of Sierra Leone College of Medicine and Allied Health Sciences, National Public Health Institute of Liberia

EBO-PEP is a phase III trial comparing Ervebo alone (ERV) versus Ervebo plus Inmazeb (ERV+IMZ) for EVD post-exposure prophylaxis in high-risk, asymptomatic individuals. ERV+IMZ arm includes revaccination at day 56. Follow-up is 21 days minimum, with in-person and remote v

See details

2024-11-07

Study of Obeldesivir as Postexposure Prophylaxis for Filovirus Diseases Virus Disease

Status: Not yet recruiting

Sponsor(s): Gilead Sciences (Group)

The goal of this clinical study is to learn more about the study drug, obeldesivir (ODV), and how safe and effective it is preventing Filovirus disease in participants with known or suspected exposure to Filovirus disease. The primary objective is to evaluate the safety and tolerability of ODV for Ebola virus (EBOV), Sudan virus (SUDV), and MARV postexposure prophylaxis (PEP).

See details

Guidelines and practical information

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

WHO	**Diagnostic testing for Ebola and Marburg virus diseases (December 2024)**
WHO	**Risk communication and community engagement for Marburg virus disease outbreaks (November 2024)**
WHO	**Ebola and Marburg virus disease epidemics: preparedness, alert, control, and evaluation (August 2024)**
CDC	**Public Health Management of People with Suspected or Confirmed VHF or High-Risk Exposures (May 2024)**
WHO	**Contact Tracing During an Outbreak of Ebola Virus Disease (January 2024)**
WHO	**Country Readiness Strengthening workshop on infection prevention and control for Ebola and Marburg disease outbreaks (December 2023)**
WHO	**Infection prevention and control guideline for Ebola and Marburg disease (August 2023)**
WHO	**Clinical management of patients with viral haemorrhagic fever: A pocket guide for front-line health workers (January 2016)**
WHO	**Case definition recommendations for Ebola or Marburg virus diseases: interim guideline (August 2014)**

Fact sheets

Marburg virus

Phylogeny

The Marburg virus (MARV) belongs to the Filoviridae family and is responsible for Marburg virus disease (MVD). Since its identification in 1967, it has caused 14 outbreaks over 50 years, primarily in Africa. The most severe outbreak occurred in Angola in 2005, with 252 cases and a case fatality rate (CFR) of 90%.

Transmission

MARV is a zoonotic hemorrhagic fever transmitted by Rousettus aegyptiacus fruit bats. Other bat species and certain non-human primates can also be infected, acting as intermediate hosts. Human-to-human transmission occurs through direct contact with bodily fluids from infected individuals or contaminated surfaces. Healthcare workers and close contacts, especially during funeral rites, are at high risk. Vertical transmission has not been demonstrated, but the virus can persist in semen for up to three months after recovery.

Diagnosis

The incubation period ranges from 2 to 21 days. Initial symptoms include fever, headache, and muscle pain, followed by skin rashes around day 7. The disease often leads to rapid multi-organ failure, with death occurring between days 8 and 9. Due to symptom overlap with other viral hemorrhagic fevers like Ebola, clinical diagnosis is challenging and requires confirmation by RT-PCR. IgG testing is used for late-stage confirmation. Samples must be handled in biosafety level 4 (BSL-4) laboratories.

Symptoms

The disease begins with fever, headache, and muscle pain. Around day 7, patients develop skin rashes, followed by multi-organ failure, which frequently leads to death between days 8 and 9. The CFR ranges from 24% to 90%, depending on the quality of supportive care.

Treatment

There is currently no specific antiviral treatment for MVD. Management is primarily supportive. Research is ongoing on several antiviral agents, including galidesivir, favipiravir, and remdesivir, which have shown promising results in animal models. The monoclonal antibody MBP091 demonstrated 100% efficacy in non-human primates and successfully completed a phase 1 clinical trial confirming its safety. The WHO has launched the SOLIDARITY PARTNERS clinical trial to assess these treatments during successive outbreaks.

Vaccination

Currently, 28 vaccine candidates are under development. The MARVAC consortium has prioritized four vaccines, focusing on two main platforms: • rVSV-MARV: The VSVΔG-MARV-GP (Musoke) vaccine, developed since 2005, has shown 100% protection in non-human primates after a single intramuscular injection, with

durable neutralizing antibody responses lasting up to 14 months. The rVSVΔG-MARV-GP (Angola) or PHV01 vaccine has demonstrated rapid protection within three days post-vaccination, making it a potential candidate for post-exposure prophylaxis. • ChAdV: The ChAd3-Marburg vaccine, developed by the Sabin Vaccine Institute, has shown rapid and long-lasting protection in non-human primates and was deployed during the 2024 Marburg outbreak in Rwanda. The ChAdOx1 Marburg vaccine, developed by the Oxford Vaccine Group, entered a phase 1 clinical trial in July 2024 to assess its safety and immunogenicity. The WHO has rapidly implemented a ring vaccination protocol in Tanzania to evaluate these vaccines in an emergency setting.

Zaire Ebola Virus

Phylogeny

Ebola virus is a filovirus belonging to the Filoviridae family and classified under the genus Orthoebolavirus. Six distinct viruses within this genus are known to cause Ebola Virus Disease (EVD): Ebola virus (EBOV), also referred to as the Zaire ebolavirus subtype; Sudan virus (SUDV); Reston virus (RESTV); Taï Forest virus (TAFV); Bundibugyo virus (BDBV); and Bombali virus (BOMV). The first documented outbreaks of Ebola occurred in 1976, with simultaneous epidemics in South Sudan and the Democratic Republic of the Congo.

Transmission

EVD is a zoonotic disease, with fruit bats of the Pteropodidae family considered the most likely natural reservoir. Animal-to-human transmission occurs through contact with infected animals. Human-to-human transmission is primarily via direct contact with blood or bodily fluids of symptomatic or deceased individuals, or indirectly through contaminated fomites. There is also evidence of sexual transmission post-recovery due to viral persistence in semen. The virus has been detected in breast milk as well.

Diagnosis

Diagnosis can be established using various methods, including ELISA assays, antigen-capture detection tests, serum neutralization assays, RT-PCR, electron microscopy, and virus isolation via cell culture. These tests are typically performed on blood samples, or oral fluids when blood collection is not feasible.

Symptoms

EVD is a viral hemorrhagic fever that induces severe and often fatal illness in humans, with a case fatality rate averaging around 50%, ranging from 25% to 90%. The incubation period spans 2 to 21 days. The disease progresses in two phases:The “dry” phase includes symptoms such as fever, fatigue, myalgia, headache, and sore throat. The “wet” phase follows, characterized by vomiting, diarrhea, cutaneous eruptions, and signs of renal and hepatic dysfunction. Complications may include multiorgan failure, internal or external hemorrhage, shock, and spontaneous miscarriage during pregnancy.

Treatment

Two therapeutic agents—Inmazeb and Ebanga—received FDA approval in 2020 for the treatment of EVD in adults, children, neonates born to infected mothers, and pregnant or lactating women.

Vaccination

Two vaccines targeting EBOV have been approved by both the FDA and EMA: Ervebo (rVSV-ZEBOV), currently deployed in outbreak response in the DRC, and Zabdeno/Mvabea (Ad26.ZEBOV/MVA-BN).