

Editorial

# Recent Advances in Vaccine Development for Flaviviruses and Alphaviruses

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Mosquito-borne viruses such as dengue (DENV), yellow fever (YFV), Zika (ZIKV), and chikungunya (CHIKV) have re-emerged in recent decades, affecting millions of people worldwide [1–3]. These flaviviruses and alphaviruses can be classified into a broader category of arboviruses, which cause significant disease burdens and public health concerns. Vaccine development against arboviruses has experienced swift progress after the sudden re-emergence of cases of DENV, CHIKV, YFV, and ZIKV in the last two decades [1–8]. The 21st century has heralded a new era in vaccinology, driven by recombinant genetic technologies that now enable unprecedented speed in vaccine development, which has been clearly demonstrated by the rapid response to the COVID-19 pandemic [9]. A broad range of vaccine platforms, including both classical and new approaches, such as inactivated and attenuated, protein subunits, virus-like particles (VLPs), viral vectors, and nucleic acids (DNA and mRNA), is currently being tested in preclinical studies and in clinical trials [10–12].

A recent milestone in vaccine development for alphaviruses is the FDA's approval of two chikungunya virus (CHIKV) vaccines—IXCHIQ, a single-dose live-attenuated vaccine (approved November 2023), and VIMKUNYA, a recombinant virus-like particle (VLP) adsorbed to aluminum hydroxide as an adjuvant (approved February 2025) [13,14]. Despite this progress, there is a continuing need for next-generation vaccines that can overcome limited supplies of inactivated or VLP vaccines and the contraindications that may restrict live-attenuated vaccines in pregnant or immunocompromised populations [15–18].

Building on the success of the first Special Issue of *Vaccines*, entitled “Vaccines Against Flaviviruses and Alphaviruses: Recent Advances and Future Challenges”, this second edition of the Special Issue will feature the latest developments in relation to vaccines against flaviviruses and alphaviruses from antigen design to clinical testing [19]. Although the overall progress against many arboviruses remains slow, a diverse pipeline of vaccine candidates spanning both classical and next-generation platforms is now in clinical trials and could lead to the future licensure of vaccines targeting these medically important emerging arboviruses.

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