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Veronique Barban

Sanofi Pasteur, France

A new dengue non-human primate protection model with improved translation to vaccine clinical efficacy


Recent data obtained with live-attenuated tetravalent dengue CYD-TDV vaccine showed moderate clinical efficacy to DENV-2 as compared to DENV-4, while high protection rates to both viruses were expected from previous non-human primate experiments. Viral loads observed in naturally-infected humans are generally much higher than those achievable in macaques by subcutaneous or intramuscular inoculation, which may contribute to levelling vaccine efficacy. More stringent conditions of infection resulting in about 100-fold increase of the viral load were established in cynomolgus macaques and subsequently applied to assess efficacy of CYD-TDV vaccine lots. Complete protection (i.e. undetectable viral RNA) against DENV-4 infection was achieved in 6/6 monkeys, while complete protection to DENV-2, or nearly (aborted RNAemia), was observed in only 6/18 animals. All other macaques (12/18) developed DENV-2 RNAemia curves, although below those of control animals. Viremia parameters were found inversely correlated to pre-

challenge neutralizing antibody titers, emphasizing the key role of these antibodies in controlling DENV infection. Moreover, early detection of antibodies to CYD-TDV antigens in all animals and post-challenge induction of strong anamnestic responses suggested efficient vaccine priming, which likely contributed to restrict DENV-2 RNAemia. Collectively, these data are in better agreement with CYD-TDV clinical vaccine efficacy data reported against DENV-2 and DENV-4, and demonstrate the improved translatability of this new dengue NHP protection model.

Speaker Biography

Veronique Barban is a trained Molecular and Cellular Virologist, with 30 years of experience in Vaccine Research in Pharmaceutical Industry. She started her career as Research Scientist at Institut Merieux that later became Pasteur Merieux Connaught (PMC), then Sanofi Pasteur. She was Head for 20 years of a Virology group that worked on various human viral diseases and contributed 15 years to the development of the 1st dengue vaccine, licensed in 2015 (commercial name Dengvaxia™). Her current position at Sanofi Pasteur is Expert in Virology in the Global Scientific Office.

[e: Veronique.Barban@sanofi.com](mailto:Veronique.Barban@sanofi.com)

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