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Zika virus, diagnosis, treatment and prevention

My laboratory in collaboration with the laboratories of Esper Kallas (University of Sao Paulo, Brazil) and Dennis Burton (Scripps, USA) has recently developed a program in Zika virus diagnostics, prevention and treatment. In collaboration with the Kallas Laboratory, we have been able to develop a serological diagnostic test for prior Zika exposure. We have also developed a pregnant Indian rhesus macaque animal model of Zika infection that causes fetal demise. Our collaborator in Brazil Myrna Bonaldo (Fio Cruz Institute Rio de Janeiro) isolated Zika from the urine of a pregnant woman during the recent 2016 epidemic of Zika in Rio. This particular isolate appears to be highly pathogenic for AG129 mice and causes fetal demise in pregnant Indian rhesus macaques. Recently, we have completely prevented Zika infection (1,000 pfu of the highly pathogenic primary isolate of a strain of Zika from Rio de Janeiro) in Indian rhesus macaques with a cocktail of three neutralizing monoclonal antibodies (nmAbs) developed by Tom Rogers in Dennis Burton's group. We have now re-challenged these animals with 10,000 pfu of the Paraiba strain of Zika. At this time, day 50 post-infusion of our cocktail, the nmAbs are at approximately 50 ug/ml. We are also starting an nmAb treatment experiment (nmAbs delivered at d3 post-infection) in 5 pregnant macaques. We are hoping that this will mimic a pregnant woman coming into her physician's office with acute Zika infection. Currently, there are no treatments for Zika-infection. I will report the data from these new challenge studies.

Biography

David I Watkins is working as a Professor of Pathology at University of Miami Health System. He finished PhD in 1985 from University of Rochester. His interests lie in understanding the relationship between the immune system and pathogens. More specifically, he is fascinated by the interactions between CD8+ T cells and the AIDS virus. This involves a comprehensive knowledge of the MHC class I molecules of humans and non-human primates. He has developed a program to understand this relationship over the past 20 years. More recently, he has devoted considerable time and effort to HIV vaccine development.

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