

ZIKA VIRUS DIAGNOSTICS: CURRENT TESTING APPROACHES AND CHALLENGES

Robert S. Lanciotti

Diagnostic and Reference Laboratory, Arbovirus Diseases Branch, Centers for Disease Control & Prevention, Fort Collins, Colorado, USA

Accurate diagnosis of Zika virus infection is a critical component in patient management, monitoring of virus movement, epidemic investigations, and especially research studies investigating the risk of poor outcomes associated with Zika virus infection during pregnancy. Existing methods of diagnosis are either antibody-based (IgM ELISA) or virus particle-based using nucleic acid detection (NAT tests). Both approaches present unique challenges and are currently inadequate in confirmatory diagnosis. The IgM capture ELISA suffers from poor specificity due to the fact that the antibody response to Zika virus infection generates antibodies which are highly cross-reactive to other related flaviviruses; particularly the dengue viruses. This cross-reactivity precludes a definitive diagnosis in a single test and requires follow up testing with the plaque reduction neutralization test (PRNT). Even using this two-tiered approach many Zika infections still cannot be definitively diagnosed. The real-time RT-PCR assays demonstrate high analytical sensitivity (<25 copies detected in most assays), yet because viremia is often very low by the time specimens are collected, the approach suffers from low clinical sensitivity. These issues will be discussed in greater detail as well as potential solutions.