

## **SPECIFIC ZIKA VIRUS GENE STRUCTURES, REPLIKINS, GIVE AUTOMATED QUANTITATIVE ADVANCE WARNING OF OUTBREAKS AND THEIR CESSATION**

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Changes in gene Replikin Counts (number of Replikins per 100 amino acids) (1) and compositions provide an automated quantitative method to detect mutations, to measure strain heterogeneity real-time, and to give advance warning of outbreaks and their cessation. Two time-course patterns of gene mutation and molecular evolution observed by gene Replikin Counts, and correlating with clinical course, have been found: time-course I: “rapid”, gene mutations (at  $p < 0.001$ ) within 1-2 years in advance of the clinical outbreaks with high mortality, followed by rapid cessation of gene change within the year of the outbreak, followed promptly by rapid cessation of the outbreak, and no recurrence within two years (eg. in Ebola 2014 (2), and SARS 2003); time-course II: “gradual” gene mutations (at  $p < 0.001$ ) over a period greater than two years in advance of the clinical outbreak, followed by gradual cessation of both the gene change and of the clinical outbreak, followed by annual endemic recurrences (eg. H1N1 influenza pandemic of 2009-10, and Zika 2015). The gene Replikins Surveillance method provides advance notice and time to respond to outbreaks before they occur, beginning to remove from the emerging lethal organism the advantage of complete surprise with regard to when, where, and with what gene sequences it may next rapidly replicate in a particular host.

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Zika Gene Mutations Are Increasing 2016-2017

Zika gene mutations increased markedly in 2016 as evidenced by the appearance of new Zika Replikin Strains.

Before 2016, only 3 Zika strains in 2000-2010, and 12 strains in 2010-2015 (14/15 ‘new’) were detected by different methods (Maron, D.F. Scientific American, May, 2016) .

As of December 4, 2016, for the year 2016, in our findings, when the number of specimens reported on Pubmed was 611, there were 49 Zika Replikin Strains.

As of February 20, 2017, when the total number of specimens reported on Pubmed was 882, there were 54 Zika Replikin Strains.

If the apparently high Zika gene mutation rate continues, an increasingly new group of Replikin Strains may appear in 2017, and the risk will increase that vaccines based on Zika virus gene strains detected prior to 2016, when released in the future, may be less effective .

References:

1. Nature Precedings doi:10.1038/npre.2011.6279.1;doi: 10.1038/npre.2012.7144.1.
2. Marked Increase in Ebola Gene Replikin Count in 2012 & 2013 Predicted Current Ebola Outbreak; Does Recent Sharp Drop in Replikin Count Signal Early End for the Current Ebola Outbreak?  
Reuters, October 4, 2014.