

## **CRISPR-Cas13 as Combination Antiviral and Diagnostic System**

Authors: Batoul Alallam, May Kyaw Oo, Abd Almonem Doolaanea

Pharmaceutical Technology Department, Kullyyiah of Pharmacy, International Islamic University Malaysia

### **Abstract:**

More than 100 million cases globally per year; In the past two decades, the number of cases increased over 8-fold. 1-5% of these affected die without treatment. Dengue is epidemic in more than 110 countries. The largest number of cases that ever reported globally was in 2019. Approximately 11 million cases of COVID19 globally in 6 months; over half million of those die. What is CRISPR: Adaptive bacterial immune system against foreign genomic material like bacteriophages. The principle of CRISPR disruption (1) A single guide RNA (sgRNA), binds to a recombinant form of Cas9 protein that has DNA endonuclease activity. (2) The resulting complex will cause target-specific DNA cleavage. 3) The cleavage site will be repaired by the nonhomologous end joining (NHEJ) DNA repair pathway, an error-prone process that may result in insertions/deletions (INDELs) that disrupt gene function. Cas 13 is a CRISPR protein that cuts RNA. Cas 13 finds its way to specific RNA sequence with the help of guide RNA, a programmable 30 base string of nucleotides that are complementary to those in target are in virus RNA strand. A recently developed CRISPR-Cas13 system has been shown to be capable of effectively inactivation of dengue virus RNA in mammalian. CRISPR-Cas13 system is a novel and effective technology to inhibit dengue viral replication, suggesting that such a programmable method may be further developed into a novel therapeutic strategy for dengue and other RNA viruses. A recently developed CRISPR-Cas13 system has been shown to be capable of effectively inactivation of dengue virus RNA in mammalian. CRISPR-Cas13 system is a novel and effective technology to inhibit dengue viral replication, suggesting that such a programmable method may be further developed into a novel therapeutic strategy for dengue and other RNA viruses.