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Comparative analysis of CpG islands in dengue virus for methylation induced gene silencing as an epigenetic tool

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DNA methylation plays crucial role in regulation of gene expression, including the expression of viral genes. Viral genome uses host machinery to replicate and therefore, methylation at CpG islands of viral DNA can help in regulating the replication of the dreadful pathogens. In the present study, comparative genomics was performed for Dengue virus which a life threatening virus is causing millions of deaths every year. So far, very little is known about the effects of mutations in DENV serotypes. This study included more than 3000 genome sequences of four serotypes of Dengue virus. These sequences were evaluated and interpreted. On analysis of complete sequences of DENV serotype 1, three CpG islands were found. Likewise, for DENV-2, DENV-3 and DENV-4; two, four and three CpG islands were found,

respectively. On comparing CpG sequences of DENV serotype 1 and DENV serotype 2, no major identity pattern was recorded as such. But, on blasting CpG sequences of serotype 1 and serotype 3, >90% query coverage and >90% identity on average was recorded. In case of CpG blast of serotype 1 and serotype 4, although the query coverage was low (<50% on average) but, the identity was high (>90% on average) and in many cases was completely identical i.e. 100%. The results exhibited that the site of DNA methylation is preserved in DENV-1, 3 and 4 even after having evident disparities among all serotypes. This can be exploited for methylation induced gene silencing for aiming a mutual vaccine or drug. In field of comparative genomics, our study can direct to a novel perceptiveness of epigenetics.

Biography

Mansi Verma is the Assistant Professor at Sri Venkateswara College, Delhi University, India. She received her Bachelor's and Master's degree in Zoology, and completed PhD in Molecular Biology in 2011 from University of Delhi. She was recently awarded as Young Scientist by Association of Microbiologists of India (AMI) and has contributed 23 research articles in journals of International reputation. She has also published 2 chapters of international reputation, 8 e-chapters and 1 book chapter. She has participated in more than 15 Conferences/ workshops and presented more than 28 posters. She has successfully completed 3 projects as Principal Investigator. She was also awarded with Certificate of Appreciation for presenting research work as a poster presentation at the 94th Foundation Day of University of Delhi at Viceregal Lodge on May 1, 2016.

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