Abstract

Zaire ebolavirus (EBOV) is one of the most dangerous and the unknown to humans. This is a filamentous virus of the family Filoviridae. Genetic studies of EBOV have shown that it has a negative-stranded RNA as genetic material and seven genes in its genome. One among these genes is the gene ‘L’, that code for a protein L (Large structural protein), this protein functions as an RNA dependent RNA polymerase. RNAi (RNA interference) is an influential method for post-transcriptional gene slicing in a specific sequence. This is done with the help of a dsRNA called siRNA. Slicing a target mRNA would mean that the mRNA will not be able to produce any protein and the viral activity can be restrained. This mechanism is observed naturally in the organism to regulate the protein production and also as a defense mechanism against some viruses. In-silico construction of siRNA is possible using computational methods in biology. Construction of siRNA is guided by many parameters and the efficiency of the cleavage of mRNA with siRNA is determined by hybridization thermodynamics. The constructed siRNA is potent of knocking down the activity of the virus. This can lead to the discovery of an effective antiviral drug against EBOV.
In-Silico Design of a Potent siRNA Molecule for Gene Silencing in Zaire Ebolavirus

- Elke M et al. 1999 73: 2333. Comparison of the Transcription and Replication Strategies of Marburg Virus and Ebola Virus by Using Artificial Replication Systems. [PMCID:PMC1044478]
- Ziying Han et al. 2003 77: 1793. Biochemical and Functional Characterization of the Ebola Virus VP24 Protein: Implications for a Role in Virus Assembly and Budding. [PMCID:PMC140957]
- Ahn J et al. 2012 56: 3516. Antiviral effects of small interfering RNA simultaneously inducing RNA interference and type 1 interferon in coxsackievirus myocarditis. [PMID:22508300]
- Prechtel AT et al. 2006 311:139. Small interfering RNA (siRNA) delivery into
monocyte-derived dendritic cells by electroporation. [PMID:16556448]
- Tafer H et al. 2008 26: 578. The impact of target site accessibility on the design of effective siRNAs. [PMID:18438400]
- S Singh et al. 2012 8: 749. Design of potential siRNA molecules for hepatitis delta virus gene silencing. [PMCID:PMC3449391]

**Index Terms**

Computer Science  
Information Science

**Keywords**

RNAi  siRNA  EBOV  Zaire Ebola