Ahmad Nejati et al., J Antivir Antiretrovir 2014, 6:2
http://dx.doi.org/10.4172/1948-5964.S1.021

OMICS Group Conferences
Accelerating Scientific Discovery

4th World Congress on
Virology

October 06-08, 2014 Hilton San Antonio Airport, TX, USA

Efficient inhibition of HIV replication by targeting 3UTR transcripts using new modified miR-30a

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RNA interference (RNAi) based gene therapy has currently been considered as a combinational anti-HIV-1 therapy. While artificial polycistronic microRNAs can reduce HIV-1 escape mutants, this approach causes cell toxicity by saturation of endogenous RNAi machinery. This study aimed to optimize the efficiency of RNAi gene therapy in order to reduce cell toxicity. We explored an artificial miR-30a-3´UTR (miR-3´UTR) from a single RNA pol II expressed transcript that targets simultaneously all viral transcripts. We constructed a pre-miR-30a backbones encoding siRNAthat targets the HIV-1 3´UTR. Our data indicated thatHIV-1 replication was significantly inhibited in the cell culture using miR-3´UTR construct, suggesting a promising tool for consideration of RNA-based gene therapy application.

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