

## POSTER 7

### HIV-1 Tat RNA SILENCING SUPPRESSOR ACTIVITY IS CONSERVED ACROSS KINGDOMS AND COUNTERACTS TRANSLATIONAL REPRESSION OF HIV-1

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The RNA silencing pathway is an intracellular innate response to plant and animal virus infections that is countered by many plant and animal viruses by expression of an RNA silencing suppressor (RSS). HIV-1 Tat and tomato bushy stunt virus P19 are double-stranded RNA (dsRNA)-binding proteins with RSS activity. Here, we demonstrate HIV-1 Tat and P19 function across the plant and animal kingdoms and suppress a common step in RNA silencing that is downstream of small RNA maturation. Our experiments reveal that RNA silencing in HIV-1 infected human cells severely attenuates the translational output of the unspliced HIV-1 gag mRNA, and possibly all HIV-1 transcripts. The attenuation in gag mRNA translation is exacerbated by K51A substitution in the Tat double-stranded RNA-binding domain, which does not affect trans-activation. Tat, plant virus RSS, or Dicer down-regulation rescues robust gag translation and bolsters HIV-1 virion production. The reversal of HIV-1 translation repression by plant RSS supports the recent finding in *Arabidopsis* that plant miRNAs operate by translational inhibition. Our results identify common features between RNA silencing suppression of plant and animal viruses. We suggest that RNA silencing-mediated translation repression plays a strategic role in determining the viral set-point in a newly HIV-1-infected patient.