

**Table S1. Parameter values for the *in vitro* experiment by the nonlinear least squared methods.**

Parameter Name	Symbol	Unit	SHIV-KS661	SHIV-#64
			Value	Value
Parameters obtained from simultaneous fit to full <i>in vitro</i> dataset				
Rate constant for infections	$\beta_{50}$	(TCID <sub>50</sub> /ml · day) <sup>-1</sup>	1.45×10 <sup>-5</sup>	1.33×10 <sup>-4</sup>
Death rate of target cells	$d$	day <sup>-1</sup>	2.10×10 <sup>-3</sup>	2.10×10 <sup>-3</sup>
Death rate of infected cells	$\delta$	day <sup>-1</sup>	1.46	1.60
Production rate of total virus	$p_{RNA}$	RNA copies · day <sup>-1</sup>	3.42×10 <sup>4</sup>	4.34×10 <sup>4</sup>
Production rate of infectious virus	$p_{50}$	TCID <sub>50</sub> · day <sup>-1</sup>	0.293	0.0295