**Figure 5-source data 1.** Competing models for fitting T cell and viral dynamics (**equations 2-3** in main text) using the best model in **Figure 3-source data 2** and fixing parameter values as in **Figure 3-source data 3**, with AIC values. Best fit in bold-red (lowest AIC).

|  |  |  |  |
| --- | --- | --- | --- |
| **Model** | **Mechanistic Assumptions** | **Statistical Assumptions** | **ΔAIC** |
| 1 | * SHIV-specific CD8+ T cells reduce virus production only (). * Immunity is lost during TBI: (, and different during acute infection and after ATI). * SHIV-infection enhances activation of CD4+CCR5- T cells leading to replenishment of CD4+CCR5+ T cells, and transient reduction of the CD4+CCR5- compartment after ATI (). * Does not include compartment *Np2* | * . * for and , and for . * . * , * ,. * . * ,. | 188.9 |
| * . * for and , and for . * . * , * ,. * . * ,. * , * ,. * . * ,. * ,. * ,. * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 105.6 |
| * . * for and , and for . * . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 163.7 |
| * . * for and , and for . * . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 64.6 |
| 2 | * SHIV-specific CD8+ T cells kill SHIV-infected cells only (). * Immunity is lost during TBI: (, and different during acute infection and after ATI). * SHIV-infection enhances activation of CD4+CCR5- T cells leading to replenishment of CD4+CCR5+ T cells, and transient reduction of the CD4+CCR5- compartment after ATI (). * Does not include compartment *Np2* | * . * for and , and for . * . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 1450.3 |
| * . * for and , and for . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 374.9 |
| * . * for and , and for . * modeled as * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 255.6 |
| 3 | * SHIV-specific CD8+ T cells reduce virus production only (). * Immunity is *not* lost during TBI ( equal during acute infection and after ATI). * SHIV-infection enhances activation of CD4+CCR5- T cells leading to replenishment of CD4+CCR5+ T cells, and transient reduction of the CD4+CCR5- compartment after ATI (). * Does not include compartment *Np2* | * . * . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 709.2 |
| 4 | * SHIV-specific CD8+ T cells reduce virus production only (). * Immunity is lost during TBI: (, and different during acute infection and after ATI). * SHIV-infection does not enhance activation of CD4+CCR5- T cells or replenishment of CD4+CCR5+ T cells (). * Does not include compartment *Np2* | * . * for and , and for . * . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 661.8 |
| 5 | * SHIV-specific CD8+ T cells reduce virus production only (). * Immunity is lost during TBI: (, and different during acute infection and after ATI). * SHIV-infection enhances activation of CD4+CCR5- T cells leading to replenishment of CD4+CCR5+ T cells, and transient reduction of the CD4+CCR5- compartment after ATI (). * Includes compartment *Np2* | * . * for and , and for . * . * , * ,. * . * ,. | 77 |
| * . * for and , and for . * . * , * ,. * . * ,. * , * ,. * . * ,. * ,. * ,. * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 29.4 |
| * . * for and , and for . * . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 69.3 |
| * . * for and , and for . * . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | **0** |
| 6 | * SHIV-specific CD8+ T cells kill SHIV-infected cells only (). * Immunity is lost during TBI: (, and different during acute infection and after ATI). * SHIV-infection enhances activation of CD4+CCR5- T cells leading to replenishment of CD4+CCR5+ T cells, and transient reduction of the CD4+CCR5- compartment after ATI (). * Includes compartment *Np2* | * . * for and , and for . * . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 1987.4 |
| * . * for and , and for . * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 317.6 |
| * . * for and , and for . * modeled as * , * ,. * . * ,. * , * for ΔCCR5 and transplant groups was modeled as and , respectively. * for ΔCCR5 and transplant groups was modeled as and respectively. | 380.9 |