The mathematical approach for HIV infection is studied under 3 different models:

1) Uninfected Model
2) Infected Model
3) Mutations Model

UNINFECTED MODEL:
The equation for the uninfected model involves four components:
Normal Tcells, Latently infected T cells, Actively infected T cells and the Virus itself.

$$\frac{dT}{dt} = s + rT(1 - \frac{T}{T_{\max}}) - \mu T$$

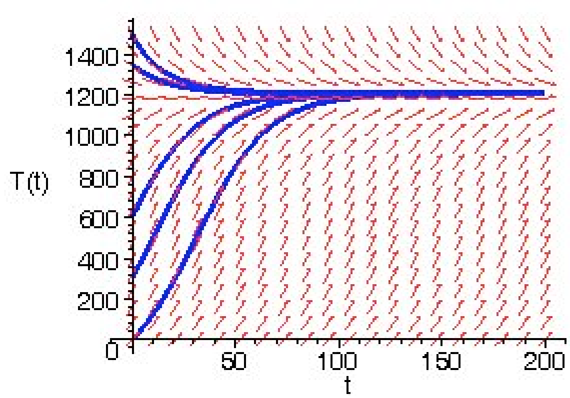
T - T cell Population in cells
T_{max} - Maximum T cell Population
s - T cell from precursor supply rate
r - Normal T cell growth rate
μ - T cell Death Rate

The Steady State solution for the equation is obtained by making the derivative dT/dt equal to 0.
We obtain :

$$T_0 = \frac{T_{\max}}{2r}(p + \sqrt{p^2 + 4s\frac{r}{T_{\max}}})$$

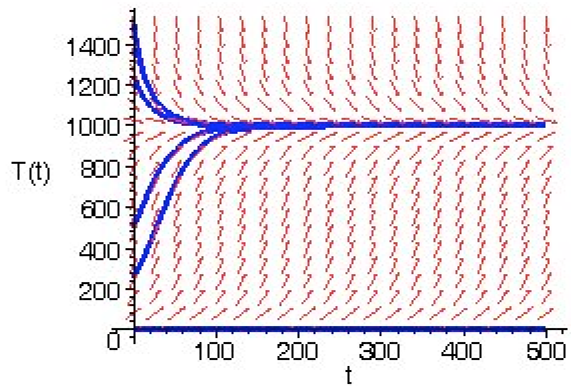
Where p = r-μ

Steady States for Different parameters when s = 10, r = 0.06, T_{max} = 1500 , μ = 0.02
Situation:1



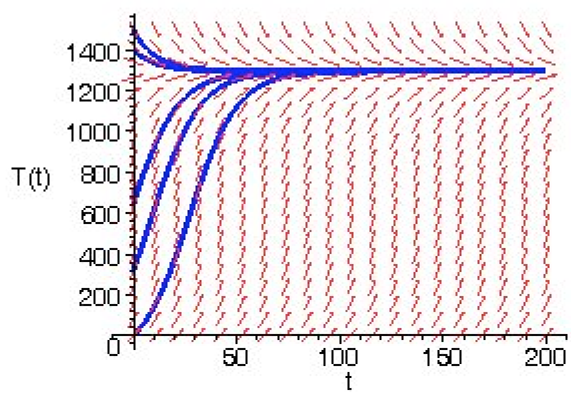
We Obtain T_0 = 1207.1

Situation 2: Steady States when s = 0, r = 0.06, T_{max} = 1500 , μ = 0.02



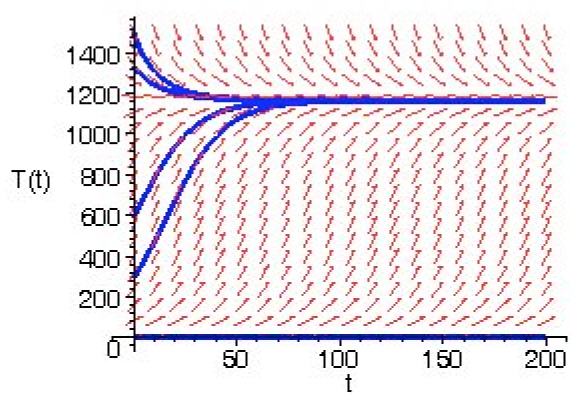
We Obtain T_0 = 1000

Situation 3: The Steady States when s = 10, r = 0.09, T_{max} = 1500 , μ = 0.02



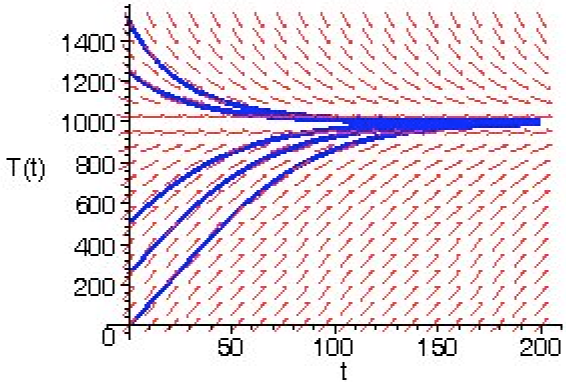
We Obtain T_0 = 1295.33

Situation 4: The Steady States when s = 0, r = 0.09, T_{max} = 1500 , μ = 0.02



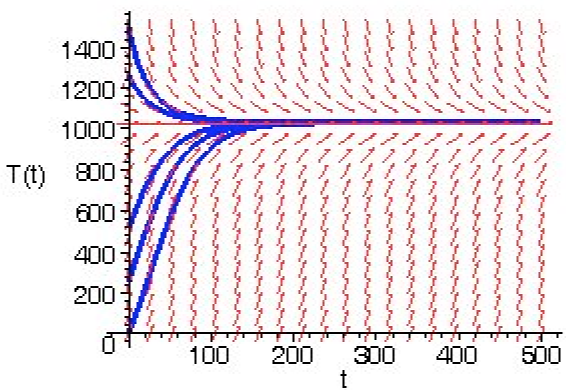
We Obtain T_0 = 1166.66

Situation 5: The Steady States when s = 10, r = 0.03, T_{max} = 1500, μ = 0.02



We Obtain T_0 = 1000

Situation 6: The Steady States when r is increased by 10% .
Hence s = 10, r = 1.1*0.03, T_{max} = 1500, μ = 0.02.



We Obtain T_0 = 1031.55

INFECTED MODEL:

There four system of equations used to Model T-cell HIV interaction.