**Steps to reproduce Figure 5 of main manuscript.**

**Construct the HNSCC model from the model equations given in the filename ‘HNSCC\_model\_equation’.**

**For Figure 7(a)**

1. Set the value of barrier building CAF proportion (alpha) =0.005
2. Load the parameter set for given alpha and from the document ‘HNSCC\_parameters\_IL2’. Store it in a vector P.
3. Set the initial condition (y\_0) for simulation as

y\_0=[22.0447; 6.1926; 17.8158; 201.5737; 5.0551; 6.3483; 59.8564; 1; 0; 8.5270; 4.4444; 0.8939; 52.8060; 15.4442; 18.1709; 13.8821; 0; 19.5717; 13.3581; 10.6108; 12.2203; 10.1635; 16.770; 13.7578];

1. Simulate the HNSCC model with anti-PD1=1 for the following values of IL2 supply rate (F\_IL2)

F\_IL2[ 0 .5 3]

1. Plot the Killer T cells vs Total tumor cells normalized by their carrying capacities for both the scenarios.

**For Figure 7(b)**

1. Set the value of barrier building CAF proportion (alpha) =0.005
2. Load the parameter set for given alpha and from the document ‘HNSCC\_parameters\_IL2’. Store it in a vector P.
3. Set the initial condition (y\_0) for simulation as

y\_0=[22.0447; 6.1926; 17.8158; 201.5737; 5.0551; 6.3483; 59.8564; 1; 0; 8.5270; 4.4444; 0.8939; 52.8060; 15.4442; 18.1709; 13.8821; 0; 19.5717; 13.3581; 10.6108; 12.2203; 10.1635; 16.770; 13.7578];

1. Simulate the HNSCC model with the following initial IL-2 levels (y\_0(17))

P(14)[0 : 0.1 : 1];

1. Plot Killer T cells population vs. IL2 for different initial condition. Adjust the axis limit appropriate for the inset figure.

**For Figure 7(c)**

1. Set the value of barrier building CAF proportion (alpha) =0.005
2. Load the parameter set for given alpha and from the document ‘HNSCC\_parameters\_IL2’. Store it in a vector P.
3. Set the initial condition (y\_0) for simulation as

y\_0=[22.0447; 6.1926; 17.8158; 201.5737; 5.0551; 6.3483; 59.8564; 1; 0; 8.5270; 4.4444; 0.8939; 52.8060; 15.4442; 18.1709; 13.8821; 0; 19.5717; 13.3581; 10.6108; 12.2203; 10.1635; 16.770; 13.7578];

1. Simulate the HNSCC model with anti-PD1=1 for the following values of IL2 supply rate

F\_IL2[ 0.5 ~ 2 : 0.02 : 3 ]

1. Plot the time profile of Killer T cells normalized by their carrying capacities for both the scenarios.