**Steps to reproduce Figure 1 of main manuscript.**

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

**For Figure 2(b)**

1. Set the value of barrier building CAF proportion (alpha) =0.02
2. Load the parameter set for given alpha and from the document ‘HNSCC\_parameters’. Store it in a vector P.
3. Use Latin-hypercube sampling to generate 10,000 different realizations of the influential parameters (P(i)) with i[12 14 30 32 33 36 37 38 39 40 41 42 43 44 45 48 49 50 51 53 54 55 58]. Ensure the existence of the scenarios where : Ratio of proliferation to death and conversion varies of state xj , where j refers to killer T cells and CAF.
4. Use scatter plot to generate the points covered by the sampled parameters in the plane. The calculation of is outlined in the main manuscript.
5. Each point in the plane is color modulated by the steady state values of Total tumor cells, Killer T, and CAF populations normalized by the respective carrying capacities.