Case study

Cancer simulator

- Model for the tumour has a large number of parameters
- Many of the parameters can be tuned via directly observing the patient
- In the inference problem we investigate two parameters
  - Sensitivity of cancer cells to the chemotherapy α
  - Minimal cell cycle length of cancer cells T_c

Case study

Cancer simulator

- Simulator can be described as a nonlinear time series model
  $x_t = f_t(\alpha, T_c, x_{t-1}, v_t)$
- f_t : nonlinear transition model at time t (30min increments)
- v_t : stochastic component of the simulator
- x_t : state that contains cells, vessels, extracellular concentration of oxygen, Avastin and vascular endothelial growth factor (VEGF)
- Simulation is done in 33 * 20 grid (scale is 10 μm)