# To be demonstrated about FEP

## Capacities:

### **Access to current beliefs, uncertainties and imagined trajectories.**

*Show plots of trajectories and beliefs and how these chance on the basis of actions*

### **Infer hidden states through actions.**

*Use a minimal toy model to show that it converges on the right beliefs about a hidden state.*

### **Likelihood and transition dynamics can be learned**

*Learn parameters of matrices. Necessitates that the matrices are prespecified. Deep-learning can also be used.*

### **Infinite treatment and testing actions can be balanced through FEP**

*Show decision making components. Ideally it should be able to also balancing the costs of treating, getting hints, and keeping a patient alive. Doesn’t have to perform well. Just that it does it. Show FEP components. Need to add an action for taking hints on each timestep, a modality for seeing whether the patient is alive or not, and then also add prior preferences over these. It could be done for all types of actions, treatments, observations, anything in between. Just necessitates that we somehow can map/learn the matrices.*

### **Model structure can be informed by experts.**

*Number of hidden states and transition probs can be specified.*

### **Translate the behavior of black box models to bayesian inference**

*Need a blackbox model. Perhaps using treatment already done, an adaptive therapy simulation or a ML-model. Then learn the POMPD parameters of the model.*

## Performance

*Outperforms ADT. Show under which circumstances. RCT would be optimal, more realistic sims are better than less realistic sims. Some traits of realistic sims:*

* *Produce realistic looking data*
* *Different types of medicines and dosing intensities are considered.*
* *Different tumor dynamics such changes to resistance and growth rates*