Val McCulloch

Silvana Saca

12/1/16

Our multi-agent system has three different types of agents: White blood cells, body cells, and viruses. Each agent has a local view of its environment and a goal. The white blood cells’ goal is to eradicate all of the viruses and give immunity to the body cells. The body cells goal is to survive and attain immunity from the virus agents. The virus’s goal is to destroy body cells before they’ve attained immunity and make as many viruses as possible. The idea is when a white blood cell kills a virus it attains a key for immunity and stores this in a map. Anytime it bumps into another WBC or body cell it will give these cells this information. However, it has to do this more quickly than the viruses kill cells and replicate. “Winning” is measured by whether or not there are no viruses or no body cells first, since WBC are currently indestructible in our model. We are going to change this to make them die over time by loss of energy (moving costs energy ). All cells will replicate.

This represents a multi-agent system because it has autonomous agents with a goal and a local view of their environment. No agent can have access to all of the information. There is a limited resource of energy. All of the cells are attempting not to be drained of energy while they are pursuing their goal. The acquired immunity by direct contact is a way that agents of a certain type can communicate with each other. While there are no decommitment strategies, we hope to program viruses and WBC to adopt the strategy of being drawn to the cells they are trying to attack as well as share information with.

We’re still working on spawning our viruses when they destroy body cells. Moreover, we still need to implement the map-key system in our model. There are many other questions to consider such as life cycles of WBC and body cells as well as random binary fission for them.

Furthermore, we are still debating whether or not to evolve the virus’s key to make the lock key relationship more difficult or the WBC’s strategy of giving immunity to other cells. Time pending, we may attempt to implement both.