

CS341 SYSTEMS BIOLOGY I

HOMEWORK ASSIGNMENT #4 – READING AND CODING (THURS SEPT 21, 2017)

1. READING

The goal of this reading assignment is to introduce you to journal articles that present mathematical models of biological systems.

Read “A mathematical model of caspase function in apoptosis” by Fussenegger et al, *Nature Biotechnology*, 2000 (emailed by Stephanie), which is chock full of new terminology. I have listed here the terms that I think are the most important. You can infer enough of the definitions of secondary terms to follow the paper. You do not need to become experts on apoptosis! Read to get a flavor of the modeling process.

- apoptosis: programmed cell death
 - protease: a protein that consumes (digests) another protein
 - caspase: a protease important to apoptosis. Caspases are also called executioner proteins
 - receptor: a receptor on the outer surface of a cell membrane, that takes part in communication between the cell and the outside world (taken from Wikipedia’s disambiguation page for receptor)
 - wild-type: the non-mutant version of an organism (this is often used as the control in experiments involving mutants (e.g. gene knock-outs))
- (1) In the Experimental protocol, what is their main focus? (Answer in 2-3 sentences)
 - (2) Identify three attributes of the model in this article that were described in the article by Bolouri & Davidson.
 - (3) Write approximately 3 sentences describing how the authors compare their model output to experimental results.