

CS341 SYSTEMS BIOLOGY I

HOMEWORK ASSIGNMENT #8 – READING (TUES OCT 24, 2017)

1. READING

The goal of this reading assignment is to gain even more practice reading a journal article about a model of a gene regulatory network. When you read the article, focus on understanding the connections between the model and the data and in understanding the mathematical expressions used to capture the biological processes (why the authors chose them). Also, think about how you would write the code to reproduce their figures.

Read “Toward a detailed computational model for the mammalian circadian clock” by J-C Leloup and A Goldbeter, Proceedings of the National Academy of Science (PNAS), 2003 (emailed by Stephanie)

- (1) Write down the clock genes/proteins included in this model, with a very brief description about what is known about them and how that knowledge is incorporated into their model. If you want to simply contrast this model to that of Becker-Weimann et al, then do so.
- (2) What kinetics are chosen for this model (i.e. which types of mathematical expressions are used for each type of biological process)? When there is more than one transcription factor affecting gene expression, how do the authors combine their effects? Is it as straight forward as the AND, SUM, and OR gates covered in class?
- (3) Identify one article that is cited by the authors. Find the article (this means you should look for an article in a journal for which Colby has a subscription) and find the evidence within the article. Relate this supporting article to statements by Leloup and Goldbeter.