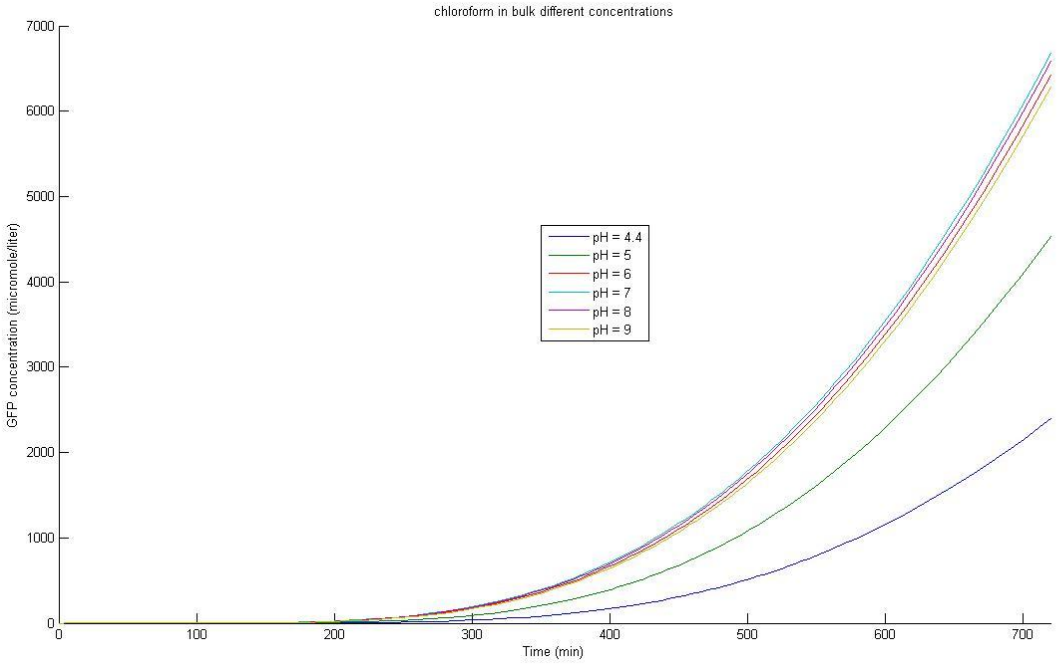
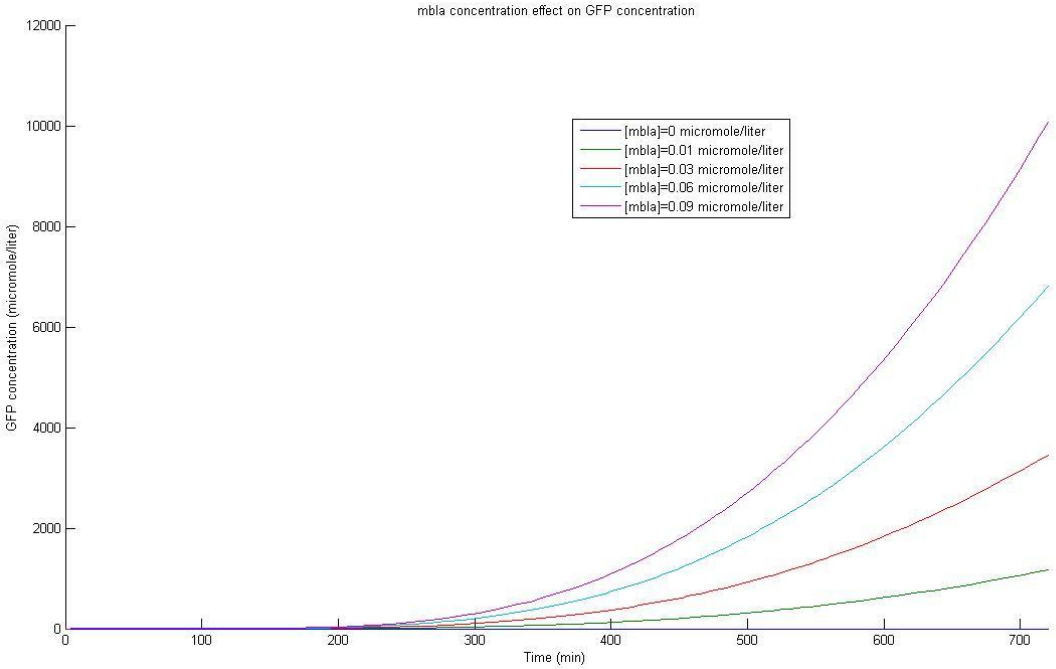
PARAMETER SCAN

One important feature in any chemistry reaction system and especially in a biological system is the concentration of protons, which increases or decreases or even kills the bacteria. We plot the influence of pH in our modeled system for the typical Escherichia coli survivality pH range (4.4-9).



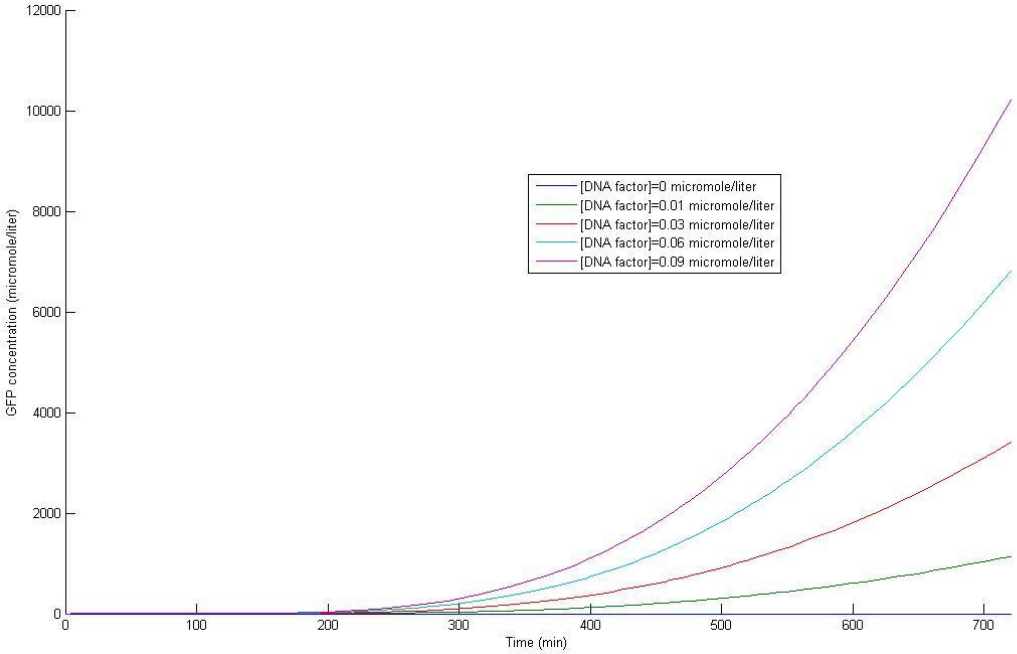
Firstly, it must be said that at least our modeled system performs properly the Escherichia coli behavior, getting the optimum at a pH around 6-7. The plot shows that the GFP answer is lower for low pH than for high ones. Actually, high pH has a close answer to the optimum pH.

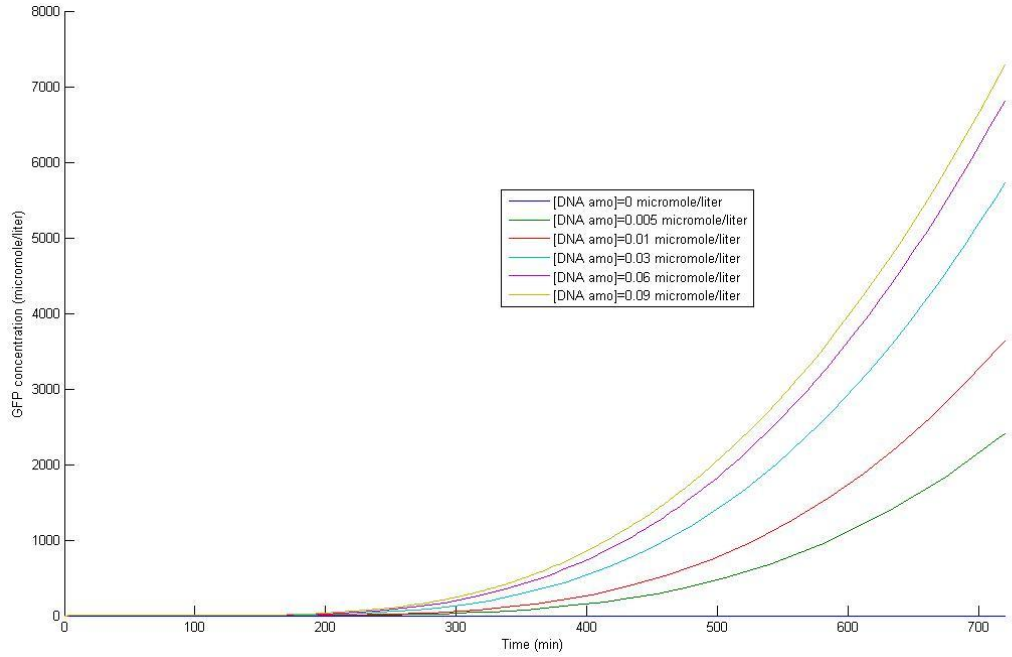
Specie that has a main role in the modeled system is the *mbla* promoter concentration, which allows bacteria to yields GFP protein. We have plotted different *mbla* promoter concentration trying to know its important behavior within the cell.



Looking at the plot, it comes out that the system answer is linked to mbla promoter concentration: at a higher mbla promoter concentration the GFP protein yield is obliviously higher, and for a zero concentration the GFP answer wears off.

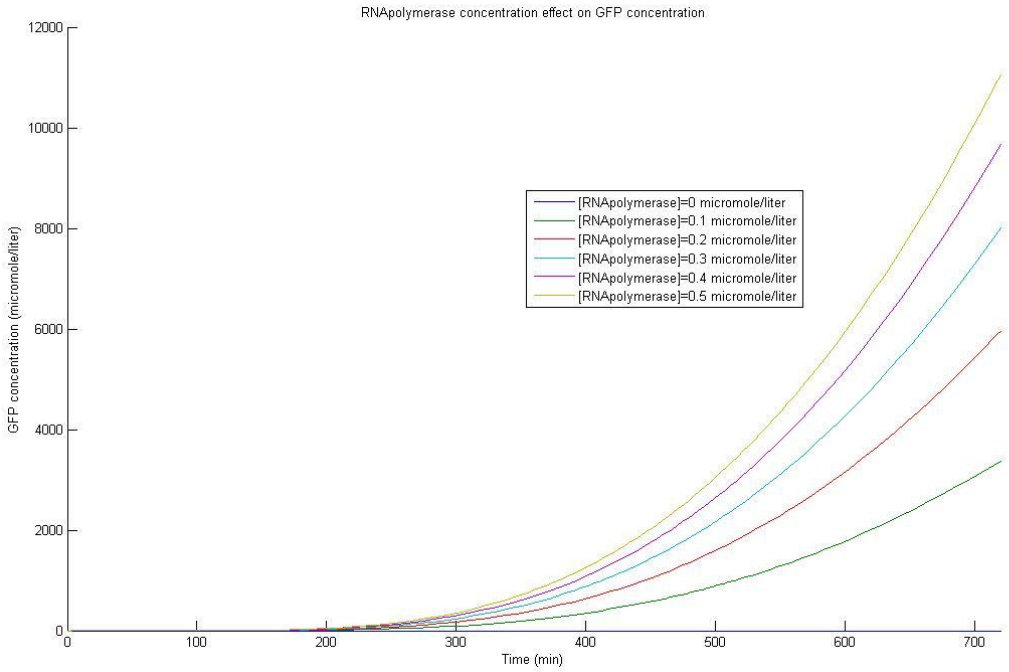
Another two important species in the system are the gens: DNA_amo and DNA_factor. We plotted both at different concentration to learn their roles into the modeled system:





Both gens have the same effect on the system: a higher gen concentration contributes a higher answer. The main different between them is that at the same low gen concentration, the GFP concentration is higher for DNA_amo, whereas at high gens concentration happens an opposite behavior.

Another species which is important to study is the RNApolymerase. It has been plotted for different concentrations:



As the other species do, a higher RNApolymerase means a higher GFP answer, but as the enzyme concentration rises GFP concentration rises somewhat less. In fact, from a given high RNApolymerase concentration enough, the GFP answer does not change.