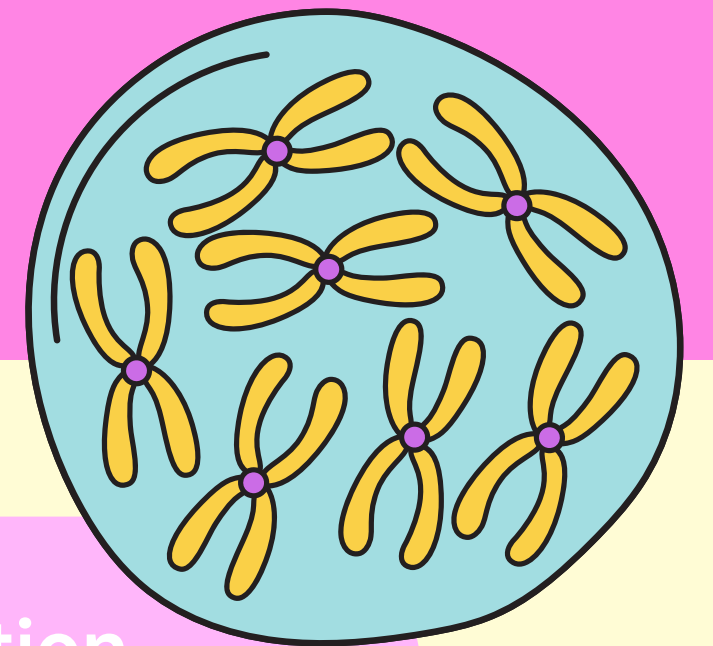




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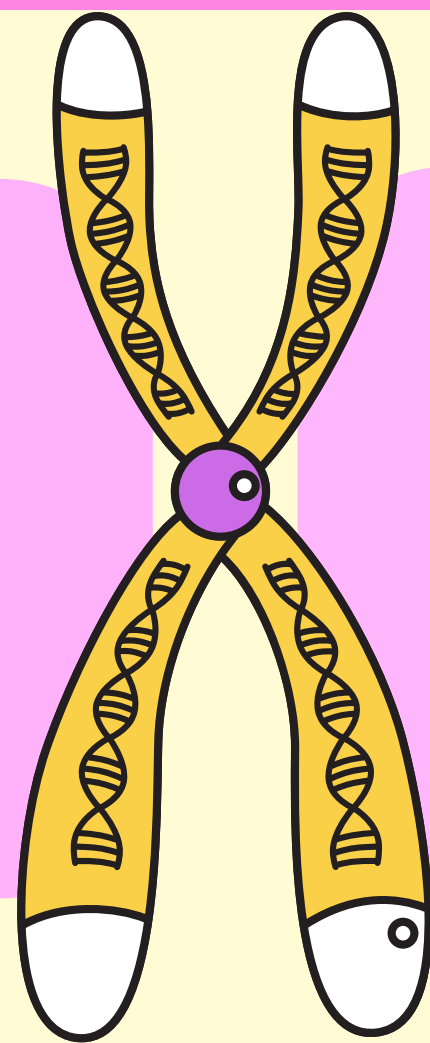
Analyzing Eleven Bistable Gene Regulatory Networks for Hopf Bifurcations

**Presented By: Katherine
Clemens '23**



When: Wednesday,
October 4th at 7pm

Where: Park 245 or via
Zoom



Zoom Information

Meeting ID:
958 0798 2212
Password:
792030

Gene regulatory networks, also referred to as GRNs, consist of sets of genes that all interact to perform many important cellular functions, including cellular differentiation and cell cycle control. By cataloguing the behaviors of these networks under various initial conditions, we learn more about how these networks function, and therefore gain some insight into cellular functions as well. The focus of this talk is the behavioral analysis of 11 small bistable GRNs that all interact to form over 40,000 important larger biochemical networks. To be more specific, we searched for the presence of Hopf bifurcations in all 11 networks, as well as the location and parameter values required for this behavior to be expressed. Of the eleven networks in question, we verified that 4 do not have Hopf bifurcations, while the remaining 7 may still exhibit this behavior. The Routh-Hurwitz stability criterion was used to exclude the possibility of Hopf bifurcations in certain networks. If this criterion did not exclude the network, the location and parameter values of the possible Hopf bifurcation will be calculated using other methods.