Biology and mathematics-can they coexist
Nathan Granneman & Satish Nair

In today's society, the desire for new and better medications for the brain is abundant. For long, biologists have thought that mathematical modeling could not produce physiologically accurate responses. Recently, however, pharmaceutical companies have pushed for the development of these models because of their cost effectiveness and their potential to produce accurate results. Computational tools such as MCell and DReAMM can be used to generate results that can be compared with experimentally determined data. For example, these tools were used to simulate the release of glutamate in a synaptic cleft in 3D. The glutamate in a specific region of this synaptic cleft was measured with respect to time and compared to data that has been experimentally determined. These two methods, biological and mathematical, produced a similar result which reinforces the fact that mathematical modeling can be used in the future to help produce accurate physiological responses.