

Neurological systems have been intriguing humans from the beginnings of civilization thousands of years ago up to this date with so many still unanswered questions. In this presentation we discuss landmark discoveries in and contributions to neuroscience that enabled not only precise experimental measurements and imaging of neuronal activity, but also the development of mathematical models with physiological meaning capable of mimicking neuronal behaviors. As a result, we have witnessed remarkable progress over the past few years in the understanding of neurological functions and disorders, with the consequent development of novel techniques for neuronal diseases treatment and prevention. Following this discussion, we focus on the results of computer simulation results for a single neuron using mathematical modeling to study the effects of ionic channel conductances on the neuronal firing rate.