1145-92-1836 **Taylor Meredith*** (taylor.meredith@nyu.edu), Courant Institute, 251 Mercer Street, New York, NY 10012, and **Calina Copos** and **Jennifer Crodelle**. *A Model of the Neuromuscular Junction and its Application to Myasthenia Gravis.*

The neuromuscular junction is an important biological structure where signals from a motor neuron are transmitted to muscle fibers and ultimately lead to a coordinated muscle contraction. Myasthenia gravis (MG) is an autoimmune disease characterized by muscle weakness. MG is caused by the blockage of a signifiant portion of ion channels, thus reducing the transmission of electrical activity to the muscle fiber. Treatment for MG extends the activation time of the working ion channels, resulting in a return of muscle strength. We develop a mathematical model to describe the dynamics of the ion channels and their effect on the electrical activity of muscle fibers. This model is then coupled to an existing framework for calcium dynamics of muscle contraction and force generation in the muscle. We demonstrate that our model reproduces experimentally-observed force generation under healthy, diseased, and treated conditions. The effectiveness of the treatment for MG is investigated using our model for varying degrees of the disease. (Received September 24, 2018)