

Paper ID:	1571068033
Paper Title:	Development of local mechanical stimulation method for clarifying mechanism of ultrasound neuromodulation
Authors:	Ryo Takuma (Mechanical Engineering, Japan); Shu Takagi and Kenta Shimba (The University of Tokyo, Japan)
Email:	takuma-ryo236@g.ecc.u-tokyo.ac.jp

---

Abstract

---

Neuromodulation is the process of stimulating neuron cells in the brain to regulate and control their activity. By using ultrasound, it is possible to stimulate the cells locally and noninvasively. In experiments using anesthetized rats, it has been observed that ultrasonic stimulation induces limb movement. However, the mechanism behind this phenomenon remains inconclusive. In this study, we aimed to investigate the response of neuron cells to mechanical stimulation through ultrasound. We conducted experiments using cultured neuron cells with and without microbubbles. As the wavelength of ultrasound is significant enhancement in release of Calcium ions in neuron cells in the presence of microbubbles. Further investigation will explore the relationship between ultrasound wavelength scale and the localized microbubble-enhanced stimulation.

---