Neuroscience Updates

김 병 곤
아주대학교 의과대학 신경과학교실

Byung Gon Kim, MD, PhD
Departments of Brain Science and Neurology, Ajou University School of Medicine

Recent advancement in neurotools has been revolutionizing neuroscience researches. Ultramicroscopic, microscopic, and macroscopic imaging techniques with ever-increasing precision and sophistication, coupled with genetic fluorescence tagging and advanced neurotracing techniques, have provided detailed information on neural connections at a single synapse level. The optogenetic technology has been widely applied to reveal functional aspects of these newly identified neural connections, and is now being adopted as a treatment modality for intractable neurological disorders. The BRAIN (Brain Research through Advancing Innovative Technologies) initiative, pushed forward by the Obama administration in US last year, will undoubtedly spur development of more creative and innovative neurotechnologies in the foreseeable future. Meanwhile, the induced pluripotent stem cell (iPSC) technique has become one of standard experimental system where genetic and even sporadic neurodegenerative disorders can be modeled in a dish, making drug screening a lot easier and more relevant to human diseases than ever. Despite disappointing results from recent clinical development against incurable neurodegenerative disorders, development of early diagnostic tools and identification of novel targets keep alive our hope that neuroscience researches can overcome the burdens from the age-related neurodegenerative disorders. This lecture will briefly introduce some of recent breakthroughs that are believed to have significant impact on our understanding of brain functions and translational application to treat neurological disorders.

Key Words: Neurotechnology; Neural circuit; Optogenetics; Induced pluripotent stem cells; Neurodegenerative diseases

Byung Gon Kim, MD, PhD
Departments of Brain Science and Neurology, Chair, Department of Brain Science, Ajou University School of Medicine, World cup-ro Yeongtong-gu, Suwon 443-749, Korea
TEL: +82-31-219-4495 FAX: +82-31-219-4530
E-mail: kimbg@ajou.ac.kr