

S58-1 Neuropharmacology in future towards systems disorders

○Yuji IKEGAYA¹, Norio MATSUKI¹

¹Grad School of Pharmaceutical Sciences, The University of Tokyo

The brain possesses flexible and adaptive functions that emerge through its circuitry. The main elements that form a circuit are neurons and glial cells. Although the physiological properties of these cells have been intensively addressed with electrophysiological, cell-biological, and morphological approaches, it is yet ill-defined about the “collective” behaviors of these cells, which occur when they are integrated in a gigantic circuit. The circuit systems exhibit complex nonlinear dynamics, rather than simple additive dynamics of the elements. Therefore, we cannot understand the high-order brain function unless we reach to understand the “element-*versus*-entity” associations. This holds true when we face the pathologic and pharmacologic aspects of brain disorders. Recent technical advances in molecular pharmacology and pathogenetics have contributed our understandings of neurodiseases at the molecular level. But in fact, for example, it has turned out that new neuroprotective drugs that are expected to treat certain disease in many lines of molecule-level and cell-level studies are often dropped off during clinical studies. With this respect, the neurophysiological malfunction now needs to be regarded as systems disorders at the mesoscopic level. In this symposium, we will overview the future direction of neuropharmacology through re-evaluation of systems disorders by introducing our lab experiments and data.