

Viral vectors for manipulation and recording of neural activity

Kazuki Nagayasu

Dept. Mol. Pharmacol., Grad. Sch. Pharm. Sci, Kyoto Univ.

Viral vectors such as adenoviral vectors (AVV), adeno-associated viral vectors (AAV) and lentiviral vectors (LVV) provide an efficient and versatile system for gene expression both *in vitro* and *in vivo*. Due to wide tropism of viral vectors for a variety of mammalian cells including neurons, viral vectors in conjunction with the optogenetic and pharmacogenetic tools are playing a critical role in the analysis and dissection of neural circuits, which are the basis of the brain functions. Viral vectors themselves, however, have drawn less attention than the genetic tools. Here we introduce the production and application of these viral vectors to manipulation and recordings of serotonin neural activity and to summarize the advantages and current limitations of them.