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*Visualizing and manipulating primate brain circuits with DREADDs*

Chemogenetic technology designer receptors exclusively activated by designer drugs (DREADDs) afford a means of reversibly and remotely controlling the activity of a neuronal population expressing designer receptors through delivery of their agonist. DREADDs have widely been used to modify neuronal activity and behavior in rodents. However, their application to non-human primates remains limited mainly because the technology for gene delivery to the primate brain is still in the development stage. We recently developed a highly potent and selective DREADD agonist, deschloroclozapine (DCZ), which can also be used as a PET imaging probe to monitor the expression of DREADD designer receptors in living monkeys. Combined with PET and MR imaging, DREADDs are now a powerful and attractive tool for non-human primate research to visualize and manipulate specific brain circuits and monitor induced network changes. This talk will summarize the current status and prospects of chemogenetic technology, especially its potential for broadening our opportunities for linking primate brain circuits to behavior.