Treatment for Neuropsychiatric Disorders by Intravitreal Injection of DREADD Followed by Eye Drops or Pills Containing DREADD agonist

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Technology description

Invention Summary

Diseases and disorders of the nervous system create a significant burden of morbidity and mortality worldwide. Therapeutic treatments are often ineffective because they lack cell-type specificity, even when combined with psychological intervention. Off-target effects of traditional treatments mostly are not easy for patients to tolerate. Therefore, improved and effective therapeutic treatments are highly desired.Rutgers scientists created a gene therapy-based method for treating depression, by utilizing the retina as a target for DREADD (designer receptor exclusively activated by designer drugs) expression. This method circumvents neurosurgical problems associated with brain-injected DREADDs for human therapeutics. Our solution involves a simple outpatient clinical procedure (one intravitreal injection) to first express the DREADD in the patient, followed by either eye drops or pills to activate the receptors. This method works on the same neurological pathways that provides elevated mood in response to bright light. Data generated to date indicate that depression-like behavior in rats (weight loss, immobility as measured by forced swim test) can be prevented by use of our invention (DD-hM3Dq) compared to control (shown in Figure 1).The effects are due to activation of key circadian/arousal brain centers (suprachiasmatic nucleus and locus coeruleus). We expect this invention will be beneficial for the treatment of several disorders, namely depression and circadian disorders.

Application area

Agents and method for therapeutic treatment of neuropsychiatric disorders, such as depression and circadian disorders.

A kit for therapeutic treatment of depression.

Advantages

Effectiveness demonstrated in rat models

Little off-target effects, cell type-specific

Potential better efficacy vs current treatment

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