

**Docket #:** S05-170

# Temporally Precise, Genetically Targeted Optical Control of Neural Circuitry

## Applications

- High-throughput cell-based screening for drugs that affect signal transduction
- Neuromodulatory therapeutics for the treatment of neurological disorders
- Drug dosing management in the context of diabetes and pain control

## Advantages

- Millisecond kinetics enables a thousand-times faster voltage control
- The expression of the ChR2 channel does not affect membrane integrity and cell health
- This method does not require synthetic chemical substrates
- Allows genetic targeting so that specific neuron subclasses can be probed

## Publications

- Boyden ES, Zhang F, Bamberg E, Nagel G, Deisseroth K. [Millisecond-timescale, genetically targeted optical control of neural activity.](#) *Nat Neurosci.* 2005 Sep;8(9):1263-8. Epub 2005 Aug 14.
- [Published international patent application no. WO 2007/024391](#)
- Published patent application USSN 11/459,637 no. [US-2007-0053996-A1](#)
- Published patent application USSN 11/459,638 no. [US-2007-0054319-A1](#)
- Published patent application USSN 11/459,636 no. [US-2007-0261127-A1](#)

## Patents

- Published Application: [20070261127](#)
- Published Application: [WO2007024391](#)
- Published Application: [20070053996](#)
- Published Application: [20070054319](#)
- Published Application: [20100234273](#)
- Published Application: [20130184817](#)
- Published Application: [20150165227](#)
- Published Application: [20160096036](#)
- Published Application: [20160252524](#)
- Published Application: [20180328944](#)
- Published Application: [20190049462](#)
- Issued: [8,906,360 \(USA\)](#)
- Issued: [9,278,159 \(USA\)](#)
- Issued: [10,036,758 \(USA\)](#)
- Issued: [9,101,690 \(USA\)](#)
- Issued: [10,094,840 \(USA\)](#)
- Issued: [9,829,492 \(USA\)](#)
- Issued: [10,422,803 \(USA\)](#)
- Issued: [10,627,410 \(USA\)](#)

## Innovators

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