

**Docket #:** S14-310

# Dopamine2 Specific Promoter

Researchers in Prof. Karl Diesseroth's laboratory have discovered a Dopamine receptor type 2 specific promoter (D2SP) that can be used to transfect, identify and isolate Dopamine R2 (D2R)-expressing cells. Because the promoter is highly specific (98.2%) and penetrant (86.8%), it could be used to drive expression of genes in DR2 cells in vitro or in vivo. Potential applications include enriching for D2R-expressing cells through cell sorting techniques and enabling tissue specific expression of optogenetic constructs or gene therapy vectors. Ultimately, this promoter could enhance research and treatment of a wide range of conditions, particularly neuropsychiatric disorders.

## Stage of Research

The inventors have used the promoter to drive expression in rat striatal primary neurons and demonstrated its specificity and penetrance.

## Applications

- **Tissue specific gene expression** with end-user applications in research and therapeutics such as:
  - cell sorting for D2R-expressing cells that can be further characterized or used for cell therapeutics
  - optogenetic constructs
  - RNA or DNA-based therapies and other gene therapies

## Advantages

- **Specific** - 98.2% specific (compared to only 90.5% specificity achieved by the D2R promoter)
- **High penetrance** - 86.8% penetrance (compared to 69% penetrance previously seen with the D2R promoter)

- **Low cost and easy to use**

## **Patents**

- Published Application: [WO2016090172](#)
- Published Application: [20170327841](#)
- Published Application: [20200032291](#)
- Issued: [10,435,709 \(USA\)](#)

## **Innovators**

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