CLAIMS

1. A non-naturally occurring CRISPR-Cas system comprising a vector comprising a bidirectional H1 promoter, wherein the bidirectional H1 promoter comprises:

a) control elements that provide for transcription in one direction of at least one nucleotide sequence encoding a CRISPR-Cas system guide RNA (gRNA), wherein the gRNA hybridizes with a target sequence of a DNA molecule in a cell, and wherein the DNA molecule encodes one or more gene products expressed in the cell; and

b) control elements that provide for transcription in the opposite direction of a nucleotide sequence encoding a Cas9 protein,

wherein the gRNA targets and hybridizes with the target sequence and the Cas9 protein cleaves the DNA molecule to alter expression of the one or more gene products.

2. The system of claim 1, wherein the target sequence comprises the nucleotide sequence $AN_{19}NGG$, $GN_{19}NGG$, $CN_{19}NGG$, or $TN_{19}NGG$.

3. The system of claim 1, wherein the Cas9 protein is codon optimized for expression in the cell.

4. The system of claim 1, wherein the Cas9 protein is a Type-II Cas9 protein.

5. The system of claim 1, wherein the cell is a eukaryotic cell.

6. The system of claim 5, wherein the eukaryotic cell is a mammalian or human cell.

7. The system of claim 5, wherein the eukaryotic cell is a retinal photoreceptor cell.

8. The system of claim 1, wherein the one or more gene products are rhodopsin.

9. The system of claim 1, wherein the expression of the one or more gene products is decreased.

10. The system of claim 1, wherein the system is packaged into a single adeno-associated virus (AAV) particle.

11. A method of altering expression of one or more gene products in a cell, wherein the cell comprises a DNA molecule encoding the one or more gene products, the method comprising introducing into the cell a non-naturally occurring CRISPR-Cas system comprising a vector comprising a bidirectional H1 promoter, wherein the bidirectional H1 promoter comprises:

a) control elements that provide for transcription in one direction of at least one nucleotide sequence encoding a CRISPR-Cas system guide RNA (gRNA), wherein the gRNA hybridizes with a target sequence of the DNA molecule; and

b) control elements that provide for transcription in the opposite direction of a nucleotide sequence encoding a Cas9 protein,

wherein the gRNA targets and hybridizes with the target sequence and the Cas9 protein cleaves the DNA molecule to alter expression of the one or more gene products in the cell.

12. The method of claim 11, wherein the target sequence comprises the nucleotide sequence $AN_{19}NGG$, $GN_{19}NGG$, $CN_{19}NGG$, or $TN_{19}NGG$.

13. The method of claim 11, wherein the Cas9 protein is codon optimized for expression in the cell.

14. The method of claim 11, wherein the Cas9 protein is a Type-II Cas9 protein.

15. The method of claim 11, wherein the cell is a eukaryotic cell.

16. The method of claim 15, wherein the eukaryotic cell is a mammalian or human cell.

17. The method of claim 15, wherein the eukaryotic cell is a retinal photoreceptor cell.

18. The method of claim 11, wherein the one or more gene products are rhodopsin.

19. The method of claim 11, wherein the expression of the one or more gene products is decreased.

20. The method of claim 11, wherein the system is introduced into the cell using a single adeno-associated virus (AAV) particle.