WHAT IS CLAIMED IS:

1. A self-replicating RNA vector comprising a sequence encoding a plurality of non-structural replication complex proteins from an alphavirus and a sequence encoding a CRISPR protein, wherein the vector is based on a modified Venezuelan equine encephalitis (VEE) virus and comprises from 5' to 3': a 5' cap, a 5' UTR, the sequence encoding the plurality of non-structural replication complex proteins encodes four non-structural replication complex proteins from a VEE virus, a promoter, the sequence encoding the CRISPR protein, an optional IRES, an optional sequence encoding an E3L protein, an optional IRES, an optional sequence encoding a selectable marker, an alphavirus 3' UTR, and a poly A tail.

2. The self-replicating RNA vector of claim 1, wherein the CRISPR protein is a type II Cas9 protein, a type V Cas12 protein, a type VI Cas13 protein, a CasX protein, or a CasY protein, and wherein the CRISPR protein is *Streptococcus pyogenes* Cas9, *Francisella novicida* Cas9, *Staphylococcus aureus Cas9*, *Streptococcus thermophilus* Cas9, *Streptococcus pasteurianus* Cas9, *Campylobacter jejuni* Cas9, *Neisseria meningitis* Cas9, *Neisseria cinerea* Cas9, *Francisella novicida* Cas12, *Acidaminococcus* sp. Cas12, *Lachnospiraceae bacterium* ND2006 Cas12, *Leptotrichia wadei* Cas13a, *Leptotrichia shahii* Cas13a, *Prevotella* sp. P5-125 Cas13, or *Ruminococcus flavefaciens* Cas13d, and, optionally, wherein the sequence encoding the CRISPR protein is codon optimized for expression in a human cell.

3. The self-replicating RNA vector of claim 2, wherein the CRISPR protein is *Streptococcus pyogenes* Cas9 or *Staphylococcus aureus Cas9.*

4. The self-replicating RNA vector of any one of claims 1 to 3, wherein the sequence encoding the CRISPR protein comprises at least one nucleotide insertion, deletion, and/or substitution such that the CRISPR protein has altered catalytic activity, improved target site specificity, and/or decreased off-target effects.

5. The self-replicating RNA vector of any one of claims 1 to 4, wherein the CRISPR protein is a nuclease, a nickase, or is devoid of cleavage activity.

6. The self-replicating RNA vector of any one of claims 1 to 5, wherein the CRISPR protein is linked to at least one nuclear localization signal and, optionally, wherein the CRISPR protein is linked to at least one fluorescent protein, at least one chromatin modulating motif, at least one functional domain, or combination thereof, wherein the at least one functional domain is an epigenetic modification domain, a transcriptional activation domain, or a transcriptional repressor domain.

7. A complex comprising the self-replicating RNA vector of any one of claims 1 to 6 and at least one guide RNA that is engineered to complex with the CRISPR protein coded by the self-replicating RNA vector.

8. A eukaryotic cell or cell line comprising the self-replicating RNA vector of any one of claims 1 to 6.

9. The eukaryotic cell or cell line of claim 8, further comprising at least one guide RNA that is engineered to complex with the CRISPR protein coded by the self-replicating RNA vector.

10. A plasmid vector encoding the self-replicating RNA vector as specified in any one of claims 1 to 6.

11. The plasmid vector of claim 10, further comprising a T7 or SP6 promoter for *in vitro* transcription.