What is claimed is:

1. A composition comprising

(i) a recombinant adeno-associated virus (AAV) vector comprising

an AAV capsid that encapsulates a nucleotide of interest,

wherein the AAV capsid comprises a recombinant AAV capsid protein modified to comprise a heterologous epitope, wherein the recombinant AAV capsid protein is derived from an AAV capsid gene modified to express the heterologous epitope;

(ii) a multispecific binding molecule comprising

(a) an antibody paratope that specifically binds the heterologous epitope; and

(b) a retargeting ligand that specifically binds a cell surface protein or marker; and optionally

(iii) a pharmaceutically acceptable carrier,

wherein the AAV capsid exhibits:

- reduced to abolished tropism in the absence of the multispecific binding molecule; and
- modified tropism, upon combination with the multispecific binding molecule, compared to a reference AAV capsid, wherein the reference AAV capsid comprises a reference AAV capsid protein that is identical to the recombinant AAV capsid protein but for the lack of the heterologous epitope.

2. The composition of claim 1, wherein the recombinant AAV capsid protein further comprises a mutation in addition to the heterologous epitope.

3. The composition of claim 1 or 2, wherein the heterologous epitope is inserted such that the insertion partially reduces the tropism of the AAV capsid compared to a reference AAV capsid lacking the heterologous epitope and the AAV capsid protein further comprises a mutation (e.g. a substitution, deletion, insertion other than the insertion of the heterologous

epitope), in addition to the insertion of the heterologous epitope, with the mutation reducing further and/or abolishing the tropism of the recombinant AAV capsid compared to a reference AAV capsid lacking the mutation.

4. The composition of any one of claims 1 to 3, wherein the modified tropism upon combination with the multispecific binding molecule means that the tropism of the AAV capsid is restored and redirected compared to the tropism of the reference AAV capsid.

5. The composition of any one of the preceding claims, wherein

(i) the heterologous epitope comprises an affinity tag and an optional linker, and/or

(ii) the recombinant AAV capsid protein comprises an amino acid sequence EQKLISEEDL (set forth as SEQ ID NO: 6) flanked by and/or operably linked to at least 5 contiguous amino acids of an AAV capsid protein.

6. The composition of any one of the preceding claims, wherein the heterologous epitope comprises an amino acid sequence EQKLISEEDL (SEQ ID NO:6) or a portion thereof, and wherein the antibody paratope specifically binds the amino acid sequence EQKLISEEDL or a portion thereof.

7. The composition of claim 1, wherein the nucleotide of interest is:

(i) under the control of a promoter selected from the group consisting of a viral promoter, a bacterial promoter, a mammalian promoter, an avian promoter, a fish promoter, an insect promoter, and any combination thereof; optionally wherein the nucleotide of interest is under the control of a non-human promoter; or

(ii) under the control of a non-human promoter and flanked by AAV ITR sequences; or

(iii) a reporter gene, optionally wherein the reporter gene encodes green fluorescent protein, or is selected from the group consisting of a suicide gene, a nucleotide encoding an antibody or fragment thereof, a nucleotide encoding a

CRISPR/Cas system or portion(s) thereof, a nucleotide encoding antisense RNA, a nucleotide encoding siRNA, and a combination thereof.

8. The composition of any one of the preceding claims, wherein the multispecific binding molecule is a bispecific binding molecule.

9. The composition of claim 1, wherein the antibody paratope is an Fv domain, optionally wherein the Fv domain is directly fused to a heavy chain constant domain.

10. The composition of claim 1, wherein the retargeting ligand is an antibody or portion thereof, optionally:

wherein the antibody is a bispecific antibody, wherein the antibody paratope and the retargeting ligand each comprise a distinct Fv domain fused to a first and second heavy chain constant domain, optionally wherein the first and second heavy chain constant domains bind to Protein A with differential binding affinities, or

wherein the retargeting ligand comprises a tetrameric antibody structure comprising two identical immunoglobulin heavy chains and two identical immunoglobulin light chains and wherein the antibody paratope that binds the heterologous epitope is appended to the C-terminus or N-terminus of one or both immunoglobulin heavy chains and/or to the C-terminus or N-terminus of one or both immunoglobulin light chains, and optionally wherein the antibody paratope is an scFv, optionally wherein the scFv comprises an amino acid sequence set forth as SEQ ID NO:37.

11. The composition of any one of the preceding claims, wherein the cell surface protein is a receptor; and/or wherein the retargeting ligand binds a receptor expressed on the surface of a mammalian or human cell.

12. The composition of any one of the preceding claims, wherein the AAV is selected from the group consisting of AAV1, AAV2, AAV3, AAV4, AAV5, AAV6, AAV7, AAV8 and AAV9 and/or wherein the heterologous epitope is inserted after and/or replaces a position selected from the group consisting of I-453 of AAV2, I-587 of AAV2, I-585 of AAV6, I-590 of AAV8, I-453

of AAV9, I-589 of AAV9, and any corresponding amino acids of an AAV serotype that infects primates.

13. The composition of any one of the preceding claims, wherein the AAV capsid is a mosaic capsid which comprises a reference AAV capsid protein of the same serotype that does not comprise the heterologous epitope at a certain ratio.

14. The composition of any one of the preceding claims, wherein the recombinant AAV capsid protein is derived from a chimeric AAV capsid gene modified to express the heterologous epitope, wherein the chimeric AAV capsid gene comprises a plurality of nucleic acid sequences, wherein each of the plurality of nucleic acid sequences encodes a portion of a capsid protein of a different AAV serotype, and wherein the plurality of nucleic acid sequences together encodes a chimeric AAV capsid protein.

15. The composition of any one of the preceding claims for use in therapy or as a medicament, wherein the nucleotide of interest is to be delivered to a target cell expressing a cell surface protein and the target cell is to be contacted with the composition, wherein the multispecific binding molecule comprises a retargeting ligand that binds the cell surface protein.

16. The composition for use according to claim 15, wherein:

(a) the nucleotide of interest is to be delivered to a human subject; or

(b) the target cell is a human cell; or

(c) the target cell is a human neuronal cell; or

(d) the target cell is a human muscle cell; or

(e) the target cell is selected from the group consisting of a liver cell, a brain cell, a T cell, a kidney cell, an intestinal cell, a pancreas cell, a cancerous cell, and a cell infected with heterologous pathogen.

17. The composition for use according to claim 15 or claim 16, wherein:

(a) the target cell is a human liver cell, optionally wherein the retargeting ligand binds human asialoglycoprotein receptor 1 (hASGR1) expressed by the human liver cell; or

(b) the retargeting ligand binds GABA receptor expressed by a human neuronal cell; or

(c) the retargeting ligand binds transferrin receptor expressed by a human neuronal cell;

(d) the target cell is a human T cell, optionally wherein the retargeting ligand binds CD3 expressed by the human T cell; or

(e) the target cell is a human T cell, optionally wherein the retargeting ligand binds CD3ε expressed by the human T cell; or

(f) the target cell is a human hematopoietic cell, optionally wherein the retargeting ligand binds CD34; or

(g) the target cell is a human cancer cell, optionally wherein the retargeting ligand binds a tumor associated antigen; or

(h) the target cell is a human cancer cell, optionally wherein the retargeting ligand binds a tumor associated antigen which is E6, E7 or Her2; or

(i) the cell surface protein is human glucagon receptor (hGCGR); or

(j) the target cell is an intestinal cell or is a pancreas cell; optionally wherein the cell surface protein is ENTPD3.

18. The composition for use according to claim 15 or claim 16, wherein:

(i) the retargeting ligand binds CD20; or

(ii) the retargeting ligand binds human glucagon receptor; or

(iii) the retargeting ligand specifically binds CD63 or human ectonucleoside triphosphate diphosphohydrolase 3 (hENTPD3).

19. The composition of claim 5(i) wherein the affinity tag comprises c-myc (EQKLISEEDL; SEQ ID NO:6).

20. The composition of claim 6 wherein the antibody paratope specifically binds c-myc, which antibody paratope comprises an HCVR, LCVR, HCDR1, HCDR2, HCDR3, LCDR1, LCDR2 and/or LCDR3 sequence of the scFv encoded by the nucleic acid sequence set forth as SEQ ID NO:28.

21. An *in vitro* or *ex vivo* method of delivering a nucleotide of interest to a target cell expressing a cell surface protein, comprising contacting the target cell with the composition of any one of claims 1 to 14, wherein the multispecific binding molecule comprises a retargeting ligand that binds the cell surface protein.