CLAIMS

1. A modified adeno-associated virus (AAV) capsid protein comprising an ocular cell targeting peptide, wherein the targeting peptide comprises a sequence from 7 to 10 amino acids in length that comprises GSTPPPM (SEQ ID NO: 1), in an amino to carboxy orientation or in a carboxy to amino orientation, and wherein the targeting peptide targets an AAV to an ocular cell.

2. The capsid protein of claim 1, wherein the targeting peptide is 7 amino acids in length.

3. The capsid protein of claim 1, wherein the targeting peptide comprises a sequence up to 10 amino acids in length having therein amino acid sequence GSTPPPM (SEQ ID NO: 1) in an amino to carboxy orientation or in a carboxy to amino orientation.

4. The capsid protein of claim 1, wherein the targeting peptide consists of amino acid sequence GSTPPPM (SEQ ID NO: 1) in an amino to carboxy orientation or in a carboxy to amino orientation.

5. The capsid protein of claim 1, wherein the targeting peptide is inserted between the AAV2 capsid residues at positions P34-A35, T138-A139, A139-P140, G453-T454, N587-R588, and/or R588-Q589 of SEQ ID NO:8.

6. The capsid protein of claim 1, wherein the targeting peptide is inserted after the AAV9 capsid residues at positions D384, G385, I560, T561, N562, E563, E564, E565, N704, and/or Y705 of SEQ ID NO:11.

7. The capsid protein of claim 1, wherein the capsid protein comprises or consists of SEQ ID NO:9 or SEQ ID NO:10.

8. The capsid protein of claim 1 or 2, wherein the targeting peptide targets a diseased ocular cell.

9. The capsid protein of claim 8, wherein the target peptide targets an ocular cell in a subject that has retinitis pigmentosa, maculopathies, Leber's congenital amaurosis, early onset severe retinal dystrophy, achromatopsia, retinoschisis, ocular albinism, oculocutaneous albinism, glaucoma, Stargardt disease, choroideremia, age-related