CLAIMS

1. A recombinant adeno-associated virus serotype 1 (rAAV1) particle comprising a viral shell comprising a modified AAV1 capsid protein,

    wherein the modified AAV1 capsid protein comprises an extraneous peptide sequence comprising a length of 7 amino acids or a length of 10 amino acids;

    wherein the extraneous peptide sequence enhances/increases the transduction efficiency of the rAAV1 particle into one or more muscle cell(s), compared to the transduction efficiency of a wild-type AAV1 particle not comprising the extraneous peptide sequence;

    wherein the extraneous peptide sequence substitutes and replaces the amino acid residue at position 590 of the wild-type AAV1 capsid protein;

    wherein the wild-type AAV1 capsid protein comprises the amino acid sequence set forth in SEQ ID NO. 66; and

    wherein the extraneous peptide sequence comprises the amino acid sequence set forth in any one of **SEQ ID NO: 1** to **SEQ ID NO: 65**.

2. The rAAV1 particle according to claim 1, wherein the one or more muscle cell(s) comprises one or more mammalian muscle cell(s).

3. The rAAV1 particle according to any one of claims 1 to 2, wherein the one or more muscle cell(s) comprises one or more cardiomyocyte(s) and/or one or more skeletal myofiber cell(s).

4. The rAAV1 particle according to claim 3, wherein the one or more muscle cell(s) comprises one or more cardiomyocyte(s).

5. The rAAV1 particle according to claim 4, wherein the extraneous peptide sequence comprises the amino acid sequence set forth in any one of **SEQ ID NO: 1** to **SEQ ID NO: 32**, or **SEQ ID NO: 58** to **SEQ ID NO: 62**.

6. The rAAV1 particle according to claim 3, wherein the one or more muscle cell(s) comprises one or more skeletal myofiber cell(s).

7. The rAAV1 particle according to claim 6, wherein the extraneous peptide sequence comprises the amino acid sequence set forth in any one of **SEQ ID NO: 33** to **SEQ ID NO: 54,** or **SEQ ID NO: 63** to **SEQ ID NO: 65**.

8. The rAAV1 particle according to claim 3, wherein the one or more muscle cell(s) comprises one or more cardiomyocyte(s) and skeletal myofiber cell(s).

9. The rAAV1 particle according to claim 8, wherein the extraneous peptide sequence comprises the amino acid sequence set forth in any one of **SEQ ID NO: 55** to **SEQ ID NO: 57**.

10. A recombinant polynucleic acid molecule encoding a modified AAV1 capsid protein, wherein the modified AAV1 capsid protein comprises an extraneous peptide sequence having a length of 7 amino acids or a length of 10 amino acids, wherein the extraneous peptide sequence comprises the amino acid sequence set forth in any one of **SEQ ID NO: 1** to **SEQ ID NO: 65**.

11. The recombinant polynucleic acid molecule according to claim 10, wherein the polynucleic acid molecule is operatively linked to a mammalian promoter sequence.

12. A pharmaceutical composition comprising the rAAV1 particle according to any one of claims 1 to 9 and a pharmaceutically acceptable carrier.

13. An rAAV1 particle according to any one of claims 1 to 9, for use in medicine.

14. Use of the rAAV1 particle according to any one of claims 1 to 9 in the manufacture of a medicament for the treatment of a cardiac-related and/or muscle-related disease or disorder in a subject, wherein the cardiac-related and/or muscle-related disease or disorder comprises inherited cardiomyopathy, skeletal muscle dystrophy, monogenic cardiovascular diseases (MCVDs) such as arrhythmia and Brugada syndrome, cardiomyopathies such as arrhythmogenic right ventricular cardiomyopathy (ARVC), Duchenne muscular dystrophy (DMD) and limb girdle muscle dystrophy (LGMD).

15. A method of delivering a gene product to one or more cell(s), the method comprising contacting the rAAV1 particle according to any one of claims 1 to 9 with the cell, optionally wherein the method is an *in vitro* method.

16. Use of the rAAV1 particle according to any one of claims 1 to 9 for the preparation of a pharmaceutical composition for gene therapy.