

WHAT IS CLAIMED IS:

1. A LEAPER-based method for target editing of a target RNA in a target cell, wherein the target RNA is an RNA comprising a G-to-A mutation in an IDUA gene transcript, and the method comprises:

delivering a construct comprising an adenosine deaminase-recruiting RNA (arRNA) for editing the target RNA or a construct for encoding the arRNA to the target cell, wherein the arRNA comprises a complementary RNA sequence that hybridizes with the target RNA, and is capable of recruiting adenosine deaminase acting on RNA (ADAR) to deaminate target adenosine (A) in the target RNA.

2. The method according to claim 1, wherein the arRNA comprises base C, A, U or G that is paired with the target A.

3. The method according to any one of claims 1 to 2, wherein the length of the arRNA is about 151-61 nt, ~~131-66 nt, 121-66 nt, 111-66 nt, 91-66 nt or 81-66 nt.~~

4. The method according to claim 3, wherein a distance between a targeting base in the arRNA and the 3'-terminal is 45-5 nt, ~~40-5 nt, 35-10 nt, 25-15 nt or 24-11 nt.~~

~~5. The method according to claim 3 or 4, wherein~~and/or, the distance between the targeting base and the 5'-terminal in the arRNA is 80-30 nt, 70-35 nt, 60-40 nt, 55-35 nt or 55-45 nt.

~~65.~~ The method according to any one of claims 1 to ~~54,~~ wherein the target cell is a human cell.

~~76.~~ The method according to any one of claims 1 to ~~65,~~ wherein the target RNA is a RNA comprising the NM_000203.4(IDUA)-c.1205G-A (p.Trp402Ter) mutation site.

~~87.~~ The method according to any one of claims 1 to ~~76,~~ wherein the arRNA comprises any one of the following sequences: SEQ ID NO: 14, SEQ ID NO: 15, SEQ ID NO: 9, SEQ ID NO: 13, SEQ ID NO: 17, SEQ ID NO: 22, SEQ ID NO: 23, SEQ ID NO: 30, SEQ ID NO: 31, ~~and~~ SEQ ID NO: 34.

~~98.~~ The method according to any one of claims 1 to ~~54,~~ wherein the arRNA comprises any one of the following sequences: SEQ ID NO: 44 and SEQ ID NO: 52.

~~109.~~ The method according to any one of claims 1 to ~~98,~~ wherein the arRNA is chemically modified, particularly, the chemical modification comprises 2-O'-methylation (2'-OMe) or thiophosphate modification, more particularly, -

~~11. The method according to claim 10, wherein the chemical modification comprises~~

~~2'-O'-methylation (2'-OMe) or thiophosphate modification.~~

~~12. The method according to claim 11, wherein~~ the chemical modification is one or more selected from the group consisting of:

2'-OMe modification on each of the first three nucleotides and the last three nucleotides in the arRNA sequence;

thiophosphate bond linkage between nucleotides of the first three nucleotides and the last three nucleotides;

2'-OMe modification on all bases U in the arRNA sequence;

2'-OMe modification on the base A which is the 3' base nearest to the targeting base;

2'-OMe modification on the base C which is the 5' base nearest to the targeting base;

thiophosphate bond linkage between the targeting base with its 3' nearest base and 5' nearest base respectively;

2'-OMe modification on each of the first five nucleotides and the last five nucleotides; and

thiophosphate bond linkage between nucleotides of the first five nucleotides and the last five nucleotides.

~~1310.~~ The method according to any one of claims 1 to ~~98~~, wherein the construct for encoding the arRNA is a linear nucleic acid chain, virus vector or plasmid, particularly, the virus vector is an adeno-associated virus (AAV) vector or lentivirus expression vector.

~~14. The method according to claim 13, wherein the virus vector is an adeno-associated virus (AAV) vector or lentivirus expression vector.~~

~~1511.~~ The method according to any one of claims 1 to ~~1410~~, wherein the delivery method is electrotransfection, lipofection, or lipid nanoparticle (LNP) delivery or infection.

~~16. The method according to claim 15, wherein the construct comprising adenosine deaminase-recruiting RNA used for editing target RNA or the construct for encoding the arRNA is delivered to a target cell via LNP.~~

~~1712.~~ The method according to any one of claims 1 to ~~1611~~, wherein the delivery concentration of the arRNA is equal to or greater than 2.5 nM, 5 nM, 10 nM, 15 nM or 20 nM.

~~1813.~~ An arRNA for LEAPER-based target editing of a target RNA in a target cell or a coding sequence of the arRNA, wherein the arRNA comprises or consists of any one of the following sequences: SEQ ID NO: 14, SEQ ID NO: 15, SEQ ID NO: 9, SEQ ID NO: 13, SEQ ID NO: 17, SEQ ID NO: 22, SEQ ID NO: 23, SEQ ID NO: 30, SEQ ID NO: 31, SEQ ID NO: 34, SEQ ID NO:

44, and SEQ ID NO: 52.

~~19~~14. A plasmid, virus vector, liposome ~~or~~, lipid nanoparticle, composition or biological product comprising the arRNA or the coding sequence of the arRNA according to claim ~~18~~13.

~~20. A composition or biological product comprising the arRNA or the coding sequence of the arRNA according to claim 18, or comprising the plasmid, virus vector, liposome or lipid nanoparticle according to claim 19.~~

~~21~~15. A An arRNA for LEAPER-based target editing of a target RNA in a target cell or a coding sequence of the arRNA used for correcting a G-to-A mutation associated with MPS IH in a target cell of an individual, wherein the arRNA comprises or consists of any one of the following sequences: SEQ ID NO: 14, SEQ ID NO: 15, SEQ ID NO: 9, SEQ ID NO: 13, SEQ ID NO: 17, SEQ ID NO: 22, SEQ ID NO: 23, SEQ ID NO: 30, SEQ ID NO: 31, SEQ ID NO: 34, SEQ ID NO: 44, and SEQ ID NO: 52, particularly, the G-to-A mutation is NM_000203.4(IDUA)-c.1205G-A (p.Trp402Ter), more particularly, the arRNA is administrated at a frequency of $\geq$ every 10 days.
~~method for treating MPS IH in an individual, comprising correcting a G to A mutation, associated with MPS IH, in a target cell of the individual by the method according to any one of claims 1 to 17.~~

~~22. The method according to claim 20, wherein the mutation is NM_000203.4(IDUA)-c.1205G-A (p.Trp402Ter) mutation.~~

~~23. The method according to claim 20 or 21, wherein the arRNA is administrated at a frequency of $\geq$ every 21 days, $\geq$ every 17 days, $\geq$ every 14 days or $\geq$ every 10 days.~~