## 【CLAIMS】

【Claim 1】

Use of a composition capable of editing a PMP22 nucleic acid sequence, , comprising:

a Cas9 protein or a Cas9 DNA sequence capable of expressing a Cas9 protein; and

a guide nucleic acid, comprising an RNA sequence of guide domain and an sgRNA backbone sequence, or a DNA encoding the guide RNA in the manufacture of a medicament for treatment of Charcot-Marie-Tooth disease type 1A (CMT1A);

wherein the sequence of the guide domain and the sgRNA backbone sequence are linked sequentially from 5′ to 3′ end;

wherein the sgRNA backbone sequence is at least 80% or more homologous to a sequence selected from a group consisting of

a). 5'-GUUUUAGUCCCUGAAAAGGGACUAAAAUAAAGAGUUUGCGGGACUCUGCGGGGUUACAAUCCCCUAAAACCGCUUUU-3' and

b). 5'-GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGC-3'

wherein the sequence of the guide domain comprises a corresponding RNA sequence of a target sequence of TATA Box in the nucleic acid sequence of a PMP22 gene, wherein the target sequence is an 18 to 25 nucleotide sequence of a PMP22 gene .

【Claim 2】

The use of the composition according to claim 1, wherein the Cas9 protein is originated from *Streptococcus pyogenes*, wherein the sgRNA backbone sequence is at least 80% or more homologous to

5'-GUUUUAGUCCCUGAAAAGGGACUAAAAUAAAGAGUUUGCGGGACUCUGCGGGGUUACAAUCCCCUAAAACCGCUUUU-3'.

【Claim 3】

The use of the composition according to claim 2, wherein the target sequence is selected from any one of SEQ ID NOs: 14 to 29 in the nucleic acid sequences

of the PMP22 gene.

【Claim 4】

The use of the composition according to claim 1, wherein the Cas9 protein is originated from *Campylobacter jejuni*, wherein the sgRNA backbone sequence is at least 80% or more homologous to

5'-GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGU
UAUCAACUUGAAAAAGUGGCACCGAGUCGGUGC-3'.

【Claim 5】

The use of the composition according to claim 4, wherein the target sequence is selected from any one of SEQ ID NOs: 30 to 40 in the nucleic acid sequences of the PMP22.

【Claim 6】

The use of the composition according to any one of claims 1 to 5, wherein the composition for gene manipulation is form of ribonucleoprotein(RNP).

【Claim 7】

The use of the composition according to any one of claims 1 to 5, wherein the composition for gene manipulation is form of plasmid vector.

【Claim 8】

The use of the composition according to any one of claims 1 to 5, wherein the composition is formed in a viral vector system.

【Claim 9】

The use of the composition of claim 8, wherein the viral vector includes one or more selected from a retrovirus, a lentivirus, an adenovirus, adeno-associated virus (AAV), vaccinia virus, a poxvirus and a herpes simplex virus.

【Claim 10】

Use of a composition capable of editing a PMP22 nucleic acid sequence, comprising:

a Cas9 protein or a Cas9 DNA sequence capable of expressing the Cas9 protein; and

a guide nucleic acid, comprising a tracrRNA, and a crRNA, or a DNA encoding the guide RNA, in the manufacture of a medicament for treatment of Charcot-Marie-Tooth disease type 1A (CMT1A),

wherein the sequence of the crRNA includes an RNA sequence of guide domain and a first complementary domain,

wherein the sequence of the guide domain and the first complementary domain are linked sequenctially from 5′ to 3′ end,

wherein the first complementary domain is at least 80% or more homologous to a sequence selected from a group consisting of 5′-GUUUUAGAGCUA-3′, and 5′-GUUUUAGUCCCUUUUUAAAUUUCUU-3′.,

wherein the tracrRNA has a sequence at least 80% or more homologous to a sequence selected from a group consisting of,

a sequence 5′-UAGCAAGUUAAAAU-3′., and 5′-AAGGCUAGUCCG-3′ that are linked sequentially from 5'-end to 3'-end,

a sequence 5′-UAGCAAGUUAAAAU-3′, 5′-AAGGCUAGUCCG-3′, and 5′-AAGGCUUAGUCCG-3′ that are linked sequentially from 5'-end to 3'-end,

a sequence 5′-AAGAAAUUUAAAAAGGGACUAAAAU-3′., and 5′-AAAGAGUUUGC-3′ that are linked sequentially from 5'-end to 3'-end, and

a sequence 5′-AAGAAAUUUAAAAAGGGACUAAAAU-3′., 5′-AAAGAGUUUGC-3′, and 5′-

UUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGC-3’ that are linked sequentially from 5'-end to 3'-end,

wherein the sequence of the guide domain comprises a corresponding RNA sequence of a target sequence of TATA Box in the nucleic acid sequence of a PMP22 gene, wherein the target sequence is an 18 to 25 nucleotide sequence of a PMP22 gene.

【Claim 11】

A kit for gene manipulation, comprising:

(a) a guide nucleic acid capable of forming complementary bonds with respect to the target sequences of SEQ ID NOs: 14 to 40 in the nucleic acid sequences of a PMP22 gene, respectively the guide nucleic acid, comprising an RNA sequence of guide domain and an sgRNA backbone sequence, or a DNA encoding the guide RNA wherein the sequence of the guide domain and the sgRNA backbone sequence are linked sequentially from 5’ to 3’ end;

wherein the sgRNA backbone sequence is at least 80% or more homologous to a sequence selected from a group consisting of

i). 5'-GUUUUAGUCCCUGAAAAGGGACUAAAAUAAAGAGUUUGCGGGACUCUGCGGGGUUACAAUCCCCUAAAACCGCUUUU-3' and

ii). 5'-GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGC-3'; and

(b) an editor protein including one or more proteins selected from the group consisting of a Streptococcus pyogenes-derived Cas9 protein, a Campylobacter jejuni-derived Cas9 protein, a Streptococcus thermophilus-derived Cas9 protein, a Streptococcus aureus-derived Cas9 protein, a Neisseria meningitidis-derived Cas9 protein, and a Cpf1 protein, respectively, or a nucleic acid sequence encoding the same.

【Claim 12】

A composition comprising:

a Cas9 protein or a Cas9 DNA sequence capable of expressing a Cas9 protein; and

a guide nucleic acid, comprising an RNA sequence of guide domain and an sgRNA backbone sequence, or a DNA encoding the guide RNA;

wherein the sequence of the guide domain and the sgRNA backbone sequence are linked sequentially from 5′ to 3′ end;

wherein the sgRNA backbone sequence is at least 80% or more homologous to a sequence selected from a group consisting of

a). 5'-GUUUUAGUCCCUGAAAAGGGACUAAAAUAAAGAGUUUGCGGGACUCUGCGGGGUUACAAUCCCCUAAAACCGCUUUU-3' and

b). 5'-GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGC-3'

wherein the sequence of the guide domain comprises a corresponding RNA sequence of a target sequence of TATA Box in the nucleic acid sequence of a PMP22 gene, wherein the target sequence is an 18 to 25 nucleotide sequence of a PMP22 gene.

【Claim 13】

The composition according to claim 12, wherein the Cas9 protein is originated from *Streptococcus pyogenes*, wherein the sgRNA backbone sequence is at least 80% or more homologous to

5'-GUUUUAGUCCCUGAAAAGGGACUAAAAUAAAGAGUUUGCGGGACUCUGCGGGGUUACAAUCCCCUAAAACCGCUUUU-3',and

Wherein the target sequence is selected from any one of SEQ ID NOs: 14 to 29 in the nucleic acid sequences of the PMP22 gene.

【Claim 14】

The composition according to claim 12, wherein the Cas9 protein is originated from Campylobacter jejuni, wherein the sgRNA backbone sequence is at least 80% or more homologous to

5'-GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGU UAUCAACUUGAAAAAGUGGCACCGAGUCGGUGC-3',

wherein the the target sequence is selected from any one of SEQ ID NOs: 30 to 40 in the nucleic acid sequences of the PMP22 gene.

【Claim 15】

The composition according to any one of claims 12 to 14, wherein the composition for gene manipulation is form of ribonucleoprotein(RNP).

【Claim 16】

The composition according to any one of claims 12 to 14, wherein the composition for gene manipulation is form of plasmid vector.

【Claim 17】

The composition according to any one of claims 12 to 14, wherein the composition is formed in a viral vector system.

【Claim 18】

The composition according to claim 17, wherein the viral vector includes one or more selected from a retrovirus, a lentivirus, an adenovirus, adeno-associated virus (AAV), vaccinia virus, a poxvirus and a herpes simplex virus.

【Claim 19】

A composition comprising:

a Cas9 protein or a Cas9 DNA sequence capable of expressing the Cas9 protein; and

a guide nucleic acid, comprising a tracrRNA, and a crRNA, or a DNA encoding

the guide RNA,

wherein the sequence of the crRNA includes an RNA sequence of guide domain and a first complementary domain,

wherein the sequence of the guide domain and the first complementary domain are linked sequenctially from 5′ to 3′ end,

wherein the first complementary domain is at least 80% or more homologous to a sequence selected from a group consisting of 5′-GUUUUAGAGCUA-3′, and 5′-GUUUUAGUCCCUUUUUAAAUUUCUU-3′.,

wherein the tracrRNA has a sequence at least 80% or more homologous to a sequence selected from a group consisting of,

a sequence 5′-UAGCAAGUUAAAAU-3′., and 5′-AAGGCUAGUCCG-3′ that are linked sequentially from 5'-end to 3'-end,

a sequence 5′-UAGCAAGUUAAAAU-3′, 5′-AAGGCUAGUCCG-3′, and 5′-AAGGCUUAGUCCG-3′ that are linked sequentially from 5'-end to 3'-end,

a sequence 5′-AAGAAAUUUAAAAAGGGACUAAAAU-3′., and 5′-AAAGAGUUUGC-3′ that are linked sequentially from 5'-end to 3'-end, and

a sequence 5′-AAGAAAUUUAAAAAGGGACUAAAAU-3′., 5′-AAAGAGUUUGC-3′, and 5′-UUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGC-3′ that are linked sequentially from 5'-end to 3'-end,

wherein the sequence of the guide domain comprises a corresponding RNA sequence of a target sequence of TATA Box in the nucleic acid sequence of a PMP22 gene, wherein the target sequence is selected from any one of SEQ ID NOs: 14 to 40 in the nucleic acid sequences of the PMP22 gene.

【Claim 20】

The composition according to any one of claims 12 to 19, for use in treating Charcot-Marie-Tooth disease type 1A (CMT1A).