<110> Viromed Co., Ltd.

<120> Composition for Preventing or Treating Amyotrophic Lateral Sclerosis using Two or More Isoforms of Hepatocyte Growth Factor

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<151> 2013-10-22

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Arg Lys Arg Arg Asn Thr Ile His Glu Phe Lys Lys Ser Ala Lys Thr
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Thr Leu Ile Lys Ile Asp Pro Ala Leu Lys Ile Lys Thr Lys Lys Val
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Asn Thr Ala Asp Gln Cys Ala Asn Arg Cys Thr Arg Asn Lys Gly Leu
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Pro Phe Thr Cys Lys Ala Phe Val Phe Asp Lys Ala Arg Lys Gln Cys
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Leu Trp Phe Pro Phe Asn Ser Met Ser Ser Gly Val Lys Lys Glu Phe
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Gly His Glu Phe Asp Leu Tyr Glu Asn Lys Asp Tyr Ile Arg Asn Cys
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Ser Phe Leu Pro Ser Ser Tyr Arg Gly Lys Asp Leu Gln Glu Asn Tyr
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Cys Arg Asn Pro Arg Gly Glu Glu Gly Gly Pro Trp Cys Phe Thr Ser
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Asn Pro Glu Val Arg Tyr Glu Val Cys Asp Ile Pro Gln Cys Ser Glu
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His Thr Glu Ser Gly Lys Ile Cys Gln Arg Trp Asp His Gln Thr Pro
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Ala Asp Asn Thr Met Asn Asp Thr Asp Val Pro Leu Glu Thr Thr Glu
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Cys Ile Gln Gly Gln Gly Glu Gly Tyr Arg Gly Thr Val Asn Thr Ile
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Trp Asn Gly Ile Pro Cys Gln Arg Trp Asp Ser Gln Tyr Pro His Glu
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His Asp Met Thr Pro Glu Asn Phe Lys Cys Lys Asp Leu Arg Glu Asn
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Asp Pro Asn Ile Arg Val Gly Tyr Cys Ser Gln Ile Pro Asn Cys Asp
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Met Ser His Gly Gln Asp Cys Tyr Arg Gly Asn Gly Lys Asn Tyr Met
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Lys Asn Met Glu Asp Leu His Arg His Ile Phe Trp Glu Pro Asp Ala
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Ser Lys Leu Asn Glu Asn Tyr Cys Arg Asn Pro Asp Asp Asp Ala His
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Gly Pro Trp Cys Tyr Thr Gly Asn Pro Leu Ile Pro Trp Asp Tyr Cys
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Pro Ile Ser Arg Cys Glu Gly Asp Thr Thr Pro Thr Ile Val Asn Leu
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Asp His Pro Val Ile Ser Cys Ala Lys Thr Lys Gln Leu Arg Val Val
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Tyr Arg Asn Lys His Ile Cys Gly Gly Ser Leu Ile Lys Glu Ser Trp
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Val Leu Thr Ala Arg Gln Cys Phe Pro Ser Arg Asp Leu Lys Asp Tyr
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Glu Ala Trp Leu Gly Ile His Asp Val His Gly Arg Gly Asp Glu Lys
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Cys Lys Gln Val Leu Asn Val Ser Gln Leu Val Tyr Gly Pro Glu Gly
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Ser Asp Leu Val Leu Met Lys Leu Ala Arg Pro Ala Val Leu Asp Asp
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Phe Val Ser Thr Ile Asp Leu Pro Asn Tyr Gly Cys Thr Ile Pro Glu
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Lys Thr Ser Cys Ser Val Tyr Gly Trp Gly Tyr Thr Gly Leu Ile Asn
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Tyr Asp Gly Leu Leu Arg Val Ala His Leu Tyr Ile Met Gly Asn Glu
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Lys Cys Ser Gln His His Arg Gly Lys Val Thr Leu Asn Glu Ser Glu
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Ile Cys Ala Gly Ala Glu Lys Ile Gly Ser Gly Pro Cys Glu Gly Asp
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Tyr Gly Gly Pro Leu Val Cys Glu Gln His Lys Met Arg Met Val Leu
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Gly Val Ile Val Pro Gly Arg Gly Cys Ala Ile Pro Asn Arg Pro Gly
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Arg Lys Arg Arg Asn Thr Ile His Glu Phe Lys Lys Ser Ala Lys Thr
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Thr Leu Ile Lys Ile Asp Pro Ala Leu Lys Ile Lys Thr Lys Lys Val
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Asn Thr Ala Asp Gln Cys Ala Asn Arg Cys Thr Arg Asn Lys Gly Leu
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Pro Phe Thr Cys Lys Ala Phe Val Phe Asp Lys Ala Arg Lys Gln Cys
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Leu Trp Phe Pro Phe Asn Ser Met Ser Ser Gly Val Lys Lys Glu Phe
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Gly His Glu Phe Asp Leu Tyr Glu Asn Lys Asp Tyr Ile Arg Asn Cys
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Ser Tyr Arg Gly Lys Asp Leu Gln Glu Asn Tyr Cys Arg Asn Pro Arg

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Cys Asn Gly Glu Ser Tyr Arg Gly Leu Met Asp His Thr Glu Ser Gly
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Lys Ile Cys Gln Arg Trp Asp His Gln Thr Pro His Arg His Lys Phe
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Leu Pro Glu Arg Tyr Pro Asp Lys Gly Phe Asp Asp Asn Tyr Cys Arg
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Asn Pro Asp Gly Gln Pro Arg Pro Trp Cys Tyr Thr Leu Asp Pro His
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Thr Arg Trp Glu Tyr Cys Ala Ile Lys Thr Cys Ala Asp Asn Thr Met
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Asn Asp Thr Asp Val Pro Leu Glu Thr Thr Glu Cys Ile Gln Gly Gln
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Gly Glu Gly Tyr Arg Gly Thr Val Asn Thr Ile Trp Asn Gly Ile Pro
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Cys Gln Arg Trp Asp Ser Gln Tyr Pro His Glu His Asp Met Thr Pro
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Glu Asn Phe Lys Cys Lys Asp Leu Arg Glu Asn Tyr Cys Arg Asn Pro
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Asp Gly Ser Glu Ser Pro Trp Cys Phe Thr Thr Asp Pro Asn Ile Arg
        355                 360                 365

Val Gly Tyr Cys Ser Gln Ile Pro Asn Cys Asp Met Ser His Gly Gln
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Asp Cys Tyr Arg Gly Asn Gly Lys Asn Tyr Met Gly Asn Leu Ser Gln
385                 390                 395                 400

Thr Arg Ser Gly Leu Thr Cys Ser Met Trp Asp Lys Asn Met Glu Asp
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Leu His Arg His Ile Phe Trp Glu Pro Asp Ala Ser Lys Leu Asn Glu
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Asn Tyr Cys Arg Asn Pro Asp Asp Asp Ala His Gly Pro Trp Cys Tyr
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Thr Gly Asn Pro Leu Ile Pro Trp Asp Tyr Cys Pro Ile Ser Arg Cys
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Glu Gly Asp Thr Thr Pro Thr Ile Val Asn Leu Asp His Pro Val Ile
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Ser Cys Ala Lys Thr Lys Gln Leu Arg Val Val Asn Gly Ile Pro Thr
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Ile Cys Gly Gly Ser Leu Ile Lys Glu Ser Trp Val Leu Thr Ala Arg
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Met Lys Leu Ala Arg Pro Ala Val Leu Asp Asp Phe Val Ser Thr Ile
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Val Tyr Gly Trp Gly Tyr Thr Gly Leu Ile Asn Tyr Asp Gly Leu Leu
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Arg Val Ala His Leu Tyr Ile Met Gly Asn Glu Lys Cys Ser Gln His
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His Arg Gly Lys Val Thr Leu Asn Glu Ser Glu Ile Cys Ala Gly Ala
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Glu Lys Ile Gly Ser Gly Pro Cys Glu Gly Asp Tyr Gly Gly Pro Leu
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Val Cys Glu Gln His Lys Met Arg Met Val Leu Gly Val Ile Val Pro
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Gly Arg Gly Cys Ala Ile Pro Asn Arg Pro Gly Ile Phe Val Arg Val
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Claims

1. A pharmaceutical composition for preventing or treating amyotrophic lateral sclerosis, the composition containing, as an active ingredient, two or more isomers of hepatocyte growth factor (HGF) or a polynucleotide encoding the isomers.

2. The composition of claim 1, wherein the two or more isoforms of HGF include full-length HGF (flHGF) and deleted variant HGF (dHGF).

3. The composition of claim 2, wherein the full-length HGF includes the amino acid sequence of SEQ ID NO: 1, and the deleted variant HGF includes the amino acid sequence of SEQ ID NO: 2.

4. The composition of claim 1, wherein the two or more isoforms of HGF are encoded by separate nucleotide sequences.

5. The composition of claim 1, wherein the two or more isoforms of HGF are encoded by a single nucleotide sequence.

6. The composition of claim 1, wherein the polynucleotide is naked DNA, or is contained in a gene delivery system.

7. The composition of claim 6, wherein the gene delivery system is a vector.

8. The composition of claim 7, wherein the vector is a plasmid.

9. The composition of claim 8, wherein the vector is pCK.

10. A method for preventing or treating amyotrophic lateral sclerosis, the method comprising administering, to a mammal, a composition containing, as an active ingredient, two or more isomers of hepatocyte growth factor (HGF) or a polynucleotide encoding the isomers.

11. The method of claim 10, wherein the two or more isoforms of HGF include full-length HGF (flHGF) and deleted variant HGF (dHGF).

12. The method of claim 11, wherein the full-length HGF includes the amino acid sequence of SEQ ID NO: 1, and the deleted variant HGF includes the amino acid sequence of SEQ ID NO: 2.

Sequence Listing

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<120> Composition for Preventing or Treating Amyotrophic Lateral Sclerosis using Two or More Isoforms of Hepatocyte Growth Factor

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Pro Phe Thr Cys Lys Ala Phe Val Phe Asp Lys Ala Arg Lys Gln Cys
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Claims

1. A pharmaceutical composition for preventing or treating amyotrophic lateral sclerosis, the composition containing, as an active ingredient, two or more isomers of hepatocyte growth factor (HGF) or a polynucleotide encoding the isomers.

2. The composition of claim 1, wherein the two or more isoforms of HGF include full-length HGF (flHGF) and deleted variant HGF (dHGF).

3. The composition of claim 2, wherein the full-length HGF includes the amino acid sequence of SEQ ID NO: 1, and the deleted variant HGF includes the amino acid sequence of SEQ ID NO: 2.

4. The composition of claim 1, wherein the two or more isoforms of HGF are encoded by separate nucleotide sequences.

5. The composition of claim 1, wherein the two or more isoforms of HGF are encoded by a single nucleotide sequence.

6. The composition of claim 1, wherein the polynucleotide is naked DNA, or is contained in a gene delivery system.

7. The composition of claim 6, wherein the gene delivery system is a vector.

8. The composition of claim 7, wherein the vector is a plasmid.

9. The composition of claim 8, wherein the vector is pCK.

10. The use of a composition containing, as an active ingredient, two or more isomers of hepatocyte growth factor (HGF) or a polynucleotide encoding the isomers in the manufacture of a medicament for the prevention or treatment of amyotrophic lateral sclerosis in a mammal.

11. The use of claim 10, wherein the two or more isoforms of HGF include full-length HGF (flHGF) and deleted variant HGF (dHGF).

12. The use of claim 11, wherein the full-length HGF includes the amino acid sequence of SEQ ID NO: 1, and the deleted variant HGF includes the amino acid sequence of SEQ ID NO: 2.