CLAIMS

1. An isolated soluble Fibroblast Growth Factor Receptor 3 (sFGFR3) polypeptide or a fragment thereof for use in the prevention or treatment of a skeletal growth retardation disorder in a subject in need thereof.

2. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 1, wherein the skeletal growth retardation disorder is an idiopathic growth retardation disorder.

3. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 1, wherein the skeletal growth retardation disorder is a FGFR3-related skeletal disease.

4. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 3, wherein the FGFR3-related skeletal disease is selected from the group consisting of thanatophoric dysplasia type I, thanatophoric dysplasia type II, severe achondroplasia with developmental delay and acanthosis nigricans, hypochondroplasia, achondroplasia, and craniosynostosis.

5. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 4, wherein the FGFR3-related skeletal disease is achondroplasia.

6. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 4, in which the craniosynostosis is selected from the group consisting of Muenke syndrome and Crouzon syndrome with acanthosis nigricans.

7. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 1, in which the FGFR3-related skeletal disease is caused by expression in the subject of a constitutively active FGFR3 variant.

8. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 7, in which the constitutively active FGFR3 variant comprises an amino acid substitution of a glycine residue at position 380 of SEQ ID NO: 1 with an arginine residue (G380R).

9. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 1, in which the isolated FGFR3 polypeptide or fragment thereof comprises the extracellular region of the FGFR3, or a variant or a fragment thereof.

10. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 1, in which the isolated FGFR3 polypeptide or fragment thereof comprises at least 300 consecutive amino acids of the extracellular region of the FGFR3.

11. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 1, in which the isolated FGFR3 polypeptide or fragment thereof comprises an amino acid sequence having at least 85% sequence identity to the amino acid sequence of SEQ ID NO: 1.

12. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 11, in which the isolated sFGFR3 polypeptide or fragment thereof comprises an amino acid sequence having at least 90% sequence identity to the amino acid sequence of SEQ ID NO: 1.

13. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 12, in which the isolated sFGFR3 polypeptide or fragment thereof comprises the amino acid sequence of SEQ ID NO: 1.

14. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 1, in which the isolated sFGFR3 polypeptide or fragment thereof is encoded by a nucleic acid sequence comprising all or a portion of the sequence of SEQ ID NO: 2.

15. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 1, in which the isolated sFGFR3 polypeptide or fragment thereof is formulated to provide about 0.0002 mg/kg/day to about 20 mg/kg/day of the isolated sFGFR3 polypeptide or fragment thereof to the subject in need thereof.

16. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 15, in which the isolated sFGFR3 polypeptide or fragment thereof is formulated to provide about 0.001 mg/kg/day to about 7 mg/kg/day of the isolated sFGFR3 polypeptide or fragment thereof to the subject in need thereof.

17. The isolated sFGFR3 polypeptide or fragment thereof according to any preceding claim, in which the subject in need thereof is a human.

18. A pharmaceutical composition comprising the isolated sFGFR3 polypeptide or fragment thereof according to any of Claims 1 to 16 and a pharmaceutically acceptable carrier for use in the prevention or treatment of a skeletal growth retardation disorder.

19. The pharmaceutical composition for use according to Claim 18, in which the pharmaceutical composition is formulated for subcutaneous, topical, oral, intranasal, intraocular, intravenous, or intramuscular administration.

20. The pharmaceutical composition for use according to Claim 19, in which the pharmaceutical composition is formulated for subcutaneous administration.

21. The isolated sFGFR3 polypeptide or fragment thereof for use according to Claim 12, in which the isolated sFGFR3 polypeptide or fragment thereof comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of SEQ ID NO: 1.

CLAIMS

1. Use of an isolated soluble Fibroblast Growth Factor Receptor 3 (sFGFR3) polypeptide or fragment thereof in the manufacture of a medicament for treating or preventing an FGFR3-related skeletal growth retardation disorder in a subject in need thereof, in which the isolated sFGFR3 polypeptide or fragment thereof comprises at least 300 consecutive amino acids of an extracellular region of a FGFR3 having an amino acid sequence with at least 85% sequence identity to the amino acid sequence of SEQ ID NO: 1.

2. Use according to Claim 1, in which the FGFR3-related skeletal disease is selected from the group consisting of thanatophoric dysplasia type I, thanatophoric dysplasia type II, severe achondroplasia with developmental delay and acanthosis nigricans, hypochondroplasia, achondroplasia, and craniosynostosis.

3. Use according to Claim 2, in which the FGFR3-related skeletal disease is achondroplasia.

4. Use according to Claim 2, in which the craniosynostosis is selected from the group consisting of Muenke syndrome and Crouzon syndrome with acanthosis nigricans.

5. Use according to Claim 1, in which the FGFR3-related skeletal disease is caused by expression in the subject in need thereof of a constitutively active FGFR3 variant.

6. Use according to Claim 5, in which the constitutively active FGFR3 variant comprises an amino acid substitution of a glycine residue at position 380 of SEQ ID NO: 1 with an arginine residue (G380R).

7. Use according to Claim 1, in which the isolated FGFR3 polypeptide or fragment thereof comprises an amino acid sequence having at least 90% sequence identity to the amino acid sequence of SEQ ID NO: 1.

8. Use according to Claim 7, in which the isolated sFGFR3 polypeptide or fragment thereof comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence of SEQ ID NO: 1.

9. Use according to Claim 8, in which the isolated sFGFR3 polypeptide or fragment thereof comprises the amino acid sequence of SEQ ID NO: 1.

10. Use according to Claim 8, in which the isolated sFGFR3 polypeptide or fragment thereof consists of the amino acid sequence of SEQ ID NO: 1

11. Use according to Claim 1, in which the isolated sFGFR3 polypeptide or fragment thereof is encoded by a nucleic acid sequence comprising all or a portion of the nucleic acid sequence of SEQ ID NO: 2.

12. Use according to Claim 1, in which the isolated sFGFR3 polypeptide or fragment thereof is formulated to provide about 0.0002 mg/kg/day to about 20 mg/kg/day of the isolated sFGFR3 polypeptide or fragment thereof to the subject in need thereof.

13. Use according to Claim 12, in which the isolated sFGFR3 polypeptide or fragment thereof is formulated to provide about 0.001 mg/kg/day to about 7 mg/kg/day of the isolated sFGFR3 polypeptide or fragment thereof to the subject in need thereof.

14. Use according to Claim 1, in which the isolated sFGFR3 polypeptide or fragment thereof further comprises a heterologous polypeptide.

15. Use according to Claim 14, in which the heterologous polypeptide comprises an immunoadhesin.

16. Use according to Claim 14, in which the heterologous polypeptide comprises an Fc region.

17. Use according to Claim 16, in which the Fc region is a constant domain of an immunoglobulin selected from the group consisting of IgG-1, IgG-2, and IgG-3.

18. Use according to any preceding claim, in which the subject in need thereof is a human.

19. Use according to any preceding claim, in which the isolated sFGFR3 polypeptide or fragment thereof is administered to the subject in need thereof in a pharmaceutical composition comprising a pharmaceutically acceptable carrier.

20. Use according to Claim19, in which the pharmaceutical composition is administered to the subject in need thereof subcutaneously, topically, orally, intranasally, intraocularly, intravenously or intramuscularly.

21. Use according to Claim 20, in which the pharmaceutical composition is administered to the subject in need thereof subcutaneously.