CLAIMS:

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

2. The polypeptide for use according to claim 1, wherein the skeletal growth retardation disorder is an idiopathic growth retardation disorder.

3. The polypeptide for use according to claim 1, wherein the skeletal growth retardation disorders is a FGFR3-related skeletal disease.

4. The polypeptide 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 FGFR3-related craniosynostosis such as Muenke syndrome and Crouzon syndrome with acanthosis nigricans.

5. The polypeptide for use according to claim 4, wherein the FGFR3-related skeletal disease is achondroplasia.

6. The polypeptide for use according to any of claims 3 to 5, wherein the FGFR3-related skeletal disease is caused by expression in the subject of a constitutively active FGFR3 receptor mutant.

7. The polypeptide for use according to claim 6, wherein the FGFR3-related skeletal disease is achondroplasia and the constitutively active FGFR3 receptor mutant is a mutant wherein the glycine residue at position 380 is substituted with arginine (named G380R).

8. The polypeptide for use according to any of claims 1 to 7, wherein said polypeptide comprises or consists of the extracellular region of the FGFR3 receptor, or a variant or a fragment thereof.

9. The polypeptide for use according to any of claims 1 to 8, wherein the polypeptide is encoded by the polypeptide sequence defined by SEQ ID NO: 1 or a variant thereof having a polypeptide sequence at least 80% identical to SEQ ID NO: 1.

10. The polypeptide for use according to any of claims 1 to 9, wherein the polypeptide is encoded by the polypeptide sequence defined by SEQ ID NO: 1.

11. The polypeptide for use according to claim 10, wherein the polypeptide sequence is encoded by a polynucleotide sequence defined by SEQ ID NO: 2.

12. A pharmaceutical composition comprising an isolated sFGFR3 polypeptide or a functional equivalent thereof and a pharmaceutically acceptable carrier.

13. The pharmaceutical composition according to claim 12, wherein the functional equivalent of sFGFR3 polypeptide is a sFGFR3 immunoadhesin.

14. A pharmaceutical composition according to claim 12 or 13, for use in the prevention or treatment of a skeletal growth retardation disorder.

15. A method for preventing or treating a skeletal growth retardation disorder comprising the step of administering a therapeutically effective amount of a sFGFR3 polypeptide or a pharmaceutical composition comprising such polypeptide to a subject in need thereof.

16. An isolated sFGFR3 immunoadhesin.

17. An isolated sFGFR3 immunoadhesin for use as drug.

CLAIMS

1. A soluble Fibroblast Growth Factor Receptor 3 (sFGFR3) fusion protein comprising a sFGFR3 polypeptide or a fragment thereof and a heterologous polypeptide for use in the prevention or treatment of a skeletal growth retardation disorder in a subject in need thereof.

2. A sFGFR3 fusion protein for use according to Claim 1, in which the heterologous polypeptide is or comprises an immunoadhesin.

3. A sFGFR3 fusion protein for use according to Claim 2, in which the immunoadhesin is or comprises a Fc region.

4. A sFGFR3 fusion protein for use according to Claim 3, 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.

5. A sFGFR3 fusion protein for use according to Claim 1, in which the skeletal growth retardation disorder is an idiopathic growth retardation disorder.

6. A sFGFR3 fusion protein for use according to Claim 1, in which the skeletal growth retardation disorder is a FGFR3-related skeletal disease.

7. A sFGFR3 fusion protein for use according to Claim 6, 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.

8. A sFGFR3 fusion protein for use according to Claim 7, in which the FGFR3-related skeletal disease is achondroplasia.

9. A sFGFR3 fusion protein for use according to Claim 7, in which the craniosynostosis is selected from the group consisting of Muenke syndrome and Crouzon syndrome with acanthosis nigricans.

10. A sFGFR3 fusion protein 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.

11. A sFGFR3 fusion protein for use according to Claim 10, 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).

12. A sFGFR3 fusion protein for use according to Claim 1, in which the FGFR3 polypeptide or fragment thereof comprises the extracellular region of the FGFR3, or a variant or a fragment thereof.

13. A sFGFR3 fusion protein for use according to Claim 1, in which the FGFR3 polypeptide or fragment thereof comprises at least 300 consecutive amino acids of the extracellular region of the FGFR3.

14. A sFGFR3 fusion protein for use according to Claim 1, in which the 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.

15. A sFGFR3 fusion protein for use according to Claim 14, in which the 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.

16. A sFGFR3 fusion protein for use according to Claim 1, in which the sFGFR3 polypeptide or fragment thereof comprises the amino acid sequence of SEQ ID NO: 1.

17. A sFGFR3 fusion protein for use according to Claim 1, in which the 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.

18. A sFGFR3 fusion protein for use according to Claim 1, in which the sFGFR3 fusion protein is formulated to provide about 0.0002 mg/kg/day to about 20 mg/kg/day of the sFGFR3 fusion protein to the subject in need thereof.

19. A sFGFR3 fusion protein for use according to Claim 18, in which the sFGFR3 fusion protein is formulated to provide about 0.001 mg/kg/day to about 7 mg/kg/day of the sFGFR3 fusion protein to the subject in need thereof.

20. A sFGFR3 fusion protein according to any preceding claim, in which the subject in need thereof is a human.

21. A pharmaceutical composition comprising a sFGFR3 fusion protein 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.

22. A pharmaceutical composition for use according to Claim 21, in which the pharmaceutical composition is formulated for subcutaneous, topical, oral, intranasal, intraocular, intravenous, or intramuscular administration.

23. A pharmaceutical composition for use according to Claim 22, in which the pharmaceutical composition is formulated for subcutaneous administration.

24. A sFGFR3 fusion protein comprising: i) an sFGFR3 polypeptide or fragment thereof comprising an amino acid sequence comprising at least 85% sequence identity to SEQ ID NO: 1; and ii) a heterologous polypeptide

25. A sFGFR3 fusion protein of Claim 24, in which the heterologous polypeptide is or comprises an immunoadhesin.

26. A fusion protein according to Claim 25, in which the immunoadhesin is or comprises an Fc region.

27. A fusion protein according to Claim 26, 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.

28. A sFGFR3 fusion protein for use according to Claim 15, in which the 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.