CLAIMS

1. ~~Use~~ An *in vitro* use of interleukin-8 (IL-8) as a biomarker for impaired bone fracture healing.

2. Use of IL-8 for the *in vitro* diagnosis, prediction, prognosis and/or monitoring of impaired bone fracture healing.

3. The use according to any one of claims 1 or 2, wherein the impaired bone fracture healing is selected from the group consisting of mal-union fracture, delayed union fracture, and non-union fracture.

4. A method for the diagnosis, prediction, prognosis and/or monitoring of impaired bone fracture healing in a subject comprising measuring the level of IL-8 in a sample from said subject.

5. The method for the diagnosis, prediction and/or prognosis of impaired bone fracture healing in a subject according to claim 4 comprising steps: (i) measuring the quantity of IL-8 in a sample from the subject; (ii) comparing the quantity as measured in (i) with a reference value representing a known diagnosis, prediction and/or prognosis of impaired bone fracture healing; (iii) finding a deviation or no deviation of the quantity as measured in (i) from the reference value; and (iv) attributing said finding of deviation or no deviation to a particular diagnosis, prediction and/or prognosis of impaired bone fracture healing in the subject.

6. The method for monitoring impaired bone fracture healing or for monitoring the risk of developing impaired bone fracture healing in a subject according to claim 4 comprising steps: (i) measuring the quantity of IL-8 in a sample from the subject at two or more successive time points; (ii) comparing the quantity as measured in (i) between said two or more successive time points; (iii) finding a deviation or no deviation of the quantity as measured in (i) between said two or more successive time points; (iv) attributing said finding of deviation or no deviation to a change in impaired bone fracture healing or to a change in the risk of developing impaired bone fracture healing in the subject between the two or more successive time points.

7. A method to determine whether a subject is or is not in need of a therapeutic or prophylactic treatment of impaired bone fracture healing comprising measuring the level of IL-8 in a sample from said subject, preferably comprising steps: (i) measuring the quantity of IL-8 in the sample from the subject; (ii) comparing the quantity as measured in (i) with a reference value representing a known diagnosis, prediction and/or prognosis of impaired bone fracture healing; (iii) finding a deviation or no deviation of the quantity as measured in (i) from the reference value; (iv) inferring from said finding the presence or absence of a need for a therapeutic or prophylactic treatment of impaired bone fracture healing.

12. The use according to any one of claims 1 to 3 or 9 or the method according to any one of claims 4 to 10, comprising measuring the quantity of IL-8 in cells or in the supernatant of cells obtained from the subject and subsequently cultured *in vitro*.

13. The use or method according to claim 12, wherein the cells are osteoblasts (OB) or mesenchymal stem cells (MSC).

14. Use of a kit for the diagnosis, prediction, prognosis and/or monitoring of impaired bone fracture healing in a subject, the kit comprising ~~(i)~~ means for measuring the quantity of IL-8, particularly in a sample from the subject~~, and (ii) optionally and preferably one or more reference values or means for establishing said one or more reference values, wherein said one or more reference values represent a known diagnosis, prediction and/or prognosis of impaired bone fracture healing~~.

15. The use according to claim 14, wherein means for collecting a sample from a subject is provided separately from or is comprised in the kit.

16. The use according to claim 14, wherein the kit comprises one or more reference values or means for establishing said one or more reference values, wherein said one or more reference values represent a known diagnosis, prediction and/or prognosis of impaired bone fracture healing.

~~16~~17. Use of a nucleic acid array or microarray or a protein, polypeptide or peptide array or microarray for the diagnosis, prediction, prognosis and/or monitoring of impaired bone fracture healing, said array or microarray comprising a nucleic acid encoding IL-8 or comprising IL-8.

18~~17~~. Use of a binding agent array or microarray for the diagnosis, prediction, prognosis and/or monitoring of impaired bone fracture healing, said array or microarray comprising one or more binding agents capable of specifically binding to IL-8~~, preferably comprising a known quantity or concentration of said one or more binding agents~~.

19.The use according to claim 18, wherein the array or microarray comprises a known quantity or concentration of said one or more binding agents.