CLAIMS

1. An inhibitory agent of the expression and/or the activity of an IL-6 type cytokine for the treatment of diseases associated with unwanted cell proliferation.

2. The inhibitory agent according to claim 1, wherein said agent acts through the inhibition of the self-regeneration of tumor stem cells.

3. The agent according to claims 1 or 2, wherein the inhibitory agent is selected from the group consisting of siRNAs, antisense oligonucleotides, specific ribozymes, antibodies, polypeptides and inhibitors of cytokine receptor binding.

4. The agent according to claim 3, wherein the antibodies are inhibitory antibodies specific to said IL-6 type cytokine or antibodies blocking IL-6 type cytokine receptors.

5. The agent according to any of claims 1 to 4, wherein said IL-6 type cytokine is selected from LIF, IL-6, IL-11, oncostatin M, cardiotrophin-1, CNTF and CLC.

6. The agent according to claim 5, wherein the IL-6 type cytokine is LIF.

7. The agent according to any of claims 1 to 6, wherein said disease presenting unwanted cell proliferation is cancer.

8. The agent according to claim 7, wherein the cancer is characterized by presenting high levels of IL-6 type cytokine.

9. The agent according to claim 7, wherein said cancer is caused by a high activity of the JAK-STAT signaling pathway.

10. The agent according to any of claims 7 to 9, wherein said cancer is is one of the following: glioma, pre-B cell acute lymphoblastic leukemia, acute myeloid leukemia, colorectal carcinoma, bladder cancer, breast ductal cancer or

breast carcinoma.

11. The agent according to claim 10, wherein said glioma is grade IV glioma.

12. A pharmaceutical composition comprising a therapeutically effective amount of an agent according to any of claims 1 to 11 together with a pharmaceutically acceptable carrier.

13. *In vitro* method for the identification of compounds capable of blocking/inhibiting the cell proliferation of tumor cells induced by an IL-6 type cytokine or a functionally equivalent variant thereof, comprising the steps of:

(i) contacting a cell expressing the receptor for an IL-6 type cytokine with an IL-6 type cytokine and a candidate compound, and

(ii)identifying those compounds blocking the cell proliferation of said cell.

14. The method according to claim 13, wherein the cell expressing the receptor for an IL-6 type cytokine is a glioma cell, preferably a glioma initiating cell (GIC).

15. The method according to any of claims 13 or 14, wherein said IL-6 type cytokine is selected from LIF, IL-6, IL-11, oncostatin M, cardiotrophin-1, CNTF and CLC.

16. The method according to claim 15, wherein the IL-6 type cytokine is LIF

17. *In vitro* method for the diagnosis of diseases associated with unwanted cell proliferation in a subject or for determining the predisposition of a subject to suffer said disease associated with unwanted cell proliferation, or for determining the stage or severity of said disease associated with unwanted cell proliferation in a subject, or for monitoring the effect of the therapy administered to a subject with said disease associated with unwanted cell proliferation, which comprises quantifying the expression levels of the gene encoding an IL-6 type cytokine or of the protein encoded by said gene or functionally equivalent variant of said protein

in a biological sample from said subject, wherein an increase of the expression of the gene encoding an IL-6 type cytokine or of the protein encoded by said gene or functionally equivalent variant of said protein, with respect to the expression of the gene encoding an IL-6 type cytokine or of the protein encoded by said gene or functionally equivalent variant of said protein in a control sample, is indicative of a disease associated with unwanted cell proliferation, or of greater predisposition of said subject to suffer from a disease associated with unwanted cell proliferation or of the non-response to the therapy administered to said subject.

18. The method according to claim 17, wherein said IL-6 type cytokine is selected from LIF, IL-6, IL-11, oncostatin cardiotrophin-1, CNTF and CLC.

19. The method according to claim 18, wherein the IL-6 type cytokine is LIF.

20. The method according to any of claims 17 to 19, wherein said disease associated with unwanted cell proliferation is cancer.

21. The method according to claim 20, wherein the cancer is characterized by presenting high levels of IL-6 type cytokine.

22. The method according to claim 21, wherein said cancer is caused by a high activity of the JAK-STAT signaling pathway.

23. The method according to any of claims 17 to 22, wherein said cancer is is one of the following: glioma, pre-B cell acute lymphoblastic leukemia, acute myeloid leukemia, colorectal carcinoma, bladder cancer, breast ductal cancer or breast carcinoma.

24. The method according to claim 23, wherein said glioma is grade IV glioma.

25. The method according to any of claims 17 to 24, wherein the quantification of the expression levels of the gene encoding an IL-6 type cytokine comprises the

quantification of the messenger RNA (mRNA) of said gene, a fragment of said mRNA, complementary DNA (cDNA) of said gene, a fragment of said cDNA, or mixtures thereof.

26. The method according to claim 25, wherein the quantification of the expression levels of the gene encoding an IL-6 type cytokine is performed by means of a quantitative polymerase chain reaction (PCR).

27. The method according to any of claims 17 to 24, wherein the quantification of the levels of protein is performed by means of Western blot, immunohistochemistry or ELISA.

28. The method according to any of claims 17 to 24, wherein the quantification of the levels of protein is performed by means of the determination of the activity of said protein.

29. Use of a kit comprising reagents for the quantification of the expression levels of the gene encoding an IL-6 type cytokine or of the protein encoded by said gene or functionally equivalent variant of said protein for the diagnosis of cancer in a subject or for determining the predisposition of a subject to suffer said cancer, or for determining the stage or severity of said cancer in a subject, or for monitoring the effect of the therapy administered to a subject with said cancer, wherein if the reagents detect an increase in the expression of said gene or said protein or functionally equivalent variant thereof with respect to a control sample, then said subject can suffer from a disease associated with unwanted cell proliferation, or present a greater predisposition to suffer said disease associated with unwanted cell prolifPl-ation, or present a greater severity of said disease, or the administered therapy is not being effective.

30. The use according to claim 33, wherein said disease associated with unwanted cell proliferation is cancer.

31. The use according to claim 34, wherein said cancer

is characterized by presenting high levels of an IL-6 type cytokine.

32. The use according to claim 35, wherein said cancer is caused by a high activity of the JAK-STAT signaling pathway.

33. The use according to claim 33 or 36, wherein said cancer is a is one of the following: glioma, pre-B cell acute lymphoblastic leukemia, acute myeloid leukemia, colorectal carcinoma, bladder cancer, breast ductal cancer or breast carcinoma.

34. The use according to claim 37, wherein said glioma is grade IV glioma.

35. The use according to any of claims 33 to 37, wherein said IL-6 type cytokine is selected from LIF, IL-6, IL-11, oncostatin M, cardiotrophin-1, CNTF and CLC.

36. The use according to claim 39, wherein the IL-6 type cytokine is LIF.

37. An in vitro method for designing a customized therapy for a patient suffering from a disease associated with unwanted cell proliferation comprising:

(a) quantifying the expression levels of the IL-6 type cytokine in said patient, and

(b) comparing said expression levels with control levels, wherein if the expression levels of an IL-6 type cytokine in said patient are greater than the control values, then an inhibitory agent of an IL-6 type cytokine is to be administered to said patient.

38. An in *vitro* method for selecting patients suffering from a disease associated with unwanted cell proliferation, to be treated with an inhibitory agent of an IL-6 type cytokine comprising

(a) quantifying the expression levels of the IL-6 type cytokine in said patient, and

(b) comparing said expression levels with control levels, wherein if the expression levels of an IL-6 type cytokine in

said patient are greater than the control values, then said patient is selected to receive treatment with an inhibitory agent of an IL-6 type cytokine.

39. The method according to claim 37 or 38, wherein said agent acts through the inhibition of the self-regeneration of tumor stem cells.

40. The method according to any of claims 37 to 39, wherein the inhibitory agent is selected from the group consisting of siRNAs, antisense oligonucleotides, specific ribozymes, antibodies, polypeptides and inhibitors of cytokine receptor binding.

41. The method according to claim 40, wherein the antibodies are inhibitory antibodies specific to said IL-6 type cytokine or antibodies blocking the IL-6 type cytokine receptors.

42. The method according to any of claims 37 to 41, wherein said IL-6 type cytokine is selected from LIF, IL-6, IL-11, oncostatin M, cardiotrophin-1, CNTF and CLC.

43. The method according to claim 42, wherein the IL-6 type cytokine is LIF.

44. The method according to any of claims 37 to 43, wherein said disease presenting unwanted cell proliferation is cancer.

45. The method according to claim 44, wherein said cancer is caused by a high activity of the JAK-STAT signaling pathway.

46. The method according to any of claims 44 or 45, wherein said cancer is a is one of the following: glioma, pre-cell acute lymphoblastic leukemia, acute myeloid leukemia, colorectal carcinoma, bladder cancer, breast ductal cancer or breast carcinoma.

47. The method according to claim 46, wherein said glioma is grade IV glioma.

48. An *in vitro* method for the prognosis of life expectancy of subjects suffering from diseases associated with

unwanted cell proliferation, comprising quantification of the expression levels of the gene encoding an IL-6 type cytokine or of the protein encoded by said gene or functionally equivalent variant of said protein in a biological sample from said subject according to claim 25 to 29, wherein an increase of the expression of the gene encoding an IL-6 type cytokine or of the protein encoded by said gene or functionally equivalent variant of said protein, with respect to the expression of the gene encoding an IL-6 type cytokine or of the protein encoded by said gene or functionally equivalent variant of said protein in a control sample, is indicative of a reduced life expectancy.

49. The use according to claim 48, wherein said disease associated with unwanted cell proliferation is cancer.

50. The use according to claim 49, wherein said cancer is characterized by presenting abnormally high levels of an IL-6 type cytokine in a subset of patients.

51. The use according to claim 50, wherein said cancer is one of the following: glioma, pre-B cell acute lymphoblastic leukemia, acute myeloid leukemia, colorectal carcinoma, bladder cancer, breast ductal cancer or breast carcinoma.

52. The use according to claim 51, wherein said glioma is glioblastoma.

53. The use according to any of claims 48 to 52, wherein said IL-6 type cytokine is selected from LIF, IL-6, IL-11, oncostatin M, cardiotrophin-1, CNTF and CLC.

54. The use according to claim 53, wherein the IL-6 type cytokine is LIF.

55. An in *vitro* method for measuring the levels of said cytokine in a patient suffering from a disease associated with unwanted cell proliferation comprising:

(a) quantifying the expression levels of the IL-6 type cytokine in said patient, and

(b) comparing said expression levels with control levels

of patients suffering from the same disease,
wherein if the expression levels of an IL-6 type cytokine in said patient are significantly greater than the control values.