CLAIMS

1. Use of a farnesyltransferase inhibitor (FTI) in the manufacture of a medicament for the treatment of a bone marrow myelodysplastic disease or bone marrow cancer in a subject, wherein the subject has a blood-to-marrow blast ratio (BMR) lower than 0.3 and a marrow blast count higher than 40%.

2. The use of claim 1, wherein the FTI is to be selectively administered to the subject that has (d) a CXCL12 and/or CXCR4 expression higher than a reference value.

3. The use of claims 1 or 2, wherein the FTI is to be selectively administered to the subject that has (e) a higher expression ratio of a homing receptor to a mobilizing receptor than a reference ratio; wherein optionally the homing receptor is CXCR4, CXCR3, or a combination thereof, and the mobilizing receptor is CXCR2, CXCR1, or a combination thereof.

4. The use of any one of claims 1-3, wherein the FTI is to be selectively administered to the subject that has (f) a higher ratio of CXCL12 to CXCR4 or HRAS expression, and/or (g) a higher ratio of CXCR4 to CXCL2 expression than a reference ratio.

5. The use of any one of claims 1-4, wherein the absolute neutrophil count (ANC) is lower than an ANC reference value, and wherein the ANC reference value is 1,500/μl, 1,400/μl, 1,300/μl, 1,200/μl, 1,100/μl, 1,000/μl, 900/μl, 800/μl, 700/μl, 600/μl, 500/μl, 400/μl, 300/μl or 200/μl.

6. The use of claim 5, wherein the ANC reference value is ANC 1,000/μl.

7. The use of any one of claims 1-5, wherein the white blood cell (WBC) count in the subject is higher than the lower limit of the normal range of a healthy control group.

8. The use of claim 7, wherein the WBC count is >2,000/μl.

9. The use of claim 8, wherein the subject has a BMR lower than 0.2, 0.1, 0.09, 0.08, 0.07, 0.06, 0.05, 0.04, 0.03, 0.02 or 0.01.

10. The use of claim 9, wherein the subject has a BMR lower than 0.03.

11. The use of any one of claims 1-5 or 7, wherein the peripheral blast count is lower than a peripheral blast count reference value, wherein the reference value is 15%, 10%, 5%, 4%, 3%, 2%, 1.0%, 0.9%, 0.8%, 0.7%, 0.6%, 0.5%, 0.4%. 0.3%, 0.2%, or 0.1%.

12. The use of claim 11, wherein the peripheral blast count reference value is 1%.

13. The use of any one of claims 1-5, 7, or 11, wherein the subject has a marrow blast count higher than 45%, 50%, 55%, 60%, 65%, 70% or 75%.

14. The use of claim 13, wherein the subject has a marrow blast count higher than 45%.

15. The use of any one of claims 1-5, 7, 11, or 13, wherein the subject has a marrow blast count higher than 45%, 50%, 55%, 60%, 65%, 70% or 75%, and a peripheral blast count lower than 15%, 10%, 5%, 4%, 3%, 2%, 1%, 0.9%, 0.8%, 0.7%, 0.6%, 0.5%, 0.4%, 0.3%, 0.2%, or 0.1%.

16. The use of claim 15, wherein the marrow blast count is higher than 45% and the peripheral blast count reference value is 10%.

17. The use of any one of claims 1 to 16, wherein the ANC, the BMR, the peripheral blast count, the marrow blast count, the CXCL12 expression, the CXCR4 expression, the CXCL12 to HRAS or CXCR4 expression ratio and/or the expression ratio of one or more of the homing receptors to one or more of the mobilizing receptors in a sample from the subject have been analyzed prior to administration of the FTI to the subject.

18. The use of claim 17, wherein the sample is a blood sample, a tumor biopsy, a bone marrow aspirate or biopsy, a plasma sample, a cell sample or a lymph node sample.

19. The use of claim 17, wherein the sample is isolated cells.

20. The use of any one of claims 17-19, wherein the ANC in the sample is lower than the ANC reference value, has been determined.

21. The use of claim 20, wherein the ANC reference value is 1,500/μl, 1,400/μl, 1,300/μl, 1,200/μl, 1,100/μl, 1,000/μl, 900/μl, 800/μl, 700/μl, 600/μl, 500/μl, 400/μl, 300/μl or 200/μl.

22. The use of claim 21, wherein the ANC reference value is 1,000/μl.

23. The use of claim 21 or 22, wherein the white blood cell (WBC) count in the sample is determined to be higher than the lower limit of the normal range of a healthy control group.

24. The use of claim 23, wherein the WBC count is >2,000/μl.

25. The use of any one of claims 17 to 24, wherein the BMR in the sample is determined to be lower than 0.2, 0.1, 0.09, 0.08, 0.07, 0.06, 0.05, 0.04, 0.03, 0.02 or 0.01.

26. The use of any one of claims 17 to 24, wherein the BMR in the sample is lower than 0.03.

27. The use of any one of claims 17 to 26, wherein the peripheral blast count in the sample is determined to be lower than the peripheral blast count reference value.

28. The use of claim 27, wherein the peripheral blast count reference value is 15%, 10%, 5%, 4%, 3%, 2%, 1.0%, 0.9%, 0.8%, 0.7%, 0.6%, 0.5%, 0.4%. 0.3%, 0.2%, or 0.1%.

29. The use of claim 28, wherein the peripheral blast count reference value is 1%.

30. The use of any one of claims 17 to 28, wherein the marrow blast count in the sample is determined to be greater than 45%.

31. The use of claim 30, wherein the marrow blast count in the sample is greater than 45%, 50%, 55%, 60%, 65%, 70% or 75%.

32. The use of claim 30, wherein the marrow blast count in the sample is greater than 45%, 50%, 55%, 60%, 65%, 70% or 75%, and a peripheral blast count lower than 15%, 10%, 5%, 4%, 3%, 2%, 1%, 0.9%, 0.8%, 0.7%, 0.6%, 0.5%, 0.4%, 0.3%, 0.2%, or 0.1%.

33. The use of claim 32, wherein the marrow blast count in the sample is greater than 45% and the peripheral blast count reference value is 10%.

34. The use of any one of claims 17 to 33, wherein the expression level of CXCL12 protein, protein fraction or RNA in the sample to be higher than a reference expression level of CXCL12, has been determined.

35. The use of any one of claims 17 to 34, wherein the DNA sequence of CXCL12 gene, has been determined.

36. The use of claim 35, wherein the CXCL12 gene sequence is a single nucleotide variant (SNV) or a variant in the 3 prime untranslated region (3' UTR) of the CXCL12 gene.

37. The use of any one of claims 17 to 36, wherein the DNA sequence of CXCR4, has been determined.

38. The use of claim 37, wherein the DNA sequence of CXCR4 comprises an activating mutation of the CXCR4 gene.

39. The use of any one of claims 17 to 38, wherein the ratio of the expression level of CXCL12 to the expression level of CXCR4 or the ratio of the expression level of CXCL12 to the expression level of HRAS in the sample to be higher than a reference ratio, has been determined.

40. The use of claim 1, wherein the subject having cancer has moderate or severe neutropenia.

41. The use of any one of claims 1 to 40, wherein the subject is transfusion dependent prior to administration of the FTI.

42. The use of claim 41, wherein the medicament is effective to convert a transfusion dependent subject into a transfusion independent subject.

43. The use of any one of claims 1 to 42, wherein the cancer is a lymphoma, leukemia, or a bone marrow metastasis of a non-hematological cancer.

44. The use of any one of claims 1 to 43, wherein the cancer is acute myeloid leukemia (AML).

45. The use of claim 44, wherein the AML is newly diagnosed AML.

46. The use of claim 45, wherein the subject having AML is an elderly patient with poor-risk AML.

47. The use of any one of claims 44 to 46, wherein the AML is relapsed or refractory AML.

48. The use of any one of claims 1 to 47, wherein the cancer is a myelodysplastic syndrome (MDS).

49. The use of any one of claim 1 to 47, wherein the cancer is chronic myeloid leukemia (CML).

50. The use of any one of claims 1 to 47, wherein the cancer is chronic myelomonocytic leukemia (CMML).

51. The use of any one of claims 1 to 47, wherein the cancer is T-cell leukemia.

52. The use of any one of claims 1 to 51, wherein the FTI is selected from the group consisting of tipifarnib, arglabin, perrilyl alcohol, SCH-66336, L778123, L739749, FTI-277, L744832, CP-609,754, R208176, AZD3409, and BMS-214662.

53. The use of claim 52, wherein the FTI is tipifarnib.