Claims:

1. A composition comprising a therapeutically effective amount of crenolanib or a pharmaceutically acceptable salt thereof for use in the treatment of a FLT3 mutated acute myeloid leukemia in a human subject.

2. The use of crenolanib for the preparation of a medicament for the treatment of a FLT3 mutated acute myeloid leukemia in a human subject, wherein the subject is administered a therapeutically effective amount of crenolanib or a pharmaceutically acceptable salt thereof.

3. The composition for use according to claim 1, wherein the therapeutically effective amount of crenolanib or pharmaceutically acceptable salt thereof is from 50 to 500 mg per day, 100 to 450 mg per day, 200 to 400 mg per day, 300 to 500 mg per day, 350 to 500 mg per day, or 400 to 500 mg per day.

4. The composition for use according to claim 1, wherein the therapeutically effective amount of crenolanib or a pharmaceutically acceptable salt thereof is administered at least one of continuously, intermittently, systemically, or locally and wherein the therapeutically effective amount of crenolanib or a pharmaceutically acceptable salt thereof is administered orally, intravenously, or intraperitoneally.

5. The composition for use according to claim 1, wherein the mutated FLT3 is defined further as including at least one of a constitutively active FLT3 mutant, a FLT3-ITD, or FLT3-TKD.

6. The composition for use according to claim 1, wherein the crenolanib is crenolanib besylate, crenolanib phosphate, crenolanib lactate, crenolanib hydrochloride, crenolanib citrate, crenolanib acetate, crenolanib toluenesulphonate and crenolanib succinate.

7. The composition for use according to claim 1, wherein the therapeutically effective amount of crenolanib or a pharmaceutically acceptable salt thereof is administered three times or more a day for as long as the subject is in need of treatment for the acute myeloid leukemia.

8. The composition for use according to claim 1, wherein the therapeutically effective amount of crenolanib or a pharmaceutically acceptable salt thereof is provided at least one of sequentially or concomitantly, with another pharmaceutical agent in a newly diagnosed acute myeloid leukemia human subject, to maintain remission in a human subject, or in a relapsed or acute myeloid leukemia human subject.

9. The composition for use according to claim 1, wherein the therapeutically effective amount of crenolanib or a pharmaceutically acceptable salt thereof is provided in a human subject with a newly diagnosed acute myeloid leukemia, to maintain remission, or in a relapsed or refractory acute myeloid leukemia human subject.

10. The composition for use according to claim 1, wherein the therapeutically effective amount of crenolanib or a pharmaceutically acceptable salt thereof is provided as a single agent or in combination with another pharmaceutical agent in a newly diagnosed acute myeloid leukemia pediatric human subject, to maintain remission in a pediatric human subject, or a relapsed or refractory acute myeloid leukemia pediatric human subject.

11. The composition for use according to claim 1, wherein the human subject is relapsed or refractory to at least one other FLT3 tyrosine kinase inhibitor or another chemotherapeutic agent.

12. A composition comprising a therapeutically effective amount of crenolanib or a salt thereof for use in the treatment of a human subject suffering from acute myeloid leukemia, comprising:

identifying the human subject in need of therapy for the acute myeloid leukemia; and

administering to the human subject in need of such treatment, wherein the acute myeloid leukemia is characterized by deregulated FLT3 receptor tyrosine kinase activity.

13. The use of crenolanib or a salt thereof for the preparation of a medicament for use in the treatment of a human subject suffering from acute myeloid leukemia, comprising:

identifying the human subject in need of therapy for the acute myeloid leukemia; and

administering to the human subject in need of such treatment a therapeutically effective amount of crenolanib or a pharmaceutically acceptable salt thereof, wherein the acute myeloid leukemia is characterized by deregulated FLT3 receptor tyrosine kinase activity.

14. The composition for use according to claim 12, wherein the crenolanib or a salt thereof is administered orally, intravenously, or intraperitoneally.

15. The composition for use according to claim 12, wherein the crenolanib or a salt thereof is at least one of crenolanib besylate, crenolanib phosphate, crenolanib lactate, crenolanib hydrochloride, crenolanib citrate, crenolanib acetate, crenolanib touluenesulphonate and crenolanib succinate.

16. The composition for use according to claim 12, wherein the FLT3 is at least one of FLT3-ITD or FLT3-TKD.

17. The composition for use according to claim 12, wherein the crenolanib or a salt thereof is provided at least one of sequentially or concomitantly, with another chemotherapeutic agent in a newly diagnosed acute myeloid leukemia, to maintain remission, or a relapsed or refractory acute myeloid leukemia.

18. The composition for use according to claim 12, wherein crenolanib or a salt thereof is provided as a single agent or in combination with another chemotherapeutic agent for treatment of a pediatric human subject with the acute myeloid leukemia.

19. The composition for use according to claim 12, wherein crenolanib or a salt thereof is provided as a single agent to at least one of post standard induction therapy, or high dose induction therapy, in newly diagnosed acute myeloid leukemia.

20. The composition for use according to claim 12, wherein crenolanib or a salt thereof is provided as a single agent in treatment of human subjects with the acute myeloid leukemia that is either refractory to, or has relapsed after prior treatment with a chemotherapeutic agent.

21. The composition for use according to claim 12, wherein the human subject is refractory to at least one other tyrosine kinase inhibitor or another chemotherapeutic agent.

22. A composition comprising a therapeutically effective amount of crenolanib or a salt thereof for use in the treatment of acute myeloid leukemia in a human subject, wherein said treatment comprising:

assaying a sample from the human subject;

determining from the human subject sample that the human subject has a deregulated FLT3 receptor tyrosine kinase; and

administering to the human subject a therapeutically effective amount of crenolanib or a salt thereof if the leukemia is characterized by deregulated FLT3 receptor tyrosine kinase activity.

23. The use of crenolanib or a salt thereof for the preparation of a medicament for use in the treatment of acute myeloid leukemia in a human subject, wherein said treatment comprising:

assaying a sample from the human subject;

determining from the human subject sample that the human subject has a deregulated FLT3 receptor tyrosine kinase; and

administering to the human subject a therapeutically effective amount of crenolanib or a salt thereof if the leukemia is characterized by deregulated FLT3 receptor tyrosine kinase activity.

24. A composition comprising crenolanib, or a salt thereof, for use in the treatment of a deregulated receptor tyrosine kinase comprising:

assaying a human subject sample;

determining which receptor tyrosine kinases are deregulated; and

administering to the human subject a therapeutically effective amount of the composition if the deregulated receptor tyrosine kinase is a FLT3 receptor tyrosine kinase, wherein the composition specifically inhibits the kinase.

25. The use of crenolanib, or a salt thereof, for the preparation of a medicament for use in the treatment of a deregulated receptor tyrosine kinase comprising:

assaying a human subject sample;

determining which receptor tyrosine kinases are deregulated; and

administering to the human subject a therapeutically effective amount of the composition if the deregulated receptor tyrosine kinase is a FLT3 receptor tyrosine kinase, wherein the composition specifically inhibits the kinase.

26. The composition for use according to claim 24, wherein the therapeutically effective amount of the composition is provided in an amount that decreases at least one of human subject circulating peripheral blood blast count or human subject bone marrow blast count.

27. The composition for use according to claim 24, wherein the human subject sample is from a human subject with acute myeloid leukemia.

28. The composition for use according to claim 24, wherein the therapeutically effective amount of crenolanib or a salt thereof is provided prophylactically at an effective amounts, from 50 to 500 mg per day, 100 to 450 mg per day, 200 to 400 mg per day, 300 to 500 mg per day, 350 to 500 mg per day, or 400 to 500 mg per day.

29. The composition for use according to claim 24, wherein the therapeutically effective amount of crenolanib or a salt thereof is administered at least one of continuously, intermittently, systemically, or locally and wherein the therapeutically effective amount of crenolanib or a salt thereof is administered orally, intravenously, or intraperitoneally.

30. The composition for use according to claim 24, wherein the deregulated FLT3 is defined further as including at least one of a mutated FLT3 that is constitutively active, a FLT3-ITD, or a FLT3-TKD.

31. The composition for use according to claim 24, wherein the crenolanib is at least one of crenolanib besylate, crenolanib phosphate, crenolanib lactate, crenolanib hydrochloride, crenolanib citrate, crenolanib acetate, crenolanib touluenesulphonate and crenolanib succinate.

32. The composition for use according to claim 24, wherein therapeutically effective amount of crenolanib or a salt thereof is administered three times or more a day for as long as the human subject is in need of treatment for acute myeloid leukemia.

33. The composition for use according to claim 24, wherein the human subject is provided treatment, and the method further comprises the steps of obtaining one or more human subject samples to determine the effect of the treatment, and continuing treatment until acute myeloid leukemia is reduced or eliminated.

34. The composition for use according to claim 24, wherein therapeutically effective amount of crenolanib or a salt thereof is provided at least one of sequentially or concomitantly, with another pharmaceutical agent in a newly diagnosed acute myeloid leukemia human subject, to maintain remission, or a relapsed or refractory acute myeloid leukemia human subject.

35. The composition for use according to claim 24, wherein therapeutically effective amount of crenolanib or a salt thereof is provided as a single agent or in combination with another pharmaceutical agent in a newly diagnosed acute myeloid leukemia human subject, to maintain remission, or a relapsed or refractory acute myeloid leukemia human subject.

36. The composition for use according to claim 24, wherein therapeutically effective amount of crenolanib or a salt thereof is provided as a single agent or in combination with another pharmaceutical agent in a newly diagnosed acute myeloid leukemia pediatric human subject, to maintain remission, or a relapsed or refractory acute myeloid leukemia pediatric human subject.

37. The composition for use according to claim 24, wherein the human subject is relapsed or refractory to a prior tyrosine kinase inhibitor or chemotherapeutic agent.

38. A composition comprising crenolanib or a salt thereof for use in the treatment of acute myeloid leukemia in a human subject comprising:

assaying a sample from the human subject;

determining whether the human subject is resistant to prior tyrosine kinase inhibitors or chemotherapy; and

administering a therapeutically effective amount of composition to the human subject to overcome resistance to the prior protein tyrosine kinase inhibitors or chemotherapy.

39. The use of crenolanib or a salt thereof for the preparation of a medicament for use in the treatment of acute myeloid leukemia in a human subject comprising:

assaying a sample from the human subject;

determining whether the human subject is resistant to prior tyrosine kinase inhibitors or chemotherapy; and

administering a therapeutically effective amount of composition to the human subject to overcome resistance to the prior protein tyrosine kinase inhibitors or chemotherapy.