

What is claimed is:

1. A method of selecting a subject having a hematological malignancy for treatment with a JAK/STAT inhibitor, the method comprising determining the level of mRNA expression of at least two or more biomarkers listed in Table 1 in a biological sample derived from the subject, thereby to predict an increased likelihood of response to a JAK/STAT inhibitor.
2. The method according to claim 1, comprising determining the level of expression of any three biomarkers in Table 1.
3. The method according to claim 1, comprising determining the level of expression of any four biomarkers in Table 1.
4. The method according to claim 3, wherein the biomarkers comprise PIM1, CISH, SOCS2, and ID1.
5. The method according to claim 1, comprising determining the level of expression of any six biomarkers in Table 1.
6. The method of claim 5, wherein the at least six biomarkers comprise PIM1, CISH, SOCS2, ID1, LCN2, and EPOR.
7. The method of claim 1, comprising determining the level of expression of PIM1, CISH, SOCS2, ID1, LCN2, EPOR and EGR1.
8. The method according to any of claims 1-7, wherein the JAK/STAT inhibitor is (R)-3-cyclopentyl-3-[4-(7H-pyrrolo[2,3-d]pyrimidin-4-yl)-1H-pyrazol-1-yl]propanenitrile; or a pharmaceutically acceptable salt thereof.
9. The method according to any of claims 1-8, wherein the hematological malignancy is leukemia, lymphoma or myeloma.
10. A method for producing a transmittable form of information for predicting the responsiveness of a patient to a JAK/STAT inhibitor, comprising:

a) determining an increased likelihood that the patient will respond to treatment with the JAK/STAT inhibitor based on an increased level of expression of two or more biomarkers in Table 1; and

b) recording the result of the determining step on a tangible or intangible media form for use in transmission.

11. A JAK/STAT inhibitor for use in a method of treating a hematological malignancy in a patient comprising the administration of a therapeutically effective amount of a JAK/STAT inhibitor to the patient on the basis that a biological sample derived from the patient has been determined to have a level of expression of at least two or more biomarkers listed in Table 1 indicative that the subject will respond to the JAK/STAT inhibitor.

12. The inhibitor for use according to claim 11, wherein the biomarkers comprise PIM1, CISH, SOCS2, and ID1.

13. The inhibitor for use according to claim 11, wherein the biomarkers comprise PIM1, CISH, SOCS2, ID1, LCN2, and EPOR.

14. The inhibitor for use according to any of claims 11-13, wherein the hematological malignancy is leukemia, lymphoma or myeloma.

15. The inhibitor for use according to any of claims 11-14, wherein the JAK/STAT inhibitor is (R)-3-cyclopentyl-3-[4-(7H-pyrrolo[2,3-d]pyrimidin-4-yl)-1H-pyrazol-1-yl]propanenitrile; or a pharmaceutically acceptable salt thereof.

Claims:

1. A method of selecting a subject having a hematological malignancy for treatment with a JAK/STAT inhibitor, the method comprising determining the level of mRNA expression of biomarkers listed in Table 1 in a biological sample derived from the subject, thereby to predict an increased likelihood of response to a JAK/STAT inhibitor, wherein an increase in the level of mRNA expression compared to a control is indicative that the subject is more likely to respond to treatment with the JAK/STAT signaling inhibitor and the biomarkers comprise PIM1, CISH, SOCS2, and ID1.
2. The method according to claim 1, wherein the biomarkers comprise PIM1, CISH, SOCS2, ID1 and LCN2.
3. The method of claim 1, wherein the biomarkers comprise PIM1, CISH, SOCS2, ID1, LCN2, and EPOR.
4. The method of claim 1, comprising determining the level of expression of PIM1, CISH, SOCS2, ID1, LCN2, EPOR and EGR1.
5. The method according to any of claims 1-4, wherein the JAK/STAT inhibitor is (R)-3-cyclopentyl-3-[4-(7H-pyrrolo[2,3-d]pyrimidin-4-yl)-1H-pyrazol-1-yl]propanenitrile; or a pharmaceutically acceptable salt thereof.
6. The method according to any of claims 1-5, wherein the hematological malignancy is leukemia, lymphoma or myeloma.
7. A method for producing a transmittable form of information for predicting the responsiveness of a patient to a JAK/STAT inhibitor, comprising:
 - a) determining an increased likelihood that the patient will respond to treatment with the JAK/STAT inhibitor based on an increased level of expression of two or more biomarkers in Table 1; and

b) recording the result of the determining step on a tangible or intangible media form for use in transmission.

8. The use of a JAK/STAT inhibitor in the manufacture of a medicament for the treatment of a hematological malignancy in a subject on the basis that a biological sample derived from the patient has been determined to have a level of expression biomarkers listed in Table 1 indicative that the subject will respond to the JAK/STAT inhibitor wherein the biomarkers comprise PIM1, CISH, SOCS2, and ID1.

9. The use according to claim 8, wherein the biomarkers comprise PIM1, CISH, SOCS2, ID1 and LCN2.

10. The use according to claim 8, wherein the biomarkers comprise PIM1, CISH, SOCS2, ID1, LCN2, and EPOR.

11. The use according to claim 8, comprising determining the level of expression of PIM1, CISH, SOCS2, ID1, LCN2, EPOR and EGR1.

12. The use according to any of claims 8-11, wherein the hematological malignancy is leukemia, lymphoma or myeloma.

13. The use according to any of claims 8-12, wherein the JAK/STAT inhibitor is (R)-3-cyclopentyl-3-[4-(7H-pyrrolo[2,3-d]pyrimidin-4-yl)-1H-pyrazol-1-yl]propanenitrile; or a pharmaceutically acceptable salt thereof.