

What is claimed is:

1. Use of a JAK inhibitor in the manufacture of a pharmaceutical composition for treating a human subject having acute, ~~suspected of having, or at risk of developing~~ Graft-Versus-Host Disease (GvHD), wherein the human subject has been previously
5 determined to have (i) a baseline concentration of at least one protein selected from the group consisting of MCP-3, CA5A, IL8, CXCL10, IL6, CCL19, CTSL1, ACE2,
ALDH1A1, TNFRSF6B, KYNU, FOSB, ALDH3A1, and DDAH1 ~~IL-8, HAOX1, ENPP7,~~
ACE2, SULT2A1, MCP-3, CES1, MFGE8, PLXNB1, TNFRSF10A, CCL15, SEMA4C,
PREB, NFATC3, CCL19, DLL1, ENTPD2, IL-4RA, EPHA2, FOSB, CXCL10, VAMP5,
10 ALDH3A1, MVK, IL12RB1, CALCA, AHCY, PRSS2, LILRB4, DDAH1, IL-1ra,
NECTIN2, PDCD1, CD74, PD-L1, REG3A, CA5A, N2DL-2, CDCP1, U-PAR,
SIGLEC7, ANGPTL4, ALDH1A1, SPINK1, HTRA2, PRDX6, IL-1RT2, IGFBP-1,
HNMT, TRAIL-R2, CXADR, CTSL1, IFN-gamma R1, IL-18R1, KRT19, KYNU, and
TGM2 in a biological sample obtained from the human subject that is lower than a
15 control, and/or (ii) a baseline concentration of at least one protein selected from the group consisting of PON3, SCF, GH, SRC, and CR2 ~~PON3, CNTN1, IGFBP3, LEP, Notch-3,~~
TN-R, HSD11B1, FAM19A5, NCAN, F11, GDF-8, CCL28, GALNT10, BCAN, TIMP4,
CRISP2, CD207, WNT9A, MBL2, EN-RAGE, TWEAK, CR2, MFAP5, KIT, GH,
PFKM, CDSN, CRH, GCP5, KLK6, and DRAXIN in a biological sample obtained from
20 the human subject that is higher than a control;

wherein the biological sample is blood, serum, or plasma;

wherein the reduced protein concentration of at least one protein selected from the group consisting of MCP-3, CA5A, IL8, CXCL10, IL6, CCL19, CTSL1, ACE2, ALDH1A1, TNFRSF6B, KYNU, FOSB, ALDH3A1, and DDAH1 compared to the

control, and/or the increased protein concentration of at least one protein selected from the group consisting of PON3, SCF, GH, SRC, and CR2 compared to the control, is predictive that the subject will respond to therapy comprising the JAK inhibitor; and

wherein the control is the concentration of the protein in a sample or samples

5 obtained from one or more subjects that have not responded to treatment with the JAK inhibitor.

2. The use of ~~of~~ according to claim 1, wherein the human subject has been

previously determined to have the(i) a baseline concentration of ~~at least one protein~~

10 ~~selected from the group consisting of MCP-3, HAOX1, CA5A, CALCA, IL8, SULT2A1,~~

~~VAMP5, SPINK1, ENPP7, ACE2, CTSL1, PRSS2, CXCL10, MFGE8, KRT19,~~

~~ALDH1A1, CES1, REG3A, KYNU, IL-4RA, CDCP1, MVK, FOSB, NFATC3, N2DL-2,~~

~~DDAH1, IGFBP-1, ALDH3A1, CXADR, PLXNB1, CD74, ENTPD2, PREB, CCL19,~~

~~HNMT, HTRA2, IL-1RT2, and IL-18R1~~ in a biological sample obtained from the human

15 subject that is lower than a control, wherein the reduced protein concentration of MCP-3

compared to the control is predictive that the subject will respond to therapy comprising

the JAK inhibitorand/or (ii) a baseline concentration of ~~at least one protein selected from~~

~~the group consisting of PON3, LEP, MBL2, GH, GDF-8, EN-RAGE, CRISP2, and CR2~~

~~in a biological sample obtained from the human subject that is higher than a control.~~

20

3. The use of claim 1, wherein the human subject has been previously

determined to have (i) a baseline concentration of ~~at least one protein selected from the~~

~~group consisting of MCP-3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5,~~

~~SPINK1, ENPP7, ACE2, CTSL1, PRSS2, CXCL10, MFGE8, KRT19, and ALDH1A1~~ in

25 ~~a biological sample obtained from the human subject that is lower than a control, and/or~~

(ii) a ~~baseline concentration of at least one protein selected from the group consisting of~~
~~PON3, LEP, and MBL2 in a biological sample obtained from the human subject that is~~
~~higher than a control.~~

5 4. ~~The use of claim 1, wherein the human subject has been previously~~
~~determined to have (i) a baseline concentration of at least one protein selected from the~~
~~group consisting of MCP-3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5, and~~
~~SPINK1 in a biological sample obtained from the human subject that is lower than a~~
~~control, and/or (ii) a baseline concentration of at least one protein selected from the group~~
10 ~~consisting of PON3 and LEP in a biological sample obtained from the human subject that~~
~~is higher than a control.~~

3. Use of a JAK inhibitor in the manufacture of a medicament for the
treatment of a human subject having acute Graft-Versus-Host Disease (GvHD), wherein
15 the medicament is adapted for use in a method comprising the steps:

providing a biological sample obtained from the human subject, wherein the
biological sample is blood, serum, or plasma;

measuring in the biological sample a reduced concentration, as compared to a
control, of at least one protein selected from the group consisting of MCP-3, CA5A, IL8,
20 CXCL10, IL6, CCL19, CTSL1, ACE2, ALDH1A1, TNFRSF6B, KYNU, FOSB,
ALDH3A1, and DDAH1, and/or an increased concentration, as compared to a control, of
at least one protein selected from the group consisting of PON3, SCF, GH, SRC, and
CR2; and

administering the medicament to the human subject;

25 wherein the reduced protein concentration of at least one protein selected from the

group consisting of MCP-3, CA5A, IL8, CXCL10, IL6, CCL19, CTSL1, ACE2, ALDH1A1, TNFRSF6B, KYNU, FOSB, ALDH3A1, and DDAH1 compared to the control, and/or the increased protein concentration of at least one protein selected from the group consisting of PON3, SCF, GH, SRC, and CR2 compared to the control, is predictive
5 that the subject will respond to therapy comprising the JAK inhibitor; and

wherein the control is the concentration of the protein in a sample or samples obtained from one or more subjects that have not responded to treatment with the JAK inhibitor.

10 4. The use of claim 3, wherein the method comprises measuring in the biological sample the reduced concentration, as compared to the control, of MCP-3, wherein the reduced protein concentration of MCP-3 compared to the control is predictive that the subject will respond to therapy comprising the JAK inhibitor.

~~5. Use of JAK inhibitor in the manufacture of a pharmaceutical composition for treating a human subject having, suspected of having, or at risk of developing Graft-Versus-Host Disease (GvHD), wherein:~~

~~a biological sample obtained from the human subject before administration of the pharmaceutical composition has a reduced concentration, as compared to a control, of at least one protein selected from the group consisting of IL8, HAOX1, ENPP7, ACE2, SULT2A1, MCP-3, CES1, MFGE8, PLXNB1, TNFRSF10A, CCL15, SEMA4C, PREB, NFATC3, CCL19, DLL1, ENTPD2, IL-4RA, EPHA2, FOSB, CXCL10, VAMP5, ALDH3A1, MVK, IL12RB1, CALCA, AHCY, PRSS2, LILRB4, DDAH1, IL-1ra, NECTIN2, PDCD1, CD74, PD-L1, REG3A, CA5A, N2DL-2, CDCP1, U-PAR, SIGLEC7, ANGPTL4, ALDH1A1, SPINK1, HTRA2, PRDX6, IL-1RT2, IGFBP-1, HNMT, TRAIL-R2, CXADR, CTSL1, IFN-gamma-R1, IL-18R1, KRT19, KYNU, and~~

25

TGM2, and/or an increased concentration, as compared to a control, of at least one protein selected from the group consisting of PON3, CNTN1, IGFBP3, LEP, Notch 3, TN R, HSD11B1, FAM19A5, NCAN, F11, GDF 8, CCL28, GALNT10, BCAN, TIMP4, CRISP2, CD207, WNT9A, MBL2, EN RAGE, TWEAK, CR2, MFAP5, KIT, GH,
5 PFKM, CDSN, CRH, GCP5, KLK6, and DRAXIN.

6. The use of claim 5, wherein:

the biological sample has a reduced concentration, as compared to a control, of at least one protein selected from the group consisting of MCP 3, HAOX1, CA5A,
10 CALCA, IL8, SULT2A1, VAMP5, SPINK1, ENPP7, ACE2, CTSL1, PRSS2, CXCL10, MFGE8, KRT19, ALDH1A1, CES1, REG3A, KYNU, IL 4RA, CDCP1, MVK, FOSB, NFATC3, N2DL 2, DDAH1, IGFBP 1, ALDH3A1, CXADR, PLXNB1, CD74, ENTPD2, PREB, CCL19, HNMT, HTRA2, IL 1RT2, and IL 18R1, and/or an increased concentration, as compared to a control, of at least one protein selected from the group
15 consisting of PON3, LEP, MBL2, GH, GDF 8, EN RAGE, CRISP2, and CR2; and administering the therapy comprising the JAK inhibitor to the human subject.

7. The use of claim 5, wherein:

the biological sample has a reduced concentration, as compared to a control, of at least one protein selected from the group consisting of MCP 3, HAOX1, CA5A,
20 CALCA, IL8, SULT2A1, VAMP5, SPINK1, ENPP7, ACE2, CTSL1, PRSS2, CXCL10, MFGE8, KRT19, and ALDH1A1, and/or an increased concentration, as compared to a control, of at least one protein selected from the group consisting of PON3, LEP, and MBL2.

25

~~8. The use of claim 5, wherein:~~

~~the biological sample has a reduced concentration, as compared to a control, of at least one protein selected from the group consisting of MCP-3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5, and SPINK1, and/or an increased concentration, as compared to a control, of at least one protein selected from the group consisting of PON3 and LEP.~~

~~95. The use of according to any one of claims 1 to 84, wherein a second therapeutic agent is to be administered to the human subject in combination with the JAK inhibitor.~~

~~106. The use of claim 95, wherein the second therapeutic agent is a corticosteroid, methotrexate, cyclosporine, mycophenolate mofetil, tacrolimus, sirolimus, everolimus, antithymocyte globulin, alemtuzumab, cyclophosphamide, ibrutinib, imatinib, infliximab, etanercept, tocilizumab, alemtuzumab, basiliximab, daclizumab, rituximab, denileukin diftitox, pentostatin, ciclosporin, thalidomide, halofuginone, hydroxychloroquine, or mesenchymal stem cells.~~

~~117. The use of claim 96, wherein the second therapeutic agent is a corticosteroid.~~

~~128. The use of claim 117, wherein the corticosteroid is methylprednisolone or prednisone.~~

139. An *in vitro* method of predicting the response of a human subject having
~~acute, suspected of having, or at risk of developing~~ Graft-Versus-Host Disease (GvHD)
to a therapy comprising a JAK inhibitor, comprising:

providing a biological sample obtained from the subject before the therapy

5 comprising the JAK inhibitor, wherein the biological sample is blood, serum, or plasma;
and

~~measuring in a biological sample obtained from the subject before the therapy~~
~~comprising the JAK inhibitor~~ the concentration of at least one protein selected from the
group consisting of PON3, SCF, GH, SRC, CR2, MCP-3, CA5A, IL8, CXCL10, IL6,

10 CCL19, CTSL1, ACE2, ALDH1A1, TNFRSF6B, KYNU, FOSB, ALDH3A1, and
DDAH1~~CNTN1, IGFBP3, LEP, Notch 3, TN-R, HSD11B1, FAM19A5, NCAN, F11,~~
~~GDF-8, CCL28, GALNT10, BCAN, TIMP4, CRISP2, CD207, WNT9A, MBL2, EN-~~
~~RAGE, TWEAK, CR2, MFAP5, KIT, GH, PFKM, CDSN, CRH, GCP5, KLK6,~~
~~DRAXIN, IL8, HAOX1, ENPP7, ACE2, SULT2A1, MCP-3, CES1, MFGE8, PLXNB1,~~
15 ~~TNFRSF10A, CCL15, SEMA4C, PREB, NFATC3, CCL19, DLL1, ENTPD2, IL-4RA,~~
~~EPHA2, FOSB, CXCL10, VAMP5, ALDH3A1, MVK, IL12RB1, CALCA, AHCY,~~
~~PRSS2, LILRB4, DDAH1, IL-1ra, NECTIN2, PDCD1, CD74, PD-L1, REG3A, CA5A,~~
~~N2DL-2, CDCP1, U-PAR, SIGLEC7, ANGPTL4, ALDH1A1, SPINK1, HTRA2,~~
~~PRDX6, IL-1RT2, IGFBP-1, HNMT, TRAIL-R2, CXADR, CTSL1, IFN-gamma R1, IL-~~
20 ~~18R1, KRT19, KYNU, and TGM2~~ in the biological sample,

wherein a reduced concentration, as compared to a control, of at least one of
MCP-3, CA5A, IL8, CXCL10, IL6, CCL19, CTSL1, ACE2, ALDH1A1, TNFRSF6B,
KYNU, FOSB, ALDH3A1, and/or DDAH1~~IL8, HAOX1, ENPP7, ACE2, SULT2A1,~~
~~MCP-3, CES1, MFGE8, PLXNB1, TNFRSF10A, CCL15, SEMA4C, PREB, NFATC3,~~
25 ~~CCL19, DLL1, ENTPD2, IL-4RA, EPHA2, FOSB, CXCL10, VAMP5, ALDH3A1,~~

MVK, IL12RB1, CALCA, AHCY, PRSS2, LILRB4, DDAH1, IL-1ra, NECTIN2, PDCD1, CD74, PD-L1, REG3A, CA5A, N2DL-2, CDCP1, U-PAR, SIGLEC7, ANGPTL4, ALDH1A1, SPINK1, HTRA2, PRDX6, IL-1RT2, IGFBP-1, HNMT, TRAIL-R2, CXADR, CTSL1, IFN-gamma-R1, IL-18R1, KRT19, KYNU, or TGM2, and/or an increased concentration, as compared to a control, of at least one of PON3, SCF, GH, SRC, and/or CR2, CNTN1, IGFBP3, LEP, Notch-3, TNFR, HSD11B1, FAM19A5, NCAN, F11, GDF-8, CCL28, GALNT10, BCAN, TIMP4, CRISP2, CD207, WNT9A, MBL2, EN-RAGE, TWEAK, CR2, MFAP5, KIT, GH, PFKM, CDSN, CRH, GCP5, KLK6, or DRAXIN is predictive that the subject will respond to the therapy

comprising the JAK inhibitor, and

wherein the control is the concentration of the protein in a sample or samples obtained from one or more subjects that have not responded to treatment with the JAK inhibitor.

1410. The method of claim 139, wherein the method comprises ing:

measuring the concentration of at least one protein selected from the group consisting of PON3, LEP, MBL2, GH, GDF-8, EN-RAGE, CRISP2, CR2, MCP-3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5, SPINK1, ENPP7, ACE2, CTSL1, PRSS2, CXCL10, MFGE8, KRT19, ALDH1A1, CES1, REG3A, KYNU, IL-4RA, CDCP1, MVK, FOSB, NFATC3, N2DL-2, DDAH1, IGFBP-1, ALDH3A1, CXADR, PLXNB1, CD74, ENTPD2, PREB, CCL19, HNMT, HTRA2, IL-1RT2, and IL-18R1 in the biological sample,

wherein a reduced concentration, as compared to a control, of at least one of MCP-3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5, SPINK1, ENPP7, ACE2, CTSL1, PRSS2, CXCL10, MFGE8, KRT19, ALDH1A1, CES1, REG3A, KYNU, IL-

4RA, CDCP1, MVK, FOSB, NFATC3, N2DL 2, DDAH1, IGFBP 1, ALDH3A1,
CXADR, PLXNB1, CD74, ENTPD2, PREB, CCL19, HNMT, HTRA2, IL 1RT2, or IL
18R1, and/or an increased concentration, as compared to a control, of at least one of
PON3, LEP, MBL2, GH, GDF 8, EN RAGE, CRISP2, or CR2 is predictive that the
5 subject will respond to the therapy comprising the JAK inhibitor.

15. The method of claim 13, comprising:

measuring the concentration of at least one protein selected from the group
consisting of PON3, LEP, MBL2, MCP 3, HAOX1, CA5A, CALCA, IL8, SULT2A1,
10 VAMP5, SPINK1, ENPP7, ACE2, CTSL1, PRSS2, CXCL10, MFGE8, KRT19, and
ALDH1A1 in the biological sample,

wherein a reduced concentration, as compared to a control, of at least one of
MCP 3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5, SPINK1, ENPP7, ACE2,
CTSL1, PRSS2, CXCL10, MFGE8, KRT19, or ALDH1A1, and/or an increased
15 concentration, as compared to a control, of at least one of PON3, LEP, or MBL2 is
predictive that the subject will respond to the therapy comprising the JAK inhibitor.

16. The method of claim 13, comprising:

measuring the concentration of at least one protein selected from the group
20 consisting of PON3, LEP, MCP 3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5,
and SPINK1 in the biological sample,

wherein a reduced concentration, as compared to a control, of at least one of
MCP 3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5, or SPINK1, and/or an
increased concentration, as compared to a control, of at least one of PON3 or LEP is
25 predictive that the subject will respond to the therapy comprising the JAK inhibitor.

17. ~~The use of any one of claims 1 to 12 or the method of any one of claims 13 to 16, wherein the control is a pre-established cut-off value.~~

5 18. ~~The use of any one of claims 1 to 12 or the method of any one of claims 13 to 16, wherein the control is the concentration of the protein in a sample or samples obtained from one or more subjects that have not responded to treatment with the JAK inhibitor.~~

10 19. ~~An *in vitro* method for measuring the amount of a protein in a sample, comprising:~~

~~measuring in a biological sample obtained from a human subject having, suspected of having, or at risk of developing Graft-Versus-Host Disease (GvHD) the concentration of at least one protein selected from the group consisting of PON3,~~
15 ~~CNTN1, IGFBP3, LEP, Notch 3, TN-R, HSD11B1, FAM19A5, NCAN, F11, GDF-8, CCL28, GALNT10, BCAN, TIMP4, CRISP2, CD207, WNT9A, MBL2, EN-RAGE, TWEAK, CR2, MFAP5, KIT, GH, PFKM, CDSN, CRH, GCP5, KLK6, DRAXIN, IL8, HAOX1, ENPP7, ACE2, SULT2A1, MCP-3, CES1, MFGE8, PLXNB1, TNFRSF10A, CCL15, SEMA4C, PREB, NFATC3, CCL19, DLL1, ENTPD2, IL-4RA, EPHA2, FOSB,~~
20 ~~CXCL10, VAMP5, ALDH3A1, MVK, IL12RB1, CALCA, AHCY, PRSS2, LILRB4, DDAH1, IL-1ra, NECTIN2, PDCD1, CD74, PD-L1, REG3A, CA5A, N2DL-2, CDCP1, U-PAR, SIGLEC7, ANGPTL4, ALDH1A1, SPINK1, HTRA2, PRDX6, IL-1RT2, IGFBP-1, HNMT, TRAIL-R2, CXADR, CTSL1, IFN-gamma-R1, IL-18R1, KRT19, KYNU, and TGM2 in the biological sample.~~

25

20. ~~The method of claim 19, comprising measuring the concentration of at least one protein selected from the group consisting of PON3, LEP, MBL2, GH, GDF 8, ENRAGE, CRISP2, CR2, MCP 3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5, SPINK1, ENPP7, ACE2, CTSL1, PRSS2, CXCL10, MFGE8, KRT19, ALDH1A1, CES1, REG3A, KYNU, IL 4RA, CDCP1, MVK, FOSB, NFATC3, N2DL 2, DDAH1, IGFBP 1, ALDH3A1, CXADR, PLXNB1, CD74, ENTPD2, PREB, CCL19, HNMT, HTRA2, IL 1RT2, and IL 18R1 in the biological sample.~~

21. ~~The method of claim 19, comprising measuring the concentration of at least one protein selected from the group consisting of PON3, LEP, MBL2, MCP 3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5, SPINK1, ENPP7, ACE2, CTSL1, PRSS2, CXCL10, MFGE8, KRT19, and ALDH1A1 in the biological sample.~~

22. ~~The method of claim 19, comprising measuring the concentration of at least one protein selected from the group consisting of PON3, LEP, MCP 3, HAOX1, CA5A, CALCA, IL8, SULT2A1, VAMP5, and SPINK1 in the biological sample.~~

23. ~~The method of any one of claims 19 to 22, wherein the concentrations of no more than 20 proteins are measured.~~

24. ~~The method of any one of claims 19 to 22, wherein the concentrations of no more than 10 proteins are measured.~~

25. ~~Use of a JAK inhibitor in the manufacture of a pharmaceutical composition for treating a human subject having, suspected of having, or at risk of developing Graft-~~

Versus Host Disease (GvHD), wherein:

a reduced concentration of at least one protein selected from the group consisting of INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP-3, CD27, MAP4K5, DAPP1, PRDX5, TLT-2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1, IRF9, HAVCR2, CD84, STX8, LY9, ZBTB16, CD200R1, TOP2B, THY-1, PRKRA, ITGB1BP2, CD48, CD244, HCLS1, MPO, SIT1, ICAM3, SOST, DDX58, TNF-R2, TRAF2, SMAD1, LAIR-2, PIK3AP1, VSIG4, SIGLEC10, CD6, SKAP1, FCRL5, CD177, KLRD1, ERBB2IP, MILR1, MIF, SNAP23, NUB1, TIGAR, STAMPB, DSC2, LAIR1, FKBP1B, RASSF2, FATC1, CBL, IgG-Fc receptor II-b, GLO1, PVALB, SCAMP3, SLAMF8, STX16, TNF-R1, DFFA, PPP1R2, ANG-1, CCL5, MAP2K6, CRKL, CD38, CXCL5, PILRA, IRAK1, CA13, STX6, PRTN3, IL-5R-alpha, ESM-1, EGLN1, CLEC1B, TYMP, SNAP29, PDGF subunit A, TNFRSF11A, gal-8, GCNT1, STK4, TNC, THBS4, CLEC4D, SIGLEC6, WASF1, WAS, COMT, RETN, SH2D1A, RNASE3, PAR-1, CD69, SIGLEC1, FR-gamma, ADAM-8, AZU1, AREG, SDC4, DCTN2, BID, RELT, CLEC5A, APEX1, PSP-D, FGR, SELE, SELL, MESDC2, IQGAP2, CRTAM, LILRB2, TANK, CPXM1, ARSB, SLAMF1, PEBP1, STIP1, PDGF subunit B, SCARF1, DEFA1, EPHB4, ARHGAP1, CLM-1, DAB2, LYN, CASP-8, APBB1P, ANXA11, ICAM1, PRKCQ, VCAM1, HDGF, CD2AP, TNFRSF6B, CLEC1A, TNFRSF14, TACC3, MMP-1, NRPI, ZBTB17, NADK, PLXNA4, MMP-9, NCR1, AMIGO2, FES, CD79B, TNXB, TXNDC5, TRANCE, ARG1, PCDH17, LRMP, C1QTNF1, CLM-6, CKAP4, APP, PGLYRP1, LILRA5, CLEC10A, NMNAT1, IL-6RA, ATG4A, TIMP1, COCH, DKN1A, CD1C, DECR1,

DAG1, IGFBP 2, RET, GSAP, PILRB, CLEC6A, PECAM 1, PXN, ADGRG1, DPP7, TDRKH, Siglec 9, CD40 L, VEGFC, LYVE1, FADD, FCRL1, EGF, HGF, GZMH, CLEC4G, LY75, PRDX3, COL4A1, CEACAM8, SEMA7A, NUDT5, FCRL6, PAPP, FASLG, GRN, and MATN3, and/or an increased concentration, as compared to the first

5 biological sample, of at least one protein selected from the group consisting of
TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal 3, CCL25, THPO, hK14, KIM1, Flt3L, PLIN1, SPON2, Gal 4, FABP4, DNER, GAL, CPM, VWC2, PPY, PAM, PVR, SERPINA5, ST3GAL1, CST5, CES2, CNDP1, CX3CL1, HO 1, PRELP, ADM, VSIG2, FABP2, CEACAM5, SLITRK2, MCP 1, NTRK3, CLUL1, CXCL16, SCF, TMPRSS5,
10 REG4, hK11, SCGB3A1, DKKL1, NEP, CPA2, Ep-CAM, THBS2, GPNMB, ITGB5, GT, APLP1, TACSTD2, NINJ1, REN, GCG, SERPINA9, KAZALD1, SERPINA12, PODXL, AMN, IGF1R, LTBP2, ANGPTL3, SCARA5, B4GAT1, ROBO2, PDGFC, CA12, DDC, EDIL3, XPNPEP2, PRTG, NQO2, AMBP, ERBB2, IL6, MCP 1, VEGFD, GDF 2, MUC 16, KLK10, FAM3C, uPA, AGR2, METRNL, RTN4R, IGF2R, NTRK2,
15 ITGB6, SCARF2, SCGB3A2, RGMB, EZR, PROC, FURIN, PIgR, and SMOC2 is
present in a second biological sample obtained from the human subject after
administration of the pharmaceutical composition compared to the concentration of the
protein in a first biological sample obtained from the human subject before
administration with the pharmaceutical composition.

20 26. The use of claim 25, wherein:
—— a reduced concentration of at least one protein selected from the group consisting
of INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17,
ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF-R alpha, CNTNAP2, ZBTB16,
25 CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2,

~~SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP 3, CD27, MAP4K5, DAPP1, PRDX5, TLT 2, PARK7, IL2 RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1, IRF9, HAVCR2, CD84, STX8, LY9, ZBTB16, CD200R1, TOP2B, THY 1, PRKRA, ITGB1BP2, CD48, CD244, HCLS1, MPO, SIT1,~~
5 ~~ICAM3, SOST, DDX58, TNF R2, TRAF2, SMAD1, LAIR 2, PIK3AP1, VSIG4, SIGLEC10, CD6, SKAP1, FCRL5, CD177, KLRD1, ERBB2IP, MILR1, MIF, SNAP23, NUB1, TIGAR, STAMPB, DSC2, LAIR1, FKBP1B, RASSF2, FATC1, CBL, IgG Fe receptor II b, GLO1, PVALB, SCAMP3, SLAMF8, STX16, TNF R1, DFFA, PPP1R2, ANG 1, CCL5, MAP2K6, CRKL, CD38, CXCL5, PILRA, IRAK1, CA13, STX6,~~
10 ~~PRTN3, IL 5R alpha, ESM 1, EGLN1, CLEC1B, TYMP, SNAP29, PDGF subunit A, TNFRSF11A, gal 8, GCNT1, STK4, TNC, THBS4, CLEC4D, SIGLEC6, WASF1, WAS, COMT, RETN, SH2D1A, RNASE3, PAR 1, CD69, SIGLEC1, FR gamma, ADAM 8, AZU1, AREG, SDC4, DCTN2, BID, and RELT, and/or an increased concentration, as compared to the first biological sample, of at least one protein selected from the group~~
15 ~~consisting of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal 3, CCL25, THPO, hK14, KIM1, Flt3L, PLIN1, SPON2, Gal 4, FABP4, DNER, GAL, CPM, VWC2, PPY, PAM, PVR, SERPINA5, ST3GAL1, CST5, CES2, CNDP1, CX3CL1, HO 1, PRELP, ADM, VSIG2, FABP2, CEACAM5, SLITRK2, MCP 1, NTRK3, CLUL1, CXCL16, SCF, TMPRSS5, REG4, hK11, SCGB3A1, DKKL1, NEP, CPA2, Ep CAM, THBS2, and~~
20 ~~GPNMB is present in a second biological sample obtained from the human subject after administration of the pharmaceutical composition compared to the concentration of the protein in a first biological sample obtained from the human subject before administration with the pharmaceutical composition.~~

25 27. The use of claim 25, wherein:

~~a reduced concentration of at least one protein selected from the group consisting of INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP-3, CD27, MAP4K5, DAPP1, PRDX5, TLT-2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1, IRF9, and HAVCR2, and/or an increased concentration of at least one protein selected from the group consisting of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, CCL25, THPO, hK14, and KIM1 is present in a second biological sample obtained from the human subject after administration of the pharmaceutical composition compared to the concentration of the protein in a first biological sample obtained from the human subject before administration with the pharmaceutical composition.~~

28. The use of claim 25, wherein:

~~a reduced concentration, as compared to the first biological sample, of at least one protein selected from the group consisting of INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF R-alpha, and CNTNAP2, and/or an increased concentration, as compared to the first biological sample, of at least one protein selected from the group consisting of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, and CCL25 is present in a second biological sample obtained from the human subject after administration of the pharmaceutical composition compared to the concentration of the protein in a first biological sample obtained from the human subject before administration with the pharmaceutical composition.~~

29. The use of claim 25, wherein:

a reduced concentration, as compared to the first biological sample, of at least one protein selected from the group consisting of INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, and ITGB2, and/or an increased concentration, as compared to the first biological sample, of at least one protein selected from the group consisting of TMPRSS15, CCL11, FAM3B, MMP7, and NCAM1 is present in a second biological sample obtained from the human subject after administration of the pharmaceutical composition compared to the concentration of the protein in a first biological sample obtained from the human subject before administration with the pharmaceutical composition.

30. The use of any one of claims 25 to 29, wherein a second therapeutic agent is to be administered to the human subject in combination with the JAK inhibitor.

31. The use of claim 30, wherein the second therapeutic agent is a corticosteroid, methotrexate, cyclosporine, mycophenolate mofetil, tacrolimus, sirolimus, everolimus, antithymocyte globulin, alemtuzumab, cyclophosphamide, ibrutinib, imatinib, infliximab, etanercept, tocilizumab, alemtuzumab, basiliximab, daclizumab, rituximab, denileukin diftitox, pentostatin, ciclosporin, thalidomide, halofuginone, hydroxychloroquine, or mesenchymal stem cells.

32. The use of claim 30, wherein the second therapeutic agent is a corticosteroid.

33. ~~The use of claim 32, wherein the corticosteroid is methylprednisolone or prednisone.~~

34. ~~An *in vitro* method of identifying a therapeutic response of a human subject having, suspected of having, or at risk of developing Graft Versus Host Disease (GvHD) to a therapy comprising a JAK inhibitor, comprising:~~

~~measuring in a first biological sample obtained from the human subject before the therapy comprising the JAK inhibitor is administered the concentration of at least one protein selected from the group consisting of INPPL1, LAT2, CLEC7A, PPP1R9B,~~

10 ~~NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFkBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP-3, CD27, MAP4K5, DAPP1, PRDX5, TLT-2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1,~~

15 ~~IRF9, HAVCR2, CD84, STX8, LY9, ZBTB16, CD200R1, TOP2B, THY-1, PRKRA, ITGB1BP2, CD48, CD244, HCLS1, MPO, SIT1, ICAM3, SOST, DDX58, TNF-R2, TRAF2, SMAD1, LAIR-2, PIK3AP1, VSIG4, SIGLEC10, CD6, SKAP1, FCRL5, CD177, KLRD1, ERBB2IP, MILR1, MIF, SNAP23, NUB1, TIGAR, STAMPB, DSC2, LAIR1, FKBP1B, RASSF2, FATC1, CBL, IgG Fc receptor II-b, GLO1, PVALB,~~

20 ~~SCAMP3, SLAMF8, STX16, TNF-R1, DFFA, PPP1R2, ANG-1, CCL5, MAP2K6, CRKL, CD38, CXCL5, PILRA, IRAK1, CA13, STX6, PRTN3, IL-5R-alpha, ESM-1, EGLN1, CLEC1B, TYMP, SNAP29, PDGF subunit A, TNFRSF11A, gal-8, GCNT1, STK4, TNC, THBS4, CLEC4D, SIGLEC6, WASF1, WAS, COMT, RETN, SH2D1A, RNASE3, PAR-1, CD69, SIGLEC1, FR-gamma, ADAM-8, AZU1, AREG, SDC4,~~

25 ~~DCTN2, BID, RELT, CLEC5A, APEX1, PSP-D, FGR, SELE, SELL, MESDC2,~~

~~IQGAP2, CRTAM, LILRB2, TANK, CPXM1, ARSB, SLAMF1, PEBP1, STIP1, PDGF subunit B, SCARF1, DEFA1, EPHB4, ARHGAP1, CLM 1, DAB2, LYN, CASP 8, APBB1IP, ANXA11, ICAM1, PRKCQ, VCAM1, HDGF, CD2AP, TNFRSF6B, CLEC1A, TNFRSF14, TACC3, MMP 1, NRP1, ZBTB17, NADK, PLXNA4, MMP 9,~~
5 ~~NCR1, AMIGO2, FES, CD79B, TNXB, TXNDC5, TRANCE, ARG1, PCDH17, LRMP, C1QTNF1, CLM 6, CKAP4, APP, PGLYRP1, LILRA5, CLEC10A, NMNAT1, IL 6RA, ATG4A, TIMP1, COCH, DKN1A, CD1C, DECR1, DAG1, IGFBP 2, RET, GSAP, PILRB, CLEC6A, PECAM 1, PXN, ADGRG1, DPP7, TDRKH, Siglec 9, CD40 L, VEGFC, LYVE1, FADD, FCRL1, EGF, HGF, GZMH, CLEC4G, LY75, PRDX3,~~
10 ~~COL4A1, CEACAM8, SEMA7A, NUDT5, FCRL6, PAPPA, FASLG, GRN, MATN3, TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal 3, CCL25, THPO, hK14, KIM1, Flt3L, PLIN1, SPON2, Gal 4, FABP4, DNER, GAL, CPM, VWC2, PPY, PAM, PVR, SERPINA5, ST3GAL1, CST5, CES2, CNDP1, CX3CL1, HO 1, PRELP, ADM, VSIG2, FABP2, CEACAM5, SLITRK2, MCP 1, NTRK3, CLUL1, CXCL16, SCF, TMPRSS5,~~
15 ~~REG4, hK11, SCGB3A1, DKKL1, NEP, CPA2, Ep CAM, THBS2, GPNMB, ITGB5, GT, APLP1, TACSTD2, NINJ1, REN, GCG, SERPINA9, KAZALD1, SERPINA12, PODXL, AMN, IGF1R, LTBP2, ANGPTL3, SCARA5, B4GAT1, ROBO2, PDGFC, CA12, DDC, EDIL3, XPNPEP2, PRTG, NQO2, AMBP, ERBB2, IL6, MCP 1, VEGFD, GDF 2, MUC 16, KLK10, FAM3C, uPA, AGR2, METRNL, RTN4R, IGF2R, NTRK2,~~
20 ~~ITGB6, SCARF2, SCGB3A2, RGMB, EZR, PROC, FURIN, PIgR, and SMOC2 in the first biological sample;~~

and

measuring in a second biological sample obtained from the subject after the therapy comprising the JAK inhibitor has been administered the concentration of at least
25 one protein selected from the group consisting of INPPL1, LAT2, CLEC7A, PPP1R9B,

~~NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP-3, CD27, MAP4K5, DAPP1, PRDX5,~~
5 ~~TLT-2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1, IRF9, HAVCR2, CD84, STX8, LY9, ZBTB16, CD200R1, TOP2B, THY-1, PRKRA, ITGB1BP2, CD48, CD244, HCLS1, MPO, SIT1, ICAM3, SOST, DDX58, TNF-R2, TRAF2, SMAD1, LAIR-2, PIK3AP1, VSIG4, SIGLEC10, CD6, SKAP1, FCRL5, CD177, KLRD1, ERBB2IP, MILR1, MIF, SNAP23, NUB1, TIGAR, STAMPB, DSC2,~~
10 ~~LAIR1, FKBP1B, RASSF2, FATC1, CBL, IgG-Fc receptor II-b, GLO1, PVALB, SCAMP3, SLAMF8, STX16, TNF-R1, DFFA, PPP1R2, ANG-1, CCL5, MAP2K6, CRKL, CD38, CXCL5, PILRA, IRAK1, CA13, STX6, PRTN3, IL-5R-alpha, ESM-1, EGLN1, CLEC1B, TYMP, SNAP29, PDGF-subunit A, TNFRSF11A, gal-8, GCNT1, STK4, TNC, THBS4, CLEC4D, SIGLEC6, WASF1, WAS, COMT, RETN, SH2D1A,~~
15 ~~RNASE3, PAR-1, CD69, SIGLEC1, FR-gamma, ADAM-8, AZU1, AREG, SDC4, DCTN2, BID, RELT, CLEC5A, APEX1, PSP-D, FGR, SELE, SELL, MESDC2, IQGAP2, CRTAM, LILRB2, TANK, CPXM1, ARSB, SLAMF1, PEBP1, STIP1, PDGF-subunit B, SCARF1, DEFA1, EPHB4, ARHGAP1, CLM-1, DAB2, LYN, CASP-8, APBB1IP, ANXA11, ICAM1, PRKCQ, VCAM1, HDGF, CD2AP, TNFRSF6B,~~
20 ~~CLEC1A, TNFRSF14, TACC3, MMP-1, NRP1, ZBTB17, NADK, PLXNA4, MMP-9, NCR1, AMIGO2, FES, CD79B, TNXB, TXNDC5, TRANCE, ARG1, PCDH17, LRMP, C1QTNF1, CLM-6, CKAP4, APP, PGLYRP1, LILRA5, CLEC10A, NMNAT1, IL-6RA, ATG4A, TIMP1, COCH, DKN1A, CD1C, DECR1, DAG1, IGFBP-2, RET, GSAP, PILRB, CLEC6A, PECAM-1, PXN, ADGRG1, DPP7, TDRKH, Siglec-9, CD40-L,~~
25 ~~VEGFC, LYVE1, FADD, FCRL1, EGF, HGF, GZMH, CLEC4G, LY75, PRDX3,~~

COL4A1, CEACAM8, SEMA7A, NUDT5, FCRL6, PAPP, FASLG, GRN, MATN3, TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal 3, CCL25, THPO, hK14, KIM1, Flt3L, PLIN1, SPON2, Gal 4, FABP4, DNER, GAL, CPM, VWC2, PPY, PAM, PVR, SERPINA5, ST3GAL1, CST5, CES2, CNDP1, CX3CL1, HO 1, PRELP, ADM, VSIG2,

5 FABP2, CEACAM5, SLITRK2, MCP 1, NTRK3, CLUL1, CXCL16, SCF, TMPRSS5, REG4, hK11, SCGB3A1, DKKL1, NEP, CPA2, Ep-CAM, THBS2, GPNMB, ITGB5, GT, APLP1, TACSTD2, NINJ1, REN, GCG, SERPINA9, KAZALD1, SERPINA12, PODXL, AMN, IGF1R, LTBP2, ANGPTL3, SCARA5, B4GAT1, ROBO2, PDGFC, CA12, DDC, EDIL3, XPNPEP2, PRTG, NQO2, AMBP, ERBB2, IL6, MCP 1, VEGFD,

10 GDF 2, MUC 16, KLK10, FAM3C, uPA, AGR2, METRNL, RTN4R, IGF2R, NTRK2, ITGB6, SCARF2, SCGB3A2, RGMB, EZR, PROC, FURIN, PIgR, and SMOC2 in the second biological sample,

———wherein a reduced concentration in the second biological sample, as compared to the first biological sample, of at least one of INPPL1, LAT2, CLEC7A, PPP1R9B,

15 NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF-R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP 3, CD27, MAP4K5, DAPP1, PRDX5, TLT 2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1,

20 IRF9, HAVCR2, CD84, STX8, LY9, ZBTB16, CD200R1, TOP2B, THY 1, PRKRA, ITGB1BP2, CD48, CD244, HCLS1, MPO, SIT1, ICAM3, SOST, DDX58, TNF-R2, TRAF2, SMAD1, LAIR 2, PIK3AP1, VSIG4, SIGLEC10, CD6, SKAP1, FCRL5, CD177, KLRD1, ERBB2IP, MILR1, MIF, SNAP23, NUB1, TIGAR, STAMPB, DSC2, LAIR1, FKBP1B, RASSF2, FATC1, CBL, IgG-Fc receptor II b, GLO1, PVALB,

25 SCAMP3, SLAMF8, STX16, TNF-R1, DFFA, PPP1R2, ANG 1, CCL5, MAP2K6,

~~CRKL, CD38, CXCL5, PILRA, IRAK1, CA13, STX6, PRTN3, IL-5R alpha, ESM-1, EGLN1, CLEC1B, TYMP, SNAP29, PDGF subunit A, TNFRSF11A, gal-8, GCNT1, STK4, TNC, THBS4, CLEC4D, SIGLEC6, WASF1, WAS, COMT, RETN, SH2D1A, RNASE3, PAR-1, CD69, SIGLEC1, FR-gamma, ADAM-8, AZU1, AREG, SDC4,~~
5 ~~DCTN2, BID, RELT, CLEC5A, APEX1, PSP-D, FGR, SELE, SELL, MESDC2, IQGAP2, CRTAM, LILRB2, TANK, CPXM1, ARSB, SLAMF1, PEBP1, STIP1, PDGF subunit B, SCARF1, DEFA1, EPHB4, ARHGAP1, CLM-1, DAB2, LYN, CASP-8, APBB1P, ANXA11, ICAM1, PRKCQ, VCAM1, HDGF, CD2AP, TNFRSF6B, CLEC1A, TNFRSF14, TACC3, MMP-1, NR1P1, ZBTB17, NADK, PLXNA4, MMP-9,~~
10 ~~NCR1, AMIGO2, FES, CD79B, TNXB, TXNDC5, TRANCE, ARG1, PCDH17, LRMP, C1QTNF1, CLM-6, CKAP4, APP, PGLYRP1, LILRA5, CLEC10A, NMNAT1, IL-6RA, ATG4A, TIMP1, COCH, DKN1A, CD1C, DECR1, DAG1, IGFBP-2, RET, GSAP, PILRB, CLEC6A, PECAM-1, PXN, ADGRG1, DPP7, TDRKH, Siglec-9, CD40-L, VEGFC, LYVE1, FADD, FCRL1, EGF, HGF, GZMH, CLEC4G, LY75, PRDX3,~~
15 ~~COL4A1, CEACAM8, SEMA7A, NUDT5, FCRL6, PAPP, FASLG, GRN, and/or MATN3, and/or an increased concentration in the second biological sample, as compared to the first biological sample, of at least one of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, CCL25, THPO, hK14, KIM1, Flt3L, PLIN1, SPON2, Gal-4, FABP4, DNER, GAL, CPM, VWC2, PPY, PAM, PVR, SERPINA5, ST3GAL1, CST5, CES2,~~
20 ~~CNDP1, CX3CL1, HO-1, PRELP, ADM, VSIG2, FABP2, CEACAM5, SLITRK2, MCP-1, NTRK3, CLUL1, CXCL16, SCF, TMPRSS5, REG4, hK11, SCGB3A1, DKKL1, NEP, CPA2, Ep-CAM, THBS2, GPNMB, ITGB5, GT, APLP1, TACSTD2, NINJ1, REN, GCG, SERPINA9, KAZALD1, SERPINA12, PODXL, AMN, IGF1R, LTBP2, ANGPTL3, SCARA5, B4GAT1, ROBO2, PDGFC, CA12, DDC, EDIL3, XPNPEP2,~~
25 ~~PRTG, NQO2, AMBP, ERBB2, IL6, MCP-1, VEGFD, GDF-2, MUC-16, KLK10,~~

~~FAM3C, uPA, AGR2, METRNL, RTN4R, IGF2R, NTRK2, ITGB6, SCARF2, SCGB3A2, RGMB, EZR, PROC, FURIN, PlgR, and/or SMOC2 indicates that the human subject has undergone a therapeutic response to the therapy comprising the JAK inhibitor.~~

5

35. The method of claim 34, comprising:

measuring the concentration of at least one protein selected from the group consisting of ~~TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal 3, CCL25, THPO, hK14, KIM1, Flt3L, PLIN1, SPON2, Gal 4, FABP4, DNER, GAL, CPM, VWC2, PPY, PAM, PVR, SERPINA5, ST3GAL1, CST5, CES2, CNDP1, CX3CL1, HO-1, PRELP, ADM, VSIG2, FABP2, CEACAM5, SLITRK2, MCP-1, NTRK3, CLUL1, CXCL16, SCF, TMPRSS5, REG4, hK11, SCGB3A1, DKKL1, NEP, CPA2, Ep-CAM, THBS2, GPNMB, INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF-R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP-3, CD27, MAP4K5, DAPP1, PRDX5, TLT-2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1, IRF9, HAVCR2, CD84, STX8, LY9, ZBTB16, CD200R1, TOP2B, THY-1, PRKRA, ITGB1BP2, CD48, CD244, HCLS1, MPO, SIT1, ICAM3, SOST, DDX58, TNF-R2, TRAF2, SMAD1, LAIR-2, PIK3AP1, VSIG4, SIGLEC10, CD6, SKAP1, FCRL5, CD177, KLRD1, ERBB2IP, MILR1, MIF, SNAP23, NUB1, TIGAR, STAMPB, DSC2, LAIR1, FKBP1B, RASSF2, FATC1, CBL, IgG-Fc receptor II-b, GLO1, PVALB, SCAMP3, SLAMF8, STX16, TNF-R1, DFFA, PPP1R2, ANG-1, CCL5, MAP2K6, CRKL, CD38, CXCL5, PILRA, IRAK1, CA13, STX6, PRTN3, IL-5R-alpha, ESM-1, EGLN1, CLEC1B, TYMP, SNAP29, PDGF~~

10

15

20

25

subunit A, TNFRSF11A, gal 8, GCNT1, STK4, TNC, THBS4, CLEC4D, SIGLEC6, WASF1, WAS, COMT, RETN, SH2D1A, RNASE3, PAR 1, CD69, SIGLEC1, FR-gamma, ADAM 8, AZU1, AREG, SDC4, DCTN2, BID, and RELT in the first biological sample; and

- 5 measuring the concentration of at least one protein selected from the group consisting of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal 3, CCL25, THPO, hK14, KIM1, Flt3L, PLIN1, SPON2, Gal 4, FABP4, DNER, GAL, CPM, VWC2, PPY, PAM, PVR, SERPINA5, ST3GAL1, CST5, CES2, CNDP1, CX3CL1, HO 1, PRELP, ADM, VSIG2, FABP2, CEACAM5, SLITRK2, MCP 1, NTRK3, CLUL1, CXCL16,
- 10 SCF, TMPRSS5, REG4, hK11, SCGB3A1, DKKL1, NEP, CPA2, Ep-CAM, THBS2, GPNMB, INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF-R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12,
- 15 CASP 3, CD27, MAP4K5, DAPP1, PRDX5, TLT 2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1, IRF9, HAVCR2, CD84, STX8, LY9, ZBTB16, CD200R1, TOP2B, THY 1, PRKRA, ITGB1BP2, CD48, CD244, HCLS1, MPO, SIT1, ICAM3, SOST, DDX58, TNF-R2, TRAF2, SMAD1, LAIR 2, PIK3AP1, VSIG4, SIGLEC10, CD6, SKAP1, FCRL5, CD177, KLRD1, ERBB2IP, MILR1, MIF,
- 20 SNAP23, NUB1, TIGAR, STAMPB, DSC2, LAIR1, FKBP1B, RASSF2, FATC1, CBL, IgG-Fc-receptor II-b, GLO1, PVALB, SCAMP3, SLAMF8, STX16, TNF-R1, DFFA, PPP1R2, ANG 1, CCL5, MAP2K6, CRKL, CD38, CXCL5, PILRA, IRAK1, CA13, STX6, PRTN3, IL-5R-alpha, ESM 1, EGLN1, CLEC1B, TYMP, SNAP29, PDGF subunit A, TNFRSF11A, gal 8, GCNT1, STK4, TNC, THBS4, CLEC4D, SIGLEC6,
- 25 WASF1, WAS, COMT, RETN, SH2D1A, RNASE3, PAR 1, CD69, SIGLEC1, FR-

~~gamma, ADAM 8, AZU1, AREG, SDC4, DCTN2, BID, and RELT in the second biological sample,~~

~~wherein a reduced concentration in the second biological sample, as compared to the first biological sample, of at least one of INPPL1, LAT2, CLEC7A, PPP1R9B,~~

- 5 ~~NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP-3, CD27, MAP4K5, DAPP1, PRDX5, TLT-2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A,~~
- 10 ~~DCTN1, IRF9, HAVCR2, CD84, STX8, LY9, ZBTB16, CD200R1, TOP2B, THY-1, PRKRA, ITGB1BP2, CD48, CD244, HCLS1, MPO, SIT1, ICAM3, SOST, DDX58, TNF-R2, TRAF2, SMAD1, LAIR-2, PIK3AP1, VSIG4, SIGLEC10, CD6, SKAP1, FCRL5, CD177, KLRD1, ERBB2IP, MILR1, MIF, SNAP23, NUB1, TIGAR, STAMPB, DSC2, LAIR1, FKBP1B, RASSF2, FATC1, CBL, IgG-Fc receptor II-b, GLO1, PVALB,~~
- 15 ~~SCAMP3, SLAMF8, STX16, TNF-R1, DFFA, PPP1R2, ANG-1, CCL5, MAP2K6, CRKL, CD38, CXCL5, PILRA, IRAK1, CA13, STX6, PRTN3, IL-5R-alpha, ESM-1, EGLN1, CLEC1B, TYMP, SNAP29, PDGF-subunit A, TNFRSF11A, gal-8, GCNT1, STK4, TNC, THBS4, CLEC4D, SIGLEC6, WASF1, WAS, COMT, RETN, SH2D1A, RNASE3, PAR-1, CD69, SIGLEC1, FR-gamma, ADAM 8, AZU1, AREG, SDC4,~~
- 20 ~~DCTN2, BID, and RELT, and/or an increased concentration in the second biological sample, as compared to the first biological sample, of at least one of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, CCL25, THPO, hK14, KIM1, Flt3L, PLIN1, SPON2, Gal-4, FABP4, DNER, GAL, CPM, VWC2, PPY, PAM, PVR, SERPINA5, ST3GAL1, CST5, CES2, CNDP1, CX3CL1, HO-1, PRELP, ADM, VSIG2, FABP2,~~
- 25 ~~CEACAM5, SLITRK2, MCP-1, NTRK3, CLUL1, CXCL16, SCF, TMPRSS5, REG4,~~

~~hK11, SCGB3A1, DKKL1, NEP, CPA2, Ep-CAM, THBS2, and GPNMB indicates that the human subject has undergone a therapeutic response to the therapy comprising the JAK inhibitor.~~

36. The method of claim 34, comprising:

measuring the concentration of at least one protein selected from the group consisting of ~~TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, CCL25, THPO, hK14, KIM1, INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF-R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP-3, CD27, MAP4K5, DAPP1, PRDX5, TLT-2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1, IRF9, and HAVCR2~~ in the first biological sample; and

measuring the concentration of at least one protein selected from the group consisting of ~~TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, CCL25, THPO, hK14, KIM1, INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF-R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP-3, CD27, MAP4K5, DAPP1, PRDX5, TLT-2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1, IRF9, and HAVCR2~~ in the second biological sample;

wherein a reduced concentration in the second biological sample, as compared to the first biological sample, of at least one of ~~INPPL1, LAT2, CLEC7A, PPP1R9B,~~

NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF-R-alpha, CNTNAP2, ZBTB16, CD163, TXLNA, MEPE, BACH1, MAX, NFKBIE, hOSCAR, LAT, PTPRJ, SIRT2, SIRPB1, AXIN1, EIF4G1, PTX3, TRIM5, IDUA, NCF2, SELP, ARHGEF12, CASP-3, CD27, MAP4K5, DAPP1, PRDX5, TLT-2, PARK7, IL2-RA, FOXO1, ST1A1, GRAP2, NBN, CD93, FCGR2A, DCTN1, IRF9, and HAVCR2, and/or an increased concentration in the second biological sample, as compared to the first biological sample, of at least one of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, CCL25, THPO, hK14, and KIM1 indicates that the human subject has undergone a therapeutic response to the therapy comprising the JAK inhibitor.

37. The method of claim 34, comprising:

measuring the concentration of at least one protein selected from the group consisting of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, CCL25, INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF-R-alpha, and CNTNAP2 in the first biological sample; and

measuring the concentration of at least one protein selected from the group consisting of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, CCL25, INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1, LAMP3, GM-CSF-R-alpha, and CNTNAP2 in the second biological sample;

wherein a reduced concentration in the second biological sample, as compared to the first biological sample, of at least one of INPPL1, LAT2, CLEC7A, PPP1R9B,

NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, ITGB2, BANK1, TPSAB1, YES1,

LAMP3, GM-CSF R-alpha, and CNTNAP2, and/or an increased concentration in the second biological sample, as compared to the first biological sample, of at least one of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, Gal-3, and CCL25 indicates that the human subject has undergone a therapeutic response to the therapy comprising the JAK inhibitor.

38. The method of claim 34, comprising:

measuring the concentration of at least one protein selected from the group consisting of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, and ITGB2 in the first biological sample; and

measuring the concentration of at least one protein selected from the group consisting of TMPRSS15, CCL11, FAM3B, MMP7, NCAM1, INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, and ITGB2 in the second biological sample;

wherein a reduced concentration in the second biological sample, as compared to the first biological sample, of at least one of INPPL1, LAT2, CLEC7A, PPP1R9B, NEMO, SH2B3, BCR, CD5, DNAJB1, CCL17, and ITGB2, and/or an increased concentration in the second biological sample, as compared to the first biological sample, of at least one of TMPRSS15, CCL11, FAM3B, MMP7, and NCAM1 indicates that the human subject has undergone a therapeutic response to the therapy comprising the JAK inhibitor.

39. The use of any one of claims 1 to 12, 17, 18, and 25 to 33 or the method of any one of claims 13 to 16, 17 to 24, or 34 to 38, wherein the biological sample is blood,

~~serum, plasma, urine, spinal fluid, saliva, lacrimal fluid, or sweat.~~

~~40. The use of any one of claims 1 to 12, 17, 18, 25 to 33 and 39 or the method of any one of claims 13 to 16, 17 to 24, or 34 to 39, wherein the biological sample is blood, serum, or plasma.~~

~~4111. The use of according to any one of claims 1 to ~~8~~12, 17, 18, 25 to 33, 39 and 40 or the method of ~~any one of~~ claims 9 or 1013 to 16, 17 to 24, or 34 to 40, wherein the concentration of the protein ~~has been~~is measured by an immunological method.~~

~~4212. The use or method of according to claim ~~41~~11, wherein the immunological method is selected from the group consisting of enzyme-linked immunosorbent assay, enzyme immunoassay, radioimmunoassay, chemiluminescent immunoassay, electrochemiluminescence immunoassay, latex turbidimetric immunoassay, latex photometric immunoassay, immuno-chromatographic assay, and western blotting.~~

~~4313. The use of according to any one of claims 1 to ~~8~~12, 17, 18, 25 to 33 and 39 to 42 or the method of ~~any one of~~ claims 9 or 1013 to 16, 17 to 24, or 34 to 42, wherein the concentration of the protein ~~has been~~is measured by mass spectrometry.~~

~~4414. The use of according to any one of claims 1 to ~~8 and 11 to 13~~12, 17, 18, 25 to 33 and 39 to 43 or the method of any one of claims 9 to13 to 16, 17 to 24, or 34 to 43, wherein the JAK inhibitor is itacitinib.~~

4515. The use of ~~according to~~ any one of claims 1 to ~~8 and 11 to 14~~12, 17, 18, 25 to 33 and 39 to 44 or the method of any one of claims ~~9 to 13 to 16, 17 to 24, or 34 to~~ 9 to 13 to 16, 17 to 24, or 34 to 44, wherein the JAK inhibitor is 4-[3-(cyanomethyl)-3-(3',5'-dimethyl-1H,1'H-4,4'-bipyrazol-1-yl)azetidin-1-yl]-2,5-difluoro-N-[(1S)-2,2,2-trifluoro-1-methylethyl]benzamide or a pharmaceutically acceptable salt thereof or ((2R,5S)-5-{2-[(1R)-1-hydroxyethyl]-1H-imidazo[4,5-d]thieno[3,2-b]pyridin-1-yl}tetrahydro-2H-pyran-2-yl)acetonitrile or a pharmaceutically acceptable salt thereof.

46. ~~The use of any one of claims 1 to 12, 17, 18, 25 to 33 and 39 to 45 or the~~
10 ~~method of any one of claims 13 to 16, 17 to 24, or 34 to 45, wherein the GvHD is acute~~
~~GvHD.~~

~~47. The use of any one of claims 1 to 12, 17, 18, 25 to 33 and 39 to 45 or the~~
~~method of any one of claims 13 to 16, 17 to 24, or 34 to 46, wherein the GvHD is chronic~~
15 ~~GvHD.~~