CLAIMS

1. A composition comprising a serotonin (5-HT) receptor-expressing cells for use in the treatment of a disease, disorder or condition, wherein said cells have been exposed to (i) a serotonin receptor agonist; or (ii) a prodrug of said serotonin receptor agonist in the presence of an enzyme capable of converting said prodrug to said serotonin receptor agonist.

2. The composition for use according to claim 1, wherein said composition is free of unbound molecules of said serotonin receptor agonist or prodrug thereof.

32. The composition for use according to claim 1 or 2, wherein said cells are selected from the group consisting of bone marrow cells, stem cells, lymphocytes, white blood cells, CAR-T cells, CAR-NK cells, and natural killer cells.

4. The composition for use according to claim 3, wherein said cells are CAR-T cells, CAR-NK cells, or natural killer cells.

53. The composition for use according to any one of claims 1-4 ~~or 2~~, wherein said serotonin receptor is selected from the group consisting of 5-HT_{1A}, 5-HT_{1B}, 5-HT_{1E}, 5-HT_{2A}, 5-HT_{2B}, 5-HT_{2C}, 5-HT_{3A}, 5-HT_3, 5-HT_4, and 5-HT_7 receptors, and a combination thereof.

64. The composition for use according to any one of claims 1-~~3~~5, wherein said serotonin receptor agonist is selected from the group consisting of a tryptamine, phenethylamine, ergoline, and a derivative, analog, or salt thereof; and/or said enzyme is a phosphatase selected from an alkaline phosphatase, esterase, and hydrolase.

~~5. The composition for use according to claim 4, wherein said phosphatase is alkaline phosphatase, an esterase, or a hydrolase.~~

76. The composition for use according to claim ~~4~~6, wherein said serotonin receptor agonist is selected from the group consisting of urapidil, 5-methyl-urapidil, quipazine, lysergic acid diethylamide (LSD), 1-(2,5-dimethoxy-4-methylphenyl)-2-aminopropane, aripiprazole, sumatriptan, CGS 12066B, CP-94,253, flesinoxan, mirtazapine, *m*-chlorophenylpiperazine, norfenfluramine, ergotamine, methylergonovine, liseride, fenfluramine, dihydroergotamine, pergolide, cabergoline, terguride, piribedil, bufotenine, 2-methyl-5-HT, phenylbiguanide, 2,5-dimethoxy-4-iodoamphetamine, 3,4-methylenedioxy -

methamphetamine, fluoxetine, 5-carboxamidotryptamine, 5-methoxytryptamine, 5-methoxy-α-methyltryptamine, *N*,*N*-dimethyltryptamine, 4-fluoro-*N*,*N*-dimethyltryptamine, 5-methoxy-*N*,*N*-dimethyltryptamine, *N*,*N*-diisopropyltryptamine, 4-hydroxy-*N*,*N*-diisopropyltryptamine, 4-hydroxy-*N*-methyl-*N*-ethyltryptamine, 5-methoxy-*N*-methyl-*N*-isopropyl tryptamine, 5-methoxydiisopropyltryptamine, α-methylserotonin, tandospirone, psilocin, 1-methylpsilocin, *N*-butylpsilocin, 8-hydroxy-2-(di-n-propylamino)tetralin, BW723C86, 4-(4-[4-(2-pyrimidinyl)piperazin-1-yl]butyl)-2,3,4,5-tetrahydro-1,4-benzoxazepine-3,5-dione, gepirone, ipsapirone, tandospirone, *N*-benzylated analogues of 2,5-dimethoxy-4-iodophenethylamine, buspirone, (+)-cis-8-hydroxy-1-methyl-2-(di-n-propylamino)tetralin, brexpiprazole, and a combination thereof; and said prodrug of said serotonin receptor agonist is selected from the group consisting of psilocybin, *N*-methylpsilocybin, aripiprazole lauroxil, 1-acetyl-LSD, 1-propionyl-LSD, and 1-butyryl-LSD.

8~~7~~. The composition for use according to claim ~~6~~7, wherein said cells have been exposed to pergolide; 8-hydroxy-2-(di-n-propylamino)tetralin; or psilocybin, in the presence of alkaline phosphatase capable of hydrolyzing psilocybin to psilocin.

9~~8~~. The composition for use according to claim 1 or 2, wherein said cells have been exposed to said serotonin receptor agonist or prodrug thereof at a concentration of from about 1 μM to about 1 mM.

10~~9~~. The composition for use according to any one of claims 1-~~8~~9, wherein said disease, disorder or condition is an immune-related disease, disorder or condition; a cardio-related disease, disorder or condition; a hyperproliferative disorder; or cancer.

11. The composition for use according to claim 10, wherein said disease, disorder or condition is an immune-related disease, disorder or condition such as rheumatoid arthritis, osteoporosis, inflammatory bowel disease, ulcerative colitis, Crohn's disease, malaria, and trypanosomiasis.

12. The composition for use according to claim 10, wherein said disease, disorder or condition is a cardio-related disease, disorder or condition such as coronary heart disease, chronic heart failure, myocardial infarction, and stroke.

13~~10~~. The composition for use according to claim ~~9~~10, wherein said disease, disorder or condition is a hyperproliferative disorder or cancer ~~is~~ such as a hyperproliferative disorder or cancer present in the lung, thyroid, head or neck, nasopharynx, throat, nose or sinuses, brain, spine, breast, adrenal gland, pituitary gland, thyroid, lymph, gastrointestinal, mouth, esophagus, stomach, duodenum, ileum, jejunum, small intestine, colon, rectum, genito-urinary tract, uterus, ovary, cervix, endometrial, bladder, testicle, prostate, kidney, pancreas, liver, bone, bone marrow, lymph, blood, skin, or muscle.

14~~11~~. The composition for use according to claim ~~9~~10, wherein said disease, disorder or condition ~~cancer~~ is a primary solid cancer such as melanoma, renal cell carcinoma, colon cancer, breast cancer, lung cancer, prostate cancer, bladder cancer, brain cancer, adenocarcinoma of the pancreas, and head and neck tumor~~,~~; ~~or~~ a metastasis ~~thereof~~of said primary solid cancer; or a hematological malignancy such as leukemia and lymphoma.

15. The composition for use according to claim 1 or 2, wherein said cells are CAR-T cells, CAR-NK cells, or natural killer cells; and said disease, disorder or condition is cancer.

~~12. A method of treatment of a disease, disorder or condition in a subject in need thereof, said method comprising the steps of:~~

~~(i) contacting a composition comprising a serotonin (5-HT) receptor-expressing cells with a serotonin receptor agonist; or a prodrug of said serotonin receptor agonist in the presence of an enzyme capable of converting said prodrug to said serotonin receptor agonist, thereby stimulating said cells; and~~

~~(i) administering a therapeutically effective amount of the stimulated cells obtained in step (i) to said subject to thereby treat said disease, disorder or condition.~~

~~13. The method of claim 12, further comprising the steps of removing excess of said serotonin receptor agonist and/or prodrug thereof from said composition; and optionally diluting the composition thus obtained, prior to step (ii).~~

~~14. The method of claim 13, wherein said removing excess of said serotonin receptor agonist and/or prodrug thereof from said composition is carried out by washing the stimulated cells obtained in step (i).~~

15. The method of any one of claims 12-14, wherein said cells are autologous cells obtained from said subject.

16. The method of any one of claims 12-14, wherein said cells are allogeneic cells obtained from a donor.

17. The method of any one of claims 12-16, wherein said cells are selected from the group consisting of bone marrow cells, stem cells, lymphocytes, white blood cells, CAR-T cells, CAR-NK cells, and natural killer cells.

18. The method of any one of claims 12-17, wherein said serotonin receptor is selected from the group consisting of 5-HT_{1A}, 5-HT_{1B}, 5-HT_{1E}, 5-HT_{2A}, 5-HT_{2B}, 5-HT_{2C}, 5-HT_{3A}, 5-HT_3, 5-HT_4, and 5-HT_7 receptors, and a combination thereof.

19. The method of any one of claims 12-18, wherein said serotonin receptor agonist is selected from the group consisting of a tryptamine, phenethylamine, ergoline, and a derivative, analog, or salt thereof; and/or said enzyme is a phosphatase.

20. The method of claim 19, wherein said phosphatase is alkaline phosphatase, an esterase, or a hydrolase.

21. The method of claim 19, wherein said serotonin receptor agonist is selected from the group consisting of urapidil, 5-methyl-urapidil, quipazine, lysergic acid diethylamide (LSD), 1-(2,5-dimethoxy-4-methylphenyl)-2-aminopropane, aripiprazole, sumatriptan, CGS 12066B, CP-94,253, flesinoxan, mirtazapine, *m*-chlorophenylpiperazine, norfenfluramine, ergotamine, methylergonovine, liseride, fenfluramine, dihydroergotamine, pergolide, cabergoline, terguride, piribedil, bufotenine, 2-methyl-5-HT, phenylbiguanide, 2,5-dimethoxy-4-iodoamphetamine, 3,4-methylenedioxy-methamphetamine, fluoxetine, 5-carboxamidotryptamine, 5-methoxytryptamine, 5-methoxy-α-methyltryptamine, *N*,*N*-dimethyltryptamine, 4-fluoro-*N*,*N*-dimethyltryptamine, 5-methoxy-*N*,*N*-dimethyltryptamine, *N*,*N*-diisopropyltryptamine, 4-hydroxy-*N*,*N*-diisopropyltryptamine, 4-hydroxy-*N*-methyl-*N*-ethyltryptamine, 5-methoxy-*N*-methyl-*N*-isopropyl tryptamine, 5-methoxydiisopropyltryptamine, α-methylserotonin, tandospirone, psilocin, 1-methylpsilocin, *N*-butylpsilocin, 8-hydroxy-2-(di-n-propylamino)tetralin, BW723C86, 4-(4-[4-(2-pyrimidinyl)piperazin-1-yl]butyl)-2,3,4,5-tetrahydro-1,4-benzoxazepine-3,5-dione,

~~gepirone, ipsapirone, tandospirone, *N*-benzylated analogues of 2,5-dimethoxy-4-iodophenethylamine, buspirone, (+)-cis-8-hydroxy-1-methyl-2-(di-n-propylamino)tetralin, brexpiprazole, and a combination thereof; and said prodrug of said serotonin receptor agonist is selected from the group consisting of psilocybin, N-methylpsilocybin, aripiprazole lauroxil, 1-acetyl-LSD, 1-propionyl-LSD, and 1-butyryl-LSD.~~

~~22. The method of claim 21, wherein said cells are treated in step (i) with pergolide; 8-hydroxy-2-(di-n-propylamino)tetralin; or psilocybin, in the presence of alkaline phosphatase capable of hydrolyzing psilocybin to psilocin.~~

~~23. The method of claim 12, wherein step (i) is carried out by exposing said cells to said serotonin receptor agonist or prodrug thereof at a concentration of from about 1 μM to about 1 mM.~~

~~24. The method of any one of claims 12-23, wherein said disease, disorder or condition is an immune-related disease, disorder or condition; a cardio-related disease, disorder or condition; a hyperproliferative disorder; or cancer.~~

~~25. The method of claim 24, wherein said an immune-related disease, disorder or condition is rheumatoid arthritis, osteoporosis, inflammatory bowel disease, ulcerative colitis, Crohn's disease, malaria, or trypanosomiasis.~~

~~26. The method of claims 24, wherein said cardio-related disease, disorder or condition is coronary heart disease, chronic heart failure, myocardial infarction, or stroke.~~

~~27. The method of claim 24, wherein said hyperproliferative disorder or cancer is present in the lung, thyroid, head or neck, nasopharynx, throat, nose or sinuses, brain, spine, breast, adrenal gland, pituitary gland, thyroid, lymph, gastrointestinal, mouth, esophagus, stomach, duodenum, ileum, jejunum, small intestine, colon, rectum, genito-urinary tract, uterus, ovary, cervix, endometrial, bladder, testicle, prostate, kidney, pancreas, liver, bone, bone marrow, lymph, blood, skin, or muscle.~~

~~28. The method of claim 24, wherein said cancer is a primary solid cancer such as melanoma, renal cell carcinoma, colon cancer, breast cancer, lung cancer, prostate cancer, bladder cancer, brain cancer, adenocarcinoma of the pancreas, and head and neck tumor, or a metastasis thereof; or a hematological malignancy such as leukemia and lymphoma.~~

~~29. A method for stimulating serotonin receptor-expressing cells, comprising contacting said cells with (i) a serotonin receptor agonist; or (ii) a prodrug of said serotonin receptor agonist in the presence of an enzyme capable of converting said prodrug to said serotonin receptor agonist.~~

~~30. The method of claim 29, wherein the stimulated serotonin receptor-expressing cells obtained are used as a therapeutic product.~~

~~31. Use of a composition comprising (i) a serotonin receptor agonist; or (ii) a prodrug of said serotonin receptor agonist in the presence of an enzyme capable of converting said prodrug to said serotonin receptor agonist, for stimulating serotonin receptor-expressing cells.~~

~~32. A composition comprising (i) a serotonin receptor agonist; or (ii) a prodrug of said serotonin receptor agonist in the presence of an enzyme capable of converting said prodrug to said serotonin receptor agonist, for stimulating serotonin receptor-expressing cells.~~