CLAIMS

1. A method for identifying a compound that binds, suppresses, blocks, inhibits, and/or modulates the activity of an olfactory receptor that is activated by a malodor-causing substance comprising:

a. contacting a test substance and a malodor-causing substance to the olfactory receptor Olfr1193;

b. measuring the response of the olfactory receptor to the malodor-causing substance by measuring the response of the olfactory receptor in the presence and absence of the test substance;

c. identifying a test substance that modulates the response of the olfactory receptor on the basis of the response that was measured in the presence and absence of the test substance; and

d. selecting the identified test substance as a compound that modulates the response of the olfactory receptor to the malodor-causing substance,

wherein the malodor-causing substance is dimethyl trisulfide (DMTS) or dimethyl disulfide (DMDS).

2. A method for identifying a malodor inhibitor comprising:

a. contacting a test substance and a malodor-causing substance to at least one olfactory receptor, wherein the receptor comprises a polypeptide comprising an amino acid sequence having at least 95%, 96%, 97%, 98%, 99%, or 100% sequence identity to SEQ ID NO: 2;

b. measuring the response of the olfactory receptor polypeptide to the malodor-causing substance;

c. identifying, based on the measured response, a test substance that can suppress the response of the olfactory receptor; and

d. selecting, as a malodor inhibitor, the test substance that suppresses the response of the olfactory receptor,

wherein the malodor-causing substance is DMTS or DMDS.

3. A method for identifying a compound that binds, suppresses, blocks, inhibits, and/or modulates the activity of at least one olfactory receptor that is activated by a malodor-causing substance, the method comprising:

a. contacting the receptor, or a chimera or fragment thereof with a compound; and

b. determining whether the compound has an effect on the activity of the receptor;

wherein the receptor is a polypeptide

i) comprising an amino acid sequence having at least 95%, 96%, 97%, 98%, 99%, or 100% sequence identity to SEQ ID NO: 2; or

ii) encoded by a nucleic acid molecule comprising a nucleic acid sequence having at least 95%, 96%, 97%, 98%, 99%, or 100% sequence identity to SEQ ID NO: 1, or the reverse complement thereof;

wherein the malodor-causing substance is dimethyl trisulfide (DMTS) or dimethyl disulfide (DMDS).

4. A method of identifying a compound that putatively modulates DMTS or DMDS associated malodor comprising: (i) contacting a cell line that expresses a DMTS or DMDS receptor polypeptide with at least one compound; (ii) screening for compounds that bind, suppress, block, inhibit, and/or modulate the activity of said olfactory receptor polypeptide; and (iii) identifying a compound that putatively modulates DMTS or DMDS associated malodor if it binds, suppresses, blocks, inhibits, and/or modulates the activity of said DMTS or DMDS receptor polypeptide,

wherein the receptor polypeptide

a. comprises an amino acid sequence having at least 95% sequence identity to SEQ ID NO: 2; or

b. is encoded by a nucleic acid molecule comprising a nucleic acid sequence having at least 95%, 96%, 97%, 98%, 99%, or 100% sequence identity to SEQ ID NO: 1, or the reverse complement thereof.

5. A recombinant nucleic acid molecule comprising

a. a nucleic acid comprising a tag combination that comprises at least one of a Lucy tag, a FLAG® tag, and/or a Rho tag; and

b. a nucleic acid encoding a receptor selected from the group consisting of Olfr1193, or the complement thereof.

6. The recombinant nucleic acid molecule of claim 7, wherein the Lucy tag comprises SEQ ID NO: 47, the FLAG® tag comprises SEQ ID NO: 43 and the Rho tag comprises SEQ ID NO: 45.

7. An expression vector comprising the nucleic acid of claim 5 or claim 6.

8. A non-human host organism or a host cell that has been modified to express a receptor that is activated by DMTS or DMDS, wherein the receptor

a. is Olfr1193; or
b. comprises the polypeptide of claim 5 or a polypeptide encoded by the nucleic acid of claim 5 or claim 6.

9. A non-human host organism or a host cell comprising

a. the nucleic acid of claim 5 or claim 6; or
b. the expression vector of claim 7.

10. The non-human host organism or host cell of claim 8 or claim 9, wherein the cell is a eukaryotic cell.

11. The non-human host organism or host cell of claim 8 or claim 9, wherein the cell is a prokaryotic cell.

12. The non-human host organism or host cell of claim 8 or claim 9, wherein the non-human host organism or host cell is selected from the group consisting of HEK293, CHO, *Xenopus oocytes*, COS, yeast and cells derived from the olfactory placode.

13. Use of a polypeptide activated by DMTS or DMDS comprising an amino acid sequence having at least 95%, 96%, 97%, 98%, 99%, or 100% sequence identity to SEQ ID NO: 2 for identifying a malodor modulating compound.