CLAIMS

1. A U2OS cell, the cell comprising a T2R bitter taste receptor and a G protein, the G protein comprising one of Gα15gust25, Gα16gust44, Gα15gust44, and Gα15-i/3-5, wherein the G protein is functionally coupled to the T2R bitter taste receptor.

2. The cell of claim 1, wherein the T2R bitter taste receptor is: a polypeptide sequence of SEQ ID NO: 1, or a functional fragment thereof; a polypeptide sequence of SEQ ID NO: 3, or a functional fragment thereof; a polypeptide sequence of SEQ ID NO: 5, or a functional fragment thereof; a polypeptide sequence of SEQ ID NO: 7, or a functional fragment thereof; or a polypeptide sequence of SEQ ID NO: 9, or a functional fragment thereof.

3. The cell of claim 2, wherein the T2R bitter taste receptor has exactly the sequence of SEQ ID NO: 7.

4. The cell of claim 1 or 2, wherein the cell is modified to overexpress the T2R bitter taste receptor.

5. The cell of any one of claims 1 to 4, wherein the cell is modified to overexpress the G protein.

6. The cell of any one of claims 1 to 5, wherein the cell is an isolated cell.

7. The cell of any one of claims 1 to 5, wherein the cell is contained in a cell-based assay or disposed on a solid support.

8. A method of identifying a bitter taste modulator, the method comprising:

(a) contacting one or more U2OS cells of any one of claims 1 to 7 with a test compound; and

(b) measuring a T2R bitter taste receptor activity, wherein a change in the T2R bitter taste activity indicates that the test compound is a bitter taste modulator.

9. The method of claim 8, further comprising:

(a) identifying the bitter taste modulator as a compound that modulates bitter taste.

10. A method of identifying a compound that reduces bitter taste, the method comprising:

(a) contacting one or more U2OS cells of any one of claims 1 to 7 with a test compound and a bitter tastant; and

(b) measuring a response of the T2R bitter taste receptor by comparing an activity of the T2R bitter taste receptor to the bitter tastant in the presence and absence of the test compound, wherein a change in the T2R bitter taste receptor activity indicates that the test compound is a bitter taste blocker.

11. The method of claim 10, the method further comprising:

(c) identifying a test compound as a bitter taste blocker based on the change in the T2R bitter taste receptor activity.

12. The method of claim 11, the method further comprising:

(d) selecting the bitter taste blocker as a compound that reduces bitter taste.