**CLAIMS**

1. An oral formulation comprising:

a plurality of agents including an effective amount of broccoli seed extract, an effective amount of red orange extract, and an effective amount of grape seed extract; and

wherein the effective amount of at least one of broccoli seed extract, red orange extract, and grape seed extract modulates expression of at least one of the Nrf2-associated genes upon ingestion of the oral formulation by a subject, wherein the Nrf2-associated genes include at least one gene encoding intrinsic antioxidants, and at least one gene encoding cellular detoxifiers, and wherein the effective amount of at least one of the plurality of agents attenuates inflammation, and wherein Nrf2-associated genes are genes that encode for Nuclear Factor (erythroid derived 2)-like 2 protein and genes modulated by the binding of Nrf2 to antioxidant response elements (ARE) associated with these genes.

2. The oral formulation of claim 1, wherein the Nrf2-associated genes are selected from the group consisting of NFE2L2, GCLM, GCLC, GSR, GSTA1, GPX1, GPX4, HMOX1, NQO1, SRXN1, SQSTM1, SOD1, UGT1A6, NOS2, NOS3, and PTGS2.

3. The oral formulation of claim 2, wherein the effective amount of at least one of the plurality of agents substantially reverses an age-related change in expression of at least one of the Nrf2-associated genes.

4. The oral formulation of claim 1, wherein the effective amounts of the plurality of agents combine to modulate expression of at least five Nrf2-associated genes.

5. The oral formulation of claim 1, wherein the effective amount of at least one of the plurality of agents upregulates a gene encoding intrinsic antioxidants, or a gene encoding cellular detoxifiers, or stimulates autophagy in a tissue of a subject.

6. The oral formulation of claim 1, wherein the plurality of agents additionally includes an effective amount of at least one of alpha lipoic acid, whole grape extract, olive leaf extract, olive fruit extract, coenzyme $Q_{10}$, pomegranate extract, curcumin, EGCG, lutein, lycopene, zeaxanthin, resveratrol, Schizandra berry extract, tart cherry, ginseng, rosemary extract, and *Cordyceps sinensis*.

7. The oral formulation of claim 1, wherein the formulation comprises from 20 to 30 wt% broccoli seed extract, from 25 wt% to 35 wt% red orange extract, and from 45 to 55 wt% grape seed extract.

8. The oral formulation of claim 1, present in a dosage form selected from the group consisting of: capsule, tablet, powder, beverage, wafer, confectionary, chewable, gel, paste, elixir, syrup, drops, and lozenge.

9. The oral formulation of claim 1, further comprising at least one excipient selected from the group consisting of microcrystalline cellulose, silicon dioxide, stearic acid, a food-grade gum, lecithin, and an anti-caking agent.

10. The oral formulation of any one of the preceding claims 1 to 9 for use in promoting detoxification in cells of a subject.

11. The oral formulation for the use of claim 10, wherein the effective amounts of the plurality of agents combine to modulate expression of at least five Nrf2-associated genes.

12. The oral formulation for the use of claim 10, wherein the effective amount of at least one of the plurality of agents stimulates autophagy in a tissue of the subject.

13. The oral formulation for the use of claim 10, wherein administering provides the subject with:

a daily dosage of 125 mg red orange extract, 210 mg grape seed extract, and 115 mg broccoli seed extract; or

a dosage per kg of body weight of from 0.15 mg to 18 mg red orange extract, from 0.3 mg to 30 mg grape seed extract, and from 0.15 mg to 16.5 mg broccoli seed extract.