system. It is thought that the secretion of various immune signaling molecules in response to β-glucans is involved in the immune-enhancing properties of natural remedies.

[0005] To meet the increasing demand for natural remedies having increasingly beneficial immune-enhancing properties, there exists a need for additional and improved immunostimulatory compositions containing natural components.

BRIEF SUMMARY

[0005a] In one aspect of the present disclosure, there is provided an immunostimulatory composition comprising a β-glucan preparation, a ginseng extract, and a mushroom extract; wherein the β-glucan preparation is present in the range of about 40% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition;
wherein the ginseng extract is present in the range of about 10% to about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition; and
wherein the mushroom extract is present in the range of about 1% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition.

[0005b] In another aspect of the present disclosure, there is provided an orally consumable product comprising the composition disclosed herein.

[0005c] In a further aspect of the present disclosure, there is provided a method of preparing a composition, the method comprising combining a β-glucan preparation, a ginseng extract, and a mushroom extract into a composition, wherein the composition is formulated such that the β-glucan preparation is present in the range of about 40% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition, the ginseng extract is present in the range of about 10% to about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition, and the mushroom extract is present in the range of about 1% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition.

[0005d] In another aspect of the present disclosure, there is provided a use of the composition disclosed herein or the product disclosed herein, in the manufacture of a medicament for enhancing an immune function in a subject.

[0005e] In a further aspect of the present disclosure, there is provided a kit for enhancing immune function in a subject, the kit comprising the immunostimulatory composition disclosed herein or the product disclosed herein.

[0005f] In another aspect of the present disclosure, there is provided a use of a composition comprising about 220 mg to about 250 mg of a β-glucan preparation, about 75 to about 90 mg of a ginseng extract, and about 20 mg to about 40 mg of a mushroom extract, in the manufacture of a medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

[0005g] In a further aspect of the present disclosure, there is provided a use of a composition comprising about 250 mg to about 325 mg of a β-glucan preparation, about 90 to about 120 mg of a ginseng extract, and about 30 mg to about 50 mg of a mushroom extract, in the manufacture of a medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

[0005h] In another aspect of the present disclosure, there is provided a use of a composition comprising about 150 mg to about 200 mg β-glucans from a β-glucan preparation, about 5 mg to about 10 mg polysaccharides from a ginseng extract, and about 8 mg to about 16 mg polysaccharides from a mushroom extract, in the manufacture of a medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

[0005i] In a further aspect of the present disclosure, there is provided a use of a composition comprising about 150 mg to about 200 mg β-glucans from a β-glucan preparation, about 20 mg to about 30 mg polysaccharides from a ginseng extract, and about 10 mg to about 20 mg polysaccharides from a mushroom extract, in the manufacture of a medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

[0005j] In another aspect of the present disclosure, there is provided a use of a composition comprising about 175 mg to about 225 mg β-glucans from a β-glucan preparation, about 25 mg to about 45 mg polysaccharides from a ginseng extract, and about 15 mg to about 30 mg polysaccharides from a mushroom extract, in the manufacture of a medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

[0006] In one aspect, the present disclosure relates to an immunostimulatory composition containing a β-glucan preparation, a ginseng extract, and a mushroom extract; where the β-glucan preparation is present in the range of about 40% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition; where the ginseng extract is present in the range of about 10% to about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition; and where the mushroom extract is present in the range of about 1% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition. In some embodiments, the β-glucan preparation is prepared from yeast extract. In some embodiments, the yeast extract is obtained from *Saccharomyces cerevisiae*. In some embodiments that may be combined with any of the preceding embodiments, the β-glucan preparation is present at about 60% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the concentration of β-glucan in the β-glucan preparation is in the range of about 60% to about 80% of the total dry weight of the preparation. In some embodiments, the concentration of β-glucan in the β-glucan preparation is about 60% to about 75% of the total dry weight of the preparation. In some embodiments, the concentration of β-glucan in the β-glucan preparation is about 65% to about 70% of the total dry weight of the preparation. In some embodiments, the concentration of β-glucan in the β-glucan preparation is at least about 60%, about 65%, about 70%, or about 80% of the total dry weight of the preparation. In some embodiments that may be combined with any of the preceding embodiments, the ginseng extract is prepared from Chinese ginseng or American ginseng. In some embodiments that may be combined with any of the preceding embodiments, the ginseng extract is present at about 20% to about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the ginseng extract is present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom

ginseng extract is from Chinese ginseng and is present at about 15% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 1% to about 5% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 10% to about 15% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 15% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from American ginseng and is present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from Reishi mushroom and is present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the composition may comprise one or more additives described herein.

[0007] The present disclosure also relates to an orally consumable product containing the composition of any one of the previous embodiments. In some embodiments, the orally consumable product is selected from a foodstuff composition, a beverage product, a dietary supplement, a nutraceutical, an edible gel mix, an edible gel composition, a granulated powder, a soft gel composition, a flash dissolve composition, and a pharmaceutical composition. In some embodiments, the orally consumable product is formulated into a tablet or capsule. In some embodiments, the orally consumable product is a foodstuff composition selected from a

confectionary composition, a condiment, a cereal composition, a baked good, and a dairy product. In some embodiments, the orally consumable product is a carbonated or non-carbonated beverage product. In some embodiments, the orally consumable product is a beverage product selected from a soft drink, a fountain beverage, a frozen and ready-to-drink beverage, coffee, tea, a dairy beverage, a powdered soft drink, a liquid concentrate, fruit juice, a sport drink, and an energy drink. In some embodiments that may be combined with any of the preceding embodiments, the orally consumable product contains one or more additives selected from a carbohydrate, a polyol, an amino acid or salt thereof, a poly-amino acid or salt thereof, a sugar acid or salt thereof, a nucleotide, an organic acid, an inorganic acid, an organic salt, an organic acid salt, an organic base salt, an inorganic salt, a bitter compound, a flavorant, a flavoring ingredient, an astringent compound, a protein, a protein hydrolysate, a surfactant, an emulsifier, a flavonoid, an alcohol, a polymer, and combinations thereof.

[0008] The present disclosure also relates to a method of preparing a composition, the method including combining a β-glucan preparation, a ginseng extract, and a mushroom extract into a composition, where the composition is formulated such that the β-glucan preparation is present in the range of about 40% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition, the ginseng extract is present in the range of about 10% to about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition, and the mushroom extract is present in the range of about 1% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition. In some embodiments, the β-glucan preparation is prepared from yeast extract. In some embodiments, the yeast extract is obtained from *Saccharomyces cerevisiae*. In some embodiments that may be combined with any of the preceding embodiments, the β-glucan preparation is present at about 60% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the concentration of β-glucan in the β-glucan preparation is in the range of about 60% to about 80% of the total dry weight of the preparation. In some embodiments, the concentration of β-glucan in the β-glucan preparation is about 60% to about 75% of the total dry weight of the preparation. In some embodiments, the concentration of β-glucan in the β-glucan preparation is at least about 60%, about 65%, about 70%, or about 80% of the total dry weight of the preparation. In some

be combined with any of the preceding embodiments, the method further includes preparing the composition into an orally consumable product.

[0009] The present disclosure also relates to a method of enhancing an immune function in a subject, the method including administering to a subject a composition or product of any one of the preceding embodiments. In some embodiments, the subject is an animal. In some embodiments, the subject is a human. In some embodiments that may be combined with any of the preceding embodiments, the enhanced immune function includes enhanced lymphocyte proliferation and/or enhanced production of one or more cytokines. In some embodiments, the one or more cytokines are selected from IFN-γ, IL-12, and IL-10.

[0010] The present disclosure also relates to a method of enhancing an immune function in a subject, the method including administering to a subject a composition including about 220 mg to about 250 mg of a β-glucan preparation, about 75 to about 90 mg of a ginseng extract, and about 20 mg to about 40 mg of a mushroom extract, where the composition is administered once daily. In some embodiments, the composition includes about 220 mg, about 230 mg, about 240 mg, or about 250 mg of a β-glucan preparation. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 80 mg, about 82 mg, about 84 mg, about 86 mg, about 88 mg, or about 90 mg of a ginseng extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 20 mg, about 25 mg, about 30 mg, about 33 mg, about 35 mg, about 38 mg, or about 40 mg of a mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 220 mg, about 230 mg, about 240 mg, or about 250 mg of a β-glucan preparation; about 80 mg, about 82 mg, about 84 mg, about 86 mg, about 88 mg, or about 90 mg of a ginseng extract; and about 20 mg, about 25 mg, about 30 mg, about 33 mg, about 35 mg, about 38 mg, or about 40 mg of a mushroom extract.

[0011] The present disclosure also relates to a method of enhancing an immune function in a subject, the method including administering to a subject a composition including about 250 mg to about 325 mg of a β-glucan preparation, about 90 to about 120 mg of a ginseng extract, and about 30 mg to about 50 mg of a mushroom extract, where the composition is administered once daily. In some embodiments, the composition includes about 250 mg, about 265 mg, about 275 mg, about 290 mg, about 300 mg, about 310 mg, or about 325 mg of a β-glucan preparation. In some embodiments that may be combined with any of the preceding

embodiments, the composition includes about 90 mg, about 95 mg, about 100 mg, about 105 mg, about 110 mg, about 115 mg, or about 120 mg of a ginseng extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 30 mg, about 35 mg, about 40 mg, about 45 mg, or about 50 mg of a mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 250 mg, about 265 mg, about 275 mg, about 290 mg, about 300 mg, about 310 mg, or about 325 mg of a β-glucan preparation; about 90 mg, about 95 mg, about 100 mg, about 105 mg, about 110 mg, about 115 mg, or about 120 mg of a ginseng extract of a ginseng extract; and about 30 mg, about 35 mg, about 40 mg, about 45 mg, or about 50 mg of a mushroom extract.

[0012] The present disclosure also relates to a method of enhancing an immune function in a subject, the method including administering to a subject a composition including about 150 mg to about 200 mg β-glucans from a β-glucan preparation, about 5 mg to about 10 mg polysaccharides from a ginseng extract, and about 8 mg to about 16 mg polysaccharides from a mushroom extract, where the composition is administered once daily. In some embodiments, the composition includes about 150 mg β-glucans, about 175 mg β-glucans, or about 200 mg β-glucans from a β-glucan preparation. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 5 mg, about 6 mg, about 7 mg, about 8 mg, about 9 mg, or about 10 mg polysaccharides from a ginseng extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 8 mg, about 9 mg, about 10 mg, about 11 mg, about 12 mg, about 13 mg, about 14 mg, about 15 mg, or about 16 mg polysaccharides from a mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 150 mg β-glucans, about 175 mg β-glucans, or about 200 mg β-glucans from a β-glucan preparation; about 5 mg, about 6 mg, about 7 mg, about 8 mg, about 9 mg, or about 10 mg polysaccharides from a ginseng extract; and about 8 mg, about 9 mg, about 10 mg, about 11 mg, about 12 mg, about 13 mg, about 14 mg, about 15 mg, or about 16 mg polysaccharides from a mushroom extract.

[0013] The present disclosure also relates to a method of enhancing an immune function in a subject, the method including administering to a subject a composition including about 150 mg to about 200 mg β-glucans from a β-glucan preparation, about 20 mg to about 30 mg polysaccharides from a ginseng extract, and about 10 mg to about 20 mg polysaccharides from a mushroom extract, where the composition is administered once daily. In some

embodiments, the composition includes about 150 mg β-glucans, about 175 mg β-glucans, or about 200 mg β-glucans from a β-glucan preparation. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 20 mg, about 25 mg, or about 30 mg polysaccharides from a ginseng extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 10 mg, about 12 mg, about 14 mg, about 16 mg, about 18 mg, or about 20 mg polysaccharides from a mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 150 mg β-glucans, about 175 mg β-glucans, or about 200 mg β-glucans from a β-glucan preparation; about 20 mg, about 25 mg, or about 30 mg polysaccharides from a ginseng extract; and about 10 mg, about 12 mg, about 14 mg, about 16 mg, about 18 mg, or about 20 mg polysaccharides from a mushroom extract.

[0014] The present disclosure also relates to a method of enhancing an immune function in a subject, the method including administering to a subject a composition including about 175 mg to about 225 mg β-glucans from a β-glucan preparation, about 25 mg to about 45 mg polysaccharides from a ginseng extract, and about 15 mg to about 30 mg polysaccharides from a mushroom extract, where the composition is administered once daily. In some embodiments, the composition includes about 175 mg β-glucans, about 195 mg β-glucans, about 200 mg β-glucans, about 205 mg β-glucans, about 210 mg β-glucans, about 215 mg β-glucans, or about 225 mg β-glucans from a β-glucan preparation. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 25 mg, about 28 mg, about 30 mg, about 32 mg, about 35 mg, about 38 mg, about 40 mg, about 42 mg, or about 45 mg polysaccharides from a ginseng extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 15 mg, about 18 mg, about 20 mg, about 22 mg, about 24 mg, about 25 mg, or about 30 mg polysaccharides from a mushroom extract. In some embodiments that may be combined with any of the preceding embodiments, the composition includes about 175 mg β-glucans, about 195 mg β-glucans, about 200 mg β-glucans, about 205 mg β-glucans, about 210 mg β-glucans, about 215 mg β-glucans, or about 225 mg β-glucans from a β-glucan preparation; about 25 mg, about 28 mg, about 30 mg, about 32 mg, about 35 mg, about 38 mg, about 40 mg, about 42 mg, or about 45 mg polysaccharides from a ginseng extract; and about 15 mg, about 18 mg, about 20 mg, about 22 mg, about 24 mg, about 25 mg, or about 30 mg polysaccharides from a mushroom extract.

[0015] The present disclosure also relates to a kit for enhancing immune function in a subject, where the kit includes an immunostimulatory composition or product of any of the preceding embodiments. In some embodiments, the kit includes instructions for administering the immunostimulatory composition to the subject. In some embodiments that may be combined with any of the preceding embodiments, the immunostimulatory composition in the kit is present in a package.

[0016] In some embodiments that may be combined with any of the preceding embodiments, polysaccharide contents of the present disclosure are determined using the Anthrone reagent-based spectrophotometric methods as described herein (see Example 2). In some embodiments that may be combined with any of the preceding embodiments, β-glucan contents of the present disclosure are determined using the Food Chemicals Codex (FCC)-based assay as described herein.

DESCRIPTION OF THE FIGURES

[0017] **FIG. 1** illustrates GM-CSF protein levels in response to various concentrations of β-glucan solution or "Blend A" solution.

[0018] **FIG. 2A** illustrates IL-8 protein levels in response to various concentrations of β-glucan solution or "Blend A" solution. **FIG. 2B** illustrates TNF-α protein levels in response to various concentrations of β-glucan solution or "Blend A" solution.

[0019] **FIG. 3A** illustrates IL-1β protein levels in response to various concentrations of β-glucan solution or "Blend A" solution. **FIG. 3B** illustrates IL-13 protein levels in response to various concentrations of β-glucan solution or "Blend A" solution.

[0020] **FIG. 4A** illustrates IL-6 protein levels in response to various concentrations of β-glucan solution or "Blend A" solution. **FIG. 4B** illustrates IL-7 protein levels in response to various concentrations of β-glucan solution or "Blend A" solution.

[0021] **FIG. 5A** illustrates IL-12 protein levels in response to various concentrations of β-glucan solution or "Blend A" solution. **FIG. 5B** illustrates IL-10 protein levels in response to various concentrations of β-glucan solution or "Blend A" solution.

[0022] **FIG. 6A** illustrates IFN-γ protein levels in response to various concentrations of β-glucan solution or "Blend A" solution. **FIG. 6B** illustrates lymphocyte proliferation in response to various concentrations of β-glucan solution or "Blend A" solution.

CLAIMS

What is claimed is:

1. An immunostimulatory composition comprising a β-glucan preparation, a ginseng extract, and a mushroom extract;
wherein the β-glucan preparation is present in the range of about 40% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition;
wherein the ginseng extract is present in the range of about 10% to about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition; and
wherein the mushroom extract is present in the range of about 1% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition.

2. The composition of claim 1, wherein the β-glucan preparation is prepared from yeast extract.

3. The composition of claim 2, wherein the yeast extract is obtained from *Saccharomyces cerevisiae*.

4. The composition of any one of claims 1-3, wherein the β-glucan preparation is:

a) present at about 60% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

b) present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

5. The composition of any one of claims 1-4, wherein the concentration of β-glucan in the β-glucan preparation is:

a) in the range of about 60% to about 80% of the total dry weight of the β-glucan preparation, or;

b) about 60% to about 75% of the total dry weight of the preparation, or;

c) at least about 60%, about 65%, about 70%, or about 80% of the total dry weight of the preparation.

6. The composition of any one of claims 1-5, wherein the ginseng extract is prepared from Chinese ginseng or American ginseng.

7. The composition of any one of claims 1-6, wherein the ginseng extract is:

a) present at about 20% to about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

b) present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

c) present at about 20%, about 25%, or about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

8. The composition of any one of claims 1-7, wherein the concentration of polysaccharides in the ginseng extract is:

a) about 5% to about 50% of the total dry weight of the ginseng extract, or;

b) about 10% to about 45% polysaccharides of the total dry weight of the ginseng extract, or;

c) about 20% to about 35% of total dry weight of the ginseng extract.

9. The composition of any one of claims 1-8, wherein the mushroom extract is prepared from a mushroom selected from the group consisting of princess Matsutake mushroom, Reishi mushroom, Shitake mushroom, Enokie mushroom, and pine mushroom.

10. The composition of any one of claims 1-9, wherein the mushroom extract is:

a) present at about 5% to about 15% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

b) present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

c) about 5%, about 7.5%, about 10%, or about 15% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

11. The composition of any one of claims 1-10, wherein the concentration of polysaccharides in the mushroom extract is:

a) about 30% to about 55% of the total dry weight of the mushroom extract, or;

b) about 30%, about 35%, about 40%, about 45%, about 50%, or about 55% of the total dry weight of the mushroom extract.

12. The composition of any one of claims 1-11, wherein the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

13. The composition of any one of claims 1-11, wherein the β-glucan preparation is present at about 75% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 15% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 1% to about 5% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

14. The composition of any one of claims 1-11, wherein the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 10% to about 15% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is

present at about 15% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

15. The composition of any one of claims 1-11, wherein the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from American ginseng and is present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

16. The composition of any one of claims 1-11, wherein the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from Reishi mushroom and is present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

17. An orally consumable product comprising the composition of any one of claims 1-16.

18. The product of claim 17, wherein the orally consumable product is selected from the group consisting of a foodstuff composition, a beverage product, a dietary supplement, a nutraceutical, an edible gel mix, an edible gel composition, a granulated powder, a soft gel composition, a flash dissolve composition, and a pharmaceutical composition.

19. The product of claim 17, wherein the orally consumable product is formulated into a tablet or capsule.

20. The product of claim 17, wherein the orally consumable product is a foodstuff composition selected from the group consisting of a confectionary composition, a condiment, a cereal composition, a baked good, and a dairy product.

21. The product of claim 17, wherein the orally consumable product is a carbonated or non-carbonated beverage product.

22. The product of claim 17, wherein the orally consumable product is a beverage product selected from the group consisting of a soft drink, a fountain beverage, a frozen and ready-to-drink beverage, coffee, tea, a dairy beverage, a powdered soft drink, a liquid concentrate, fruit juice, a sport drink, and an energy drink.

23. The product of any one of claims 17-22, further comprising one or more additives selected from the group consisting of a carbohydrate, a polyol, an amino acid or salt thereof, a poly-amino acid or salt thereof, a sugar acid or salt thereof, a nucleotide, an organic acid, an inorganic acid, an organic salt, an organic acid salt, an organic base salt, an inorganic salt, a bitter compound, a flavorant, a flavoring ingredient, an astringent compound, a protein, a protein hydrolysate, a surfactant, an emulsifier, a flavonoid, an alcohol, a polymer, and combinations thereof.

24. A method of preparing a composition, the method comprising combining a β-glucan preparation, a ginseng extract, and a mushroom extract into a composition, wherein the composition is formulated such that the β-glucan preparation is present in the range of about 40% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition, the ginseng extract is present in the range of about 10% to about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition, and the mushroom extract is present in the range of about 1% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract in the composition.

25. The method of claim 24, wherein the β-glucan preparation is prepared from yeast extract.

26. The method of claim 25, wherein the yeast extract is obtained from *Saccharomyces cerevisiae*.

27. The method of any one of claims 24-26, wherein the β-glucan preparation is:

a) present at about 60% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

b) present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

28. The method of any one of claims 24-27, wherein the concentration of β-glucan in the β-glucan preparation is:

a) in the range of about 60% to about 80% of the total dry weight of the preparation, or;

b) about 60% to about 75% of the total dry weight of the preparation, or;

c) at least about 60%, about 65%, about 70%, or about 80% of the total dry weight of the preparation.

29. The method of any one of claims 24-28, wherein the ginseng extract is prepared from Chinese ginseng or American ginseng.

30. The method of any one of claims 24-29, wherein the ginseng extract is:

a) present at about 20% to about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

b) present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

c) about 20%, about 25%, or about 30% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

31. The method of any one of claims 24-30, wherein the concentration of polysaccharides in the ginseng extract is:

a) about 5% to about 50% of the total dry weight of the ginseng extract, or;

b) about 10% to about 45% polysaccharides of the total dry weight of the ginseng extract, or;

c) about 20% to about 35% of total dry weight of the ginseng extract.

32. The method of any one of claims 24-31, wherein the mushroom extract is prepared from a mushroom selected from the group consisting of princess Matsutake mushroom, Reishi mushroom, Shitake mushroom, Enokie mushroom, and pine mushroom.

33. The method of any one of claims 24-32, wherein the mushroom extract is:

a) present at about 5% to about 15% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

b) present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, or;

c) about 5%, about 7.5%, about 10%, or about 15% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

34. The method of any one of claims 24-33, wherein the concentration of polysaccharides in the mushroom extract is:

a) about 30% to about 55% of the total dry weight of the mushroom extract, or;

b) about 30%, about 35%, about 40%, about 45%, or about 50% of the total dry weight of the mushroom extract.

35. The method of any one of claims 24-34, wherein the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

36. The method of any one of claims 24-34, wherein the β-glucan preparation is present at about 75% to about 80% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 15% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 1% to about 5% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

37. The method of any one of claims 24-34, wherein the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 10% to about 15% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 15% to about 20% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

38. The method of any one of claims 24-34, wherein the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from American ginseng and is present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from princess Matsutake mushroom and is present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

39. The method of any one of claims 24-34, wherein the β-glucan preparation is present at about 65% to about 70% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract; the ginseng extract is from Chinese ginseng and is present at about 20% to about 25% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract, and; the mushroom extract is from Reishi mushroom and is present at about 5% to about 10% of the total dry weight of the β-glucan preparation, the ginseng extract, and the mushroom extract.

40. The method of any one of claims 24-39, further comprising combining one or more additives into the composition.

41. The method of any one of claims 24-40, further comprising preparing the composition into an orally consumable product.

42. Use of the composition of any one of claims 1-16 or the product of any one of claims 17-23, in the manufacture of a medicament for enhancing an immune function in a subject.

43. The use of claim 42, wherein the subject is a human or other animal.

44. The use of any one of claims 42-43, wherein the enhanced immune function comprises enhanced lymphocyte proliferation and/or enhanced production of one or more cytokines.

45. The use of claim 44, wherein the one or more cytokines are selected from the group consisting of IFN-γ, IL-12, and IL-10.

46. A kit for enhancing immune function in a subject, the kit comprising the immunostimulatory composition of any one of claims 1-16 or the product of any one of claims 17-23.

47. The kit of claim 46, wherein the kit comprises instructions for administering the immunostimulatory composition to the subject.

48. Use of a composition comprising about 220 mg to about 250 mg of a β-glucan preparation, about 75 to about 90 mg of a ginseng extract, and about 20 mg to about 40 mg of a mushroom extract, in the manufacture of a medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

49. The use of claim 48, wherein the composition comprises (1) about 220 mg, about 230 mg, about 240 mg, or about 250 mg of a β-glucan preparation; and/or (2) about 80 mg, about 82 mg,

about 84 mg, about 86 mg, about 88 mg, or about 90 mg of a ginseng extract; and/or (3) about 20 mg, about 25 mg, about 30 mg, about 33 mg, about 35 mg, about 38 mg, or about 40 mg of a mushroom extract.

50. Use of a composition comprising about 250 mg to about 325 mg of a β-glucan preparation, about 90 to about 120 mg of a ginseng extract, and about 30 mg to about 50 mg of a mushroom extract, in the manufacture of a medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

51. The use of claim 50, wherein the composition comprises (1) about 250 mg, about 265 mg, about 275 mg, about 290 mg, about 300 mg, about 310 mg, or about 325 mg of a β-glucan preparation; and/or (2) about 90 mg, about 95 mg, about 100 mg, about 105 mg, about 110 mg, about 115 mg, or about 120 mg of a ginseng extract of a ginseng extract; and/or (3) about 30 mg, about 35 mg, about 40 mg, about 45 mg, or about 50 mg of a mushroom extract.

52. Use of a composition comprising about 150 mg to about 200 mg β-glucans from a β-glucan preparation, about 5 mg to about 10 mg polysaccharides from a ginseng extract, and about 8 mg to about 16 mg polysaccharides from a mushroom extract, in the manufacture of a medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

53. The use of claim 52, wherein the composition comprises (1) about 150 mg β-glucans, about 175 mg β-glucans, or about 200 mg β-glucans from a β-glucan preparation; and/or (2) about 5 mg, about 6 mg, about 7 mg, about 8 mg, about 9 mg, or about 10 mg polysaccharides from a ginseng extract; and/or (3) about 8 mg, about 9 mg, about 10 mg, about 11 mg, about 12 mg, about 13 mg, about 14 mg, about 15 mg, or about 16 mg polysaccharides from a mushroom extract.

54. Use of a composition comprising about 150 mg to about 200 mg β-glucans from a β-glucan preparation, about 20 mg to about 30 mg polysaccharides from a ginseng extract, and about 10 mg to about 20 mg polysaccharides from a mushroom extract, in the manufacture of a

medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

55. The use of claim 54, wherein the composition comprises (1) about 150 mg β-glucans, about 175 mg β-glucans, or about 200 mg β-glucans from a β-glucan preparation; and/or (2) about 20 mg, about 25 mg, or about 30 mg polysaccharides from a ginseng extract; and/or (3) about 10 mg, about 12 mg, about 14 mg, about 16 mg, about 18 mg, or about 20 mg polysaccharides from a mushroom extract.

56. Use of a composition comprising about 175 mg to about 225 mg β-glucans from a β-glucan preparation, about 25 mg to about 45 mg polysaccharides from a ginseng extract, and about 15 mg to about 30 mg polysaccharides from a mushroom extract, in the manufacture of a medicament for enhancing an immune function in a subject, wherein the composition is to be administered once daily to said subject.

57. The use of claim 56, wherein the composition comprises (1) about 175 mg β-glucans, about 195 mg β-glucans, about 200 mg β-glucans, about 205 mg β-glucans, about 210 mg β-glucans, about 215 mg β-glucans, or about 225 mg β-glucans from a β-glucan preparation; and/or (2) about 25 mg, about 28 mg, about 30 mg, about 32 mg, about 35 mg, about 38 mg, about 40 mg, about 42 mg, or about 45 mg polysaccharides from a ginseng extract; and/or (3) about 15 mg, about 18 mg, about 20 mg, about 22 mg, about 24 mg, about 25 mg, or about 30 mg polysaccharides from a mushroom extract.