indicate that they provide no apparent clinical benefit and may increase morbidity]. Nafamostat and camostat are a serine protease inhibitor used in the treatment of chronic pancreatitis and reflux esophagitis that are theorized to interfere with SARS-CoV-2 entry into cells, however data from well-designed randomized controlled trials for these drugs are not yet available

[0006] Therefore, there is an urgent need to identify safe and effective approaches to the treatment of COVID-19.

Summary

[0007] The inventive subject matter provides compositions and methods in which a nutritional supplement is provided that is effective in treating viral infections (e.g., coronavirus, HCV, HIV), for example by correcting dysregulation of apoptosis, reducing production of pro-inflammatory cytokines, and increasing production of native anti-viral compounds (e.g., interferon). Such a nutritional supplement can be used in combination with known antiviral therapies (therapeutic antibodies, small molecule antiviral drugs), as well as low level radiotherapy and/or chemotherapy drugs conventionally used in the treatment of neoplastic disease (e.g., cancer).

[0008] In one aspect, the present disclosure refers to use of a nutritional supplement comprising fish oil and selenium, in the manufacture of a medicament for treating a viral infection, wherein the nutritional supplement is to be provided in an amount effective to treat the viral infection, wherein the viral infection results from infection with a virus that induces a dysregulation of apoptosis in a cell infected with the virus, and wherein the nutritional supplement provides fish oil and selenium in quantities sufficient to modify an apoptic event in the cell infected with the virus upon administration, wherein the medicament is to be used in combination with a radiotherapy or wherein the medicament is to be used in combination with a cancer chemotherapy drug. One example of the inventive concept is a method of treating an individual for a viral infection by obtaining a nutritional supplement that includes fish oil and selenium (e.g., in the form of selenium yeast), and administering the nutritional supplement to the individual in an amount effective to treat the viral infection or sequelae of the viral infection. The viral infection can result from infection with a virus that induces a dysregulation of apoptosis in a cell infected with the virus, where the nutritional supplement provides fish oil and selenium in quantities sufficient to modify an apoptic event in the cell infected with the virus upon administration. In some examples the amount of fish oil and selenium is also selected to reduce serum concentration of a pro-inflammatory cytokine. In some examples selenium is provided at from 1,000 µg to 10,000 µg per day, and/or fish oil at from 1,000 mg to 20 mg per day. The nutritional supplement can also include coenzyme Q10 (e.g., from 1 mg to 5,000 mg coenzyme Q10). In some examples the nutritional supplement can include three or more components listed in Table 1. Contemplated viral infections include those resulting from infection with a coronavirus (e.g., SARS-CoV-2), HCV, and/or HIV. Such treatment can be applied to an active

CLAIMS

What is claimed is:

1. Use of a nutritional supplement comprising fish oil and selenium, in the manufacture of a medicament for treating a viral infection, wherein the nutritional supplement is to be provided in an amount effective to treat the viral infection, wherein the viral infection results from infection with a virus that induces a dysregulation of apoptosis in a cell infected with the virus, and wherein the nutritional supplement provides fish oil and selenium in quantities sufficient to modify an apoptic event in the cell infected with the virus upon administration, wherein the medicament is to be used in combination with a radiotherapy or wherein the medicament is to be used in combination with a cancer chemotherapy drug.

2. The use of claim 1, wherein amounts of fish oil and selenium are additionally selected to reduce serum concentration of a pro-inflammatory cytokine in the individual.

3. The use of claim 1 or 2, wherein selenium comprises selenium yeast.

4. The use of one of claims 1 to 3, wherein selenium is to be provided at up to 10,000 µg per day.

5. The use of one of claims 1 to 4, wherein fish oil is to be provided at up to 20 grams per day.

6. The use of one of claims 1 to 5, wherein the nutritional supplement further comprises coenzyme Q10.

7. The use of claim 6, wherein the nutritional supplement comprises from 1 mg to 5,000 mg coenzyme Q10.

8. The use of one of claims 1 to 5, wherein the nutritional supplement further comprises maltodextrin, 10,000 mg to 50,000 mg; whey protein isolate, 5,000 mg to 60,000 mg; whey protein concentrate, 1,000 mg to 50,000 mg; fructooligosaccharides/inulin, 40 mg to 15,000 mg; granulated honey, 1,000 mg to 9,000 mg; oat fiber, 500 mg to 15,000 mg; natural French Vanilla flavor, 500 mg to 20,000 mg; soy protein, 500 mg to 50,000 mg; brownulated powdered brown sugar, 500 mg to 10,000 mg; natural vanilla masking flavor, 500 mg to 5,000 mg; lecithin, 200 mg to 10,000 mg; milk, non-fat, 50 mg to 5,000 mg; rice protein powder, 50 mg to 5,000 mg;

calcium caseinate, 50 mg to 2,000 mg; flax seed oil, 100 mg to 7,000 mg; canola oil, 100 mg to 7,000 mg; borage oil, 100 mg to 7,000 mg; olive oil, 100 mg to 7,000 mg; pure lemon oil, 100 mg to 1,000 mg; pure orange oil, 50 mg to 1,000 mg; mixed tocopherols, 0.5 mg to 200 mg; potassium phosphate, 200 mg to 1,500 mg; calcium carbonate, 100 mg to 5,000 mg; choline bitartrate, 150 mg to 2,500 mg; sodium chloride, 100 mg to 2,000 mg; calcium phosphate tribasic, 100 mg to 2,000 mg; ascorbic acid, 50 mg to 3,000 mg; potassium chloride, 50 mg to 2,000 mg; magnesium oxide, 50 mg to 500 mg; chromium yeast, 30 µg to 3,000 µg; molybdenum yeast, 30 µg to 2,000 µg; inositol, 10 mg to 5,000 mg; zinc sulfate monohydrate, 5 mg to 200 mg; dry vitamin E acetate, 5 IU to 2,000 IU; niacinamide, 5 mg to 500 mg; ferric orthophosphate, 3 mg to 100 mg; calcium pantothenate, 3 mg to 200 mg; manganese sulfate monohydrate, 3 mg to 100 mg; beta carotene, 1 mg to 100 mg; copper gluconate, 1 mg to 15 mg; vitamin D3, 25 IU to 5,000 IU; vitamin K2, 2 µg to 1,000 µg; pyridoxine HCl, 0.5 mg to 200 mg; potassium iodide, 0.5 mg to 1,500 mg; riboflavin, 0.5 mg to 1,000 mg; thiamine hydrochloride, 0.5 mg to 2,500 mg; dry vitamin K1, 1 µg to 500 µg; vitamin A acetate, 500 IU to 100,000 IU; folic acid, 100 µg to 10,000 µg; d-biotin, 10 µg to 10,000 µg; vitamin B12, 1 µg to 3,000 µg; L-carnitine, 300 mg to 30,000 mg; L-glutamine, 500 mg to 60,000 mg; L-arginine base, 500 mg to 30,000 mg; taurine, 50 mg to 2,000 mg; L-lysine, 50 mg to 2,000 mg; alpha lipoic acid, 10 mg to 1,000 mg; resveratrol, 15 mg to 1,500 mg; co-enzyme Q10, 10 mg to 5,000 mg; glycine, 5 mg to 1,000 mg; proline, 5 mg to 1,000 mg; Lact. acidophilus (app. 10 billion total), 2 mg to 500 mg; Bifido bifidium (app. 10 billion total), 2 mg to 500 mg; Lac. bulgaricus (app. 10 billion total), 2 mg to 500 mg; Bifido longum (app. 10 billion total), 2 mg to 500 mg; Strep. thermophilus (app. 10 billion total), 2 mg to 500 mg; papain, 5 mg to 100 mg; pepsin, 5 mg to 100 mg; lipase, 5 mg to 100 mg; bromelain, 5 mg to 100 mg; pancreatin 4X, 0.5 mg to 100 mg; lactase, 1 mg to 100 mg; betaine HCl, 3 mg to 100 mg; pineapple juice powder, 2 mg to 500 mg; papaya fruit powder, 2 mg to 500 mg; quercetin, 30 mg to 3,000 mg; EGCG, 25 mg to 600 mg; OPC, 15 mg to 500 mg; anthocyanins, 15 mg to 5,000 mg; ellagic acid, 10 mg to 300 mg; astaxanthin, 2 mg to 90 mg; fucoidan, 20 mg to 1,500 mg; Cordyceps, 5 mg to 6,000 mg; Ganoderma lucidum, 15 mg to 10,000 mg; Shiitake, 40 mg to 15,000 mg; Maitake, 30 mg to 15,000 mg; and Turkey Tail, 30 mg to 15,000 mg.

9. The use of one of claims 1 to 8, wherein the virus is a coronavirus.

10. The use of claim 9, wherein the coronavirus is SARS-CoV-2.

11. The use of one of claims 1 to 8, wherein the virus is HIV.

12. The use of one of claims 1 to 8, wherein the virus is HCV.

13. The use of one of claims 1 to 12, wherein treatment comprises treatment of an active infection.

14. The use of claim 13, wherein the active infection is asymptomatic.

15. The use of one of claims 1 to 12, wherein treatment is prophylactic.

16. The use of claim 1, wherein the radiotherapy comprises a nonzero radiation dose of up to 2 rems.

17. The use of claim 1, wherein the radiotherapy comprises a single application of radiation.

18. The use of claim 1, wherein the radiotherapy comprises a plurality of applications of radiation.

19. The use of claim 1, wherein cancer chemotherapy drug is selected from the group consisting of a taxol, adriamycin, and avastin.

20. The use of claim 1, wherein the cancer chemotherapy drug is to be provided in an amount corresponding to from 1% to 50% of an amount of the cancer chemotherapy drug provided for treatment of cancer.