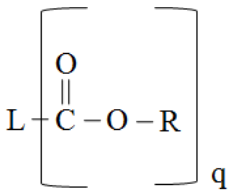
CLAIMS

What is claimed is:

1. A compound which is represented by Formula (I),



Formula (I),

wherein

L is a saturated or unsaturated aliphatic group;

R is selected from the group consisting of hydrogen, a polyol group and a saccharide group of $(G)_p$ wherein G is a monosaccharide residue and p is an integer from 1 to 100 wherein at least one of the hydroxyl groups in $(G)_p$ is substituted by a halogen atom; and

q is an integer from 2 to 4, and each of R is the same or different,

or a pharmaceutically acceptable salt thereof.

2. The compound of claim 1, wherein L is an alkyl group having 1 to 40 carbon atoms.

3. The compound of claim 1, wherein L is selected form the group consisting of a branched-chain alkyl group, a straight-chained alkyl group substituted with a benzene ring, a branched-chain alkyl group substituted with a benzene ring, a benzenyl group substituted with a straight-chained aliphatic group, and a benzenyl group substituted with a branched-chain aliphatic group.

4. The compound of claim 1, wherein the polyol group is linear or circular, substituted or unsubstituted.

5. The compound of claim 1, wherein the monosaccharide residue is a hexose.

6. A compound which is represented by Formula (II),

R_1-O-X-$(CH_2)_m$-X-O-R_2 Formula (II),

wherein

X is C=O;

R_1 and R_2 are the same or different, selected from the group consisting of hydrogen, a polyol group and a saccharide group of $(G)_p$ wherein G is a monosaccharide residue and p is an integer from 1 to 100 wherein at least one of the hydroxyl groups in $(G)_p$ is substituted by a halogen atom, wherein when R_1 is hydrogen, then R_2 is not hydrogen; and

m is an integer from 1 to 40.

or a pharmaceutically acceptable salt thereof.

7. The compound of claim 6, wherein the polyol group is $-CH(CHOH)_nCH_2OH$, wherein n is an integer from 1 to 18.

8. The compound of claim 6, wherein two or more of the hydroxyl groups in $(G)_p$ are substituted by halogen atoms.

9. The compound of claim 6, wherein the monosaccharide residue is a hexose.

10. The compound of claim 9, wherein the hexose is selected from the group consisting of an aldohexose and a ketohexose.

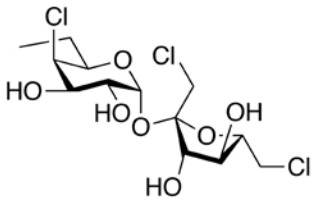
11. The compound of claim 6, wherein the saccharide group R_1 or R_2 is represented by $-G_1-O-G_2$, wherein G_1 and G_2 are the same or different, selected from the group consisting of an aldohexose and a ketohexose, and at least one of the hydroxyl groups in G_1 or at least one of the hydroxyl groups in G_2 is substituted by a halogen atom.

12. The compound of claim 11, the halogen atom is selected from the group consisting of chlorine, bromine and iodine.

13. The compound of claim 12 wherein the halogen atom is chlorine.

14. The compound of claim 11, wherein G_1 is glucose wherein one of the hydroxyl groups is substituted by chlorine; and G_2 is fructose wherein two of the hydroxyl groups are substituted by chlorine.

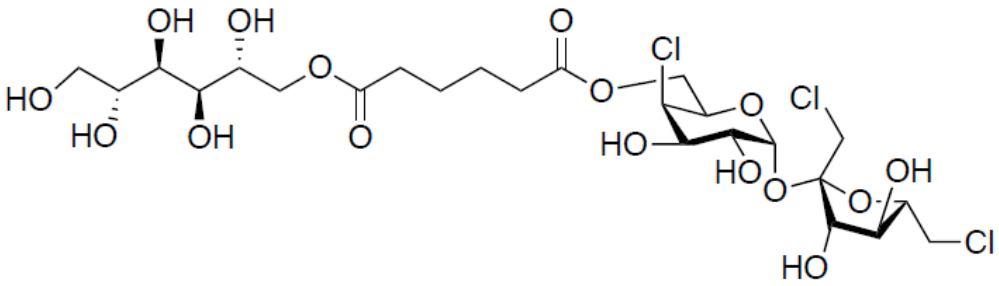
15. The compound of claim 11, wherein R_1 or R_2 is represented by formula (Ia)



formula (Ia).

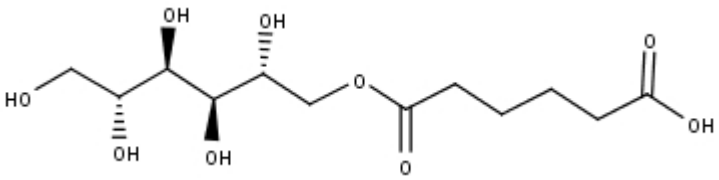
16. The compound of claim 7, wherein m and n are 4.

17. The compound of claim 1, which is selected from the group consisting of: ((2R,3R,4R,5R,6R)-6-(((2R,5R)-2,5-bis(chloromethyl)-3,4-dihydroxytetrahydrofuran-2-yl)oxy)-3-chloro-4,5-dihydroxytetrahydro-2H-pyran-2-yl)methyl ((2R,3R,4R)-2,3,4,5,6-pentahydroxyhexyl) adipate of Formula 1



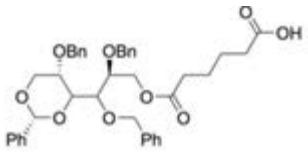
Formula 1.

18. The compound of claim 1, which is C6-mannitol of Formula 2



Formula 2.

19. A compound which is represented by Formula C,



Formula C

wherein Ph is phenyl and Bn is benzyl.

20. A pharmaceutical composition comprising a compound of claim 1 or a pharmaceutically acceptable salt thereof together with a pharmaceutically acceptable carrier.

21. Use of a compound of claim 1 or a pharmaceutically acceptable salt thereof for manufacturing a medicament for preventing or treating a disease or condition in a subject in need thereof.

22. The use of claim 21, wherein the compound of claim 1 or a pharmaceutically acceptable salt thereof is administered in combination with one or more additional agents selected from the group consisting of:

(i) a first active agent selected from the group consisting of: polyethylene glycol sorbitan monolaurate (Tween 20), microcrystalline cellulose, dicalcium phosphate dihydrate, Brij 35, saccharin, mannitol, Cremophor RH40, sucralose, crospovidone, sodium starch glycolate, Eudragit S100, croscarmellose sodium, Pluronic F68, menthol, low-substituted hydroxypropyl cellulose, pregelatinized starch, Dextrates NF hydrated, citric acid, Cremophor EL, Aerosil 200, Myrj 52, sorbic acid, lemon oil, hydroxypropyl cellulose, Sorbitol, acesulfame potassium, hydroxypropyl methylcellulose, lactose monohydrate, maltodextrin, Brij 58, Brij 76, Tween 80, Tween 40, PEG 400, PEG 4000, PEG 8000, Span 60, sodium benzoate, hydroxy ethylmethylcellulose, methylcellulose, Span 80, sodium cyclamate, glyceryl behenate, oxide red, glycerin monostearate, Copovidone K28, starch acetate, magnesium stearate, sodium lauryl sulfate, Providone K30, PEG 2000, and N-acetylcysteine (NAC) and any combination thereof;

(ii) a second active agent selected from the group consisting of: sodium lauryl sulfate, menthol, sucralose, mannitol, sorbitol, saccharin, glycerin, sodium benzoate, oxide red, pregelatinized starch, sodium cyclamate, sorbic acid, lemon oil, citric acid, butylated hydroxyanisole, poncirin, isovitexin, eriodictyol, ergosterol, β-myrcene, hyperoside, (+)-catechin, galangin, morin, sciadopitysin, didymin, gossypin, luteolin-7-glucoside,

(+)-taxifolin, trans-cinnamic acid, diosmin, linarin, xylitol, luteolin, swertiamarin, puerarin, phloridzin, sinensetin, (-)-epigallocatechin, kaempferol, ursolic acid, silymarin, (+)-limonene, hesperidin, (-)-epicatechin-3-gallate, silybin, formononetin, myristic acid ethyl ester, eicosapentaenoic acid (EPA), wongonin, povidone K-30, protocatechuic acid, umbelliferone, hesperitin, nordihydroguaiaretic acid, neohesperidin, naringin, (-)-epicatechin, glycyrrhizin, baicalin, quercitrin, baicalein and any combinations thereof; and

any combination of (i) and (ii).

23. The use of claim 22, wherein the one or more additional agents are selected from the group consisting of dicalcium phosphate dehydrate, menthol, mannitol, sucralose, N-acetylcysteine (NAC) and any combination thereof.

24. The use of claim 22, wherein the one or more additional agents are selected from the group consisting of (1) a combination of saccharin and mannitol, (2) a combination of menthol and mannitol, (3) a combination of sucralose and mannitol, (4) a combination of eriodictyol and mannitol, (5) a combination of eriodictyol and sucralose, (6) a combination of menthol, mannitol, and eriodictyol, and (7) a combination of sucralose, mannitol, and eriodictyol.

25. The use of claim 22, wherein the compound of claim 1 or a pharmaceutically acceptable salt thereof and the one or more additional agents are administered simultaneously or sequentially.

26. Use of a compound of claim 1 or a pharmaceutically acceptable salt thereof for manufacturing a medicament for preventing or treating a disease or condition characterized by increased cytochrome P450 activities or increased free radical level in a subject in need thereof.

27. The use of claim 26, wherein the compound of claim 1 or a pharmaceutically acceptable salt thereof is administered in combination with one or more of the additional agent as defined in claim 22.

28. Use of a compound of claim 1 or a pharmaceutically acceptable salt thereof for

manufacturing a medicament for preventing or treating organ injuries in a subject in need.

29. The use of claim 28, wherein the organ injuries are in liver or kidney.

30. The use of claim 28 wherein the organ injuries are caused by a therapeutic drug, CCl_4 or lipid.

31. The use of claim 30, wherein the therapeutic drug is acetaminophen.

32. The use of claim 28, wherein the compound of claim 1 or a pharmaceutically acceptable salt thereof is administered in combination with one or more of the additional agent as defined in claim 22.

33. Use of a compound of claim 1 or a pharmaceutically acceptable salt thereof for manufacturing a medicament for preventing or treating hepatotoxicity in a subject in need.

34. The use of claim 33, wherein the hepatotoxicity is caused by a therapeutic drug, CCl_4 or lipid.

35. The use of claim 34, wherein the therapeutic drug is acetaminophen.

36. The use of claim 33, wherein the compound of claim 1 or a pharmaceutically acceptable salt thereof is administered in combination with one or more of the additional agent as defined in claim 22.

37. Use of a compound of claim 1 or a pharmaceutically acceptable salt thereof for manufacturing a medicament for preventing or treating fatty liver, protecting liver function or ameliorating liver diseases caused by fatty liver or other associated disorders.

38. The use of claim 37, wherein the compound of claim 1 or a pharmaceutically acceptable salt thereof is administered in combination with one or more of the additional agent as defined in claim 22.