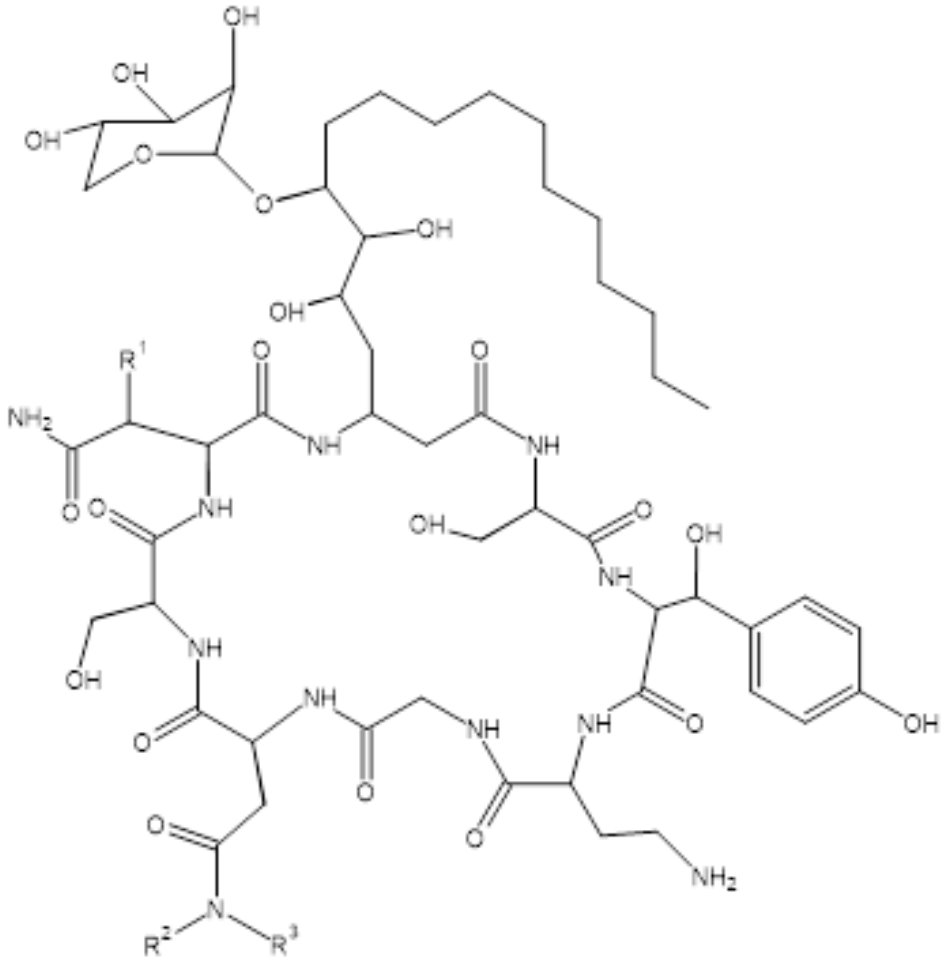
CLAIMS

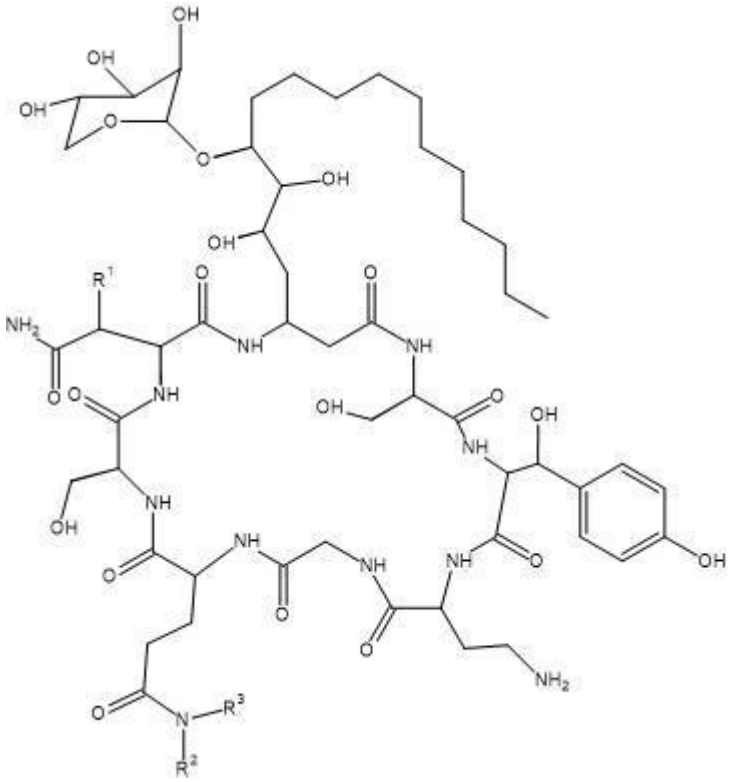
1. An analog of an occidiofungin, the occidiofungin analog having Formula (I), Formula (II), Formula (III), or Formula (IV):

Formula (I)



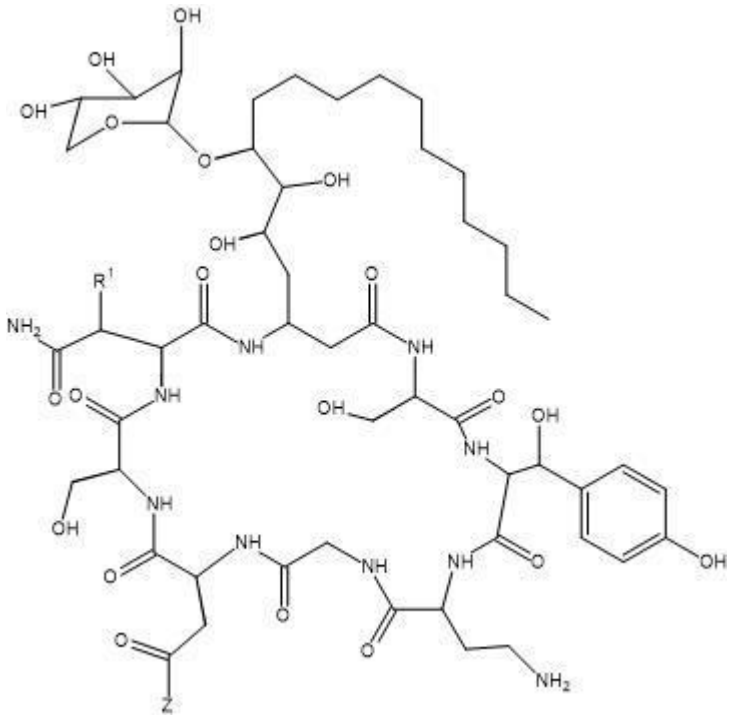
wherein R^1 is H or OH, R^2 is H or CH_3, and R^3 is H, CH_3, CH_2CH_3, $CH_2CH_2CH_3$, $(CH_2)_{10}CH_3$, or $(CH_2)_{11}CH_3$, a terminal alkyne group, a terminal alcohol group, a terminal alcohol group linked to a prodrug functional group, a prodrug functional group, or antibody;

Formula (II):



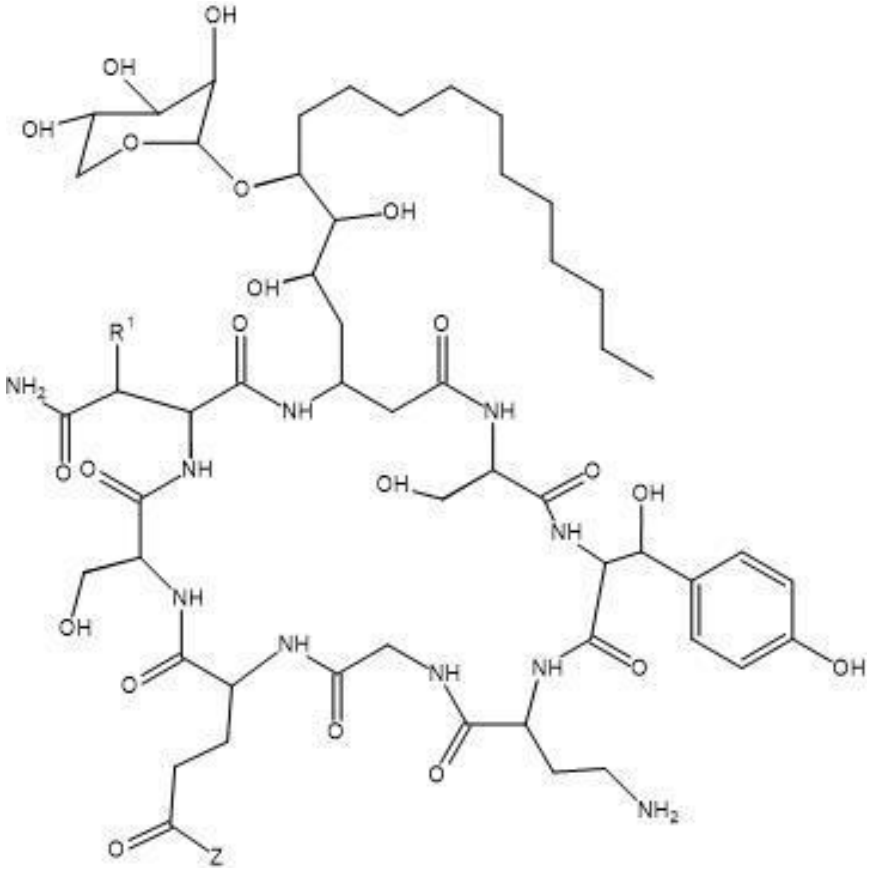
wherein R^1 is H or OH, R^2 is H or CH_3, and R^3 is H, CH_3, CH_2CH_3, $CH_2CH_2CH_3$, $(CH_2)_{10}CH_3$, or $(CH_2)_{11}CH_3$, a terminal alkyne group, a terminal alcohol group, a terminal alcohol group linked to a prodrug functional group, a prodrug functional group, or antibody;

Formula (III):



wherein R^1 is H or OH, and Z is an ester, a thioester, an acid anhydride, an acid chloride, an amide or a carboxylate ion;

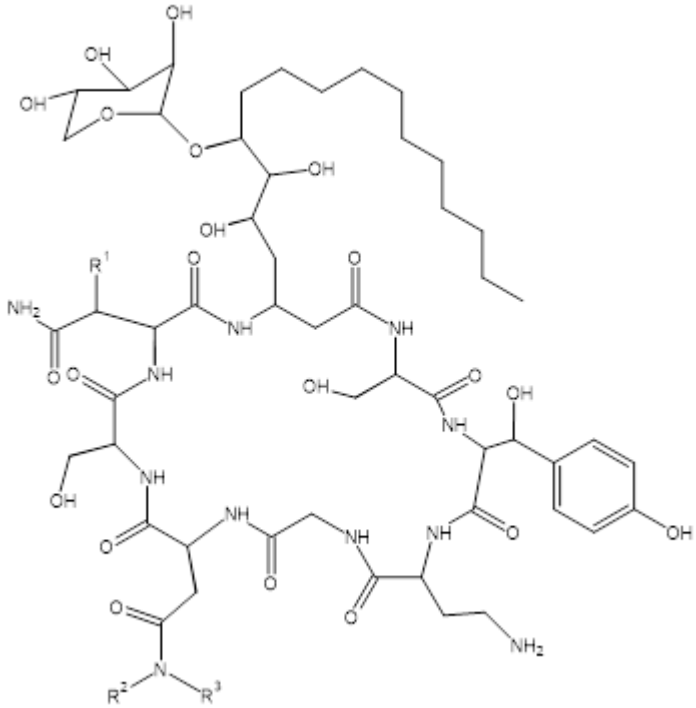
Formula (IV):



wherein R^1 is H or OH, and Z is an ester, a thioester, an acid anhydride, an acid chloride, an amide or a carboxylate ion.

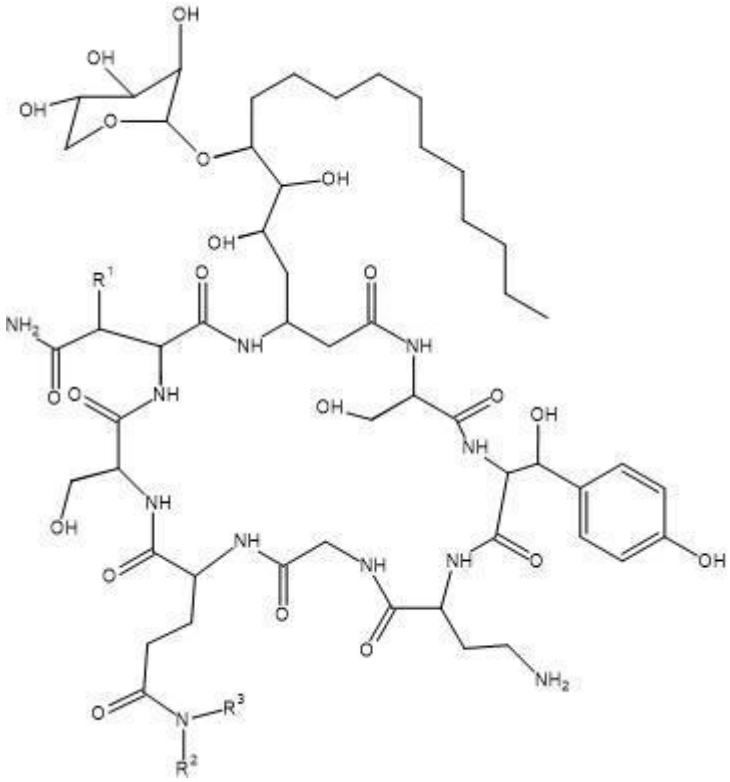
2. The analog of an occidiofungin of claim 1, wherein the occidiofungin analog is according to Formula (I) or Formula (II):

Formula (I)



wherein R^1 is H or OH, R^2 is H, and R^3 is H, CH_3, CH_2CH_3, $CH_2CH_2CH_3$, $(CH_2)_{10}CH_3$, $(CH_2)_{11}CH_3$ or CH_2CH_2 CCH; or wherein R^1 is H or OH, R^2 is CH_3, and R^3 is CH_3;

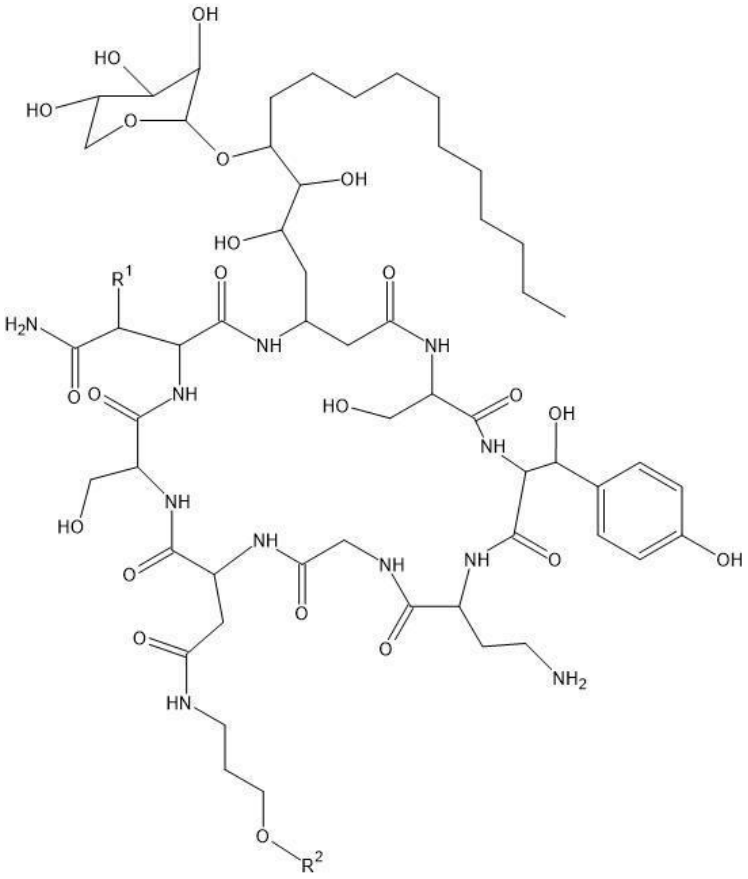
Formula (II)



wherein R^1 is H or OH, R^2 is H, and R^3 is H, CH_3, CH_2CH_3, $CH_2CH_2CH_3$, $(CH_2)_{10}CH_3$, $(CH_2)_{11}CH_3$ or CH_2CH_2 CCH; or wherein R^1 is H or OH, R^2 is CH_3, and R^3 is CH_3.

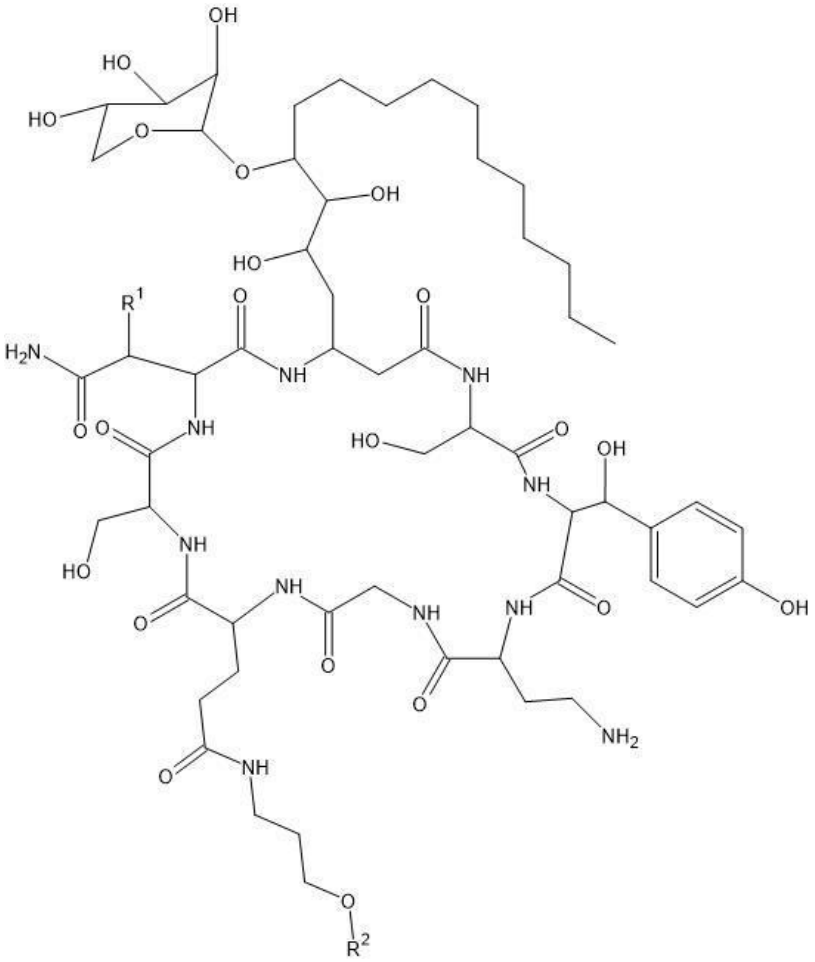
3. The analog of an occidiofungin of claim 1, the occidiofungin analog having Formula (V) or Formula (VI):

Formula (V)



wherein R^1 is H or OH and R^2 is a prodrug-functional group;

Formula (VI)

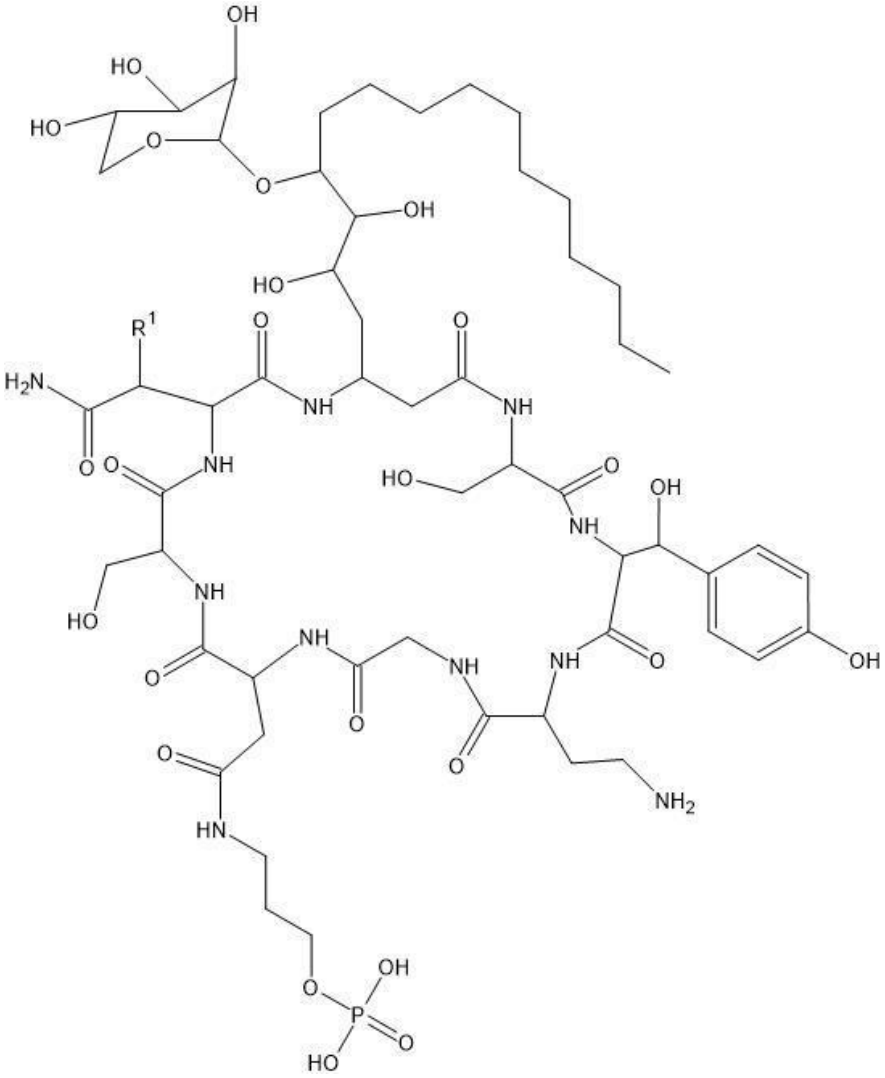


wherein R^1 is H or OH and R^2 is a prodrug-functional group.

4. The analog of an occidiofungin of claim 1 or 3, wherein the prodrug functional group is a phosphate group, methyl succinate, an ether, or benzoic acid ester.

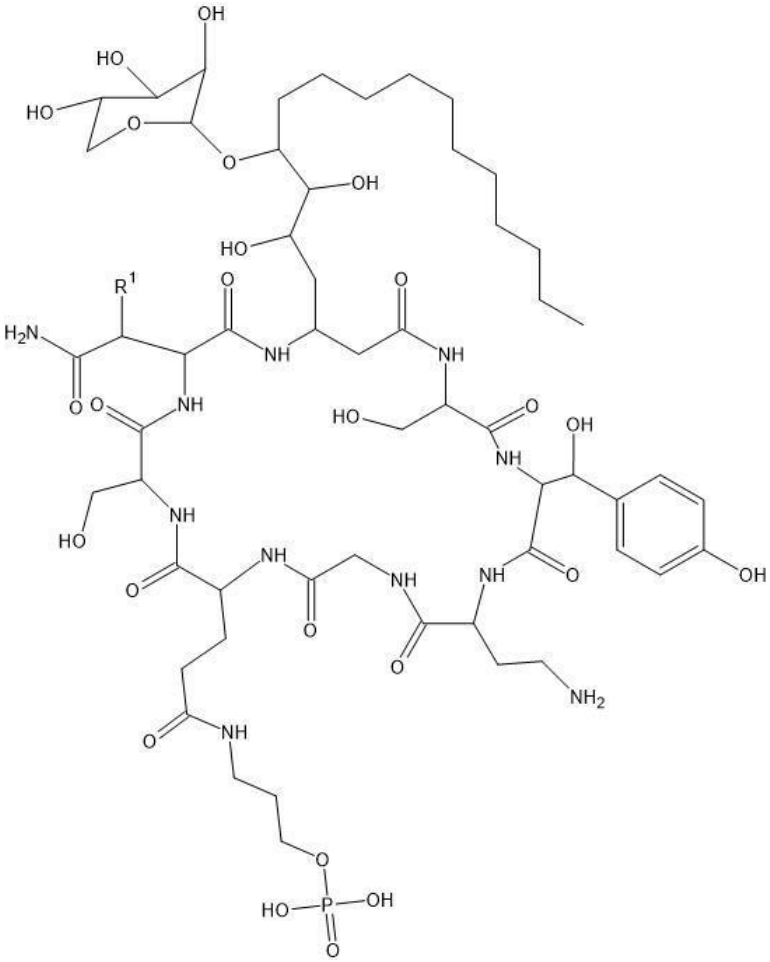
5. The analog of an occidiofungin of claim 3, wherein the analog of occidiofungin is according to Formula (VII) or Formula (VIII):

Formula (VII)



wherein R^1 is H or OH;

Formula (VIII)



wherein R^1 is H or OH.

6. A pharmaceutical composition comprising an occidiofungin analog of any of the preceding claims and a pharmaceutically acceptable vehicle.

7. Use of an occidiofungin analog according to any one of claims 1-5, or a pharmaceutical composition comprising said occidiofungin analog, for the treatment or prevention of a fungal infection.

8. The use according to claim 6, wherein the occidiofungin analog or pharmaceutical composition is administered intravaginally, intramuscularly, subcutaneously, intrathecally, intravenously or intraperitoneally.

9. The use of claim 7 or 8, wherein the fungal infection is caused by a *Candida* spp., *Saccharomyces* spp., *Trichophyton* spp., *Rhizopus* spp., *Mucor* spp., *Fusarium* spp., *Aspergillus* spp. or *Cryptococcus* spp.

10. The use of claim 9, wherein the Candida spp. is *C. albicans*, *C. glabrata*, *C. krusei*, *C. auris*, *C. parapsilosis*, or *C. tropicalis*.

11. Use of an occidiofungin analog according to any one of claims 1-5, or a pharmaceutical composition comprising said occidiofungin analog, for the treatment or prevention of a parasitic infection.

12. The use of claim 11, wherein the occidiofungin analog or pharmaceutical composition is administered intravaginally, intramuscularly, subcutaneously, intrathecally, intravenously or intraperitoneally.

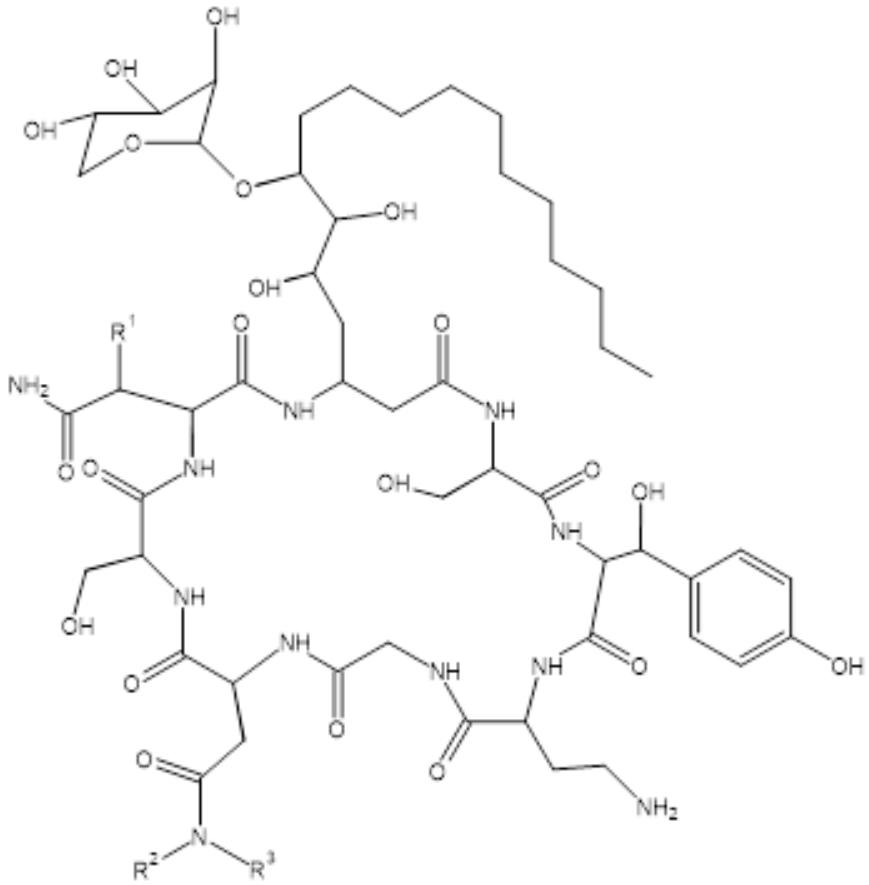
13. The use of claim 11 or 12, wherein the parasitic infection is caused by a *Cryptosporidium* spp.

14. Use of an occidiofungin analog according to any one of claims 1-5, or a pharmaceutical composition comprising said occidiofungin analog, for the treatment of prevention of cancer.

15. The use of claim 14, wherein the occidiofungin analog or pharmaceutical composition is administered intravaginally, intramuscularly, subcutaneously, intrathecally, intravenously or intraperitoneally.

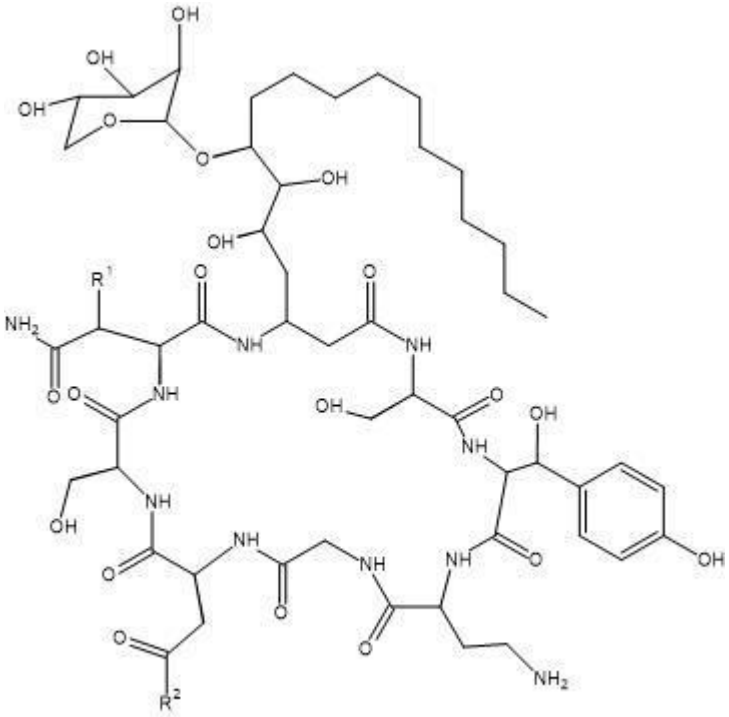
16. A method of producing an occidiofungin analog of Formula (I) or Formula (II), comprising a condensation of an occidiofungin analog of Formula (IX) or Formula (X), respectively, mediated by 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide hydrochloride (EDC) with an amine:

Formula (I)



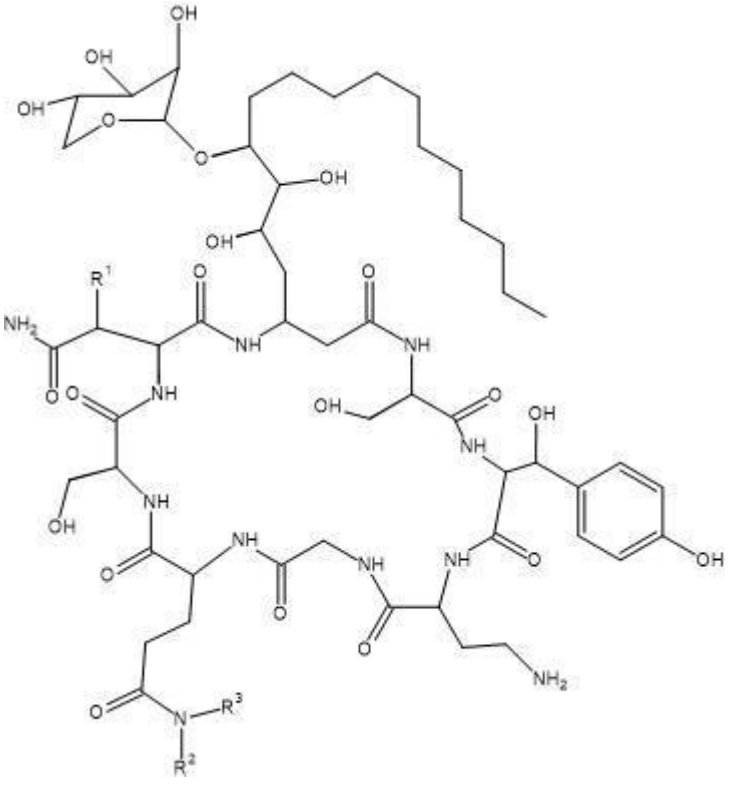
wherein R^1 is H or OH, R^2 is H or CH_3, and R^3 is H, CH_3, CH_2CH_3, $CH_2CH_2CH_3$, $(CH_2)_{10}CH_3$, or $(CH_2)_{11}CH_3$, a terminal alkyne group, a terminal alcohol group, a terminal alcohol group linked to a prodrug functional group, a prodrug functional group, or antibody;

Formula (IX)



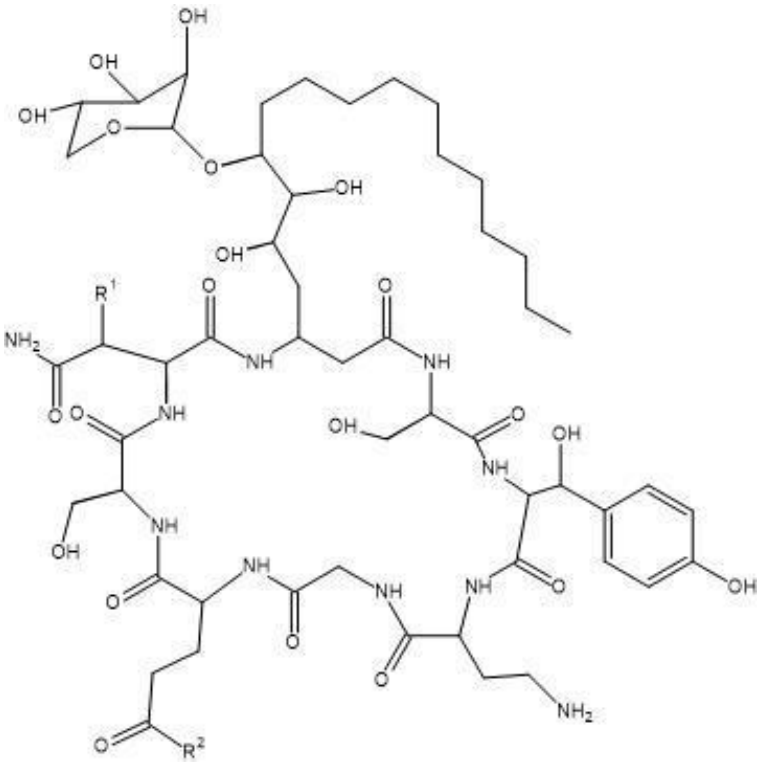
wherein R^1 is H or OH and R^2 is NH_2 or OH;

Formula (II)



wherein R^1 is H or OH, R^2 is H or CH_3, and R^3 is H, CH_3, CH_2CH_3, $CH_2CH_2CH_3$, $(CH_2)_{10}CH_3$, or $(CH_2)_{11}CH_3$, a terminal alkyne group, a terminal alcohol group, a terminal alcohol group linked to a prodrug functional group, a prodrug functional group, or antibody;

Formula (X)



wherein R^1 is H or OH and R^2 is NH_2 or OH.

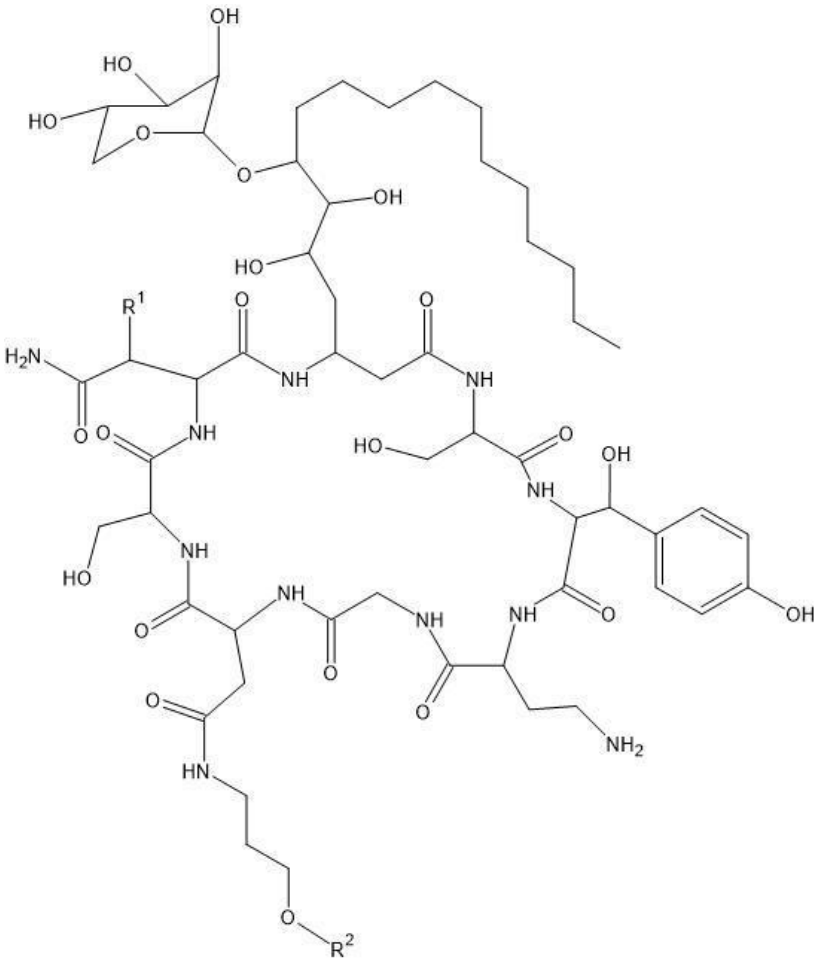
17. The method of claim 16, wherein the amine is ammonia, methylamine, dimethylamine, ethylamine, propylamine, undecylamine, dodecylamine, but-3-yn-1-amine, 3-amino-1-propanol, protected 3-amino-1-propanol, 3-amino-1-propanol conjugated to methyl succinate, 3-amino-1-propanol conjugated to benzyl succinate, or 3-amino-1-propanol conjugated to a phosphate group.

18. The method of claim 16, further comprising adding 1-hydroxybenzo-triazole (HOBt) to the occidiofungin analog of Formula III, EDC, and the amine.

19. The method of claim 16, wherein the condensation reaction is carried out in N,N-Dimethylformamide or dimethyl sulfoxide.

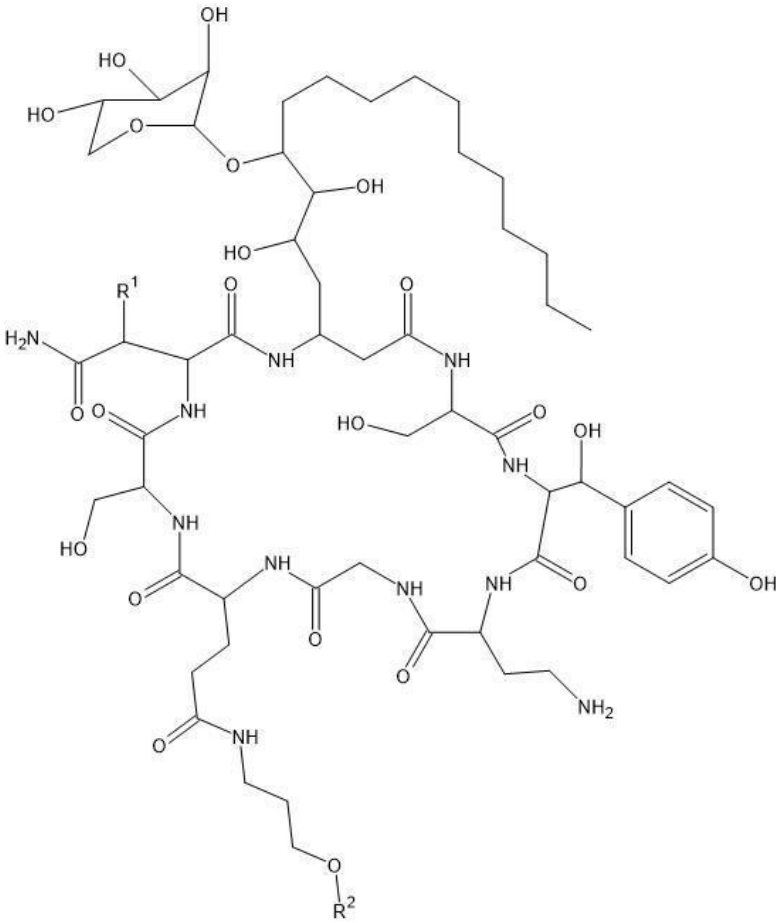
20. A method of producing an occidiofungin analog of Formula (V) or Formula (VI), comprising a condensation of an occidiofungin analog of Formula (IX) or Formula (X), respectively, mediated by EDC with an amine containing a prodrug functional group to produce an terminal alcohol arm containing occidiofungin:

Formula (V)



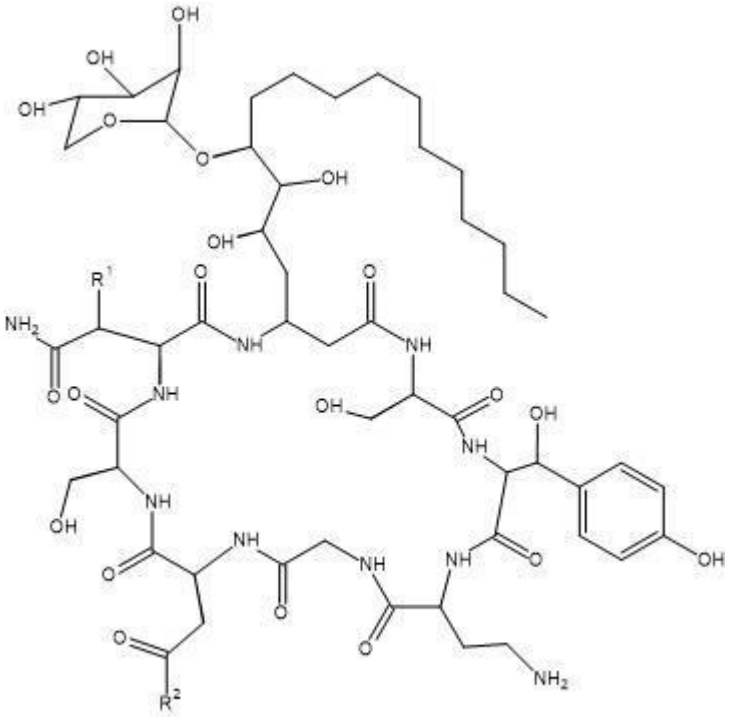
wherein R^1 is H or OH and R^2 is a prodrug-functional group;

Formula (VI)



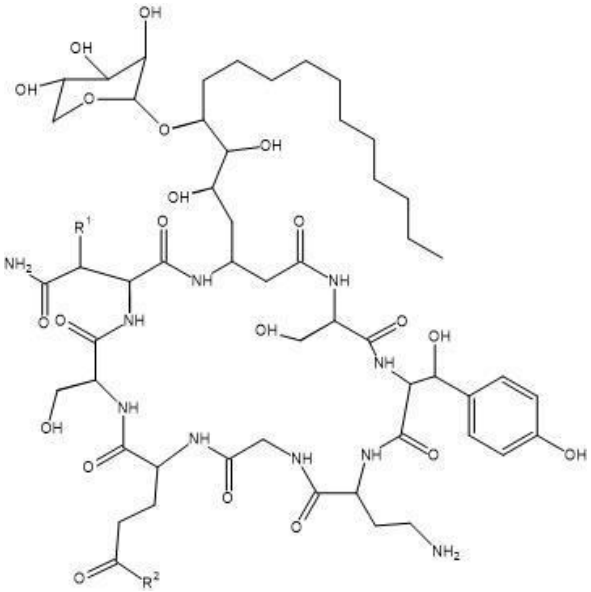
wherein R^1 is H or OH and R^2 is a prodrug-functional group;

Formula (IX)



wherein R^1 is H or OH and R^2 is NH_2 or OH;

Formula (X)



wherein R^1 is H or OH and R^2 is NH_2 or OH.

21. The method of claim 20, wherein the prodrug functional group is a phosphate group, methyl succinate, or benzyl succinate.

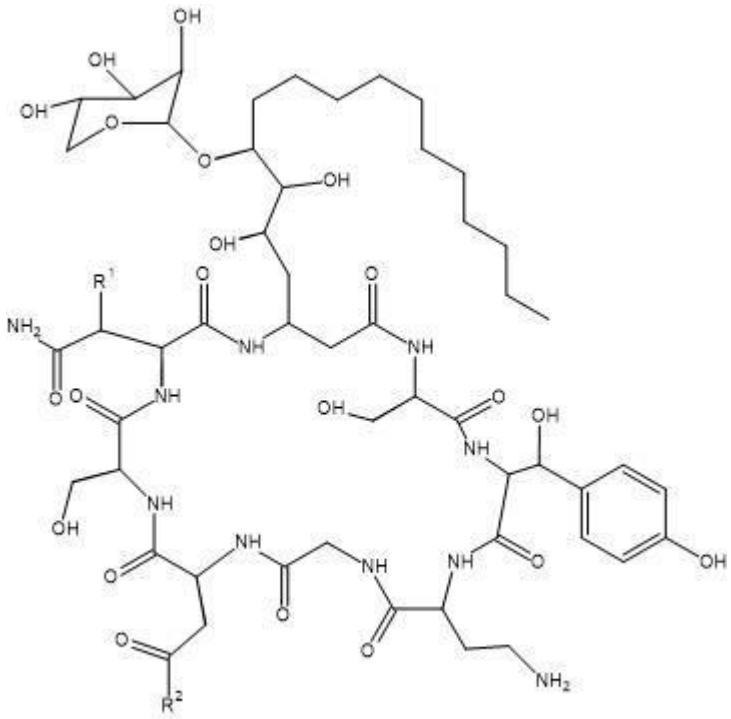
22. The method of claim 20, wherein the amine is 3-amino-1-propanol, protected 3-amino-1-propanol, 3-amino-1-propanol conjugated to methyl succinate, or 3-amino-1-propanol conjugated to benzyl succinate.

23. The method of claim 20, further comprising adding 1-hydroxybenzo-triazole (HOBt) to the occidiofungin analog of Formula III, 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide hydrochloride (EDC), and the amine containing the prodrug functional group.

24. The method of claim 20, wherein the condensation reaction is carried out in N,N-Dimethylformamide or dimethyl sulfoxide.

25. The method of claim 16 or 20, wherein Formula (IX) is according to:

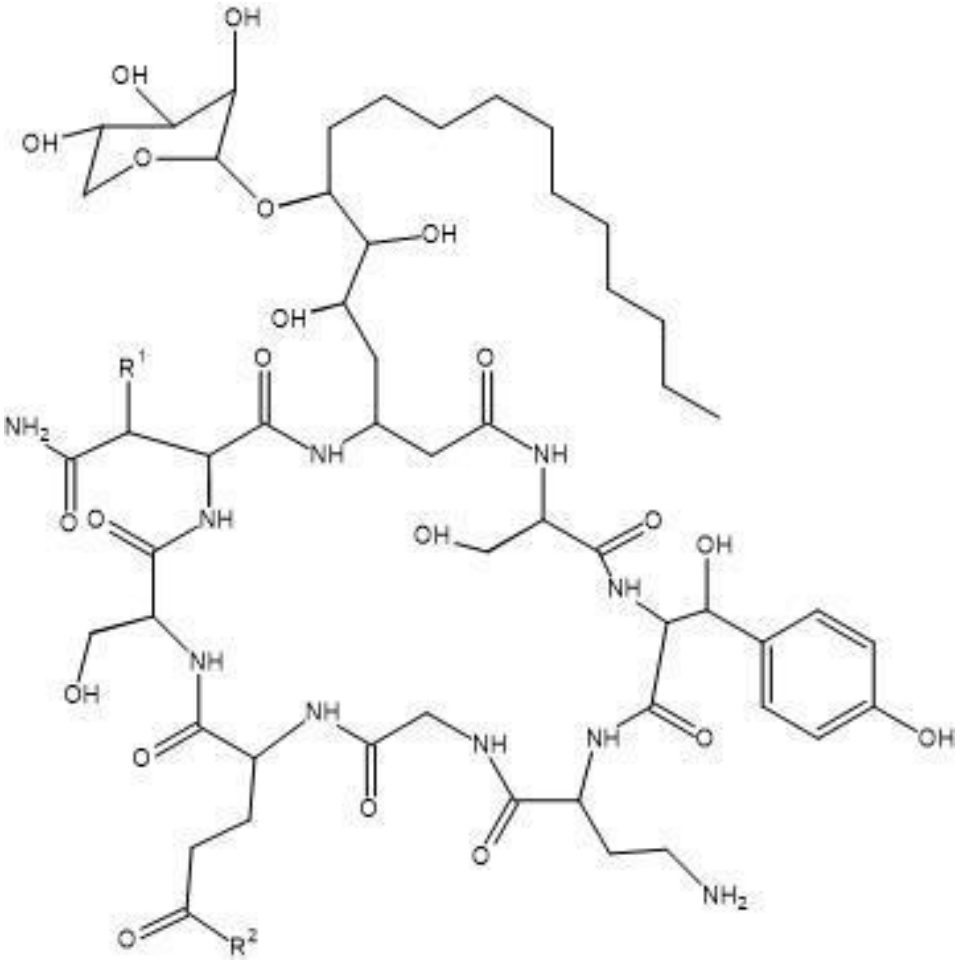
Formula (IX)



wherein R^1 is H or OH and R^2 is OH.

26. The method of claim 16 or 20, wherein Formula (X) is according to:

Formula (X)



wherein R^1 is H or OH and R^2 is OH.