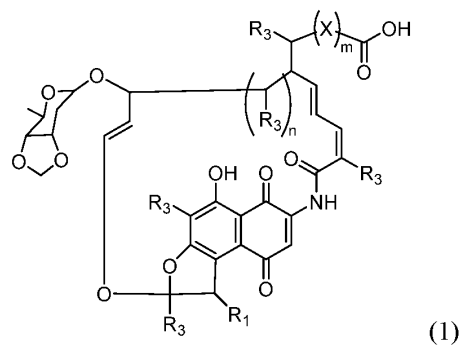


CLAIMS

What is claimed is:

5

1. A compound of formula (1):



wherein

R_1 is CHR_4R_5 or OR_6 ;

10 each occurrence of R_4 and R_5 independently represent a hydrogen atom, a halogen atom, alkyl, cycloalkyl, aryl, or heteroaryl;

R_6 is a hydrogen atom, alkyl, cycloalkyl, aryl, or heteroaryl;

each occurrence of R_3 independently represents a hydrogen atom, a halogen atom, alkyl, cycloalkyl, aryl, or heteroaryl, or OR_7 ;

15 R_7 represents a hydrogen atom, alkyl, cycloalkyl, aryl, heteroaryl, or $\text{C}(=\text{O})\text{R}_8$;

R_8 represents alkyl, cycloalkyl, aryl, or heteroaryl;

X represents $-\text{O}-$, $-\text{NR}_9-$, $-\text{CR}_9\text{R}_{10}-$, or $-\text{C}(=\text{O})-$;

R_9 and R_{10} each independently represent a hydrogen atom, a halogen atom, alkyl, cycloalkyl, aryl, or heteroaryl;

20 m represents an integer from 1 to 6; and

n represents an integer from 4 to 10;

or a salt thereof.

2. The compound of claim 1, wherein R_1 represents OR_6 .

25

3. The compound of claim 1 or 2, wherein R_1 represents OH .

4. The compound of any one of claims 1-3, wherein each R_3 independently represents alkyl or OR_7 .

30

5. The compound of any one of claims 1-4, wherein each R_7 independently represents a hydrogen atom or $C(=O)R_8$.

6. The compound of any one of claims 1-5, wherein R_8 is alkyl.

35

7. The compound of any one of claims 1-6, wherein each R_3 is independently selected from the group consisting of $-OH$, methyl, and $-OC(=O)CH_3$.

8. The compound of any one of claims 1-7, X represents $-O-$, $-CR_9R_{10}-$, or -

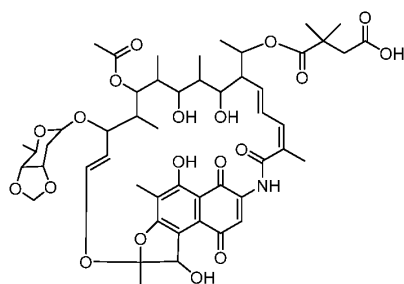
40 $C(=O)-$.

9. The compound of any one of claims 1-8, wherein each of R_9 and R_{10} are a hydrogen atom.

45

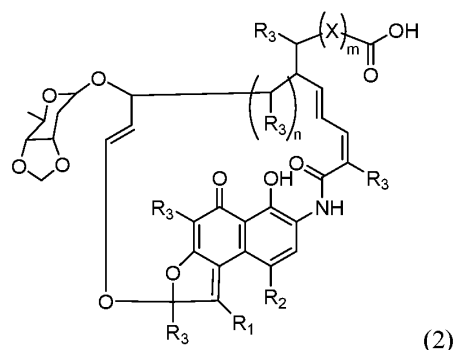
10. The compound of claim 1, wherein each occurrence of X is selected from the group consisting of $-O-$, $-C(=O)-$, $-CH_2-$, and $-C(CH_3)_2-$.

11. The compound of any of claims 1-10, wherein the compound



50

12. A compound of formula (2):



wherein:

R_1 and R_2 each independently represent CHR_4R_5 , CR_4R_5 , OR_6 , or O , wherein R_1
 55 and R_2 may optionally be joined to form a ring;

each occurrence of R_4 and R_5 independently represent a hydrogen atom, a
 halogen atom, alkyl, alkylene, cycloalkyl, aryl, or heteroaryl;

each occurrence of R_6 independently represent a hydrogen atom, alkyl, alkylene,
 cycloalkyl, aryl, or heteroaryl;

60 each occurrence of R_3 independently represents a hydrogen atom, a halogen
 atom, alkyl, cycloalkyl, aryl, or heteroaryl, or OR_7 ;

R_7 represents a hydrogen atom, alkyl, cycloalkyl, aryl, heteroaryl, or $\text{C}(=\text{O})\text{R}_8$;

R_8 represents alkyl, cycloalkyl, aryl, or heteroaryl;

X represents O , NR_9 , CR_9R_{10} , or $\text{C}(=\text{O})$;

65 R_9 and R_{10} each independently represent a hydrogen atom, a halogen atom,
 alkyl, cycloalkyl, aryl, or heteroaryl;

m represents an integer from 1 to 6; and

n represents an integer from 4 to 10;

or a salt thereof.

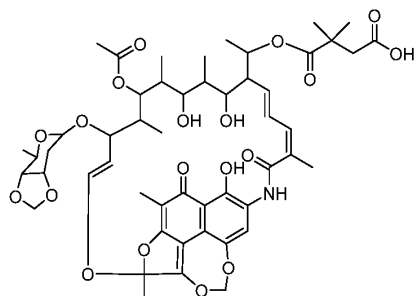
70

13. The compound of claim 12, wherein R_1 and R_2 each independently
 represent OR_6 .

14. The compound of claim 13, wherein each R_6 independently represents a
 75 hydrogen atom or alkyl.

15. The compound of claim 12, wherein R_1 and R_2 each independently
 represent OR_6 and O , and R_1 and R_2 are joined to form a ring.

- 80 16. The compound of claim 15, wherein R₆ is alkylene.
17. The compound of any of claims 12, 14, or 15, wherein R₁ represents -OCH₂- and R₂ represents -O-, and R₁ and R₂ are joined to form a ring.
- 85 18. The compound of any one of claims 12-17, wherein each R₃ independently represents alkyl or OR₇.
19. The compound of any one of claims 12-18, wherein each R₇ independently represents a hydrogen atom or C(=O)R₈.
- 90 20. The compound of any one of claims 12-19, wherein R₈ is alkyl.
21. The compound of any one of claims 12-20, wherein each R₃ is independently selected from the group consisting of -OH, methyl, and -OC(=O)CH₃.
- 95 22. The compound of any one of claims 12-21, X represents -O-, -CR₉R₁₀-, or -C(=O)-.
23. The compound of any one of claims 12-22, wherein each of R₉ and R₁₀
- 100 are a hydrogen atom.
24. The compound of any one of claims 12-23, wherein each occurrence of X is selected from the group consisting of -O-, -C(=O)-, -CH₂-, and -C(CH₃)₂-.
- 105 25. The compound of any one of claims 12-24, wherein the compound is



26. The compound of any one of claims 1-25, wherein the compound is substantially pure.

110

27. The compound of any one of claims 1-25, wherein the compound is enantiomerically pure.

28. The compound of any one of claims 1-25, wherein the compound has a lower MIC ($\mu\text{g/mL}$) against rifamycin-resistant bacteria than rifamycin.

115

29. A pharmaceutical composition comprising a therapeutically effective amount compound of any one of claims 1-28 and a pharmaceutically acceptable excipient.

120

30. The pharmaceutical composition of claim 29, further comprising a pharmaceutical carrier.

31. The pharmaceutical composition of claim 29 or 30, wherein the pharmaceutical composition is formulated as an instant release, delayed release, or extended release composition, or combination thereof.

125

32. A method of preventing or reducing the growth or proliferation of a microorganism, wherein the method comprises contacting the microorganism with a composition comprising a compound of any one of claims 1-31.

130

33. The method of claim 32, wherein the microorganism is a bacterium.

34. The method of claim 33, wherein the bacterium is resistant to at least one antibiotic.

135

35. The method of claim 34, wherein the bacterium is resistant to rifamycin.

36. The method of claim 35, wherein the bacterium has at least one point mutation that confers antibiotic resistance.

140

37. The method of any of claims 33-36, wherein the bacterium has one or more of the following mutations of one or more amino acids: (1) serine to leucine; (2) histidine to tyrosine; (3) or asparagine to tyrosine.

145

38. A method of treating or preventing a bacterial infection in a subject, wherein the method comprises administering to the subject a composition comprising a compound of any one of claims 1-31.

150

39. The method of claim 38, wherein the bacterial infection is an infection of *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Listeria monocytogenes*, *Salmonella enterica*, *Pseudomonas aeruginosa*, *Proteus mirabills*, *Enterococcus faecium*, *Acinetobacter baumannii*, *Myobacterium tuberculosis*.

155

40. The method of claim 39, wherein the bacterial infection is resistant to rifamycin.

41. The method of claim 40, wherein the bacterial infection is caused by a bacterium that has at least one point mutation that confers antibiotic resistance.

160

42. The method of claim 41, wherein the bacterium has one or more of the following mutations of one or more amino acids: (1) serine to leucine; (2) histidine to tyrosine; (3) or asparagine to tyrosine.

165

43. The method of any one of claims 32-42, wherein the method further comprises administering to the subject an additional therapeutic agent.

44. A compound according to claims 1-31 for use in treating a bacterial infection.

170

45. The compound for use according to claim 44, wherein the bacterial infection is an infection of *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Listeria monocytogenes*, *Salmonella enterica*, *Pseudomonas aeruginosa*, *Proteus*

175 *mirabills*, *Enterococcus faecium*, *Acinetobacter baumannii*, and *Mycobacterium tuberculosis*.

46. The compound for use according to claim 45, wherein the bacterial infection is resistant to rifamycin.

180 47. The compound for use according to claim 46, wherein the bacterial infection is caused by a bacterium that has at least one point mutation that confers antibiotic resistance.

185 48. The compound for use according to claim 47, wherein the bacterium has one or more of the following mutations of one or more amino acids: (1) serine to leucine; (2) histidine to tyrosine; (3) or asparagine to tyrosine.