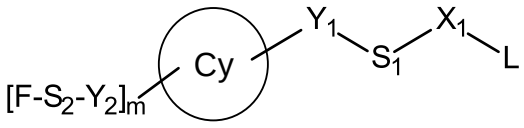
CLAIMS

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein:

L represents a binding moiety selected from a cationic anti-microbial peptide linked to X_1 by an amine;

S_1 represents a bond or a spacer selected from a $–(CH_2)_a-$ or $–(CH_2)_b-(CH_2-CH_2-O)_c-(CH_2)_d-$ group, wherein one to five of said $–CH_2-$ groups may optionally be substituted by a –C(O)NH- or -NHC(O)- group;

a represents an integer selected from 1 to 40;

b represents an integer selected from 0 to 25;

c represents an integer selected from 1 to 20;

d represents an integer selected from 1 to 15;

S_2 represents a spacer selected from a $–(CH_2)_e-$ or $–(CH_2)_f-(CH_2-CH_2-O)_g-(CH_2)_h-$ group, wherein one to three of said $–CH_2-$ groups may optionally be substituted by a –C(O)NH- or -NHC(O)- group;

e represents an integer selected from 1 to 20;

f represents an integer selected from 1 to 10;

g represents an integer selected from 1 to 15;

h represents an integer selected from 1 to 5;

X_1 represents a bond or –C(O)-;

Y_1 and Y_2 independently represent a bond, -O-, -S-, -NH-, –C(O)-, -NHC(O)- or -C(O)NH- group;

F represents a carbohydrate molecule capable of binding to a human anti-alpha-galactosyl antibody;

m represents an integer selected from 1 to 5; and

Cy represents phenyl, biphenyl or triphenyl, such that when Cy represents biphenyl or triphenyl, said $–Y_1-S_1-X_1-L$ group may be present on any of said phenyl rings and said $[F-S_2-Y_2]_m-$ group or groups may be present on any of said phenyl rings.

2. The compound as defined in claim 1 or a pharmaceutically acceptable salt thereof, wherein S_1 represents a bond or a spacer selected from:

$–(CH_2)_a$-, wherein one or five of said $–CH_2$- groups are optionally substituted by a -C(O)NH- group (such as $–(CH_2)_5$-CONH-$(CH_2)_5$ or -$(CH_2)_5$-CONH-$(CH_2)_5$-CONH-$(CH_2)_5$-CONH-$(CH_2)_5$-CONH-$(CH_2)_5$-CONH-$(CH_2)_5$-); or

$–(CH_2)_b$-$(CH_2$-CH_2-$O)_c$-$(CH_2)_d$-, wherein two of said $–CH_2$- groups are optionally substituted by a -C(O)NH- group (such as -$(CH_2CH_2O)_8$-$(CH_2)_2$-, -$(CH_2CH_2O)_8$-$(CH_2)_2$-CONH-$(CH_2)_5$-CONH-$(CH_2)_5$- or -$(CH_2)_5$-CONH-$(CH_2)_5$-CONH-$(CH_2)_5$-CONH-$(CH_2)_5$-CONH-$(CH_2CH_2O)_8$-$(CH_2)_2$-);

or S_1 represents a spacer selected from:

$–(CH_2)_a$-, wherein one of said $–CH_2$- groups is substituted by a -C(O)NH- group (such as $–(CH_2)_5$-CONH-$(CH_2)_5$); or

$–(CH_2)_b$-$(CH_2$-CH_2-$O)_c$-$(CH_2)_d$- (such as -$(CH_2CH_2O)_8$-$(CH_2)_2$-);

or S_1 represents a spacer selected from: $–(CH_2)_a$-, wherein one of said $–CH_2$- groups is substituted by a -C(O)NH- group (such as $–(CH_2)_5$-CONH-$(CH_2)_5$).

3. The compound as defined in claim 1 or claim 2 or a pharmaceutically acceptable salt thereof, wherein:

a represents an integer selected from: 1 to 35; or 10 to 35; or 11 or 35; or 11; and/or

b represents an integer selected from 0 to 24; or 0 or 24; or 0; and/or

c represents an integer selected from 1 to 15; or 1 to 10; or 8; and/or

d represents an integer selected from 1 to 3; or 1 or 2; or 2; and/or

Y_1 represents -C(O)NH- or -C(O)-; or -C(O)NH-.

4. The compound as defined in any one of claims 1 to 3 or a pharmaceutically acceptable salt thereof, wherein S_2 represents a spacer selected from:

$–(CH_2)_e$-, wherein one or three of said $–CH_2$- groups are optionally substituted by a -NHC(O)- group (such as -$(CH_2)_3$-NHCO-CH_2- or -$(CH_2)_3$-NHCO-$(CH_2)_5$-NHCO-$(CH_2)_5$-NHCO-CH_2-); or

$–(CH_2)_f$-$(CH_2$-CH_2-$O)_g$-$(CH_2)_h$-, wherein two of said $–CH_2$- groups are optionally substituted by a -NHC(O)- group (such as -$(CH_2)_3$-NHCO-$(CH_2CH_2O)_4$-$(CH_2)_2$-NHCO-CH_2-);

or S_2 represents a spacer selected from $–(CH_2)_e$-, wherein three of said $–CH_2$- groups are optionally substituted by a -NHC(O)- group (such as -$(CH_2)_3$-NHCO-$(CH_2)_5$-NHCO-$(CH_2)_5$-NHCO-CH_2-).

5. The compound as defined in any one of claims 1 to 4 or a pharmaceutically acceptable salt thereof, wherein:

e represents an integer selected from 1 to 17; or 5 to 17; or 5 or 17; or 17; and/or

f represents an integer selected from 1 to 8; or 2 to 6; or 4; and/or

g represents an integer selected from 1 to 5; or 1 to 4; or 4; and/or

h represents an integer selected from 1 to 4; or 4; and/or

X_1 represents –C(O)-; and/or

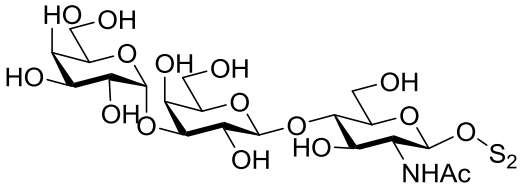
Y_2 represents –O-; and/or

m represents an integer selected from 1 to 4; or 1, 2 or 3; or 1 or 2; or 1.

6. The compound as defined in any one of claims 1 to 5 or a pharmaceutically acceptable salt thereof, wherein Cy represents phenyl or biphenyl.

7. The compound as defined in any one of claims 1 to 6 or a pharmaceutically acceptable salt thereof, wherein F is selected from galactosyl-alpha-1,3-galactosyl-beta-1,4-N-acetylglucosamine, alpha1-3 galactobiose, alpha1-3-beta1-4-galactotriose or galilipentasaccharide.

8. The compound as defined in any one of claims 1 to 7 or a pharmaceutically acceptable salt thereof, wherein F has a structure as shown in the following formula:

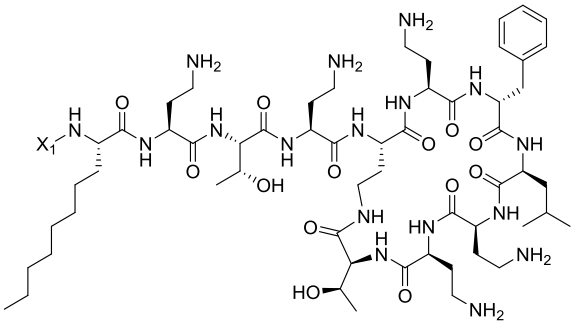


wherein S_2 refers to the point of attachment to the S_2 group.

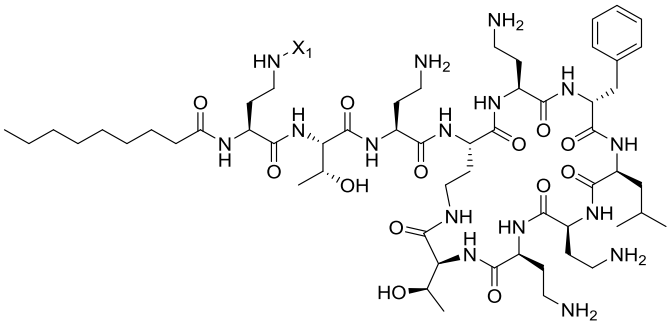
9. The compound as defined in any one of claims 1 to 8 or a pharmaceutically acceptable salt thereof, wherein L represents a lipopeptide, such as a polymyxin selected from Polymyxin B, Polymyxin B_2, Polymyxin Nonapeptide, Colistin A, Colistin B, CB-182,204 (Cubist Pharmaceuticals), 5a (Pfizer), 5x (Pfizer), CA 14 (Cantab Anti-Infectives) CA824 (Cantab Anti-Infectives), NAB739 (Northern Antibiotics), NAB741 (Northern Antibiotics), NAB7061 (Northern Antibiotics), 38 (University of Queensland), FADDI-002 (Monash University), FADDI-100 (Monash University).

10. The compound as defined in any one of claims 1 to 8 or a pharmaceutically acceptable salt thereof, wherein L represents a lipopeptide; or a Polymyxin B derivative; or a Polymyxin B derivative selected from one of the following structures:

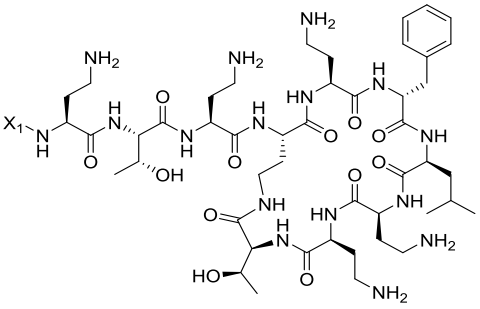
H_2N-[L-OctylGly]-Dab-Thr-Dab-Dab*-Dab-[D-Phe]-Leu-Dab-Dab-Thr*



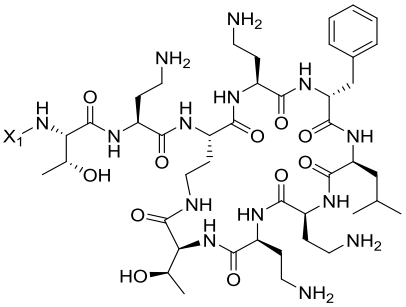
Nonanamide-Dab(NH_2)-Thr-Dab-Dab*-Dab-[D-Phe]-Leu-Dab-Dab-Thr*



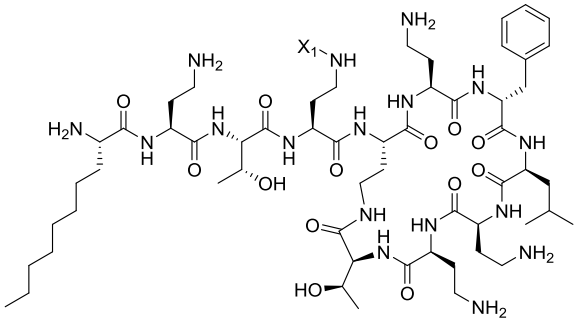
H_2N-Dab-Thr-Dab-Dab*-Dab-[D-Phe]-Leu-Dab-Dab-Thr*



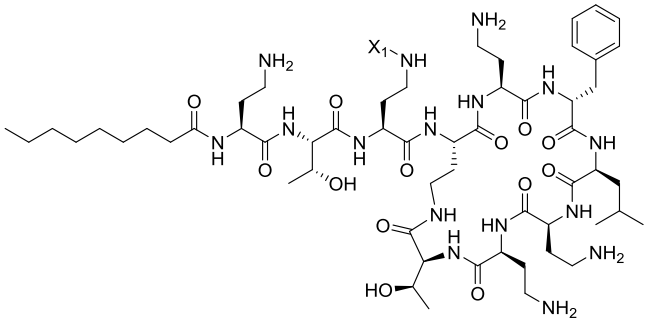
H_2N-Thr-Dab-Dab*-Dab-[D-Phe]-Leu-Dab-Dab-Thr*



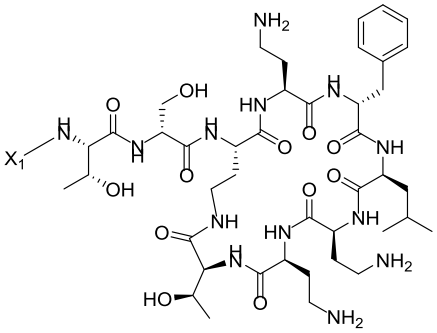
H_2N-[L-OctylGly]-Dab-Thr-Dab(NH_2)-Dab*-Dab-[D-Phe]-Leu-Dab-Dab-Thr*



Nonanamide-Dab-Thr-Dab(NH_2)-Dab*-Dab-[D-Phe]-Leu-Dab-Dab-Thr*



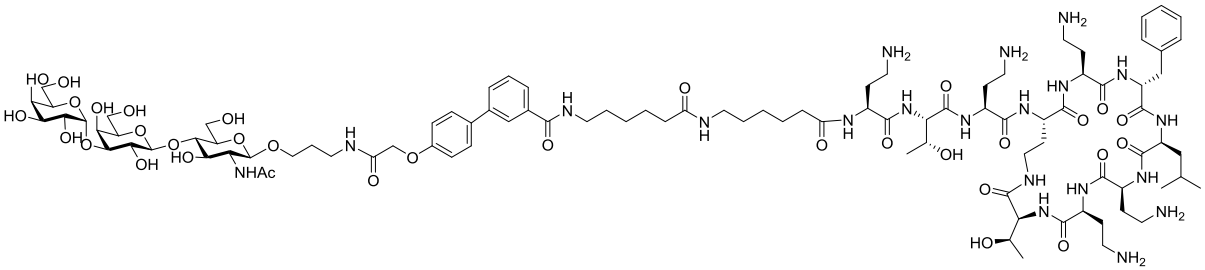
H_2N-Thr-[D-Ser]-Dab*-Dab-[D-Phe]-Leu-Dab-Dab-Thr*



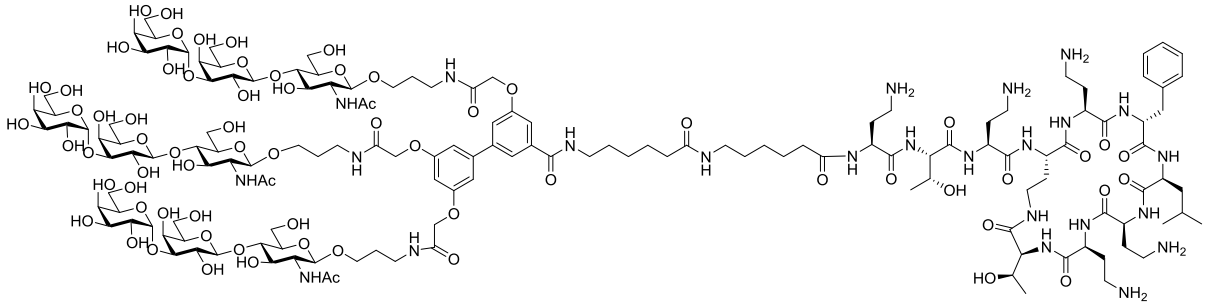
wherein X_1 refers to the point of attachment to the X_1 group.

11. The compound as defined in claim 1 or a pharmaceutically acceptable salt thereof, which is selected from any one of Examples 1-25:

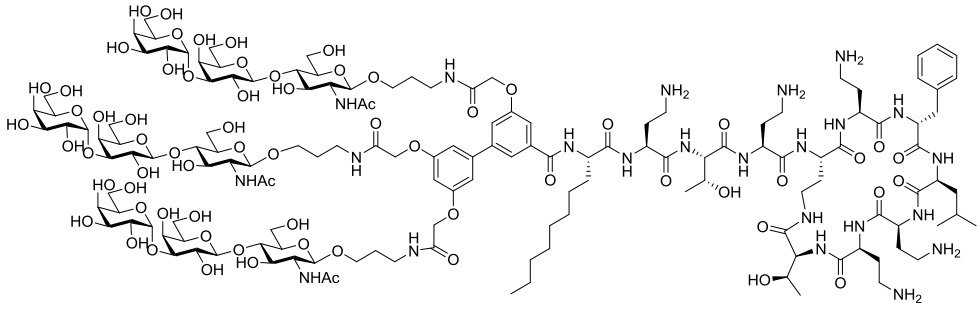
Example 1



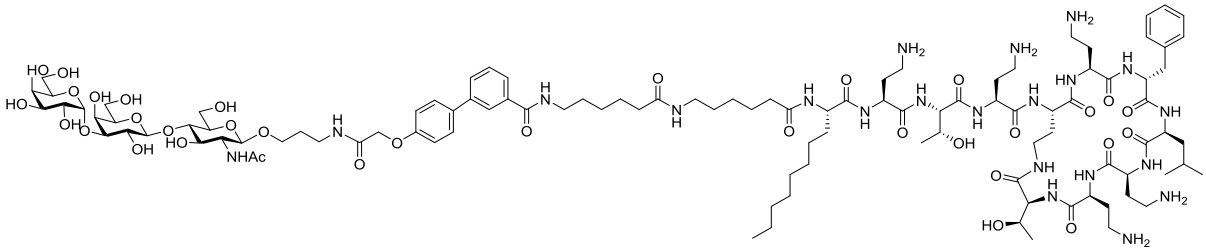
Example 2



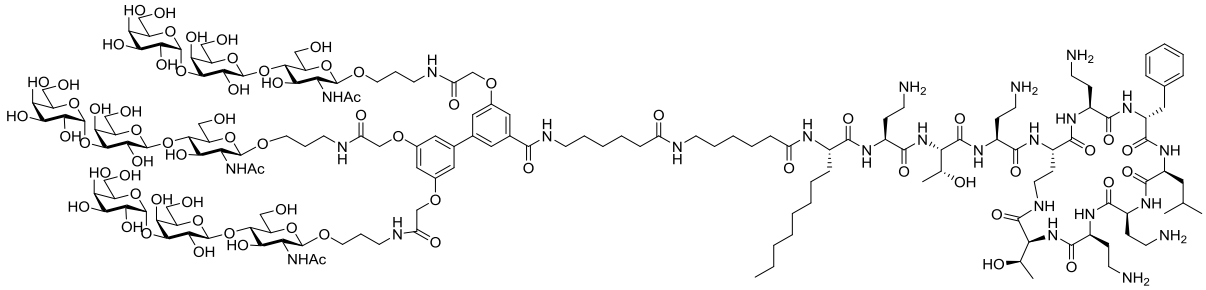
Example 3



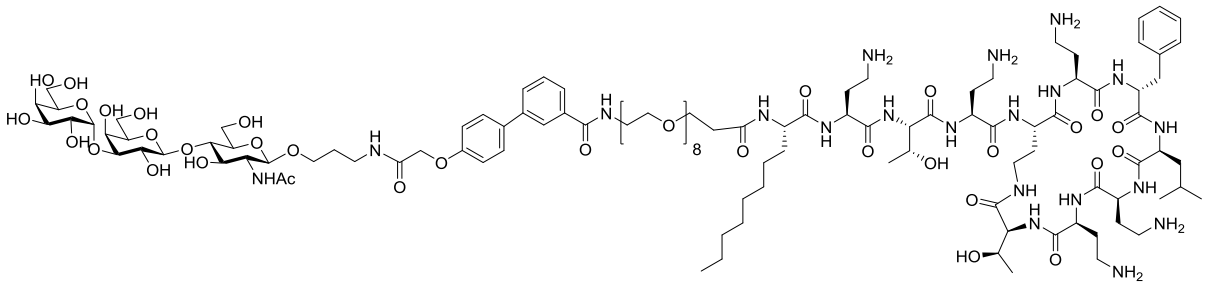
Example 4



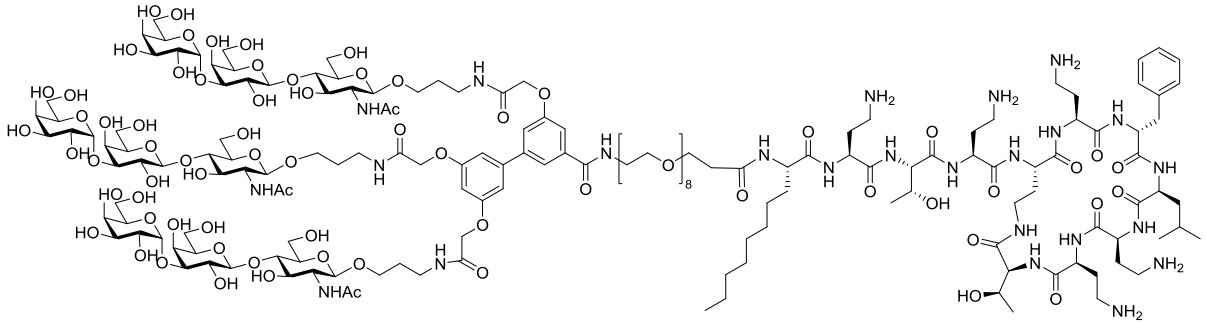
Example 5



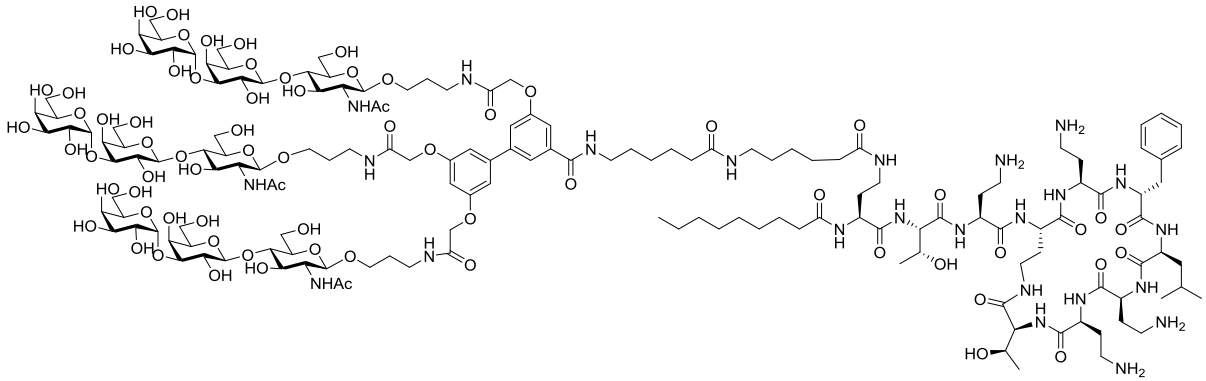
Example 6



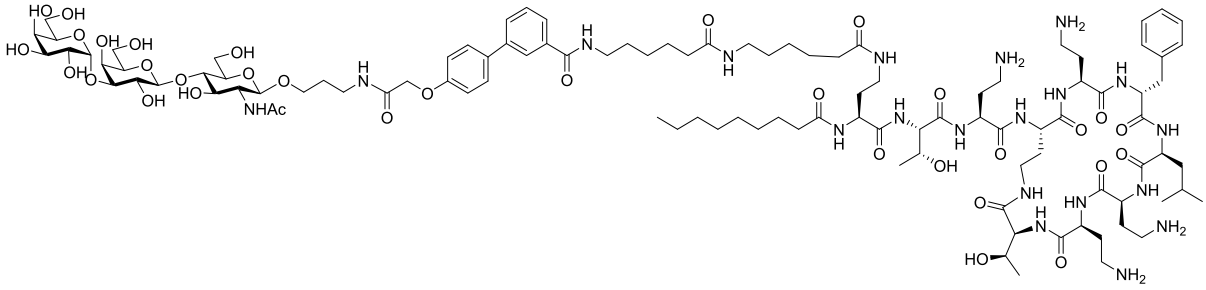
Example 7



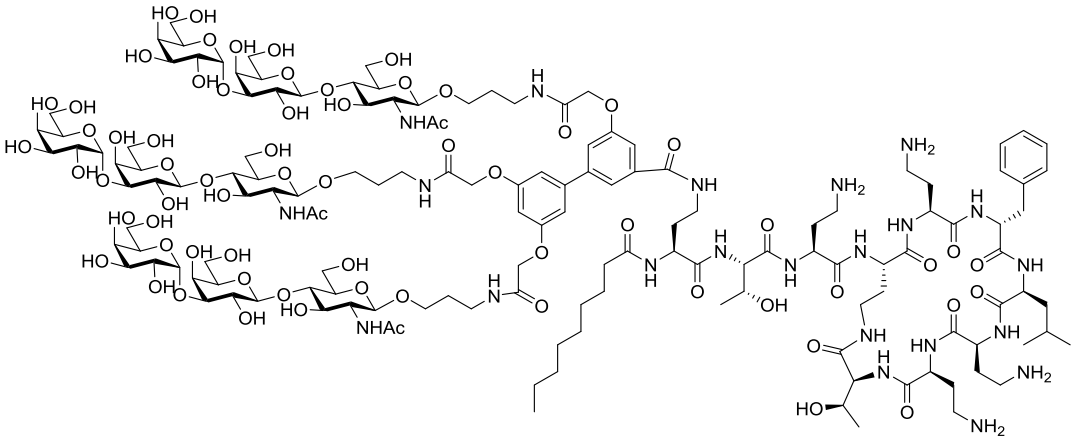
Example 8



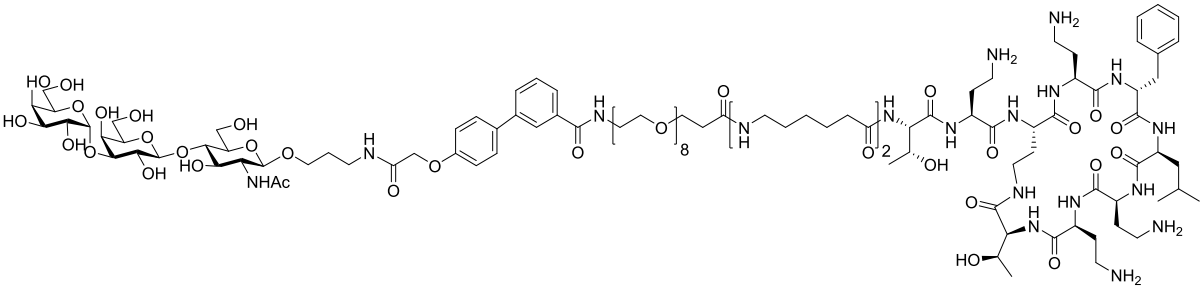
Example 9



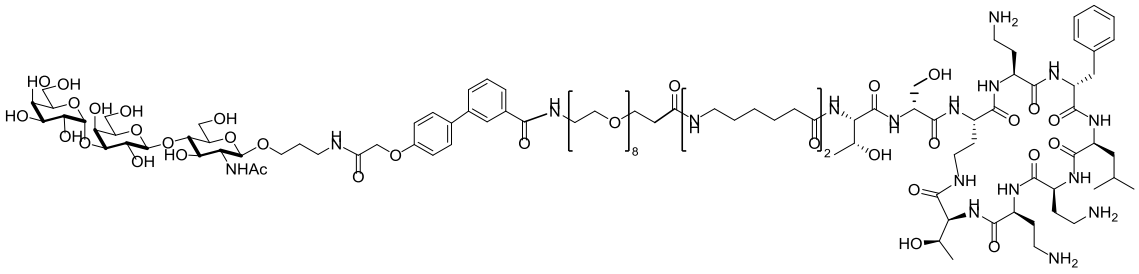
Example 10



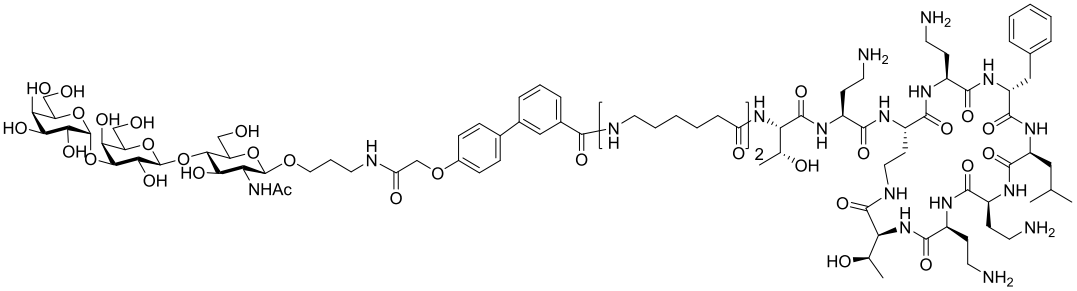
Example 11



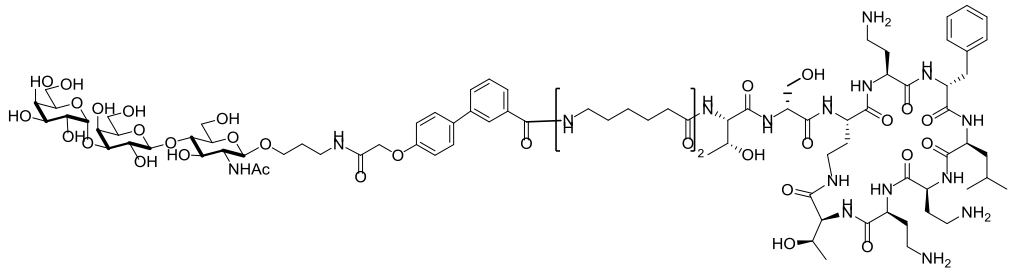
Example 12



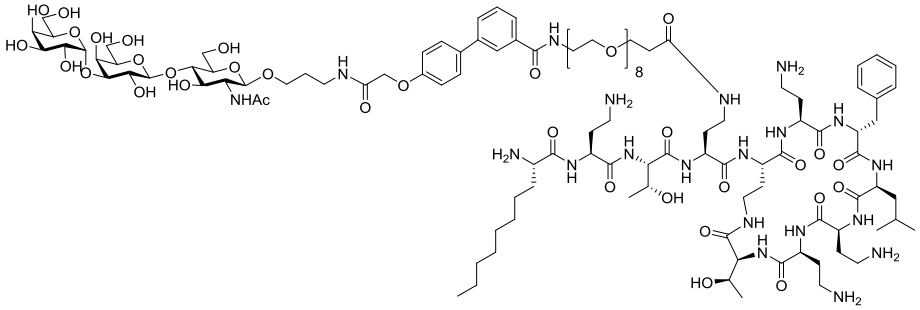
Example 13



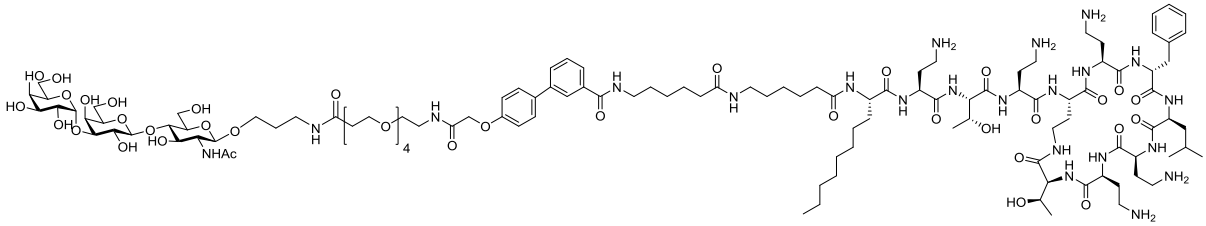
Example 14



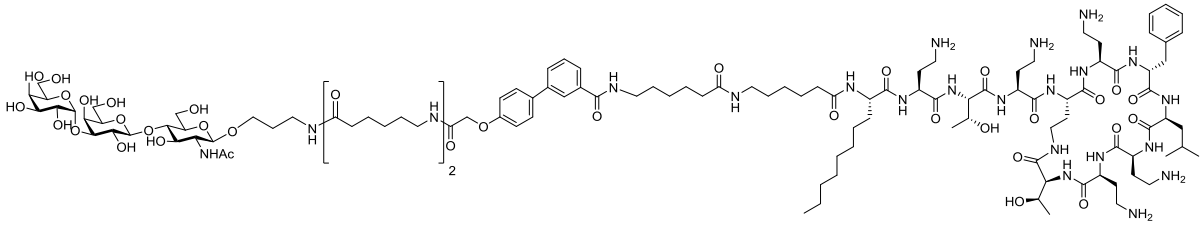
Example 15



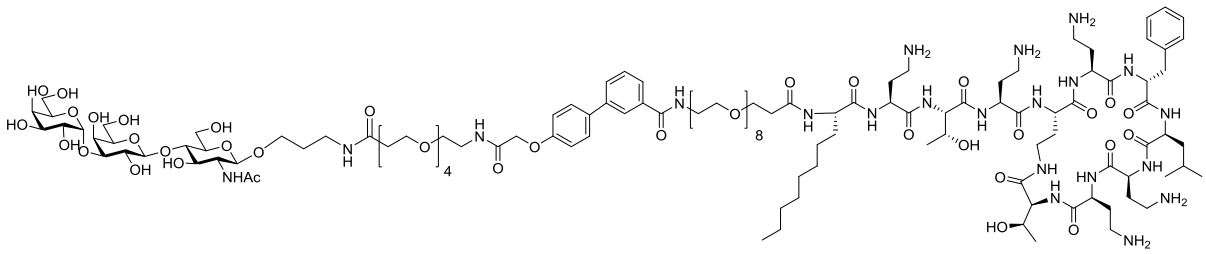
Example 16



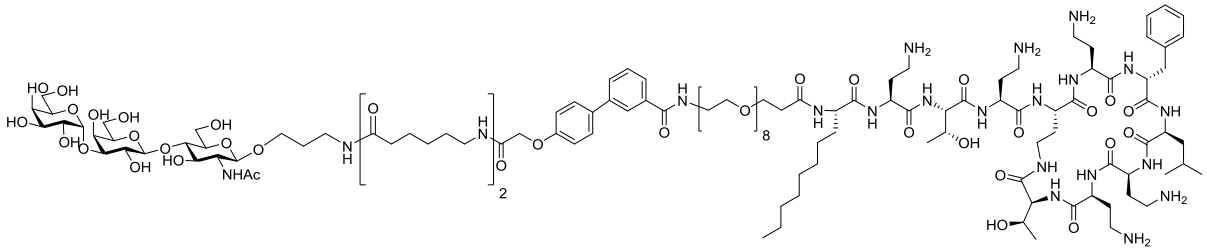
Example 17



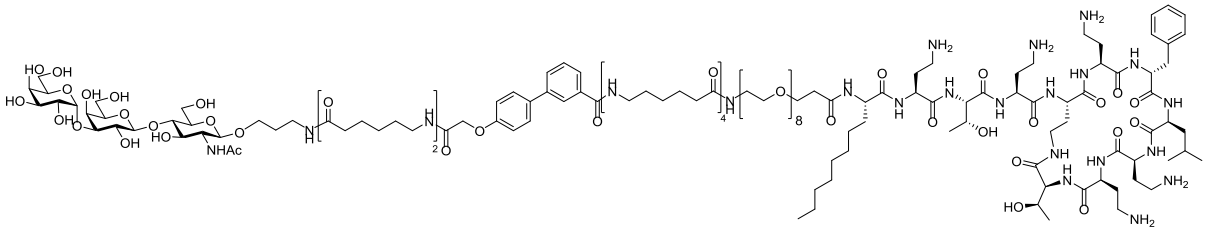
Example 18



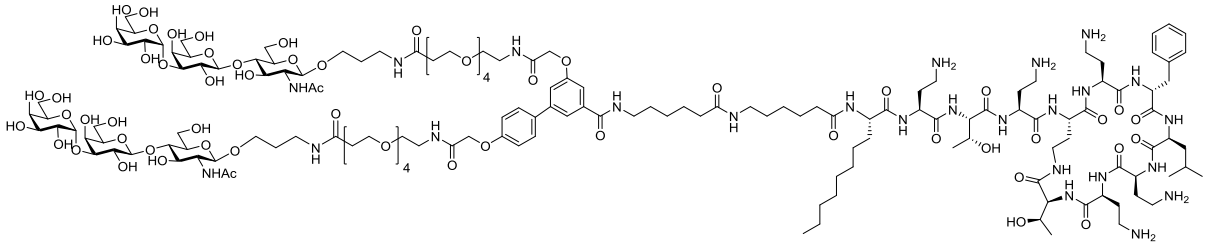
Example 19



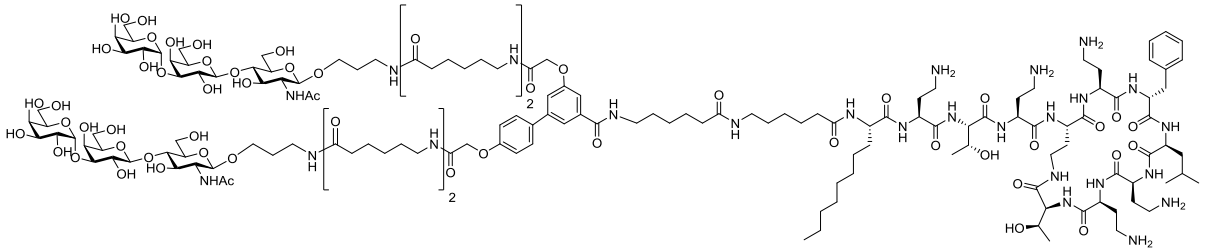
Example 20



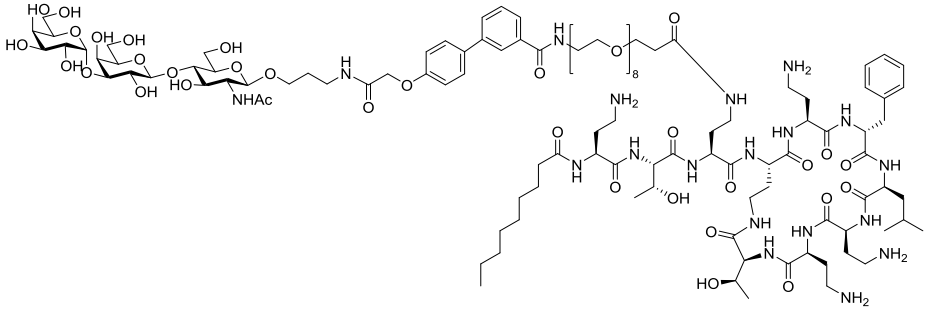
Example 21



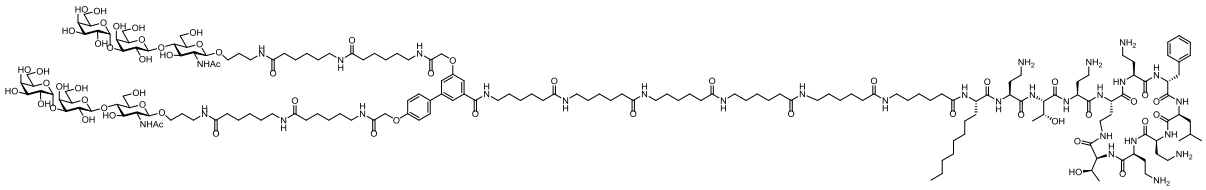
Example 22



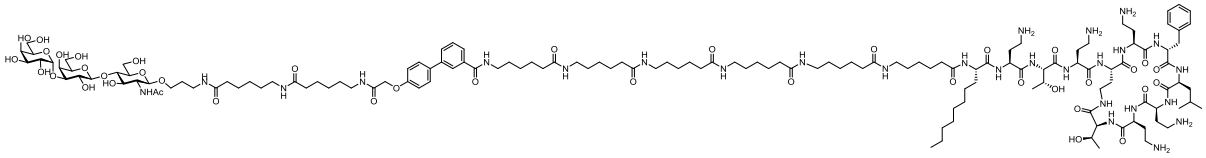
Example 23



Example 24



Example 25



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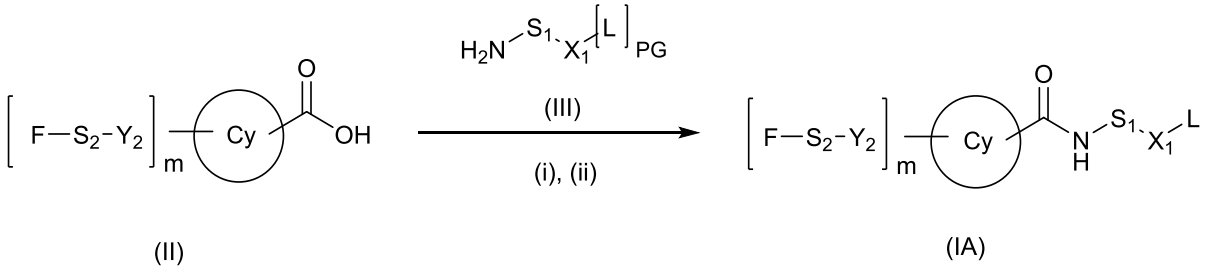
12. A pharmaceutical composition comprising a compound as defined in any one of claims 1 to 11 or a pharmaceutically acceptable salt thereof.

13. The compound as defined in any one of claims 1 to 11 or a pharmaceutically acceptable salt thereof, for use in therapy.

14. The compound as defined in any one of claims 1 to 11 or a pharmaceutically acceptable salt thereof, for use in the treatment of a disease or disorder mediated and/or caused by an infective agent.

15. A process for preparing a compound of formula (I) as defined in claim 1 which comprises:

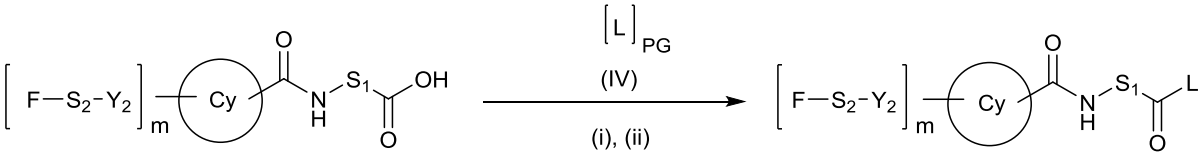
(a) preparing a compound of formula (I) wherein Y_1 represents –CONH- (i.e. a compound of formula (IA)) by reacting a compound of formula (II) with a compound of formula (III) followed by a suitable deprotection step:



(II) (IA)

wherein S_2, Y_2, m, Cy, S_1, X_1, L and F are as defined in claim 1 and PG is a suitable peptide protecting group such as Dde; or

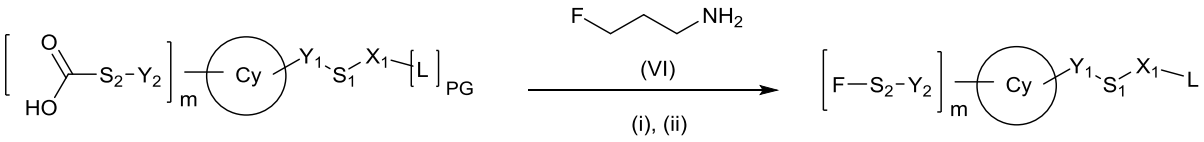
(b) preparing a compound of formula (I) wherein Y_1 represents –CONH- and X_1 represents -C(O)- (i.e. a compound of formula (IB)) by reacting a compound of formula (IV) with a compound of formula (V) followed by a suitable deprotection step:



(V) (IB)

wherein S_2, Y_2, m, Cy, S_1, L and F are as defined in claim 1 and PG is a suitable peptide protecting group such as Dde; or

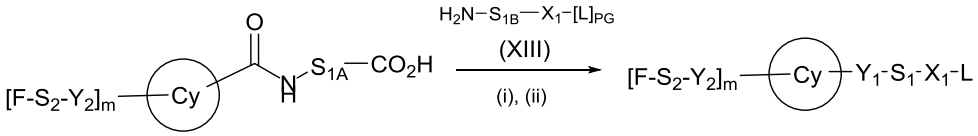
(c) preparing a compound of formula (I) by reacting a compound of formula (VI) with a compound of formula (VII) followed by a suitable deprotection step:



(VII) (I)

wherein S_2, Y_2, m, Cy, S_1, X_1, L and F are as defined in claim 1, PG is a suitable peptide protecting group such as Dde; or

(d) preparing a compound of formula (I) by reacting a compound of formula (XII) with a compound of formula (XIII) followed by a suitable deprotection step, wherein Y_1 represents a CONH group:



(XII) (I)

wherein S_2, Y_2, m, Cy, X_1, L and F are as defined hereinbefore, S_{1A} and S_{1B} together form an S_1 group and PG is a suitable peptide protecting group such as Dde; or

(e) interconversion of a compound of formula (I) or protected derivative thereof to a further compound of formula (I) or protected derivative thereof.