R^1, R^2 and R^3 are independently from one another H, or a carbohydrate selected from the group consisting of cyclic monosaccharides, disaccharides, ~~or~~ oligosaccharides, galactosamine, glucosamine, mannosamine and N-acetylglucosamine, and wherein at least one of R^1, R^2 and R^3 is not H.

[0012] In an example, the glycoside derivative is of the general formula as described above, wherein R^1 and R^2 are H and R^3 is a carbohydrate.

[0013] A further example of the disclosure relates to the treprostinil derivative as described herein, wherein the carbohydrate is a cyclic monosaccharide, disaccharide, oligosaccharide, an amino sugar or an alditol.

[0014] In one example of the disclosure the monosaccharide is a pyranoside or a furanoside.

[0015] In one example of the disclosure the carbohydrate is selected from hexoaldoses like allose, altrose, glucose, mannose, gulose, idose, galactose and talose, from hexoketoses like psicose, fructose sorbose and tagatose, from aldopentoses like ribose, arabinose, xylose, and lyxose, from ketopentoses like ribulose and xylulose, or from hexosamines, like galactosamine, glucosamine, mannosamine, neuramine acid, muramine acid, and N-acetylglucosamine.

[0016] In one example of the disclosure the pyranoside is glucose or galactose.

[0017] A further example of the disclosure relates to the treprostinil derivative as described herein, wherein the treprostinil derivative has a plasma half-life of at least 60 min, specifically 70 min, 80 min, 90 min, specifically of 100 min ± 20 min.

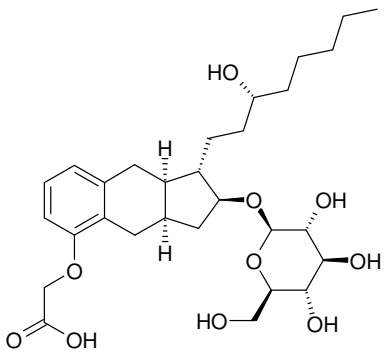
[0018] A further example of the disclosure relates to the treprostinil derivative as described herein, wherein the treprostinil derivative is being cleaved in plasma in 20 h ± 5 h for at least 50%, specifically at least 60%, 70%, 80%, more specifically at least 90%.

[0019] A further example of the disclosure relates to the treprostinil derivative as described herein, wherein the treprostinil derivative has reduced receptor binding affinity towards IP, EP2 and/or EP receptors compared to unmodified treprostinil. Specifically, the receptor binding is at least 2-fold, specifically 5-fold, 10-fold, 15-fold, more specifically about 20-fold reduced with regard to the receptor binding affinity of unmodified treprostinil.

[0020] In another aspect, the disclosure relates to a composition comprising a glycoside derivative of treprostinil as described herein.

[0021] In another aspect, the disclosure relates to a pharmaceutical composition comprising a glycoside derivative of treprostinil as described herein.

[0022] A further example of the disclosure relates to the pharmaceutical composition as described herein, wherein the treprostinil derivative is selected from



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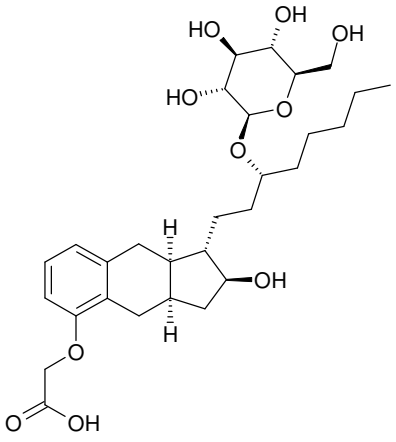

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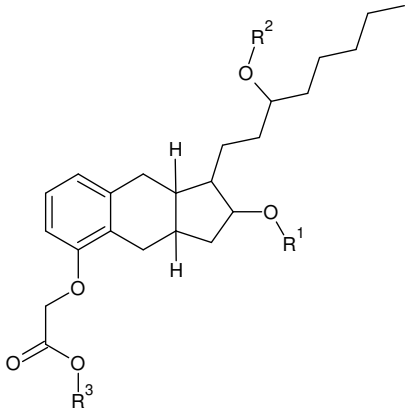
Claims

1. A glycoside derivative of treprostinil of general formula I,



wherein

R^1, R^2 and R^3 are independently from one another H, or a carbohydrate selected from the group consisting of cyclic monosaccharides, disaccharides, ~~or~~ oligosaccharides, galactosamine, glucosamine, mannosamine and N-acetylglucosamine, and wherein at least one of R^1, R^2 and R^3 is not H.

2. The glycoside derivative of treprostinil according to claim 1, wherein the monosaccharide is a pyranoside or a furanoside.

3. The glycoside derivative of treprostinil according to claim 1, wherein the carbohydrate is selected from hexoaldoses like allose, altrose, glucose, mannose, gulose, idose, galactose and talose, from hexoketoses like psicose, fructose sorbose and tagatose, from aldopentoses like ribose, arabinose, xylose, and lyxose, or from ketopentoses like ribulose and xylulose~~, or from hexosamines like galactosamine, glucosamine, mannosamine, and N-acetylglucosamine~~.

4. The glycoside derivative of treprostinil according to claim 2, wherein the pyranoside is glucose or galactose.

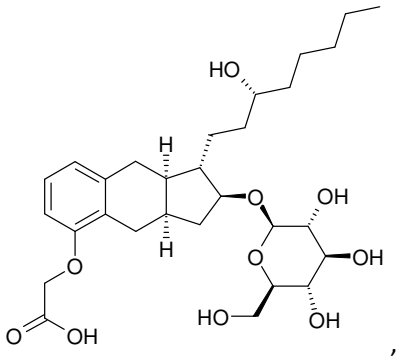
5. The glycoside derivative of treprostinil according to any one of claims 1 to 4, wherein said treprostinil derivative has a plasma half-life of at least 60 min, specifically 70 min, 80 min, 90 min, specifically of 100 min ± 20 min.

6. The glycoside derivative of treprostinil according to any one of claims 1 to 4, wherein said treprostinil derivative is being cleaved in plasma in 20 h ± 5 h for at least 50%, specifically at least 60%, 70%, 80%, more specifically at least 90%.

7. A composition comprising a glycoside derivative of treprostinil according to any of claims 1 to 6.

8. A pharmaceutical composition comprising a glycoside derivative of treprostinil according to any of claims 1 to 6.

9. The pharmaceutical composition according to claim 8, wherein the glycoside derivative of treprostinil is selected from



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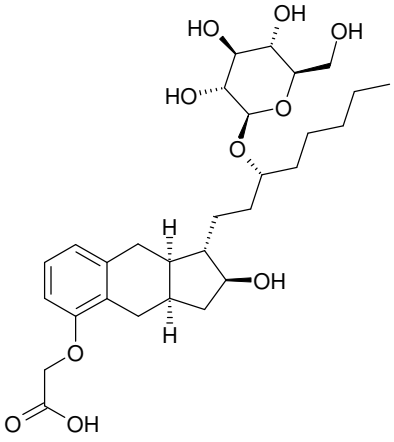

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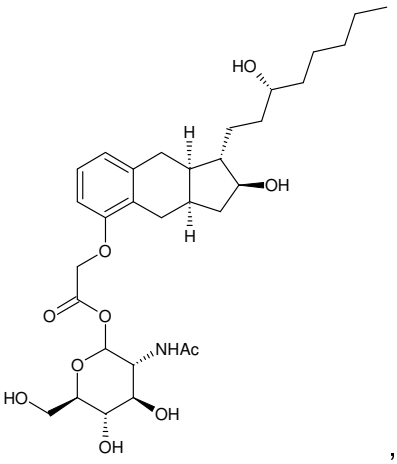

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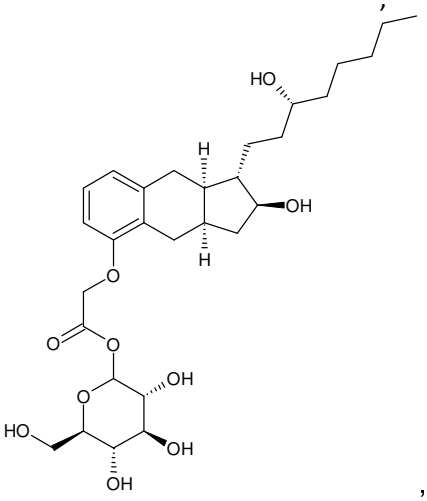

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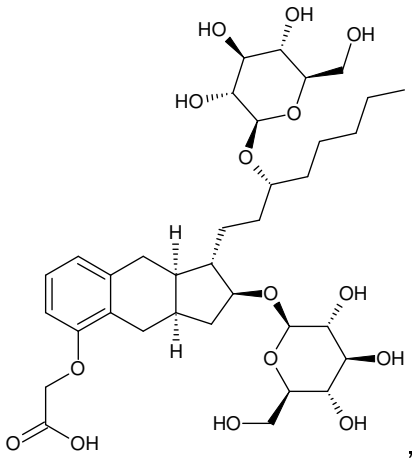

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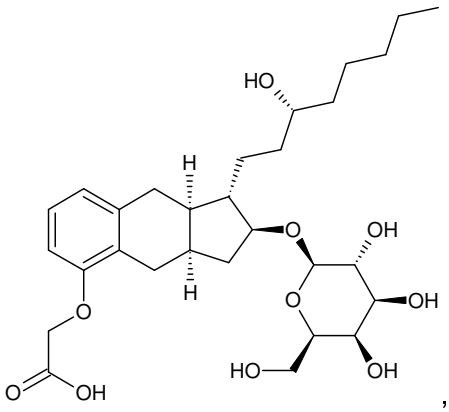

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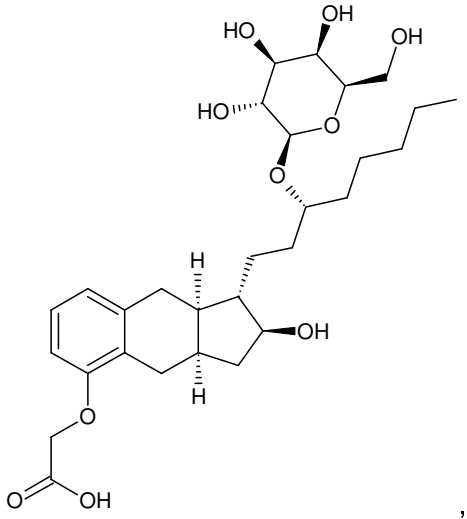
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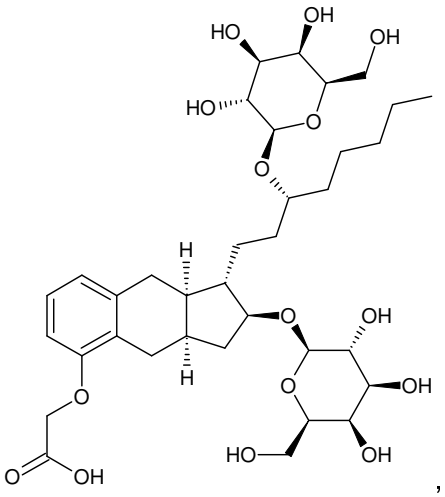
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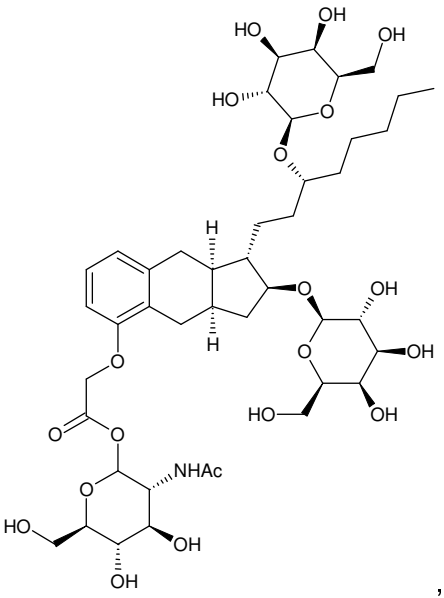
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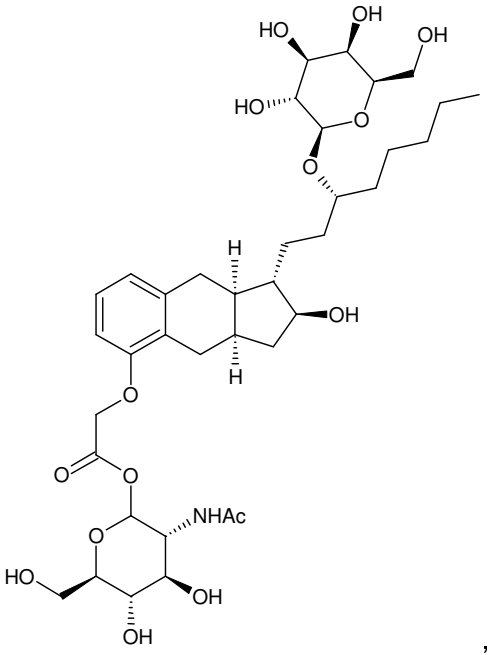
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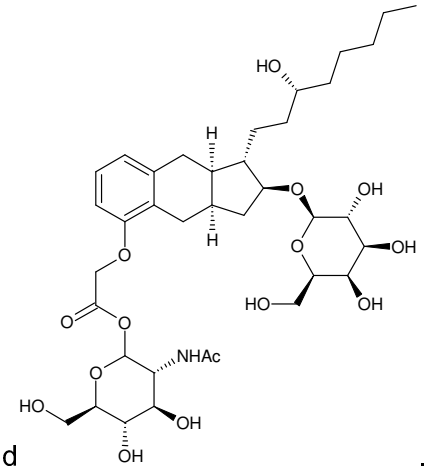
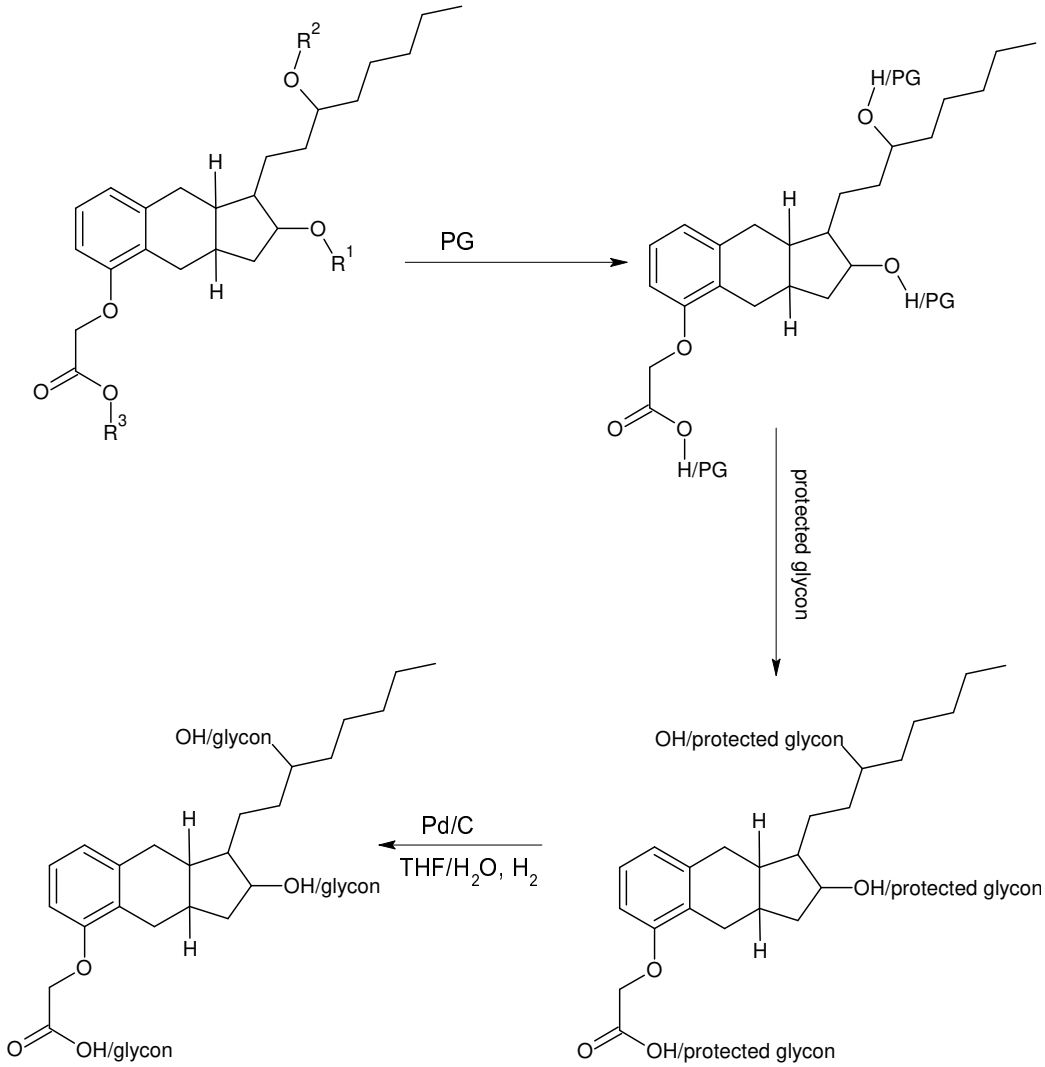


and .

10. A method for producing a compound of formula I, wherein at least one of R^1, R^2, or R^3 is H, comprising the following reaction steps:



wherein PG is a protecting group,

R^1, R^2 and R^3 are as defined in claim 1.

11. The method according to claim 10, wherein the protecting group is benzyl ether selected from the group consisting of substituted methyl ether, substituted ethyl ether, substituted benzyl ether, various silyl ethers, ester selected from the group consisting of acetate, substituted acetate, benzoate, carbonate, sulfonate, cyclic acetal, acetal from ketones, ester, amide, hydracid, benzyl ester.

~~12. The method according to claim 11, wherein the glycoside is a pyranoside, specifically a glucose or a galactose.~~