

(19) (KR)
(12) (A)

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C07C 405/00

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(43)

2002 - 0004993
2002 01 16

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(87)

WO 2000/61550
2000 10 19

(81)

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EP	:	,	,	,	,	,	,
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(30) JP - P - 1999 - 0010 1999 04 09 (JP)
3323

(71) 가 가

3 24 1

가 가 가 3 - 1 - 219

(72) 가 가 가 3-1-219

170 - 8633	3	24	1	가	가
170 - 8633	3	24	1	가	가
170 - 8633	3	24	1	가	가
170 - 8633	3	24	1	가	가
170 - 8633	3	24	1	가	가

(74)

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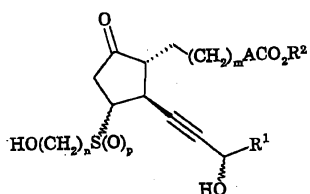
(54) E 1

1

가 , PTCA

PG

< | >


$$\begin{array}{ccccccc} \text{A}, & , & , & , & \text{O(CH}_2\text{)}_q & \text{S(O)}_r(\text{CH}_2)_q & , \text{R}^1 \\ \text{C}_{3-10} & , & \text{C}_{3-10} & , & \text{C}_{1-4} & , \text{C}_{1-10} & , \text{C}_{1-4} \\ \text{C}_{1-10} & , & \text{C}_{2-10} & , & \text{C}_{1-4} & , & \text{C}_{2-10} \\ & \text{C}_{1-4} & & & \text{C}_{2-10} & \text{가} & , \text{C}_{2-10} \\ & \text{C}_{3-10} & & & & & , \text{R}^2 \\ \text{C}_{3-10} & , & m, q & 1 & 5 & , n & 1 & 4 & , p, r & 0, 1 \\ 2 & . & & & & & & & & \end{array}$$

, PTCA

(PG) 가
PG 가 ,
52 - 100446 , 4,131,738 .

PG (起炎)

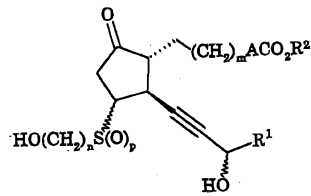
가 (PTCA) 가 30 40 % . , PTCA .

PTCA

가, PTCA

PG

가, 13 - 14 3 가, 11



, A, , , O(CH₂)_q S(O)_r(CH₂)_q, R¹ C₃₋₁₀, C
 1 - 4 C₃₋₁₀, C₃₋₁₀ C₁₋₄, C₁₋₁₀, C₁₋₄ C₂₋₁₀, C₂₋₁₀, R², C
 C₁₋₁₀, C₂₋₁₀, C₁₋₄ 가, C₂₋₁₀, C₂₋₁₀, R², C
 1 - 10 C₃₋₁₀, m, q 1 5, n 1 4, p, r 0, 1
 2

, R¹ C₅₋₁₀, C₁₋₄ C₅₋₁₀, C₅₋₁₀, C₅₋₁₀, C₅₋₁₀, C₅₋₁₀
 , C₅₋₁₀, C₁₋₄, C₅₋₁₀, q가 1 2, m
 2 4, n 2 3

C₃₋₁₀, 3 10

C₁₋₄ C₃₋₁₀, 1 4 3

C₃₋₁₀ C₁₋₄, 3 10
 1 4

C_{1-10} , 1 10 , ,
 , tert - , , 1 - , 2 -
 , 1 - , 2 - , 2,4 - , 2 - , 2 - , 2 -
 , 2 - , 2,6 - , .

1 4 C₁₋₄ C₁₋₁₀ , 1 10 5 -
- 2 - , 4,5 - , 5 - - 2 - , 4 - , 4 - ,

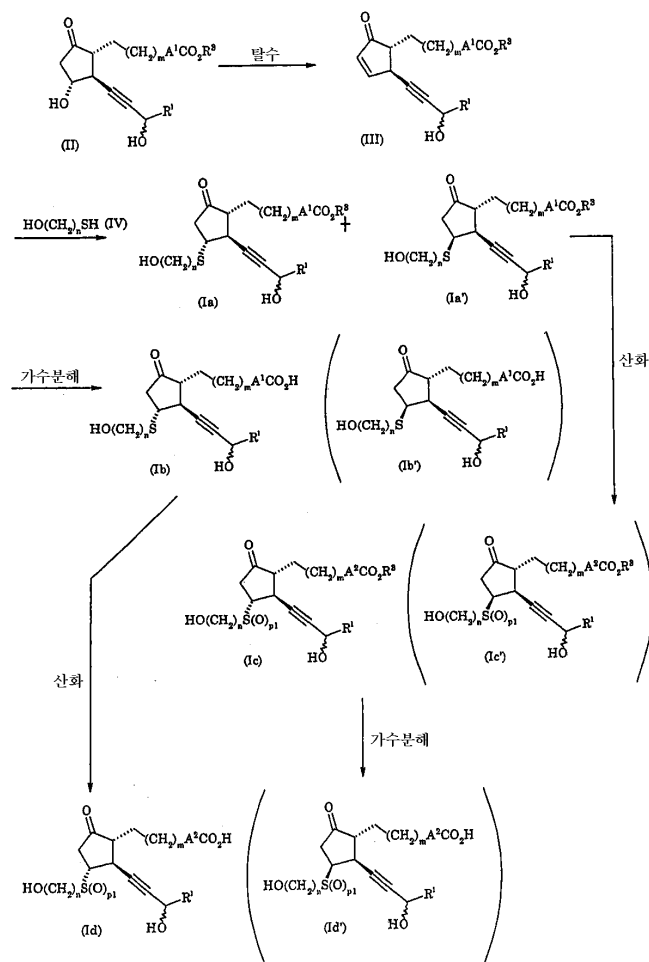
C_{2-10} , 2 10 , , ,
 2 - , 3 - , 4 - , 5 - , 4 - - 3 - , 2,4 - - 3 - , 6 - -
 5 - , 2,6 - - 5 - .

1 4 C₁₋₄ C₂₋₁₀ , 2 10 , 6 -
-2 - -3 - , 6 - -3 - .

$$C_{2-10}^2 = \frac{10!}{2!8!} = \frac{10 \cdot 9 \cdot 8!}{2 \cdot 8!} = \frac{10 \cdot 9}{2} = 45$$

C_{1-4} C_{2-10} , 2 10 , 5
 1 4 - 1 - - 3 - , 6 - - 3 - .

$$\frac{1}{\Gamma(\alpha)} \int_0^t (t-s)^{\alpha-1} f(s) ds = \frac{1}{\Gamma(\alpha)} \left(\int_0^t (t-s)^{\alpha-1} f(s) ds + \int_t^\infty (t-s)^{\alpha-1} f(s) ds \right)$$



, A^1 , $\text{O}(\text{CH}_2)_q$, $\text{S}(\text{O})_{r1}(\text{CH}_2)_q$, $\text{O}(\text{CH}_2)_q$, $\text{S}(\text{CH}_2)_q$, R^2 , A^2 , $p1, r1$, 1, 2, R^3 , R^1, m, n, q .

(1), 2641622 (WO92/18472), 4 - 818473, 5 - 117230, 5 - 294924, 6 - 192219, II, (, ,), (, ,), 0 60, III.

(2), III, IV, (, , , n -, n -, , - 78, 100, 11, 가, la, la', (, ,), (, ,), 가.

(3) la (la') , ,) 가 , 가 1b (1b') (, (candida) , (Pseudomonas)), (, VII (,), AY (,), PS (,), MF (,), PLE (,), II (,) (가 ,) .

가 [la], 0.1
20 . 25 50 , 30 40 .

(4) Ia Ia' , , , m - , tert -
 - 20 50 Ic Ic' .

$$(5) \quad \begin{array}{ccccc} \text{lb} & \text{lb'} & (4) & \text{ld} & \text{ld'} \end{array}$$

가

10 mg/1 ng, 1 mg/1 ng, 0.1 ng

화합물	A	m	n	p	R ¹	R ²	11-위치	15-OH
1	CH ₂ CH ₂	2	2	0	(R)-2- 메틸헥실	메틸	α	α
2	CH ₂ CH ₂	2	2	0	(R)-2- 메틸헥실	수소	α	α
3	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	tert- 부틸	α	α
4	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	tert- 부틸	β	α
5	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	메틸	α	α
6	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	메틸	β	α
7	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	수소	α	α
8	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	수소	β	α
9	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	메틸	α	β
10	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	메틸	β	β
11	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	수소	α	β
12	CH ₂ CH ₂	3	2	0	(R)-2- 메틸헥실	수소	β	β
13	CH ₂ CH ₂	3	3	0	(R)-2- 메틸헥실	메틸	α	α
14	CH ₂ CH ₂	3	3	0	(R)-2- 메틸헥실	메틸	β	α
15	CH ₂ CH ₂	3	3	0	(R)-2- 메틸헥실	수소	α	α
16	CH ₂ CH ₂	3	3	0	(R)-2- 메틸헥실	수소	β	α
17	CH ₂ CH ₂	4	2	0	(R)-2- 메틸헥실	메틸	α	α
18	CH ₂ CH ₂	4	2	0	(R)-2- 메틸헥실	수소	α	α
19	CH ₂ CH ₂	2	2	0	(S)-2- 메틸헥실	메틸	α	α
20	CH ₂ CH ₂	2	2	0	(S)-2- 메틸헥실	메틸	β	α
21	CH ₂ CH ₂	2	2	0	(S)-2- 메틸헥실	수소	α	α
22	CH ₂ CH ₂	2	2	0	(S)-2- 메틸헥실	수소	β	α
23	CH ₂ CH ₂	2	2	0	(S)-2- 메틸헥실	수소	α	β
24	CH ₂ CH ₂	3	2	0	(R)-1- 메틸헥실	수소	α	α
25	CH ₂ CH ₂	3	2	0	(S)-1- 메틸헥실	수소	α	α
26	CH ₂ CH ₂	3	2	0	(S)-2, 6-dMe-5-Hp	시클로헥실	α	α

27	CH ₂ CH ₂	3	2	0	(S)-2, 6-dMe-5-Hp	메틸	α	α
28	CH ₂ CH ₂	3	2	0	(S)-2, 6-dMe-5-Hp	수소	α	α
29	CH ₂ CH ₂	3	2	0	(S)-2, 6-dMe-5-Hp	수소	α	β
30	CH ₂ CH ₂	3	2	0	(RS)-1-메틸-3-헥시닐	메틸	α	α
31	CH ₂ CH ₂	3	2	0	(RS)-1-메틸-3-헥시닐	메틸	β	α
32	CH ₂ CH ₂	3	2	0	(RS)-1-메틸-3-헥시닐	수소	α	α
33	CH ₂ CH ₂	3	2	0	(S)-1-메틸-3-헥시닐	메틸	α	α
34	CH ₂ CH ₂	3	2	0	(S)-1-메틸-3-헥시닐	메틸	β	α
35	CH ₂ CH ₂	3	2	0	(S)-1-메틸-3-헥시닐	수소	α	α
36	CH ₂ CH ₂	3	2	0	(R)-1-메틸-3-헥시닐	메틸	α	α
37	CH ₂ CH ₂	3	2	0	(R)-1-메틸-3-헥시닐	수소	α	α
38	CH ₂ CH ₂	3	2	0	시클로헥실	메틸	α	α
39	CH ₂ CH ₂	3	2	0	시클로헥실	메틸	β	α
40	CH ₂ CH ₂	3	2	0	시클로헥실	수소	α	α
41	CH ₂ CH ₂	3	2	0	시클로헥실메틸	메틸	α	α
42	CH ₂ CH ₂	3	2	0	시클로헥실메틸	메틸	β	α
43	CH ₂ CH ₂	3	2	0	시클로헥실메틸	수소	α	α
44	CH=CH (E)	3	2	0	(R)-2-메틸헥실	메틸	α	α
45	CH=CH (E)	3	2	0	(R)-2-메틸헥실	수소	α	α
46	CH=CH (E)	3	2	0	(R)-2-메틸헥실	메틸	β	α
47	CH=CH (E)	3	2	0	(R)-2-메틸헥실	수소	β	α
48	CH=CH (Z)	3	2	0	(S)-2-메틸헥실	메틸	α	α
49	CH=CH (E)	3	2	0	(S)-2-메틸헥실	수소	α	α
50	CH=CH (E)	3	2	0	(S)-2-메틸헥실	수소	β	α
51	CH=CH (Z)	3	2	0	(R)-2, 6-dMe-5-Hp	수소	α	α
52	CH=CH (E)	3	2	0	(R)-2-메틸헥틸	메틸	α	α
53	CH=CH (E)	3	2	0	(R)-2-메틸헥틸	메틸	β	α
54	CH=CH (E)	3	2	0	(R)-2-메틸헥틸	수소	α	α
55	CH=CH (E)	3	2	0	2-메틸프로필	메틸	α	α

56	CH=CH (E)	3	2	0	2-메틸프로필	메틸	β	α
57	CH=CH (E)	3	2	0	2-메틸프로필	수소	α	α
58	C $\equiv$ C	3	2	0	(R)-2-메틸헥실	메틸	α	α
59	C $\equiv$ C	3	2	0	(R)-2-메틸헥실	메틸	β	α
60	C $\equiv$ C	3	2	0	(R)-2-메틸헥실	수소	α	α
61	C $\equiv$ C	3	2	0	(R)-2-메틸헥실	수소	β	α
62	C $\equiv$ C	3	2	0	(S)-2-메틸헥실	메틸	α	α
63	C $\equiv$ C	3	2	0	(S)-2-메틸헥실	수소	α	α
64	C $\equiv$ C	3	2	0	(S)-2-메틸헥실	메틸	α	β
65	C $\equiv$ C	3	2	0	(S)-2-메틸헥실	수소	α	β
66	C $\equiv$ C	3	2	0	(R)-1-메틸헥실	수소	α	α
67	C $\equiv$ C	3	2	0	(S)-1-메틸헥실	수소	α	α
68	C $\equiv$ C	3	2	0	2,2-디메틸헥실	수소	α	α
69	C $\equiv$ C	3	2	0	2,2-디메틸헥실	수소	β	α
70	OCH ₂	3	2	0	(R)-2-메틸헥실	메틸	α	α
71	OCH ₂	3	2	0	(R)-2-메틸헥실	메틸	β	α
72	OCH ₂	3	2	0	(R)-2-메틸헥실	메틸	α	β
73	OCH ₂	3	2	0	(R)-2-메틸헥실	메틸	β	β
74	OCH ₂	3	2	0	(R)-2-메틸헥실	수소	α	α
75	OCH ₂	3	2	1	(R)-2-메틸헥실	메틸	α	α
76	OCH ₂	3	2	0	(R)-2-메틸헥실	수소	α	β
77	OCH ₂	3	2	2	(R)-2-메틸헥실	메틸	α	α
78	OCH ₂	3	2	0	(S)-2-메틸헥실	메틸	α	α
79	OCH ₂	3	2	0	(S)-2-메틸헥실	메틸	β	α
80	OCH ₂	3	2	0	(S)-2-메틸헥실	메틸	α	β
81	OCH ₂	3	2	0	(S)-2-메틸헥실	메틸	β	β
82	OCH ₂	3	2	0	(S)-2-메틸헥실	수소	α	α
83	OCH ₂	3	2	0	(S)-2-메틸헥실	수소	β	α
84	OCH ₂	3	2	0	(S)-2-메틸헥실	수소	α	β

85	$O(CH_2)_2$	2	2	0	(R)-2-메틸헥실	메틸	α	α
86	$O(CH_2)_2$	2	2	0	(R)-2-메틸헥실	메틸	β	α
87	$O(CH_2)_2$	2	2	0	(R)-2-메틸헥실	수소	α	α
88	OCH_2	3	2	0	(R)-1-메틸-3-헥시닐	수소	α	α
89	OCH_2	3	2	0	(S)-2, 6-dMe-5-Hp	메틸	α	α
90	OCH_2	3	2	0	(S)-2, 6-dMe-5-Hp	메틸	β	α
91	OCH_2	3	2	0	(S)-2, 6-dMe-5-Hp	수소	α	α
92	OCH_2	3	2	0	(R)-2, 6-dMe-5-Hp	메틸	α	α
93	OCH_2	3	2	0	(R)-2, 6-dMe-5-Hp	메틸	β	α
94	OCH_2	3	2	0	(R)-2, 6-dMe-5-Hp	수소	α	α
95	OCH_2	3	2	0	n-펜틸	메틸	α	α
96	OCH_2	3	2	0	n-펜틸	메틸	β	α
97	OCH_2	3	2	0	n-펜틸	수소	α	α
98	SCH_2	3	2	0	(R)-2-메틸헥실	메틸	α	α
99	SCH_2	3	2	0	(R)-2-메틸헥실	메틸	β	α
100	SCH_2	3	2	0	(R)-2-메틸헥실	수소	α	α
101	OCH_2	3	2	0	(S)-1-메틸헥실	메틸	α	α
102	OCH_2	3	2	0	(S)-1-메틸헥실	메틸	β	α
103	OCH_2	3	2	0	(S)-1-메틸헥실	수소	α	α
104	OCH_2	3	2	0	(R)-1-메틸헥실	메틸	α	α
105	OCH_2	3	2	0	(R)-1-메틸헥실	메틸	β	α
106	OCH_2	3	2	0	(R)-1-메틸헥실	수소	α	α
107	OCH_2	3	2	0	1, 1-디메틸펜틸	메틸	α	α
108	OCH_2	3	2	0	1, 1-디메틸펜틸	메틸	β	α
109	OCH_2	3	2	0	1, 1-디메틸펜틸	수소	α	α
110	SCH_2	3	2	0	(R)-2, 6-dMe-5-Hp	수소	α	β
111	SCH_2	3	2	0	(S)-1-메틸-3-헥시닐	수소	α	α
112	SCH_2	3	2	0	(S)-1-메틸-3-헥시닐	수소	α	β
113	SCH_2	3	2	0	(R)-1-메틸-3-헥시닐	수소	α	α
114	SCH_2	3	2	0	(R)-1-메틸-3-헥시닐	수소	α	β
115	$S(O)CH_2$	3	2	1	(S)-1-메틸-3-헥시닐	수소	α	α
116	$S(O)_2CH_2$	3	2	2	(R)-1-메틸-3-헥시닐	수소	α	α
117	$S(CH_2)_2$	2	2	0	(R)-2-메틸헥실	수소	α	α
118	$S(O)(CH_2)_2$	2	2	1	(R)-2-메틸헥실	수소	α	α
119	$CH=CH(E)$	3	2	0	(R)-5-OH-2-메틸펜틸	메틸	α	α
120	$CH=CH(E)$	3	2	1	(R)-5-OH-2-메틸펜틸	메틸	α	α
121	$CH=CH(E)$	3	2	0	(R)-5-OH-2-메틸펜틸	메틸	β	α
122	$CH=CH(E)$	3	2	0	(R)-5-OH-2-메틸펜틸	수소	α	α
123	$CH=CH(E)$	3	2	1	(R)-5-OH-2-메틸펜틸	수소	α	α
124	$CH=CH(E)$	3	2	0	(R)-5-OMe-2-메틸펜틸	메틸	α	α
125	$CH=CH(E)$	3	2	2	(R)-5-OMe-2-메틸펜틸	메틸	α	α
126	$CH=CH(E)$	3	2	0	(R)-5-OMe-2-메틸펜틸	메틸	β	α
127	$CH=CH(E)$	3	2	1	(R)-5-OMe-2-메틸펜틸	메틸	β	α
128	$CH=CH(E)$	3	2	0	(R)-5-OMe-2-메틸펜틸	수소	α	α
129	$CH=CH(E)$	3	2	1	(R)-5-OMe-2-메틸펜틸	수소	α	α
130	$CH=CH(E)$	3	2	2	(R)-5-OMe-2-메틸펜틸	수소	α	α

2,6 - dMe - 5 - HP: 2,6 - - 5 - , 5 - OH - 2 - : 5 - - 2 - , 5 - OMe - 2 -
: 5 - - 2 -

11 - : $S(O)_p(CH_2)_nOH$

15 - : R^1 OH

CH=CH(E):

CH=CH(Z):

, , " 17,18,19,20 - , " " , 가
(17 20 가).

< 1 >

(11R,17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (5)
(11S,17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (6)

(1) (17R) - 17,20 - - 13,14 - - PGE₁ (370 mg, 0.94 mmol) (37 Mℓ)
(4 M, 2.8 Mℓ, 11.3 mmol) 가 1.5 .
(17R) - 17,20 - - 13,14 - - PGA₁ (230 mg) ; : =3:1

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.82 - 1.01(m, 6H), 1.04 - 2.00(m, 20H), 2.21 - 2.48(m, 1H), 2.32(t, J=7.4Hz, 2H), 3.40 - 3.47(m, 1H), 3.67(s, 3H), 4.39 - 4.50(m, 1H), 6.18(dd, J=5.7, 2.4Hz, 1H), 7.47(dd, J=5.7, 2.4Hz, 1H)

IR() cm⁻¹ ;

3438, 2930, 2858, 2209, 1739, 1715, 1592, 1463, 1438, 1379, 1199, 1174, 1065, 885, 599

(2) (1) (220 mg, 0.58 mmol) (2.9 Mℓ) 2 - (82 μℓ, 1.19 mmol)
(16 μℓ, 0.12 mmol) 가 .
(;) , (; : =1:1)
(11R, 17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (106 mg) (11S,17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (136 mg) .

(11R,17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.84 - 1.04(m, 6H), 1.08 - 2.01(m, 21H), 2.11(dd, J=18.7, 11.9Hz, 1H), 2.17 - 2.41(m, 1H), 2.31(t, J=7.4Hz, 2H), 2.57 - 3.02(m, 3H), 3.07 - 3.37(m, 2H), 3.67 (s, 3H), 3.79 - 3.92(m, 2H), 4.37 - 4.53(m, 1H)

IR() cm^{-1} ;

3431, 2929, 2859, 2231, 1742, 1438, 1380, 1201, 1159, 1049, 772

(11S,17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.82 - 1.02(m, 6H), 1.06 - 1.90(m, 21H), 2.31(t, J=7.4Hz, 2H), 2.43 - 2.69(m, 3H), 2.85 - 3.15(m, 3H), 3.56 - 3.88(m, 3H), 3.67(s, 3H), 4.42 - 4.55(m, 1H)

IR() cm^{-1} ;

3432, 2930, 2858, 2234, 1741, 1462, 1438, 1383, 1282, 1201, 1166, 1048, 728

< 2 >

(11R,17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (7)

1 (11R,17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁
 (100 mg, 0.22 mmol) (0.55 M ℓ) (5.5 M ℓ), (pH=8.0, 0.2 M, 5.5
 M ℓ) 가 , 가 PLE (, 2.53 / $\mu\ell$, , 87 $\mu\ell$) 가 2
 . 1 M pH=4 , ,
 , (; : =1:2) (76 mg) .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.81 - 0.99(m, 6H), 1.02 - 1.81(m, 19H), 2.11(dd, J=18.9, 11.8Hz, 1H), 2.20 - 2.39(m, 1H), 2.35(t, J=7.3Hz, 2H), 2.61 - 3.36(m, 8H), 3.79 - 3.95(m, 2H), 4.38 - 4.52(m, 1H)

IR() cm^{-1} ;

3392, 2929, 2858, 2235, 1741, 1713, 1463, 1403, 1283, 1158, 1048, 728

< 3 >

(11S,17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (8)

1 (11S,17R) - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁
 , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.81 - 1.00(m, 6H), 1.06 - 1.82(m, 22H), 2.35(t, J=7.0Hz, 2H), 2.44 - 2.68(m, 3H), 2.86 - 3.13(m, 3H), 3.57 - 3.95(m, 3H), 4.39 - 4.53(m, 1H)

IR() cm^{-1} ;

3392, 2930, 2858, 2233, 1739, 1714, 1637, 1464, 1403, 1380, 1285, 1163, 1049, 728, 605

< 4 >

(11R,16RS) - 11 - - 11 - (2 -) - 16,20 - - 13,14,18,18, 19,19 - - PGE₁
 (30) (11S,16RS) - 11 - - 11 - (2 -) - 16,20 - - 13,14,18,18,
 19,19 - - PGE₁ (31)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (16RS) - 16,20
 - - 13,14,18,18,19,19 - - PGE₁ , 1(1)
 (16RS) - 16,20 - - 13,14,18,18,19,19 - - PGA₁ .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

1.02 - 1.16(m, 3H), 1.12(t, J=7.4Hz, 3H), 1.20 - 2.46(m, 17H), 2.31(t, J=7.5Hz, 2H), 3.42 - 3.48(m, 1H),
 3.67(s, 3H), 4.37 - 4.47(m, 1H), 6.19(dd, J=5.6, 2.3Hz, 1H), 7.48(dd, J=5.6, 2.4Hz, 1H)

IR() cm⁻¹ ;

3453, 2934, 2858, 2213, 1734, 1713, 1591, 1456, 1437, 1346, 1320, 1200, 1174, 1098, 1027, 984, 885,
 606

(2) (1) , 1(2) .

(11R,16RS) - 11 - - 11 - (2 -) - 16,20 - - 13,14,18,18, 19,19 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

1.08(d, J=6.9Hz, 3/2H), 1.09(d, J=6.7Hz, 3/2H), 1.12(t, J=7.3Hz, 3H), 1.24 - 2.34(m, 17H), 2.30(t, J=7.
 4Hz, 2H), 2.50 - 3.00(m, 5H), 3.13(dt, J=13.8, 6.9Hz, 1H), 3.23 - 3.35(m, 1H), 3.67(s, 3H), 3.80 - 3.90(m,
 2H), 4.37 - 4.48(m, 1H)

IR() cm⁻¹ ;

3400, 2932, 2858, 2242, 1740, 1436, 1376, 1320, 1278, 1205, 1169, 1097, 1022

(11S,16RS) - 11 - - 11 - (2 -) - 16,20 - - 13,14,18,18, 19,19 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

1.08(d, J=7.1Hz, 3/2H), 1.10(d, J=6.7Hz, 3/2H), 1.12(t, J=7.5Hz, 3H), 1.18 - 3.16(m, 23H), 2.30(t, J=7.
 4Hz, 2H), 3.58 - 3.68(m, 1H), 3.67(s, 3H), 3.75 - 3.84(m, 2H), 4.40 - 4.49(m, 1H)

IR() cm⁻¹ ;

3437, 2933, 2858, 2233, 1739, 1456, 1437, 1375, 1320, 1281, 1202, 1167, 1024

< 5 >

(11R,16RS) - 11 - - 11 - (2 -) - 16,20 - - 13,14,18,18, 19,19 - - PGE₁
 (32)

4 (11R,16RS) - 11 - - 11 - (2 -) - 16,20 - - 13,14,18,18,19,19 -
- PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

1.08(d, J=6.9Hz, 3/2H), 1.10(d, J=6.7Hz, 3/2H), 1.12(t, J=7.5Hz, 3H), 1.22 - 2.46(m, 20H), 2.35(t, J=7.3Hz, 2H), 2.63 - 2.93(m, 3H), 3.07 - 3.18(m, 1H), 3.23 - 3.36(m, 1H), 3.85(t, J=6.5Hz, 2H), 4.40 - 4.48(m, 1H)

IR() cm⁻¹ ;

3392, 2933, 2858, 2235, 1741, 1458, 1403, 1320, 1282, 1157, 1096, 1019, 935, 725, 624

< 6>

(11R) - 11 - - 11 - (2 -) - 16,17,18,19,20 - - 15 - - 13,14 - -
PGE₁ (38) (11S) - 11 - - 11 - (2 -) - 16,17,18,19,20 - - 15
- - 13,14 - - PGE₁ (39)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ 16,17,18,19,2
0 - - 15 - - 13,14 - - PGE₁ , 1(1)
16,17,18,19,20 - - 15 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.97 - 2.00(m, 22H), 2.20 - 2.46(m, 1H), 2.31(t, J=7.4Hz, 2H), 3.40 - 3.49(m, 1H), 3.67(s, 3H), 4.11 - 4.21(m, 1H), 6.19(dd, J=5.7, 2.4Hz, 1H), 7.48(dd, J=5.7, 2.4Hz, 1H)

IR() cm⁻¹ :

3437, 2929, 2855, 2213, 1738, 1713, 1450, 1346, 1198, 1174, 1097, 1017, 893

(2) (1) , 1(2) .

(11R) - 11 - - 11 - (2 -) - 16,17,18,19,20 - - 15 - - 13,14 - -
PGE₁

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.94 - 1.98(m, 21H), 2.12(dd, J=18.8, 11.8Hz, 1H), 2.18 - 2.40(m, 1H), 2.31 (t, J=7.4Hz, 2H), 2.48 - 2.98(m, 5H), 3.06 - 3.38(m, 2H), 3.68(s, 3H), 3.86(t, J= 6.2Hz, 2H), 4.12 - 4.26(m, 1H)

IR() cm⁻¹ :

3426, 2928, 2854, 1740, 1450, 1260, 1206, 1171, 1044, 1013, 893, 725, 594

(11S) - 11 - - 11 - (2 -) - 16,17,18,19,20 - - 15 - - 13,14 - - P
GE₁

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.90 - 1.94(m, 21H), 2.31(t, J=7.4Hz, 2H), 2.36 - 3.17(m, 5H), 3.11(ddd, J= 9.8, 5.4, 1.8Hz, 1H), 3.56 - 4.01(m, 5H), 3.67(s, 3H), 4.09 - 4.26(m, 1H)

IR() cm^{-1} :

3410, 2928, 2854, 1739, 1638, 1450, 1401, 1278, 1207, 1169, 1046, 1014, 893, 726, 580

< 7 >

(11R) - 11 - - 11 - (2 -) - 16,17,18,19,20 - - 15 - - 13,14 - P
GE₁ (40)

6 (11R) - 11 - - 11 - (2 -) - 16,17,18,19, 20 - - 15 - - 1
3,14 - - PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.96 - 1.91(m, 23H), 2.12(dd, J=18.7, 11.7Hz, 1H), 2.22 - 2.39(m, 1H), 2.35 (t, J=7.3Hz, 2H), 2.62 - 2.98(m, 4H), 3.14(dt, J=13.8, 6.6Hz, 1H), 3.29(ddd, J= 11.7, 10.4, 8.1Hz, 1H), 3.85(t, J=6.6Hz, 2H), 4.18(dd, J=6.0, 1.8Hz, 1H)

IR() cm^{-1} :

3399, 2928, 2854, 1740, 1450, 1402, 1278, 1157, 1044, 1011, 956, 893, 757, 596

< 8 >

(11R) - 11 - - 11 - (2 -) - 17,18,19,20 - - 16 - - 13,14 - - P
GE₁ (41) (11S) - 11 - - 11 - (2 -) - 17,18,19,20 - - 16 -
- 13,14 - - PGE₁ (42)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ 17,18,19,20 -
- 16 - - 13,14 - - PGE₁ , 1(1)
17,18,19,20 - - 16 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.82 - 1.98(m, 24H), 2.23 - 2.46(m, 1H), 2.32(t, J=7.4Hz, 2H), 3.38 - 3.49(m, 1H), 3.68(s, 3H), 4.35 - 4.55(m, 1H), 6.19(dd, J=5.7, 2.4Hz, 1H), 7.48(dd, J=5.7, 2.4Hz, 1H)

IR() cm^{-1} ;

3448, 2925, 2853, 1739, 1713, 1448, 1347, 1200, 1174, 1099, 887

(2) (1) , 1(2) .

(11R) - 11 - - 11 - (2 -) - 17,18,19,20 - - 16 - - 13,14 - - P
GE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.85 - 1.82(m, 24H), 2.11(dd, J=18.9, 11.8Hz, 1H), 2.22 - 2.35(m, 1H), 2.31 (t, J=7.4Hz, 2H), 2.60 - 2.93(m, 2H), 2.79(ddd, J=18.9, 8.0, 1.4Hz, 1H), 2.87 (dt, J=14.0, 6.2Hz, 1H), 3.14(dt, J=14.0, 6.6Hz, 1H), 3.27(ddd, J=11.8, 10.4, 8.0Hz, 1H), 3.67(s, 3H), 3.86(dd, J=6.6, 6.2Hz, 2H), 4.39 - 4.53(m, 1H)

IR() cm^{-1} ;

3400, 2924, 2852, 1740, 1447, 1348, 1261, 1201, 1170, 1045, 895, 725

(11S) - 11 - - 11 - (2 -) - 17,18,19,20 - - 16 - - 13,14 - - P
GE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.82 - 1.88(m, 23H), 2.13 - 3.04(m, 7H), 2.31(t, J=7.4Hz, 2H), 3.10(ddd, J= 9.8, 5.3, 1.8Hz, 1H), 3.62(d
dd, J=7.1, 5.3, 3.9Hz, 1H), 3.67(s, 3H), 3.74 - 3.96(m, 2H), 4.40 - 4.55(m, 1H)

IR() cm^{-1} ;

3410, 2924, 2852, 1740, 1638, 1447, 1347, 1282, 1201, 1168, 1045, 726, 581, 430

< 9>

(11R) - 11 - - 11 - (2 -) - 17,18,19,20 - - 16 - - 13,14 - - P
GE₁ (43)

8 (11R) - 11 - - 11 - (2 -) - 17,18,19,20 - - 16 - - 13,
14 - - PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.85 - 1.82(m, 25H), 2.11(dd, J=18.8, 11.7Hz, 1H), 2.22 - 2.39(m, 1H), 2.35 (t, J=7.3Hz, 2H), 2.62 - 2.94(m, 3H), 2.87(dt, J=13.8, 6.4Hz, 1H), 3.14(dt, J= 13.8, 6.6Hz, 1H), 3.28(ddd, J=11.7, 10.5, 8.0Hz, 1H), 3.86(dd, J=6.6, 6.4Hz, 2H), 4.47(dt, J=1.8, 7.0Hz, 1H)

IR() cm^{-1} ;

3378, 2924, 2853, 1740, 1448, 1402, 1347, 1281, 1158, 1044, 896, 757, 605

< 10>

(2E,11R,17S) - 11 - - (2 -) - 17,20 - - 2,3,13,14 - - PGE₁ (4
9) (2E,11S,17S) - 11 - - (2 -) - 17,20 - - 2,3,13,14 - - PGE₁ (
50)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (2E,17S) - 17,
20 - - 2,3,13,14 - - PGE₁ , 1(1) (2E,17S) - 1
7,20 - - 2,3,13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.78 - 0.97(m, 6H), 1.04 - 1.97(m, 17H), 2.14 - 2.33(m, 2H), 2.34 - 2.45(m, 1H), 3.40 - 3.46(m, 1H), 4.45 (dt, J=2.0, 7.1Hz, 1H), 5.85(dd, J=15.6, 1.6Hz, 1H), 6.19(dd, J=5.7, 2.3Hz, 1H), 7.08(dt, J=15.6, 6.9Hz, 1H), 7.47(dd, J=5.7, 2.5Hz, 1H)

IR() cm^{-1} ;

3400, 2929, 2859, 2230, 1698, 1653, 1592, 1542, 1460, 1418, 1379, 1345, 1285, 1224, 1043, 983, 875, 757, 667

(2) (1) , 1(2) .

(2E,11R,17S) - 11 - (2 -) - 17,20 - - 2,3,13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.84 - 0.95(m, 6H), 1.06 - 1.86(m, 15H), 2.03 - 2.34(m, 3H), 2.11(dd, J= 18.9, 11.7Hz, 1H), 2.59 - 3.67(m, 8H), 3.86(t, J=6.5Hz, 2H), 4.46(dt, J=1.8, 7.2Hz, 1H), 5.84(dt, J=15.6, 1.5Hz, 1H), 7.04(dt, J=15.6, 7.1Hz, 1H)

IR() cm^{-1} ;

3388, 2929, 2858, 2230, 1743, 1697, 1653, 1460, 1402, 1379, 1283, 1158, 1045, 1017, 984, 729, 670, 539, 447

(2E,11S,17S) - 11 - (2 -) - 17,20 - - 2,3,13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.82 - 0.97(m, 6H), 1.05 - 1.78(m, 15H), 2.08 - 2.82(m, 8H), 2.86 - 3.13(m, 3H), 3.59 - 3.88(m, 3H), 4.38 - 4.53(m, 1H), 5.80 - 5.90(m, 1H), 7.05(dt, J=15.8, 7.0Hz, 1H)

IR() cm^{-1} ;

3389, 2929, 2858, 2230, 1739, 1696, 1653, 1461, 1402, 1378, 1285, 1164, 1046, 984, 729, 670

< 11 >

(11R,17R) - 11 - - 11 - (2 -) - 17,20 - - 2,2,3,3,13,14 - - PGE₁
(58) (11S,17R) - 11 - - 11 - (2 -) - 17,20 - - 2,2,3,3,13,14 -
- PGE₁ (59)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (17R) - 17,20 -
- 2,2,3,3,13,14 - - PGE₁ , 1(1) (1
7R) - 17,20 - - 2,2,3,3,13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.82 - 0.99(m, 6H), 1.08 - 2.00(m, 16H), 2.27 - 2.46(m, 3H), 3.41 - 3.48(m, 1H), 3.77(s, 3H), 4.33 - 4.49(m, 1H), 6.19(dd, J=5.7, 2.3Hz, 1H), 7.48(dd, J= 5.7, 2.5Hz, 1H)

IR() cm^{-1} ;

3416, 2953, 2929, 2860, 2237, 1715, 1591, 1459, 1435, 1379, 1258, 1179, 1077, 819, 753, 561

(2) (1) , 1(2) .

(11R,17R) - 11 - - 11 - (2 -) - 17,20 - - 2,2,3,3,13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.83 - 1.01(m, 3H), 0.94(d, J=6.7Hz, 3H), 1.08 - 1.84(m, 15H), 2.12(dd, J= 18.9, 11.8Hz, 1H), 2.22 - 2.41(m, 3H), 2.47 - 2.94(m, 3H), 2.79(ddd, J=18.9, 8.0, 1.2Hz, 1H), 2.88(dt, J=13.8, 6.2Hz, 1H), 3.14(dt, 13.8, 6.6Hz, 1H), 3.28(ddd, J=11.8, 10.4, 8.0Hz, 1H), 3.76(s, 3H), 3.80 - 3.91(m, 2H), 4.39 - 4.50(m, 1H)

IR() cm^{-1} ;

3409, 2953, 2929, 2869, 2236, 1745, 1714, 1460, 1435, 1402, 1379, 1258, 1155, 1076, 819, 753, 561

(11S,17R) - 11 - - 11 - (2 -) - 17,20 - - 2,2,3,3,13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.79 - 1.02(m, 6H), 1.04 - 1.93(m, 16H), 2.24 - 3.15(m, 7H), 3.10(ddd, J= 10.1, 5.3, 1.7Hz, 1H), 3.60 - 3.69(m, 3H), 3.65(ddd, J=6.9, 5.3, 3.6Hz, 1H), 3.76(s, 3H), 4.37 - 4.54(m, 1H)

IR() cm^{-1} ;

3410, 2953, 2927, 2858, 2236, 1743, 1712, 1638, 1459, 1435, 1402, 1377, 1261, 1158, 1076, 820, 753, 561

< 12 >

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁
 (70) (11S,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 -
 - PGE₁ (71)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (17R) - 3 -
 - 17,20 - - 13,14 - - PGE₁ , 1(1) (1
 7R) - 3 - - 17,20 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.80 - 2.18(m, 22H), 2.35 - 2.50(m, 1H), 3.42 - 3.65(m, 3H), 3.76(s, 3H), 4.09(s, 2H), 4.37 - 4.50(m, 1H), 6.19(dd, J=5.7, 2.4Hz, 1H), 7.48(dd, J=5.7, 2.4Hz, 1H).

IR() cm^{-1} ;

3435, 2953, 2929, 2870, 1755, 1711, 1591, 1458, 1438, 1379, 1346, 1286, 1212, 1139, 1061, 812, 707, 582

(2) (1) , 1(2) .
 (11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.84 - 1.86(m, 18H), 0.91(t, J=7.0Hz, 3H), 2.12(dd, J=18.8, 11.9Hz, 1H), 2.22 - 2.36(m, 1H), 2.40 - 2.97(m, 5H), 3.13(dt, J=13.8, 6.6Hz, 1H), 3.27(ddd, J=11.9, 10.3, 8.0Hz, 1H), 3.47 - 3.63(m, 2H), 3.75(s, 3H), 3.78 - 3.90(m, 2H), 4.08(s, 2H), 4.37 - 4.49(m, 1H)

IR() cm⁻¹ ;

3435, 2953, 2929, 2870, 1745, 1458, 1439, 1401, 1379, 1284, 1214, 1140, 1048, 706, 593

(11S,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.84 - 1.82(m, 18H), 0.92(t, J=7.1Hz, 3H), 2.35 - 2.70(m, 5H), 2.86 - 3.05(m, 2H), 3.11(ddd, J=9.9, 5.3, 1.7Hz, 1H), 3.54(t, J=5.8Hz, 2H), 3.59 - 3.67(m, 1H), 3.71 - 3.86(m, 2H), 3.75(s, 3H), 4.07(s, 2H), 4.41 - 4.52(m, 1H)

IR() cm⁻¹ ;

3435, 2953, 2929, 2870, 1745, 1638, 1459, 1439, 1401, 1379, 1286, 1214, 1139, 1049, 706, 579

< 13>

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (74)

12 (11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 -
 - PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.80 - 1.90(m, 18H), 0.92(t, J=7.0Hz, 3H), 2.07 - 2.93(m, 8H), 3.05 - 3.17(m, 1H), 3.22 - 3.34(m, 1H), 3.55 - 3.65(m, 2H), 3.85(t, J=6.2Hz, 2H), 4.08(s, 2H), 4.38 - 4.51(m, 1H)

IR() cm⁻¹ ;

3400, 2928, 2870, 2236, 1740, 1621, 1460, 1429, 1348, 1228, 1131, 1049, 726, 677, 542

< 14>

(11R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁
 (78) (11S,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 -
 - PGE₁ (79)

(1) 1(1), (17R) - 17,20 - - 13,14 - - PGE₁ (17S) - 3 -
 - 17,20 - - 13,14 - - PGE₁, 1(1) (1
 7S) - 3 - - 17,20 - - 13,14 - - PGA₁.

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.84 - 0.96(m, 6H), 1.08 - 2.10(m, 15H), 2.13(d, J=5.9Hz, 1H), 2.38 - 2.50(m, 1H), 3.42 - 3.62(m, 3H), 3.76(s, 3H), 4.09(s, 2H), 4.35 - 4.52(m, 1H), 6.19(dd, J=5.7, 2.2Hz, 1H), 7.47(dd, J=5.7, 2.4Hz, 1H)

IR() cm⁻¹ ;

3442, 2953, 2929, 2870, 2242, 1752, 1712, 1591, 1459, 1439, 1378, 1346, 1285, 1212, 1139, 1043, 811, 706, 581

(2) (1), 1(2).

(11R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.84 - 0.96(m, 6H), 1.09 - 1.90(m, 15H), 2.12(dd, J=18.8, 11.6Hz, 1H), 2.20 - 2.36(m, 1H), 2.48 - 2.98(m, 5H), 3.13(dt, J=14.0, 6.7Hz, 1H), 3.27(ddd, J= 11.6, 10.5, 8.0Hz, 1H), 3.48 - 3.64(m, 2H), 3.76(s, 3H), 3.78 - 3.89(m, 2H), 4.08(s, 2H), 4.37 - 4.50(m, 1H)

IR() cm⁻¹ ;

3400, 2929, 2870, 2242, 1745, 1458, 1439, 1401, 1379, 1352, 1284, 1214, 1138, 1045, 705, 669

(11S,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.83 - 0.97(m, 6H), 1.08 - 1.81(m, 15H), 2.46 - 3.05(m, 5H), 2.91(dt, J= 13.3, 5.8Hz, 1H), 2.99(dt, J=13.3, 5.8Hz, 1H), 3.12(ddd, J=9.9, 5.4, 1.8Hz, 1H), 3.54(t, J=6.8Hz, 2H), 3.59 - 3.68(m, 1H), 3.71 - 3.88(m, 2H), 3.75(s, 3H), 4.07(s, 2H), 4.47(t, J=6.8Hz, 1H)

IR() cm⁻¹ ;

3435, 2953, 2929, 2870, 2242, 1745, 1459, 1439, 1401, 1378, 1286, 1217, 1138, 1045, 1018, 706, 580

< 15>

(11R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (82)

14 (11R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 -
 - PGE₁, 2.

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.82 - 0.96(m, 6H), 1.06 - 1.86(m, 15H), 2.13(dd, $J=18.9$, 11.7Hz, 1H), 2.22 - 2.36(m, 1H), 2.62 - 3.21(m, 6H), 3.11(dt, $J=13.8$, 6.7Hz, 1H), 3.28(ddd, $J=11.3$, 10.5, 8.0Hz, 1H), 3.52 - 3.64(m, 2H), 3.80 - 3.98(m, 2H), 4.08(s, 2H), 4.39 - 4.52(m, 1H)

IR() cm^{-1} ;

3400, 2928, 2870, 2242, 1740, 1459, 1401, 1380, 1352, 1224, 1131, 1045, 1018, 729, 676

< 16 >

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁
 (98) (11S,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 -
 - PGE₁ (99)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (17R) - 3 -
 - 17,20 - - 13,14 - - PGE₁ , 1(1) (1
 7R) - 3 - - 17,20 - - 13,14 - - PGA₁ .

^1H - NMR(CDCl_3 , 200MHz) δ ppm;

0.83 - 0.98(m, 6H), 1.12 - 1.98(m, 16H), 1.87(d, $J=5.7$ Hz, 1H), 2.34 - 2.47(m, 1H), 2.67(t, $J=6.9$ Hz, 2H), 3.24(s, 2H), 3.41 - 3.49(m, 1H), 3.75(s, 3H), 6.19 (dd, $J=5.7$, 2.3Hz, 1H), 7.48(dd, $J=5.7$, 2.4Hz, 1H)

IR() cm^{-1} ;

3435, 2952, 2928, 2858, 2229, 1734, 1708, 1590, 1541, 1458, 1436, 1383, 1345, 1282, 1155, 1132, 1054, 1010, 590

(2) (1) , 1(2) .

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

^1H - NMR(CDCl_3 , 200MHz) δ ppm;

0.82 - 1.02(m, 6H), 1.08 - 1.86(m, 17H), 2.12(dd, $J=18.9$, 11.6Hz, 1H), 2.17 - 2.37(m, 1H), 2.54 - 2.97(m, 5H), 3.05 - 3.37(m, 2H), 3.23(s, 2H), 3.75(s, 3H), 3.85(t, $J=6.3$ Hz, 2H), 4.37 - 4.50(m, 1H)

IR() cm^{-1} ;

3400, 2952, 2928, 2858, 2360, 2235, 1740, 1459, 1436, 1402, 1379, 1348, 1282, 1196, 1153, 1046, 1011, 729, 593

(11S,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

^1H - NMR(CDCl_3 , 200MHz) δ ppm;

0.83 - 0.99(m, 6H), 1.10 - 1.85(m, 17H), 2.49 - 2.70(m, 5H), 2.91 - 3.03(m, 2H), 3.04 - 3.15(m, 1H), 3.23 (s, 2H), 3.57 - 3.68(m, 1H), 3.75(s, 3H), 3.71 - 3.85(m, 2H), 4.40 - 4.54(m, 1H)

IR() cm^{-1} ;

3400, 2952, 2928, 2858, 2229, 1740, 1638, 1459, 1436, 1405, 1379, 1283, 1222, 1197, 1154, 1049, 1010, 848, 730

< 17 >

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (100)

16 (11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.86 - 0.97(m, 6H), 1.10 - 1.90(m, 16H), 2.14(dd, J=18.7, 11.6Hz, 1H), 2.23 - 2.37(m, 1H), 2.65 - 2.95(m, 7H), 3.04 - 3.16(m, 1H), 3.20 - 3.34(m, 1H), 3.23(s, 2H), 3.86(t, J=6.3Hz, 2H), 4.44 - 4.55(m, 1H)

IR() cm^{-1} ;

3399, 2928, 2858, 2360, 2229, 1740, 1459, 1401, 1380, 1348, 1284, 1154, 1048, 1009, 729, 669

< 18 >

(11R,15R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13, 14 - - PGE₁
(72) (11S,15R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13, 14 - - 1
3,14 - - PGE₁ (73)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (15R,17R) - 3 - - 17,20 - - 13,14 - - PGE₁ , 1(1)
(15R,17R) - 3 - - 17,20 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.77 - 1.00(m, 6H), 1.06 - 2.16(m, 15H), 2.08(d, J=5.7Hz, 1H), 2.36 - 2.52(m, 1H), 3.37 - 3.66(m, 3H), 3.76(s, 3H), 4.09(s, 2H), 4.30 - 4.54(m, 1H), 6.19(dd, J=5,7, 2.4Hz, 1H), 7.47(dd, J=5.7, 2.4Hz, 1H)

IR() cm^{-1} ;

3435, 2953, 2929, 2870, 2229, 1953, 1755, 1708, 1591, 1542, 1458, 1438, 1378, 1346, 1286, 1210, 1139, 1042, 846, 809, 757, 706, 596

(2) (1) , 1(2) .

(11R,15R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13, 14 - - PGE₁

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.83 - 0.96(m, 6H), 1.08 - 1.88(m, 14H), 2.03 - 2.97(m, 7H), 2.12(dd, $J=18.8, 11.8\text{Hz}$, 1H), 3.12(dt, $J=13.8, 6.5\text{Hz}$, 1H), 3.26(ddd, $J=11.8, 10.5, 7.8\text{Hz}$, 1H), 3.46 - 3.63(m, 2H), 3.75(s, 3H), 3.77 - 3.90(m, 2H), 4.07(s, 2H), 4.36 - 4.52(m, 1H)

IR() cm^{-1} ;

3400, 2929, 2870, 1745, 1459, 1439, 1401, 1380, 1352, 1284, 1213, 1138, 1045, 706, 596

(11S,15R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13, 14 - - PGE₁

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.81 - 0.97(m, 6H), 1.06 - 1.81(m, 15H), 2.26 - 2.78(m, 5H), 2.85 - 3.05(m, 2H), 3.12(ddd, $J=9.8, 5.5, 1.9\text{Hz}$, 1H), 3.54(t, $J=5.8\text{Hz}$, 2H), 3.63(ddd, $J=6.9, 5.5, 4.4\text{Hz}$, 1H), 3.71 - 3.85(m, 2H), 3.75(s, 3H), 4.07(s, 2H), 4.39 - 4.51(m, 1H)

IR() cm^{-1} ;

3400, 2952, 2929, 2870, 1742, 1697, 1638, 1438, 1401, 1378, 1285, 1214, 1138, 1045, 846, 769

< 19 >

(11R,15R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13, 14 - - PGE₁ (76)

18 (11R,15R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁, 2 .

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.78 - 1.00(m, 6H), 1.04 - 1.88(m, 15H), 2.13(dd, $J=18.9, 11.7\text{Hz}$, 1H), 2.22 - 2.37(m, 1H), 2.52 - 3.01(m, 3H), 3.11(dt, $J=14.0, 6.4\text{Hz}$, 1H), 3.28(ddd, $J=11.7, 10.5, 7.7\text{Hz}$, 1H), 3.22 - 3.96(m, 5H), 3.85(t, $J=6.4\text{Hz}$, 2H), 4.09(s, 2H), 4.40 - 4.53(m, 1H)

IR() cm^{-1} ;

3399, 2929, 2870, 2235, 1740, 1460, 1429, 1402, 1379, 1351, 1283, 1223, 1135, 1045, 1018, 756, 676, 578

< 20 >

(11R,15R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13, 14 - - PGE₁ (80) (11S,15R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (81)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (15R,17S) - 3 - - 17,20 - - 13,14 - - PGE₁ , 1(1) (15R,17S) - 3 - - 17,20 - - 13,14 - - PGA₁ .

^1H - NMR(CDCl_3 , 200MHz) δ ppm;

0.82 - 2.10(m, 21H), 2.04(d, $J=5.7\text{Hz}$, 1H), 2.36 - 2.51(m, 1H), 3.42 - 3.64(m, 3H), 3.76(s, 3H), 4.09(s, 2H), 4.35 - 4.52(m, 1H), 6.18(dd, $J=5.7$, 2.4Hz, 1H), 7.47(dd, $J=5.7$, 2.4Hz, 1H)

IR() cm^{-1} ;

3435, 2953, 2929, 2870, 2224, 1952, 1755, 1708, 1590, 1458, 1438, 1379, 1346, 1286, 1210, 1139, 1061, 846, 809, 742, 590, 503

(2) (1) , 1(2) .

(11R,15R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13, 14 - - PGE₁

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.84 - 1.88(m, 21H), 2.12(dd, $J=18.8$, 11.8Hz, 1H), 2.14 - 2.36(m, 1H), 2.51 (t, $J=6.2\text{Hz}$, 1H), 2.63 - 2.97(m, 2H), 2.68(ddd, $J=11.5$, 10.5, 1.9Hz, 1H), 2.88 (dt, $J=13.9$, 6.1Hz, 1H), 3.12(dt, $J=13.9$, 6.5Hz, 1H), 3.26(ddd, $J=11.8$, 10.5, 7.9Hz, 1H), 3.48 - 3.63(m, 2H), 3.75(s, 3H), 3.79 - 3.90(m, 2H), 4.07(s, 2H), 4.37 - 4.51(m, 1H)

IR() cm^{-1} ;

3400, 2953, 2929, 2870, 2235, 1745, 1458, 1439, 1401, 1379, 1284, 1214, 1140, 1047, 706, 579

(11S,15R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13, 14 - - PGE₁

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.84 - 1.81(m, 21H), 2.37(t, $J=6.2\text{Hz}$, 1H), 2.52 - 2.61(m, 4H), 2.86 - 3.05(m, 2H), 3.12(ddd, $J=9.7$, 5.4, 1.9Hz, 1H), 3.54(t, $J=5.9\text{Hz}$, 2H), 3.63(ddd, $J=6.8$, 5.4, 4.0Hz, 1H), 3.73 - 3.84(m, 2H), 3.75(s, 3H), 4.07(s, 2H), 4.41 - 4.50(m, 1H)

IR() cm^{-1} ;

3431, 2952, 2929, 2870, 2229, 1745, 1697, 1638, 1456, 1439, 1401, 1379, 1287, 1217, 1138, 1049, 846, 706, 580

< 21 >

(11R,15R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13, 14 - - PGE₁ (84)

20 (11R,15R,17S) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ , 2 .

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.84 - 0.96(m, 6H), 1.09 - 1.86(m, 15H), 2.13(dd, J=18.9, 11.7Hz, 1H), 2.23 - 2.36(m, 1H), 2.64 - 3.36(m, 7H), 2.88(dt, J=13.9, 6.4Hz, 1H), 3.54 - 3.64(m, 2H), 3.85(t, J=6.4Hz, 2H), 4.09(s, 2H), 4.42 - 4.52(m, 1H)

IR() cm^{-1} ;

3400, 2929, 2870, 2235, 1740, 1460, 1402, 1379, 1351, 1223, 1135, 1050, 955, 729, 676

< 22 >

(11R,17S) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 - - 13,14 -
 - PGE₁ (89) (11S,17S) - 3 - - 11 - - 11 - (2 -) - 20 -
 - 17 - - 13,14 - - PGE₁ (90)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (17S) - 3 -
 - 20 - - 17 - - 13,14 - - PGE₁ , 1(1)
 (17S) - 3 - - 20 - - 17 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.82 - 2.10(m, 16H), 1.60(s, 3H), 1.68(d, J=0.9Hz, 3H), 2.15(d, J=5.7Hz, 1H), 2.35 - 2.50(m, 1H), 3.42 - 3.64(m, 3H), 3.76(s, 3H), 4.08(s, 2H), 4.37 - 4.51 (m, 1H), 5.03 - 5.17(m, 1H), 6.19(dd, J=5.7, 2.4Hz, 1 H), 7.47(dd, J=5.7, 2.4Hz, 1H)

IR() cm^{-1} ;

3436, 2929, 2866, 2229, 1952, 1755, 1711, 1591, 1545, 1438, 1377, 1346, 1287, 1211, 1140, 1033, 886, 811, 706, 580

(2) (1) , 1(2) .

(11R,17S) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 - - 13,14 -
 - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.84 - 2.06(m, 16H), 1.61(s, 3H), 1.68(d, J=0.9Hz, 3H), 2.13(dd, J=18.8, 11.7Hz, 1H), 2.20 - 2.36(m, 1H), 2.46(t, J=6.4Hz, 1H), 2.62 - 2.98(m, 3H), 2.87 (dt, J=13.8, 6.1Hz, 1H), 3.12(dt, J=13.8, 6.5Hz, 1H), 3.26(ddd, J=11.7, 10.5, 7.9Hz, 1H), 3.46 - 3.64(m, 2H), 3.75(s, 3H), 3.78 - 3.90(m, 2H), 4.07(s, 2H), 4.37 - 4.52(m, 1H), 5.05 - 5.14(m, 1H)

IR() cm^{-1} ;

3400, 2928, 2869, 2229, 1745, 1438, 1401, 1378, 1284, 1213, 1138, 1045, 705, 580

(11S,17S) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 - - 13,14 -
 - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.85 - 2.08(m, 16H), 1.61(s, 3H), 1.68(d, J=1.1Hz, 3H), 2.40 - 2.68(m, 4H), 2.78(d, J=4.8Hz, 1H), 2.86 - 3.05(m, 2H), 3.11(ddd, J=9.9, 5.3, 1.7Hz, 1H), 3.53(t, J=5.9Hz, 2H), 3.63(ddd, J=6.8, 5.3, 3.8Hz, 1H), 3.70 - 3.86(m, 2H), 3.75(s, 3H), 4.07(s, 2H), 4.38 - 4.53(m, 1H), 5.04 - 5.15(m, 1H)

IR() cm^{-1} ;

3431, 2924, 2869, 2235, 1745, 1697, 1641, 1439, 1401, 1376, 1287, 1214, 1138, 1045, 706, 580

< 23 >

(11R,17S) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 - - 13,14 -
- PGE₁ (91)

22 (11R,17S) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 -
- 13,14 - - PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.84 - 2.09(m, 16H), 1.61(s, 3H), 1.68(s, 3H), 2.13(dd, J=18.9, 11.7Hz, 1H), 2.22 - 2.37(m, 1H), 2.52 - 3.20(m, 6H), 3.11(dt, J=13.8, 6.5Hz, 1H), 3.28 (ddd, J=11.7, 10.5, 7.9Hz, 1H), 3.52 - 3.67(m, 2H), 3.74 - 3.93(m, 2H), 4.08(s, 2H), 4.40 - 4.53(m, 1H), 5.04 - 5.15(m, 1H)

IR() cm^{-1} ;

3400, 2928, 2235, 1740, 1434, 1401, 1378, 1351, 1227, 1132, 1045, 676

< 24 >

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 - - 13,14 -
- PGE₁ (92) (11S,17R) - 3 - - 11 - - 11 - (2 -) - 20 -
- 17 - - 13,14 - - PGE₁ (93)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (17R) - 3 -
- 20 - - 17 - - 13,14 - - PGE₁ , 1(1)
(17R) - 3 - - 20 - - 17 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.90 - 0.97(m, 3H), 1.10 - 2.05(m, 13H), 1.60(s, 3H), 1.68(s, 3H), 2.08(d, J=5.8Hz, 1H), 2.38 - 2.50(m, 1H), 3.43 - 3.63(m, 3H), 3.76(s, 3H), 4.09(s, 2H), 4.39 - 4.50(m, 1H), 5.04 - 5.14(m, 1H), 6.16 - 6.21(m, 1H), 7.43 - 7.50(m, 1H)

IR() cm^{-1} ;

3435, 2929, 2866, 2229, 1755, 1711, 1591, 1545, 1438, 1377, 1346, 1287, 1210, 1139, 1059, 887, 812, 706, 579, 429

(2) (1) , 1(2) .

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 - - 13,14 -
- PGE₁

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.90 - 0.97(m, 3H), 1.10 - 2.03(m, 15H), 1.60(s, 3H), 1.68(s, 3H), 2.12(dd, $J=18.8$, 11.7Hz, 1H), 2.27 - 2.36(m, 1H), 2.62 - 2.93(m, 2H), 2.87(dt, $J=13.8$, 6.1 Hz, 1H), 3.12(dt, $J=13.8$, 6.4Hz, 1H), 3.27(ddd, $J=11.7$, 10.5, 7.8Hz, 1H), 3.48 - 3.58(m, 2H), 3.75(s, 3H), 3.80 - 3.87(m, 2H), 4.07(s, 2H), 4.39 - 4.49(m, 1H), 5.05 - 5.13(m, 1H)

IR() cm^{-1} ;

3435, 2928, 2869, 2235, 1745, 1439, 1401, 1378, 1284, 1213, 1139, 1046, 705, 580

(11S,17R) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 - - 13,14 -
- PGE_1

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.94(d, $J=6.5\text{Hz}$, 3H), 1.12 - 2.06(m, 15H), 1.60(s, 3H), 1.68(s, 3H), 2.47 - 2.66(m, 3H), 2.85 - 3.05(m, 2H), 3.07 - 3.16(m, 1H), 3.48 - 3.57(m, 2H), 3.59 - 3.67 (m, 1H), 3.69 - 3.83(m, 2H), 3.75(s, 3H), 4.07(s, 2H), 4.41 - 4.48(m, 1H), 5.05 - 5.13(m, 1H)

IR() cm^{-1} ;

3400, 2928, 2869, 1742, 1438, 1401, 1377, 1284, 1213, 1138, 1046, 846, 741, 579

< 25 >

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 - - 13,14 -
- PGE_1 (94)

24 (11R,17R) - 3 - - 11 - - 11 - (2 -) - 20 - - 17 -
- 13,14 - - PGE_1 , 2 .

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.95(d, $J=6.7\text{Hz}$, 3H), 1.12 - 2.06(m, 16H), 1.61(s, 3H), 1.68(d, $J=1.1\text{Hz}$, 3H), 2.13(dd, $J=19.0$, 11.7Hz, 1H), 2.22 - 2.36(m, 1H), 2.62 - 2.86(m, 2H), 2.88 (dt, $J=13.8$, 6.2Hz, 1H), 3.11(dt, $J=13.8$, 6.6Hz, 1H), 3.27(ddd, $J=11.7$, 10.3, 8.0Hz, 1H), 3.54 - 3.64(m, 2H), 3.81 - 3.88(m, 2H), 4.09(s, 2H), 4.39 - 4.51(m, 1H), 5.04 - 5.14(m, 1H)

IR() cm^{-1} ;

3400, 2929, 2235, 1740, 1434, 1402, 1378, 1351, 1223, 1135, 1049, 676

< 26 >

(11R) - 3 - - 11 - - 11 - (2 -) - 13,14 - - PGE_1 (95)
(11S) - 3 - - 11 - - 11 - (2 -) - 13,14 - - PGE_1 (96)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE_1 3 - - 13,14
- - PGE_1 , 1(1) 3 - - 13,14 -
- PGA_1 .

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.86 - 0.93(m, 3H), 1.22 - 1.80(m, 14H), 2.12(d, $J=5.8\text{Hz}$, 1H), 2.40 - 2.47(m, 1H), 3.44 - 3.59(m, 3H), 3.76(s, 3H), 4.08(s, 2H), 4.30 - 4.40(m, 1H), 6.18(dd, $J=5.7$, 2.4Hz, 1H), 7.47(dd, $J=5.7$, 2.5Hz, 1H)

IR() cm^{-1} ;

3436, 2934, 2860, 2235, 1954, 1755, 1708, 1591, 1545, 1438, 1399, 1378, 1345, 1287, 1211, 1139, 1028, 888, 847, 811, 773, 706, 580

(2) (1) , 1(2) .

(11R) - 3 - - 11 - - 11 - (2 -) - 13,14 - - PGE_1

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.86 - 0.94(m, 3H), 1.22 - 1.88(m, 16H), 2.12(dd, $J=18.7$, 11.7Hz, 1H), 2.22 - 2.37(m, 1H), 2.63 - 2.93(m, 3H), 3.12(dt, $J=14.0$, 6.4Hz, 1H), 3.27(ddd, $J=11.7$, 10.8, 8.1Hz, 1H), 3.48 - 3.60(m, 2H), 3.76(s, 3H), 3.84(t, $J=6.4\text{Hz}$, 2H), 4.08(s, 2H), 4.30 - 4.42(m, 1H)

IR() cm^{-1} ;

3435, 2933, 2860, 2229, 1745, 1439, 1401, 1348, 1283, 1214, 1138, 1045, 707, 580

(11S) - 3 - - 11 - - 11 - (2 -) - 13,14 - - PGE_1

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.86 - 0.94(m, 3H), 1.20 - 1.80(m, 16H), 2.52 - 2.66(m, 3H), 2.86 - 3.05(m, 2H), 3.08 - 3.16(m, 1H), 3.48 - 3.58(m, 2H), 3.60 - 3.67(m, 1H), 3.72 - 3.83(m, 2H), 3.76(s, 3H), 4.08(s, 2H), 4.34 - 4.42(m, 1H)

IR() cm^{-1} ;

3400, 2930, 2862, 2229, 1740, 1439, 1401, 1284, 1218, 1138, 1046, 1014, 847, 706, 580

< 27 >

(11R) - 3 - - 11 - - 11 - (2 -) - 13,14 - - PGE_1 (97)

26 (11R) - 3 - - 11 - - 11 - (2 -) - 13, 14 - - PGE_1
2

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.85 - 0.95(m, 3H), 1.22 - 1.84(m, 18H), 2.13(dd, $J=18.8$, 11.7Hz, 1H), 2.23 - 2.36(m, 1H), 2.69(ddd, $J=13.5$, 10.6, 1.9Hz, 1H), 2.80(ddd, $J=18.8$, 7.9, 1.4 Hz, 1H), 2.88(dt, $J=13.9$, 6.3Hz, 1H), 3.11(dt, $J=13.9$, 6.3Hz, 1H), 3.28(ddd, $J=11.7$, 10.6, 7.9Hz, 1H), 3.54 - 3.64(m, 2H), 3.85(t, $J=6.3\text{Hz}$, 1H), 4.09(s, 2H), 4.41(dt, $J=1.9$, 6.6Hz, 1H)

IR() cm^{-1} ;

3400, 2933, 2860, 2235, 1740, 1402, 1347, 1223, 1132, 1046, 729, 676

< 28 >

(2E,11R,17R) - 11 - - 17,20 - - 11 - (2 -) - 2,3,13,14 - - PGE₁
 (44) (2E,11S,17R) - 11 - - 17,20 - - 11 - (2 -) - 2,3,13,14 -
 - PGE₁ (46)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (2E,17R) - 17,
 20 - - 2,3,13,14 - - PGE₁ , 1(1)
 (2E,17R) - 17,20 - - 2,3,13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.81 - 0.99(m, 6H), 1.06 - 2.08(m, 16H), 2.13 - 2.48(m, 3H), 3.38 - 3.48(m, 1H), 3.74(s, 3H), 4.37 - 4.56(m, 1H), 5.84(dt, J=15.6, 1.4Hz, 1H), 6.19(dd, J=5.6, 2.2Hz, 1H), 6.98(dt, J=15.6, 7.0Hz, 1H), 7.48(dd, J=5.6, 2.4Hz, 1H)

IR() cm⁻¹ :

3441, 2952, 2929, 2858, 2224, 1718, 1697, 1654, 1591, 1457, 1436, 1379, 1342, 1273, 1201, 1177, 1155, 1110, 1038, 981, 855

(2) (1) , 1(2) .

(2E,11R,17R) - 11 - - 17,20 - - 11 - (2 -) - 2,3,13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.83 - 0.97(m, 6H), 1.06 - 1.85(m, 15H), 2.04 - 2.97(m, 7H), 2.11(dd, J=18.8, 11.7Hz, 1H), 2.87(dt, J=13.9, 6.2Hz, 1H), 3.14(dt, J=13.9, 6.8Hz, 1H), 3.28 (ddd, J=11.7, 10.4, 7.9Hz, 1H), 3.73(s, 3H), 3.79 - 3.91(m, 2H), 4.45(ddd, J=8.0, 5.9, 1.8Hz, 1H), 5.83(dt, J=15.6, 1.5Hz, 1H), 6.96(dd, J=15.6, 7.0Hz, 1H)

IR() cm⁻¹ :

3416, 2952, 2929, 2859, 2229, 1740, 1723, 1653, 1457, 1436, 1401, 1376, 1311, 1278, 1202, 1174, 1158, 1045, 984, 844

(2E,11S,17R) - 11 - - 17,20 - - 11 - (2 -) - 2,3,13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.84 - 0.99(m, 6H), 1.08 - 1.83(m, 15H), 2.15 - 3.13(m, 9H), 3.08(ddd, J= 10.2, 5.4, 1.6Hz, 1H), 3.62(dd, J=6.9, 5.4, 3.7Hz, 1H), 3.66 - 3.90(m, 2H), 3.73(s, 3H), 4.40 - 4.53(m, 1H), 5.83(dt, J=15.7, 1.5Hz, 1H), 6.96(dt, J=15.7, 7.0Hz, 1H)

IR() cm⁻¹ :

3432, 2952, 2929, 2862, 2229, 1734, 1709, 1654, 1460, 1436, 1401, 1376, 1314, 1278, 1201, 1163, 1045, 981, 847

< 29 >

(2E,11R,17R) - 11 - - 17,20 - - 11 - (2 -) - 2,3,13,14 - - PGE₁ (45)

28 (2E,11R,17R) - 11 - - 17,20 - - 11 - (2 -) - 2,3,13,14 -
- PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.83 - 0.96(m, 6H), 1.06 - 1.84(m, 18H), 2.11(dd, J=19.0, 11.7Hz, 1H), 2.18 - 2.33(m, 3H), 2.60 - 2.96(m, 2H), 2.87(dt, J=14.0, 6.4Hz, 1H), 3.15(dt, J=14.0, 6.2Hz, 1H), 3.28(ddd, J=11.7, 10.4, 7.8Hz, 1H), 3.79 - 3.89(m, 2H), 4.38 - 4.49 (m, 1H), 5.84(dt, J=15.7, 1.6Hz, 1H), 7.06(dt, J=15.7, 7.0Hz, 1H)

IR() cm⁻¹ :

3368, 2929, 2857, 1743, 1697, 1653, 1460, 1384, 1284, 1155, 1048

< 30 >

(2E,11S,17R) - 11 - - 17,20 - - 11 - (2 -) - 2,3,13,14 - - PGE₁ (47)

28 (2E,11S,17R) - 11 - - 17,20 - - 11 - (2 -) - 2,3,13,14 -
- PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.83 - 0.96(m, 6H), 1.08 - 1.82(m, 18H), 2.17 - 2.34(m, 2H), 2.46 - 2.67(m, 2H), 2.86 - 3.12(m, 3H), 3.58 - 3.66(m, 1H), 3.73 - 3.88(m, 3H), 4.45 - 4.55(m, 1H), 5.79 - 5.89(m, 1H), 7.05(dt, J=15.7, 7.1Hz, 1H)

IR() cm⁻¹ :

3390, 2929, 2862, 1739, 1697, 1653, 1462, 1404, 1284, 1163, 1048, 984

< 31 >

(11R,16S) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 - - PGE₁
(101) (11S,16S) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 -
- PGE₁ (102)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (16S) - 3 -
- 16,20 - - 13,14 - - PGE₁ , 1(1) (1
6S) - 3 - - 16,20 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.89(t, J=6.6Hz, 3H), 0.97(d, J=6.6Hz, 3H), 1.04 - 2.06(m, 15H), 2.10(d, J=5.9Hz, 1H), 2.30 - 2.48(m, 1H), 3.43 - 3.64(m, 3H), 3.76(s, 3H), 4.08(s, 2H), 4.22 - 4.34(m, 1H), 6.19(dd, J=5.7, 2.2Hz, 1H), 7.48(d, J=5.7, 2.4Hz, 1H)

IR() cm^{-1} :

3467, 2929, 2859, 2212, 1752, 1708, 1591, 1459, 1438, 1383, 1346, 1285, 1211, 1139, 1026, 895, 810, 768, 605

(2) (1) , 1(2) .

(11R,16S) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.89(t, J=6.8Hz, 3H), 1.00(d, J=6.7Hz, 3H), 1.16 - 1.76(m, 15H), 2.13(dd, J=18.8, 11.7Hz, 1H), 2.24 - 2.36(m, 1H), 2.39 - 2.52(m, 1H), 2.61 - 2.94(m, 4H), 3.11(dt, J=14.0, 6.6Hz, 1H), 3.18 - 3.36(m, 1H), 3.46 - 3.58(m, 2H), 3.76(s, 3H), 3.77 - 3.89(m, 2H), 4.07(s, 2H), 4.24 - 4.32(m, 1H)

IR() cm^{-1} :

3435, 2928, 2859, 1745, 1459, 1439, 1401, 1380, 1352, 1283, 1214, 1140, 1044, 1016, 726, 580

(11S,16S) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.89(t, J=6.8Hz, 3H), 1.00(d, J=6.7Hz, 3H), 1.12 - 1.80(m, 15H), 2.36(br s, 1H), 2.47 - 2.67(m, 4H), 2.84 - 3.03(m, 2H), 3.13(ddd, J=9.6, 5.6, 1.9Hz, 1H), 3.47 - 3.58(m, 2H), 3.60 - 3.68(m, 1H), 3.70 - 3.84(m, 2H), 3.75(s, 3H), 4.07(s, 2H), 4.28 - 4.34(m, 1H)

IR() cm^{-1} :

3435, 2928, 2859, 1742, 1638, 1459, 1438, 1401, 1378, 1284, 1215, 1139, 1045, 1016, 706, 579

< 32 >

(11R,16S) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 - - PGE₁ (103)

31 (11R,16S) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 -
- PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.89(t, J=6.7Hz, 3H), 1.00(d, J=6.7Hz, 3H), 1.10 - 1.88(m, 15H), 2.13(dd, J=18.9, 11.6Hz, 1H), 2.22 - 2.39(m, 1H), 2.52 - 2.61(m, 1H), 2.65 - 3.01(m, 4H), 3.10(dt, J=13.8, 6.5Hz, 1H), 3.22 - 4.22(m, 1H), 3.29(ddd, J=11.6, 10.7, 8.1Hz, 1H), 3.51 - 3.63(m, 2H), 3.84(t, J=6.4Hz, 2H), 4.09(s, 2H), 4.26 - 4.36(m, 1H)

IR() cm^{-1} :

3400, 2929, 2859, 2235, 1740, 1460, 1402, 1351, 1224, 1134, 1044, 1014, 728, 676

< 33 >

(11R,16R) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 - - PGE₁
 (104) (11S,16R) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 -
 - PGE₁ (105)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (16R) - 3 -
 - 16,20 - - 13,14 - - PGE₁ , 1(1) (1
 6R) - 3 - - 16,20 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃ + D₂O, 300MHz) δ ppm;

0.89(t, J=6.8Hz, 3H), 0.96(d, J=6.8Hz, 3H), 1.05 - 2.02(m, 15H), 2.38 - 2.49(m, 1H), 3.45 - 3.59(m, 3H),
 3.76(s, 3H), 4.08(s, 2H), 4.24(dd, J=4.9, 1.9Hz, 1H), 6.19(dd, J=5.7, 2.4Hz, 1H), 7.48(dd, J=5.7, 2.4H
 z, 1H)

IR() cm^{-1} :

3468, 2930, 2859, 2211, 1752, 1708, 1592, 1545, 1459, 1439, 1380, 1346, 1283, 1212, 1139, 1027, 887,
 811, 772, 706, 580

(2) (1) , 1(2) .

(11R,16R) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃ + D₂O, 300MHz) δ ppm;

0.83 - 1.03(m, 3H), 0.99(d, J=6.7Hz, 3H), 1.08 - 1.90(m, 15H), 2.13(dd, J= 18.8, 11.8Hz, 1H), 2.23 - 2.3
 8(m, 1H), 2.63 - 2.97(m, 3H), 3.12(dt, J=13.8, 6.5Hz, 1H), 3.28(ddd, J=11.8, 10.5, 7.8, 1H), 3.46 - 3.65
 (m, 2H), 3.76(s, 3H), 3.83(t, J=6.5Hz, 2H), 4.07(s, 2H), 4.20 - 4.30(m, 1H)

IR() cm^{-1} :

3435, 2929, 2859, 2235, 1745, 1459, 1439, 1401, 1378, 1283, 1214, 1139, 1045, 726, 580, 428

(11S,16R) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.83 - 1.03(m, 3H), 1.00(d, J=6.7Hz, 3H), 1.12 - 1.82(m, 15H), 2.00 - 2.44(m, 2H), 2.47 - 2.78(m, 3H), 2.
 84 - 3.04(m, 2H), 3.13(ddd, J=9.8, 5.4, 1.9Hz, 1H), 3.53(t, J=5.8Hz, 2H), 3.59 - 3.68(m, 1H), 3.71 - 3.87
 (m, 2H), 3.75(s, 3H), 4.07 (s, 2H), 4.20 - 4.34(m, 1H)

IR() cm^{-1} :

3432, 2929, 2859, 2235, 1745, 1697, 1637, 1456, 1439, 1401, 1376, 1284, 1217, 1138, 1046, 1015, 888, 706, 580

< 34 >

(11R,16R) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 - - PGE₁ (106)

33 (11R,16R) - 3 - - 11 - - 11 - (2 -) - 16,20 - - 13,14 -
- PGE₁ , 2 .

¹H - NMR(CDCl₃ + D₂O, 300MHz) δ ppm;

0.83 - 1.05(m, 6H), 1.10 - 1.90(m, 17H), 2.13(dd, J=18.8, 11.8Hz, 1H), 2.23 - 2.37(m, 1H), 2.52 - 3.03(m, 2H), 2.87(dt, J=14.0, 6.1Hz, 1H), 3.11(dt, J=14.0, 6.5Hz, 1H), 3.28(ddd, J=11.8, 10.3, 7.9Hz, 1H), 3.40 - 4.00(m, 3H), 3.57(t, J= 5.8Hz, 2H), 4.09(s, 2H), 4.23 - 4.33(m, 1H)

IR() cm⁻¹ :

3426, 2929, 2859, 1740, 1459, 1401, 1379, 1348, 1224, 1135, 1045, 1013, 940, 727, 676

< 35 >

(11R,15RS) - 3 - - 11 - - 11 - (2 -) - 16,16 - - 13,14 - - PGE₁
(107) (11S,15RS) - 3 - - 11 - - 11 - (2 -) - 16,16 - - 13,14 -
- PGE₁ (108)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (15RS) - 3 -
- 16,16 - - 13,14 - - PGE₁ , 1(1) (15RS) - 3 -
15RS) - 3 - - 16,16 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.86 - 0.99(m, 9H), 1.18 - 2.02(m, 13H), 2.38 - 2.47(m, 1H), 3.46 - 3.60(m, 3H), 3.76(s, 3H), 4.04 - 4.15(m, 1H), 4.08(s, 2H), 6.19(dd, J=5.7, 2.4Hz, 1H), 7.48(dd, J=5.7, 2.3Hz, 1H)

IR() cm⁻¹ :

3468, 2955, 2933, 2870, 2207, 1752, 1708, 1591, 1542, 1458, 1438, 1384, 1345, 1283, 1212, 1139, 1033, 811, 706, 579

(2) (1) , 1(2) .

(11R,15RS) - 3 - - 11 - - 11 - (2 -) - 16,16 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.86 - 0.99(m, 9H), 1.16 - 3.36(m, 20H), 2.14(dd, J=18.7, 11.7Hz, 1H), 3.48 - 3.58(m, 2H), 3.76(s, 3H), 3.78 - 3.91(m, 2H), 4.04 - 4.15(m, 1H), 4.07(s, 2H)

IR() cm^{-1} :

3435, 2955, 2932, 2870, 1745, 1439, 1384, 1283, 1214, 1139, 1039, 767, 729, 579

(11S,15RS) - 3 - - 11 - - 11 - (2 -) - 16,16 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.86 - 0.98(m, 9H), 1.16 - 1.78(m, 13H), 2.31 - 2.41(m, 1H), 2.43 - 2.60(m, 4H), 2.82 - 3.02(m, 2H), 3.11 - 3.18(m, 1H), 3.48 - 3.84(m, 4H), 3.76(s, 3H), 4.03 - 4.15(m, 1H), 4.07(s, 2H)

IR() cm^{-1} :

3435, 2955, 2932, 2870, 2229, 1742, 1638, 1439, 1384, 1284, 1215, 1139, 1039, 706, 579

< 36 >

(11R,15RS) - 3 - - 11 - - 11 - (2 -) - 16,16 - - 13,14 - - PGE₁ (109)

35 (11R,15RS) - 3 - - 11 - - 11 - (2 -) - 16,16 - - 13,14 -
- PGE₁ , 2 .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.85 - 1.02(m, 9H), 1.14 - 1.86(m, 12H), 2.14(dd, J=18.9, 11.4Hz, 1H), 2.24 - 3.36(m, 9H), 3.54 - 3.66(m, 2H), 3.79 - 3.88(m, 2H), 4.06 - 4.17(m, 1H), 4.09(s, 2H)

IR() cm^{-1} :

3431, 2933, 2870, 2229, 1740, 1468, 1432, 1385, 1364, 1281, 1223, 1135, 1024, 761, 676

< 37 >

(11R,17R) - 4 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁
(85) (11S,17R) - 4 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 -
- PGE₁ (86)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (17R) - 4 -
- 17,20 - - 13,14 - - PGE₁ , 1(1) (1
7R) - 4 - - 17,20 - - 13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.81 - 1.05(m, 3H), 0.92(d, J=6.6Hz, 3H), 1.07 - 2.04(m, 14H), 2.42(ddd, J= 9.2, 4.6, 3.3Hz, 1H), 2.58(t, J=6.3Hz, 2H), 3.39 - 3.60(m, 3H), 3.61 - 3.83(m, 2H), 3.70(s, 3H), 4.28 - 4.54(m, 1H), 6.18(dd, J=5.7, 2.2Hz, 1H), 7.47(dd, J=5.7, 2.4Hz, 1H)

IR() cm^{-1} :

3436, 2955, 2930, 2871, 2214, 1740, 1708, 1457, 1438, 1376, 1326, 1262, 1198, 1179, 1116, 1068, 1028, 848

(2) (1) , 1(2) .

(11R,17R) - 4 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.75 - 1.02(m, 3H), 0.93(d, J=6.6Hz, 3H), 1.04 - 3.00(m, 19H), 2.12(dd, J=18.9, 11.6Hz, 1H), 2.57(t, J=6.4Hz, 2H), 3.15(dt, J=20.4, 6.3Hz, 1H), 3.28(ddd, J=11.6, 10.4, 7.8Hz, 1H), 3.36 - 3.55(m, 2H), 3.68(t, J=6.4Hz, 2H), 3.70(s, 3H), 3.85(t, J=6.3Hz, 2H), 4.34 - 4.53(m, 1H)

IR() cm⁻¹ :

3432, 2955, 2929, 2871, 2236, 1746, 1740, 1456, 1440, 1402, 1380, 1326, 1282, 1197, 1179, 1154, 1116, 1062, 849, 590

(11S,17R) - 4 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.81 - 1.04(m, 3H), 0.93(d, J=6.6Hz, 3H), 1.08 - 3.18(m, 20H), 2.58(t, J= 6.4Hz, 2H), 3.11(ddd, J=9.8, 5.3, 1.8Hz, 1H), 3.31 - 3.85(m, 5H), 3.69(t, J=6.4 Hz, 2H), 3.70(s, 3H), 4.36 - 4.56(m, 1H)

IR() cm⁻¹ :

3432, 2953, 2929, 2871, 2236, 1740, 1456, 1439, 1402, 1376, 1338, 1284, 1198, 1177, 1116, 1062, 849, 593

< 38 >

(11R,17R) - 4 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁ (87)

37 (11R,17R) - 4 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 -
- PGE₁ , 2 .

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.78 - 1.00(m, 3H), 0.93(d, J=6.6Hz, 3H), 1.06 - 2.00(m, 14H), 2.12(dd, J=18.9, 11.5Hz, 1H), 2.23 - 4.63(m, 9H), 2.58(t, J=5.8Hz, 2H), 2.79(ddd, J=18.9, 7.8, 1.6Hz, 1H), 2.87(dt, J=14.0, 6.2Hz, 1H), 3.12(dt, J=14.0, 6.4Hz, 1H), 3.30(ddd, J=11.5, 10.4, 7.8Hz, 1H), 3.70(t, J=5.8Hz, 2H)

IR() cm⁻¹ :

3400, 2956, 2930, 2870, 2236, 1746, 1740, 1456, 1402, 1380, 1326, 1283, 1196, 1158, 1116, 1056, 935, 844, 594

< 39 >

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁
(75)

12 (11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 -
- PGE₁ (40 mg) (2.2 Mℓ) (71 mg) (0.9 Mℓ)
가 1.5 가 ,
(39 mg) (;)

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.82 - 0.97(m, 6H), 1.08 - 2.16(m, 15H), 2.30 - 2.63(m, 3H), 2.71 - 3.02(m, 2H), 2.90(d, J=5.4Hz, 1H), 3.17 - 3.64(m, 5H), 3.76(s, 3H), 4.08(s, 2H), 4.10 - 4.26(m, 2H), 4.37 - 4.49(m, 1H)

IR() cm⁻¹ :

3368, 2930, 2871, 2236, 1746, 1456, 1440, 1402, 1380, 1288, 1214, 1138, 1034, 996, 705

< 40 >

(11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 - - PGE₁
(77)

12 (11R,17R) - 3 - - 11 - - 11 - (2 -) - 17,20 - - 13,14 -
- PGE₁ (40 mg) (3 Mℓ) (45 mg) 가
30 가 ,
(; : =1:2) (3
3 mg)

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.85 - 0.99(m, 6H), 1.10 - 1.96(m, 15H), 2.39 - 2.51(m, 1H), 2.66 - 2.94(m, 4H), 3.06 - 3.17(m, 1H), 3.35 (ddd, J=14.9, 5.5, 4.3Hz, 1H), 3.45 - 3.65(m, 2H), 3.76(s, 3H), 3.81(ddd, J=14.9, 7.8, 4.7Hz, 1H), 3.92 - 4.05(m, 1H), 4.08(s, 2H), 4.10 - 4.28(m, 2H), 4.40 - 4.53(m, 1H)

IR() cm⁻¹ :

3470, 2956, 2930, 2870, 2236, 1752, 1746, 1456, 1440, 1402, 1380, 1321, 1284, 1224, 1127, 1062, 708, 526

< 41 >

(2E,11R,17R) - 11 - - 11 - (2 -) - 17 - - 2,3,13,14 - - PGE₁
(52) (2E,11S,17R) - 11 - - 11 - (2 -) - 17 - - 2,3,13,14 -
- PGE₁ (53)

(1) 1(1), (17R) - 17,20 - 13,14 - - PGE₁ (2E,17R) - 17 -
 - 2,3,13,14 - - PGE₁, 1(1) (2E,1
 7R) - 17 - - 2,3,13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.76 - 2.50(m, 20H), 0.92(d, J=6.6Hz, 3H), 3.34 - 3.52(m, 1H), 3.74(s, 3H), 4.29 - 4.57(m, 1H), 5.85(dt, J=15.7, 1.5Hz, 1H), 6.19(dd, J=5.7, 2.4Hz, 1H), 6.99(dt, J=15.7, 7.0Hz, 1H), 7.48(dd, J=5.7, 2.4Hz, 1H)

IR() cm⁻¹ :

3436, 2954, 2930, 2871, 2214, 1718, 1654, 1594, 1546, 1460, 1437, 1381, 1274, 1201, 1178, 1044, 983, 871

(2) (1), 1(2) .
 (2E,11R,17R) - 11 - - 11 - (2 -) - 17 - - 2,3,13,14 - - PGE₁

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.81 - 1.00(m, 3H), 0.93(d, J=6.6Hz, 3H), 1.07 - 1.90(m, 13H), 2.00 - 3.00(m, 7H), 2.11(dd, J=18.8, 11.7 Hz, 1H), 2.88(dt, J=14.1, 6.4Hz, 1H), 3.14(dt, J=14.1, 6.4Hz, 1H), 3.27(ddd, J=11.7, 10.4, 7.9Hz, 1H), 3.74(s, 3H), 3.86(t, J=6.4Hz, 2H), 4.45(ddd, J=8.1, 5.8, 1.9Hz, 1H), 5.83(dt, J=15.6, 1.5Hz, 1H), 6.97(dt, J=15.6, 7.0Hz, 1H)

IR() cm⁻¹ :

3400, 2930, 2871, 2230, 1746, 1724, 1654, 1460, 1438, 1384, 1314, 1278, 1202, 1175, 1045, 984, 720

(2E,11S,17R) - 11 - - 11 - (2 -) - 17 - - 2,3,13,14 - - PGE₁

¹H - NMR(CDCl₃, 200MHz) δ ppm;

0.78 - 1.00(m, 3H), 0.93(d, J=6.6Hz, 3H), 1.04 - 1.88(m, 13H), 2.12 - 3.16(m, 10H), 3.57 - 3.68(m, 1H), 3.73(s, 3H), 3.87(dt, J=1.8, 5.9Hz, 2H), 4.41 - 4.55(m, 1H), 5.83(dt, J=15.7, 1.5Hz, 1H), 6.97(dt, J=15.7, 7.0Hz, 1H)

IR() cm⁻¹ :

3400, 2930, 2871, 2230, 1740, 1734, 1654, 1460, 1437, 1402, 1384, 1278, 1202, 1163, 1046, 984, 740

< 42 >

(2E,11R,17R) - 11 - - 11 - (2 -) - 17 - - 2,3,13,14 - - PGE₁ (54)

41 (2E,11R,17R) - 11 - - 11 - (2 -) - 17 - - 2,3,13,14 -
 - PGE₁, 2 .

^1H - NMR(CDCl_3 , 200MHz) δ ppm;

0.81 - 1.02(m, 3H), 0.93(d, $J=6.6\text{Hz}$, 3H), 1.06 - 3.42(m, 24H), 2.11(dd, $J=18.8$, 11.8Hz, 1H), 3.87(t, $J=6.4\text{Hz}$, 2H), 4.46(ddd, $J=10.9$, 5.9, 1.8Hz, 1H), 5.85(dt, $J=15.7$, 1.5Hz, 1H), 7.06(dt, $J=15.7$, 7.0Hz, 1H)

IR() cm^{-1} :

3368, 2930, 2871, 2236, 1740, 1697, 1654, 1460, 1402, 1383, 1347, 1283, 1228, 1158, 1048, 1016, 985, 876, 740, 670

< 43 >

(2E,11R) - 11 - - 11 - (2 -) - 19,20 - - 17 - - 2,3,13,14 - - PGE₁
 (55) (2E,11S) - 11 - - 11 - (2 -) - 19,20 - - 17 - - 2,3,13,14
 4 - - PGE₁ (56)

(1) 1(1) , (2E,17R) - 17,20 - - 13,14 - - PGE₁ 19,20 -
 - 17 - - 2,3,13,14 - - PGE₁ , 1(1)
 (2E) - 19,20 - - 17 - - 2,3,13,14 - - PGA₁ .

^1H - NMR(CDCl_3 , 200MHz) δ ppm;

0.93(d, $J=6.6\text{Hz}$, 3H), 0.94(d, $J=6.4\text{Hz}$, 3H), 1.20 - 2.50(m, 13H), 3.35 - 3.49(m, 1H), 3.74(s, 3H), 4.26 - 4.55(m, 1H), 5.85(dt, $J=15.7$, 1.5Hz, 1H), 6.19 (dd, $J=5.7$, 2.4Hz, 1H), 6.98(dt, $J=15.7$, 6.9Hz, 1H), 7.48(dd, $J=5.7$, 2.4Hz, 1H)

IR() cm^{-1} :

3436, 2953, 2868, 2214, 1718, 1654, 1594, 1541, 1466, 1437, 1386, 1368, 1274, 1202, 1176, 1114, 1039, 983, 860, 720

(2) (1) , 1(2) .

(2E,11R) - 11 - - 11 - (2 -) - 19,20 - - 17 - - 2,3,13,14 - - PGE₁

^1H - NMR(CDCl_3 , 200MHz) δ ppm;

0.94(d, $J=6.6\text{Hz}$, 3H), 0.96(d, $J=6.6\text{Hz}$, 3H), 1.18 - 1.96(m, 10H), 2.02 - 2.36(m, 4H), 2.12(dd, $J=18.8$, 11.7Hz, 1H), 2.58 - 2.97(m, 1H), 2.66(ddd, $J=11.7$, 10.5, 1.9Hz, 1H), 2.88(dt, $J=13.9$, 6.4Hz, 1H), 3.14(dt, $J=13.9$, 6.4Hz, 1H), 3.27(ddd, $J=11.7$, 10.5, 7.9Hz, 1H), 3.74(s, 3H), 3.86(t, $J=6.4\text{Hz}$, 2H), 4.44(dt, $J=1.9$, 7.3Hz, 1H), 5.84(dt, $J=15.7$, 1.5Hz, 1H), 6.97(dt, $J=15.7$, 6.9Hz, 1H)

IR() cm^{-1} :

3427, 2930, 2869, 2236, 1734, 1654, 1462, 1456, 1436, 1402, 1368, 1278, 1202, 1174, 1045, 986, 924, 844, 720, 536

(2E,11S) - 11 - - 11 - (2 -) - 19,20 - - 17 - - 2,3,13,14 - - PGE₁

^1H - NMR(CDCl_3 , 200MHz) δ ppm;

0.94(d, J=6.6Hz, 3H), 0.96(d, J=6.6Hz, 3H), 1.19 - 2.01(m, 10H), 2.11 - 3.15(m, 9H), 3.57 - 3.68(m, 1H), 3.73(s, 3H), 3.81(dt, J=1.7, 6.0Hz, 2H), 4.47 (dt, J=1.8, 7.3Hz, 1H), 5.83(dt, J=15.6, 1.5Hz, 1H), 6.97 (dt, J=15.6, 7.0Hz, 1H)

IR() cm^{-1} :

3400, 2930, 2867, 2230, 1734, 1654, 1466, 1437, 1402, 1385, 1368, 1278, 1202, 1164, 1045, 844, 720

< 44 >

(2E,11R) - 11 - - 11 - (2 -) - 19,20 - - 17 - - 2,3,13,14 - - PGE₁ (57)

41 (2E,11R) - 11 - - 11 - (2 -) - 19,20 - - 17 - - 2,3,13,14 - - PGE₁, 2 .

^1H - NMR(CDCl_3 , 200MHz) δ ppm;

0.94(d, J=6.6Hz, 3H), 0.96(d, J=6.4Hz, 3H), 1.34 - 1.96(m, 9H), 2.01 - 3.38(m, 8H), 2.11(dd, J=18.9, 11.7Hz, 1H), 2.87(dt, J=14.0, 6.4Hz, 1H), 3.15 (dt, J=14.0, 6.4Hz, 1H), 3.28(ddd, J=11.7, 10.5, 7.9Hz, 1H), 3.86(t, J=6.4Hz, 2H), 4.44(dt, J=1.8, 7.3Hz, 1H), 5.84(dt, J=15.6, 1.4Hz, 1H), 7.06(dt, J=15.6, 7.0Hz, 1H)

IR() cm^{-1} :

3368, 2930, 2869, 2236, 1740, 1697, 1654, 1466, 1402, 1368, 1284, 1218, 1163, 1046, 985, 670, 539

< 45 >

(2E,11R,17R) - 11 - - 11 - (2 -) - 20 - - 17 - - 2,3, 13,14 - - PGE₁ (119) (2E,11S,17R) - 11 - - 11 - (2 -) - 20 - - 17 - - 2,3,13,14 - - PGE₁ (121)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (2E,17R) - 20 - - 17 - - 2,3,13,14 - - PGE₁ , 1(1) (2E,17R) - 20 - - 17 - - 2,3,13,14 - - PGA₁ .

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.92 - 0.98(m, 3H), 1.15 - 1.98(m, 15H), 2.14 - 2.45(m, 3H), 3.39 - 3.45(m, 1H), 3.64(t, J=6.6Hz, 2H), 3.74(s, 3H), 4.40 - 4.52(m, 1H), 5.85(d, J=15.7Hz, 1H), 6.19(dd, J=5.8, 2.3Hz, 1H), 6.98(dt, J=15.7, 7.0Hz, 1H), 7.47(dd, J=5.8, 2.5Hz, 1H)

IR() cm^{-1} :

3400, 2934, 2860, 2214, 1708, 1702, 1654, 1437, 1384, 1277, 1202, 1179, 1055, 876, 719

(2) (1) , 1(2) .

(2E,11R,17R) - 11 - (2 -) - 20 - - 17 - - 2,3, 13,14 - - P
GE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.88 - 1.00(m, 3H), 1.16 - 2.34(m, 19H), 2.12(dd, J=18.9, 11.7Hz, 1H), 2.60 - 2.97(m, 3H), 3.13(dt, J=13.6, 6.8Hz, 1H), 3.21 - 3.34(m, 1H), 3.59 - 3.70(m, 2H), 3.73(s, 3H), 3.77 - 3.89(m, 2H), 4.40 - 4.52(m, 1H), 5.79 - 5.89(m, 1H), 6.90 - 7.04(m, 1H)

IR() cm⁻¹ :

3400, 2930, 2860, 2236, 1740, 1724, 1654, 1438, 1402, 1384, 1283, 1203, 1176, 1046, 720

(2E,11S,17R) - 11 - (2 -) - 20 - - 17 - - 2,3, 13,14 - - P
GE₁

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.89 - 1.01(m, 3H), 1.35 - 1.86(m, 13H), 2.15 - 2.29(m, 4H), 2.47 - 2.66(m, 4H), 2.87 - 3.13(m, 3H), 3.58 - 3.88(m, 5H), 3.73(s, 3H), 4.44 - 4.54(m, 1H), 5.83 (dt, J=15.6, 1.5Hz, 1H), 6.96(dt, J=15.6, 7.1Hz, 1H)

IR() cm⁻¹ :

3400, 2934, 2864, 2230, 1740, 1724, 1654, 1437, 1402, 1380, 1284, 1202, 1177, 1050, 720

< 46 >

(2E,11R,17R) - 11 - (2 -) - 20 - - 17 - - 2,3, 13,14 - - PG
E₁ (124) (2E,11S,17R) - 11 - (2 -) - 20 - - 17 - -
2,3,13,14 - - PGE₁ (126)

(1) 1(1) , (17R) - 17,20 - - 13,14 - - PGE₁ (2E,17R) - 20 -
- 17 - - 2,3,13,14 - - PGE₁ , 1(1)
(2E,17R) - 20 - - 17 - - 2,3,13,14 - - PGA₁ .

¹H - NMR(CDCl₃, 300MHz) δ ppm;

0.90 - 0.98(m, 3H), 1.14 - 2.46(m, 18H), 3.30 - 3.45(m, 2H), 3.33(s, 3H), 3.73(s, 3H), 4.39 - 4.52(m, 1H), 5.84(dt, J=15.7, 1.6Hz, 1H), 6.19(dd, J=5.6, 2.3Hz, 1H), 6.98(dt, J=15.7, 7.1Hz, 1H), 7.47(dd, J=5.6, 2.3Hz, 1H)

IR() cm⁻¹ :

3436, 2930, 2860, 2214, 1718, 1702, 1654, 1437, 1384, 1273, 1201, 1116, 1039, 984, 670

(2) (1) , 1(2) .

(2E,11R,17R) - 11 - (2 -) - 20 - - 17 - - 2,3, 13,14 - - PG
E₁

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.89 - 0.99(m, 3H), 1.15 - 1.85(m, 15H), 2.11(dd, $J=19.0$, 11.7Hz, 1H), 2.14 - 2.33(m, 3H), 2.60 - 2.93(m, 3H), 3.13(dt, $J=13.7$, 6.8Hz, 1H), 3.20 - 3.41(m, 3H), 3.33(s, 3H), 3.73(s, 3H), 3.78 - 3.89(m, 2H), 4.39 - 4.50(m, 1H), 5.83(d, $J=15.5$ Hz, 1H), 6.96(dt, $J=15.5$, 7.0Hz, 1H)

IR() cm^{-1} :

3420, 2930, 2860, 2236, 1745, 1724, 1654, 1456, 1436, 1402, 1278, 1202, 1116, 1045, 848, 720, 595

(2E,11S,17R) - 11 - - 11 - (2 -) - 20 - - 17 - - 2,3, 13,14 - - PG
E₁

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.95(d, $J=6.4$ Hz, 3H), 1.13 - 1.84(m, 13H), 2.16 - 2.28(m, 3H), 2.46 - 2.67 (m, 4H), 2.86 - 3.13(m, 3H), 3.30 - 3.41(m, 2H), 3.33(s, 3H), 3.58 - 3.66(m, 1H), 3.71 - 3.86(m, 2H), 3.73(s, 3H), 4.44 - 4.53(m, 1H), 5.83(dt, $J=15.6$, 1.6Hz, 1H), 6.96(dt, $J=15.6$, 7.0Hz, 1H)

IR() cm^{-1} :

3427, 2930, 2860, 2236, 1740, 1724, 1654, 1437, 1401, 1278, 1202, 1178, 1116, 1045, 720

< 47 >

(2E,11R,17R) - 11 - - 11 - (2 -) - 20 - - 17 - - 2,3, 13,14 - - PG
E₁ (128)

47 (2E,11R,17R) - 11 - - 11 - (2 -) - 20 - - 17 - - 2,3,13,14 -
- PGE₁ , 2 .

^1H - NMR(CDCl_3 , 300MHz) δ ppm;

0.91 - 0.98(m, 3H), 1.16 - 1.86(m, 16H), 2.11(dd, $J=18.9$, 11.9Hz, 1H), 2.24 - 2.34(m, 3H), 2.59 - 2.93(m, 3H), 3.07 - 3.51(m, 4H), 3.37(s, 3H), 3.85(t, $J=6.5$ Hz, 2H), 4.40 - 4.50(m, 1H), 5.84(d, $J=15.6$ Hz, 1H), 7.01(dt, $J=15.6$, 7.2Hz, 1H)

IR() cm^{-1} :

3394, 2930, 2860, 2236, 1745, 1697, 1654, 1461, 1402, 1283, 1206, 1157, 1114, 1046, 986, 876, 666

< >

[PGE₁ DNA]

24 () () 5 1×10^4 /
2 (SG2;) (SB2;)
24 . 가 (SG2) 가 .
 ^3H - (가가) 0.01 mci/ 가 24 ,
(PBS) .

5 % (TCA) 가 4 20 , TCA 1 . PBS , 0.5 M (^3H -) ^3H - 20 $\mu\ell$, 1 .

[1]

	(%)
7	98.4
70	95.6
92	99.3

7, 70 92 .

(가 1×10^{-5} M) , .

7, 70 92 .

가

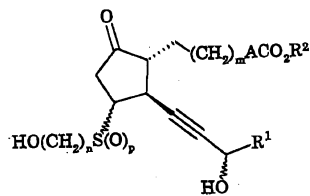
(, PG 가 ,) , .

(57)

1.

| , .

< | >



, A , , , $\text{O}(\text{CH}_2)_q$ $\text{S}(\text{O})_r(\text{CH}_2)_q$, R^1 C_{3-10} , C
 1 - 4 C_{3-10} , C_{3-10} C_{1-4} , C_{1-10} , C_{1-4}
 C_{1-10} , C_{2-10} , C_{1-4} C_{2-10} , C_{2-10} ,
 C_{1-4} C_{2-10} 가 , R^2 , C
 1 - 10 C_{3-10} , m, q 1 5 , n 1 4 , p, r 0, 1
 2 .

2.

