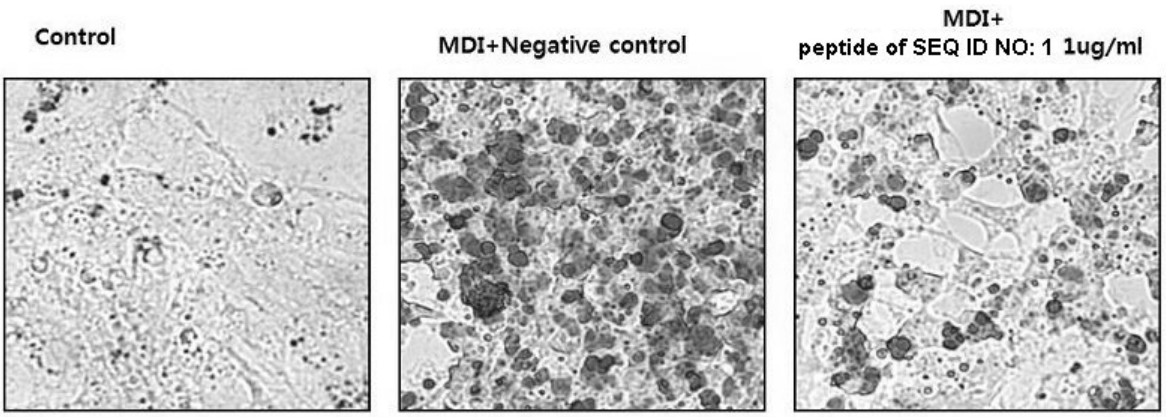

Control
MDI+Negative control
MDI+
peptide of SEQ ID NO: 1 1ug/ml

FIG. 1A

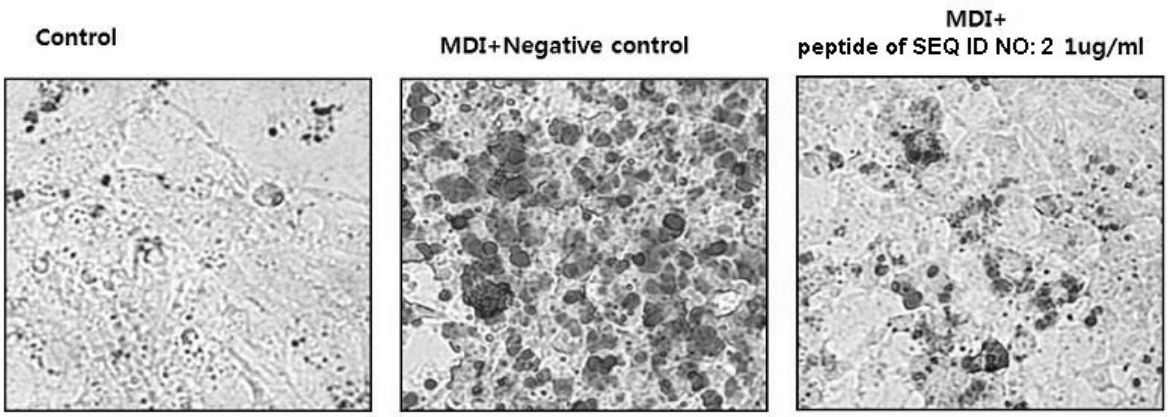

Control
MDI+Negative control
MDI+
peptide of SEQ ID NO: 2 1ug/ml

FIG. 1B

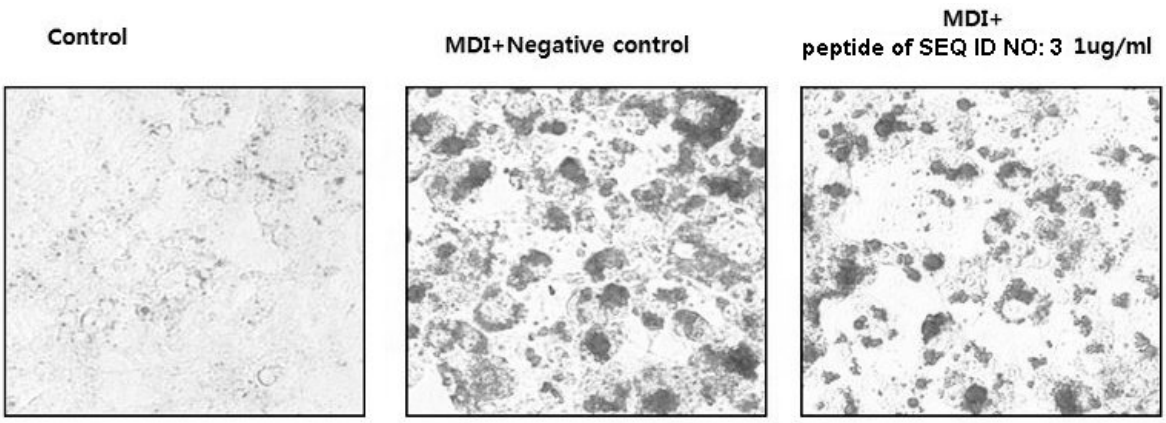

Control
MDI+Negative control
MDI+
peptide of SEQ ID NO: 3 1ug/ml

FIG. 1C

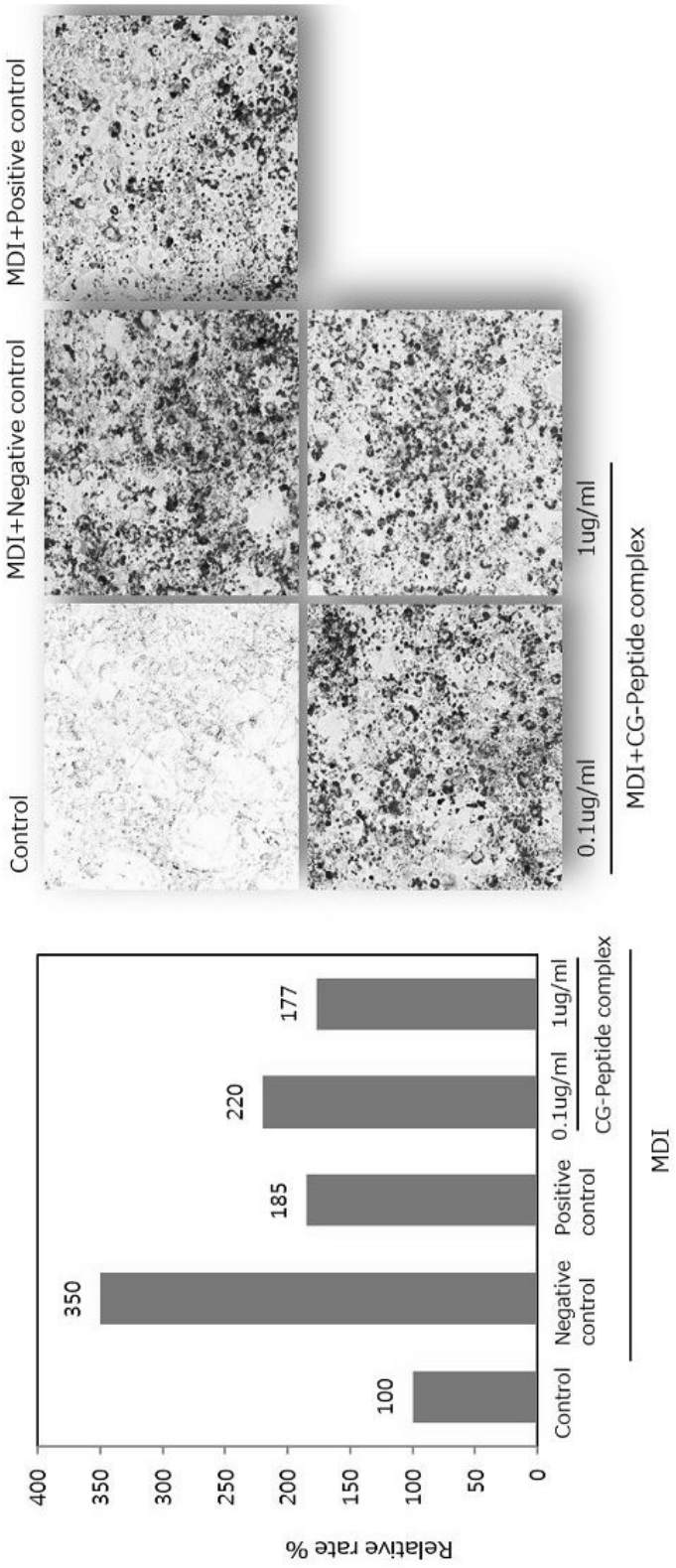

Control
MDI+Negative control
MDI+Positive control
0.1ug/ml
1ug/ml
MDI+CG-Peptide complex
Relative rate %
400
350
300
250
200
150
100
50
0
100
350
185
220
177
Control
Negative control
Positive control
0.1ug/ml
1ug/ml
CG-Peptide complex
MDI

FIG. 2

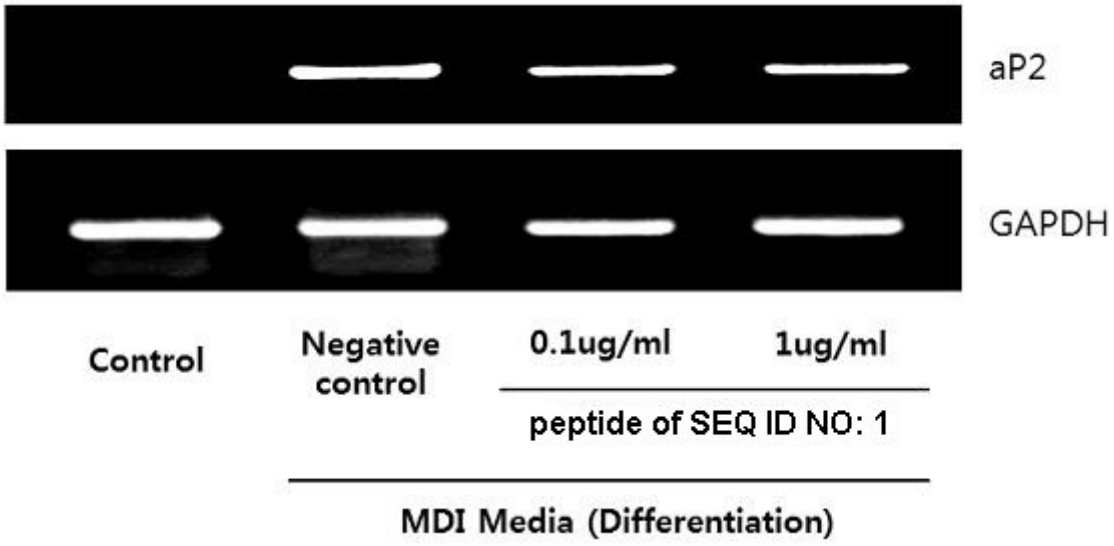

aP2
GAPDH
Control
Negative control
0.1ug/ml
1ug/ml
peptide of SEQ ID NO: 1
MDI Media (Differentiation)

FIG. 3A

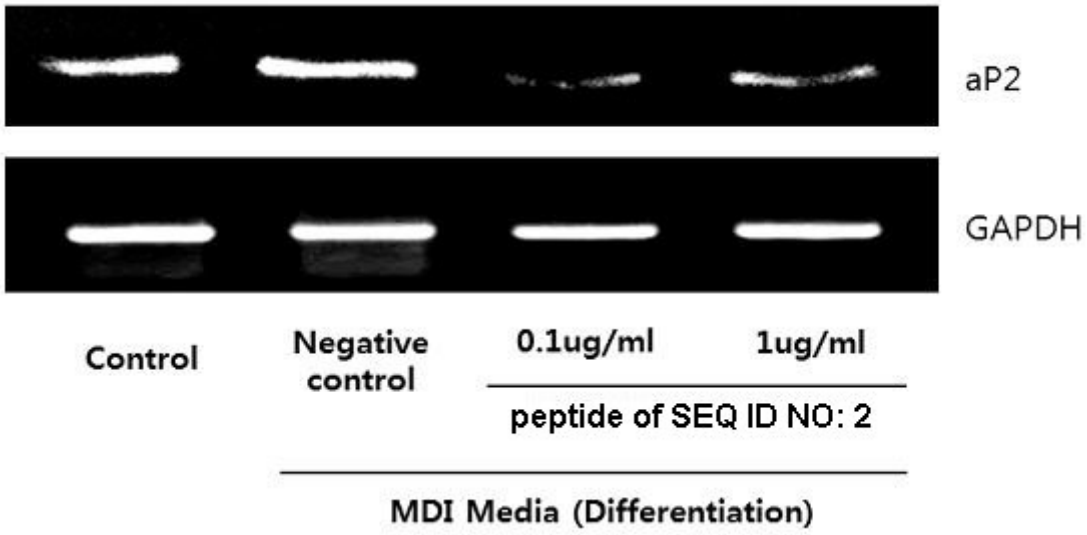

aP2
GAPDH
Control
Negative control
0.1ug/ml
1ug/ml
peptide of SEQ ID NO: 2
MDI Media (Differentiation)

FIG. 3B

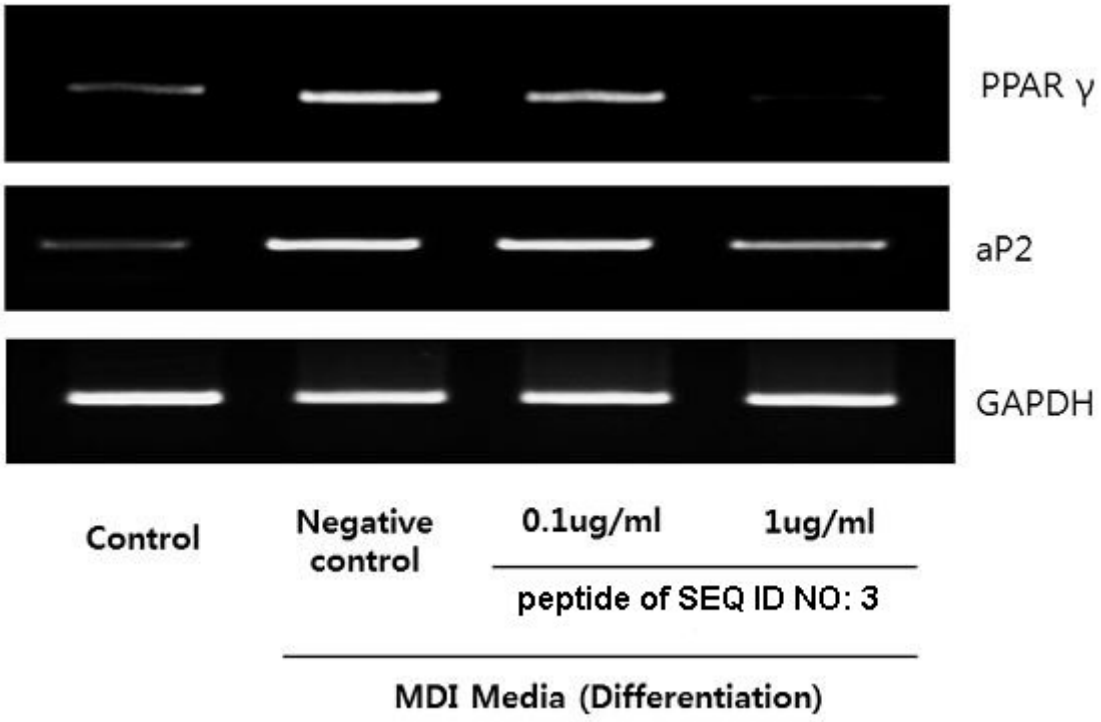

PPAR γ
aP2
GAPDH
Control
Negative control
0.1ug/ml
1ug/ml
peptide of SEQ ID NO: 3
MDI Media (Differentiation)

FIG. 3C

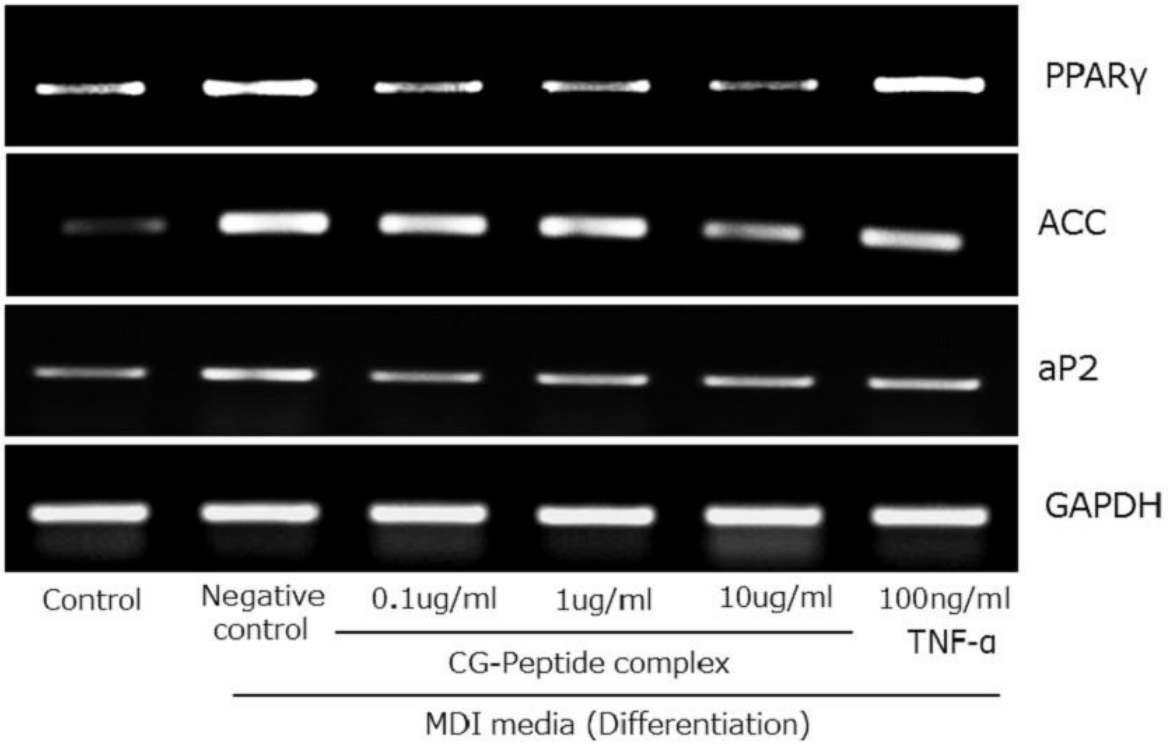

PPARγ
ACC
aP2
GAPDH
Control
Negative control
0.1ug/ml
1ug/ml
10ug/ml
100ng/ml TNF-α
CG-Peptide complex
MDI media (Differentiation)

FIG. 4

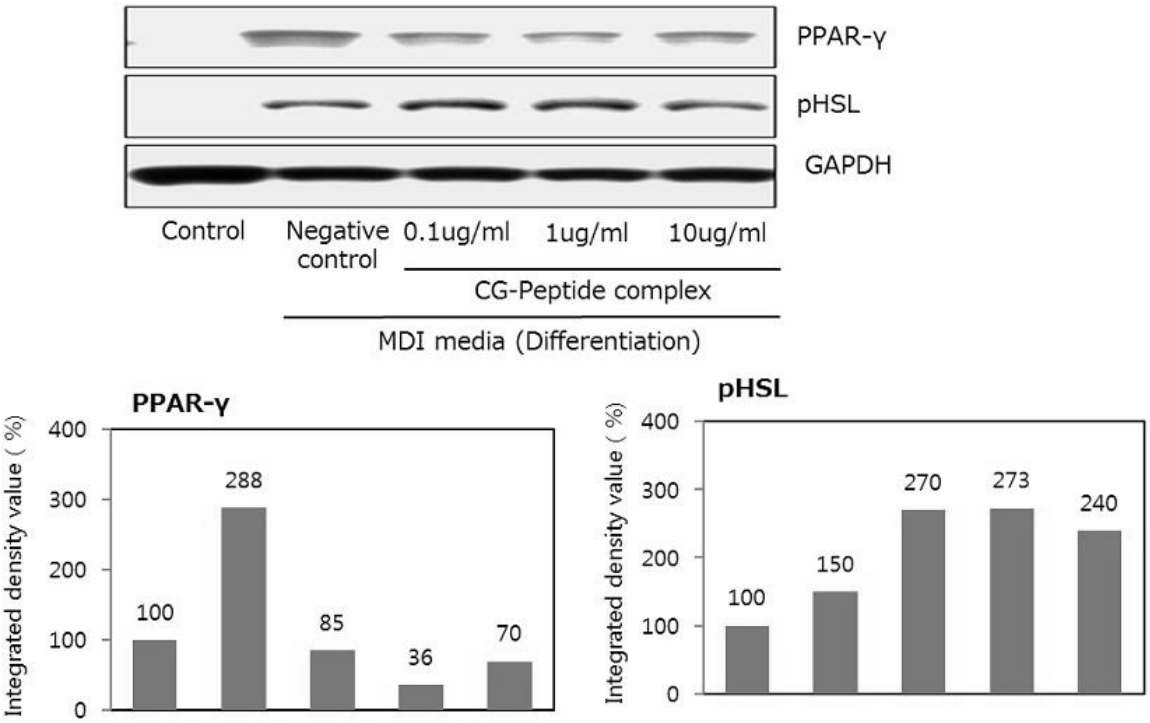

PPAR-γ
pHSL
GAPDH
Control
Negative control
0.1ug/ml
1ug/ml
10ug/ml
CG-Peptide complex
MDI media (Differentiation)
PPAR-γ
Integrated density value (%)
400
300
200
100
0
100
288
85
36
70
pHSL
Integrated density value (%)
400
300
200
100
0
100
150
270
273
240

FIG. 5

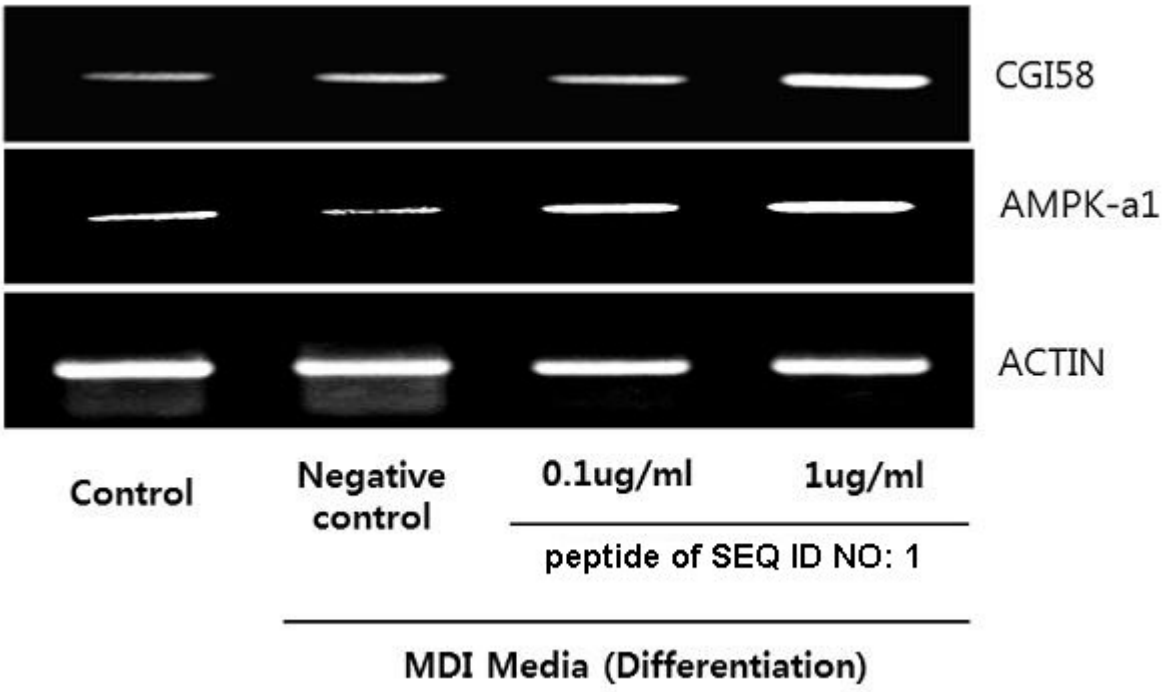

CGI58
AMPK-a1
ACTIN
Control
Negative control
0.1ug/ml
1ug/ml
peptide of SEQ ID NO: 1
MDI Media (Differentiation)

FIG. 6A

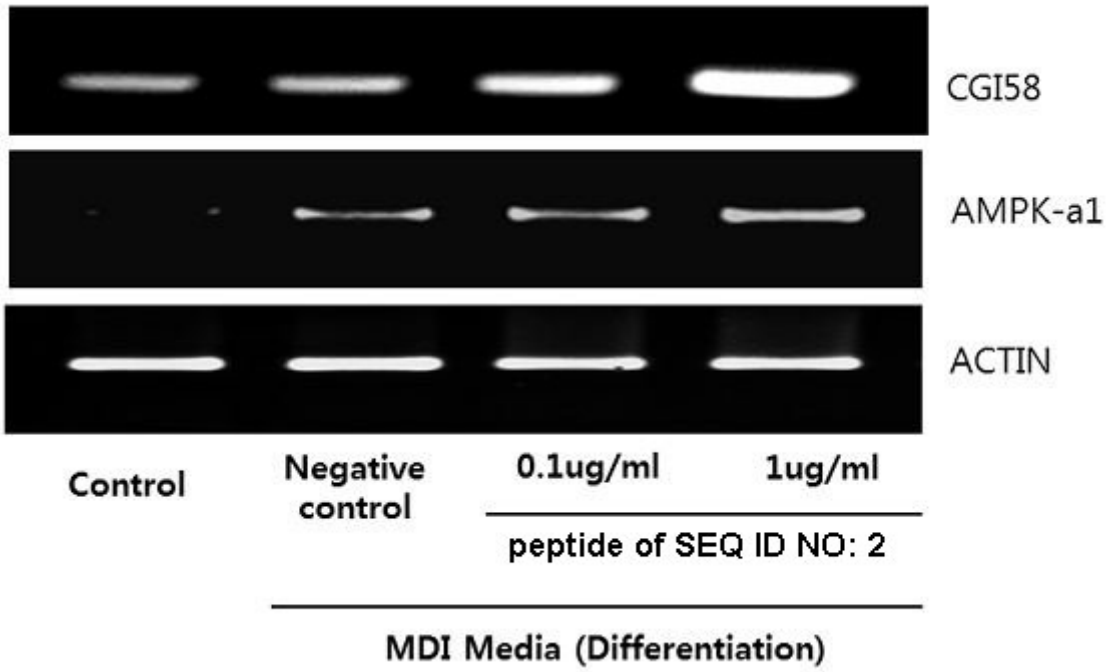

CGI58
AMPK-a1
ACTIN
Control
Negative control
0.1ug/ml
1ug/ml
peptide of SEQ ID NO: 2
MDI Media (Differentiation)

FIG. 6B

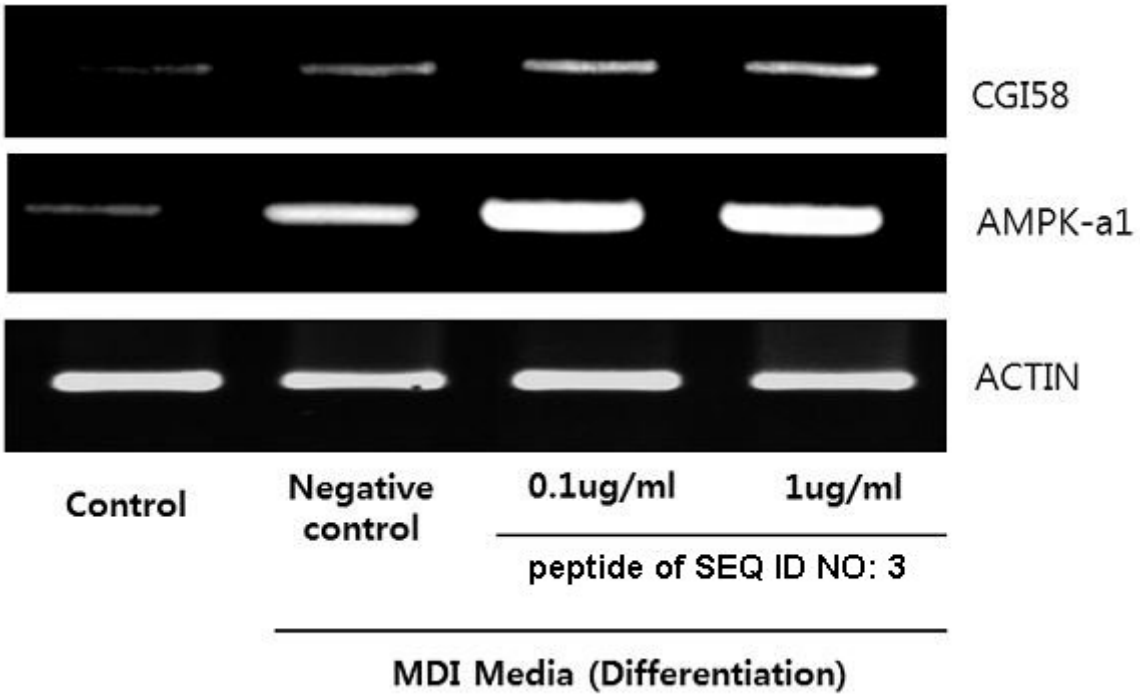

CGI58
AMPK-a1
ACTIN
Control
Negative control
0.1ug/ml
1ug/ml
peptide of SEQ ID NO: 3
MDI Media (Differentiation)

FIG. 6C

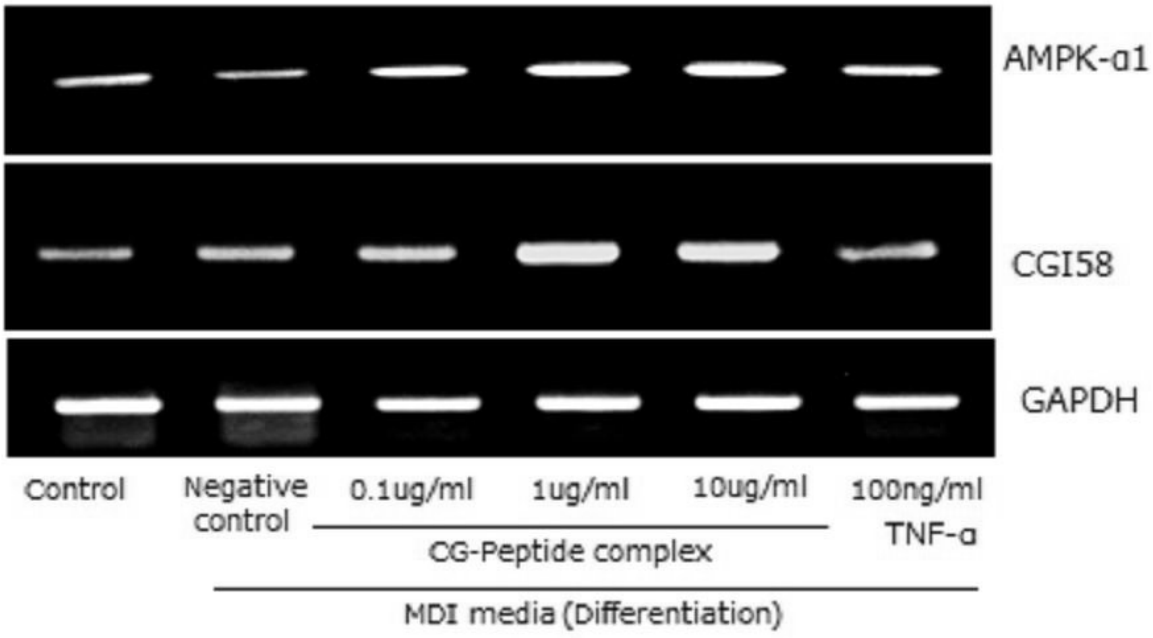

AMPK-α1
CGI58
GAPDH
Control
Negative control
0.1ug/ml
1ug/ml
10ug/ml
100ng/ml TNF-α
CG-Peptide complex
MDI media (Differentiation)

FIG. 6D

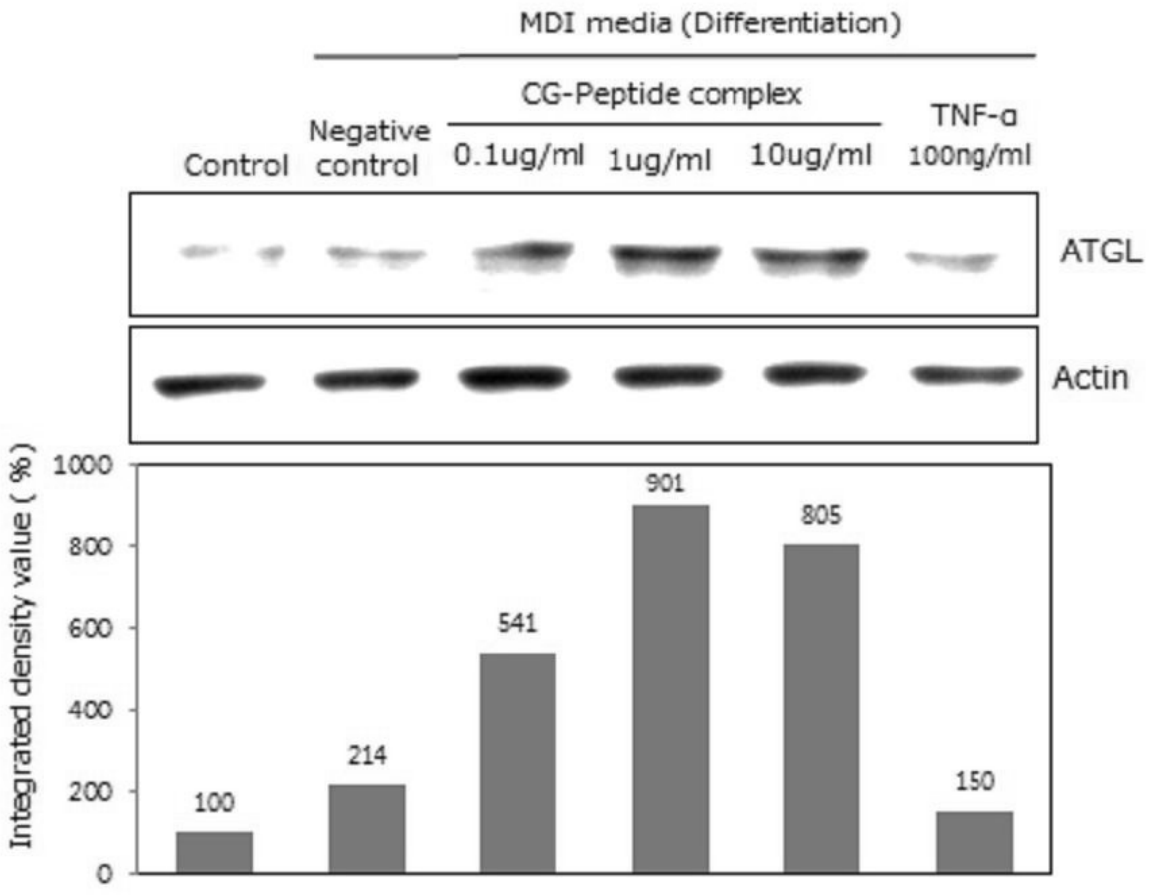

MDI media (Differentiation)
CG-Peptide complex
Control
Negative control
0.1ug/ml
1ug/ml
10ug/ml
TNF-α 100ng/ml
ATGL
Actin
Integrated density value (%)
1000
800
600
400
200
0
100
214
541
901
805
150

FIG. 7

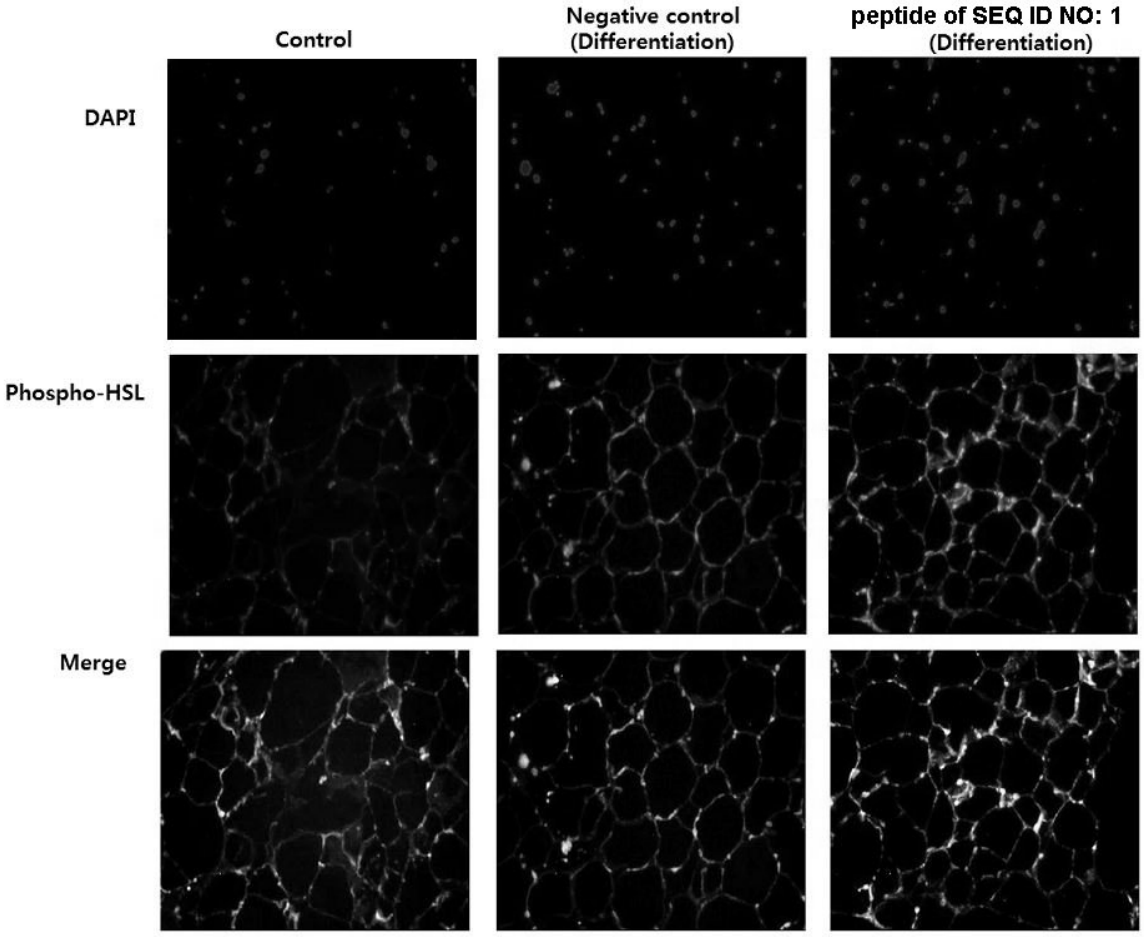

Control
Negative control
(Differentiation)
peptide of SEQ ID NO: 1
(Differentiation)
DAPI
Phospho-HSL
Merge

FIG. 8A

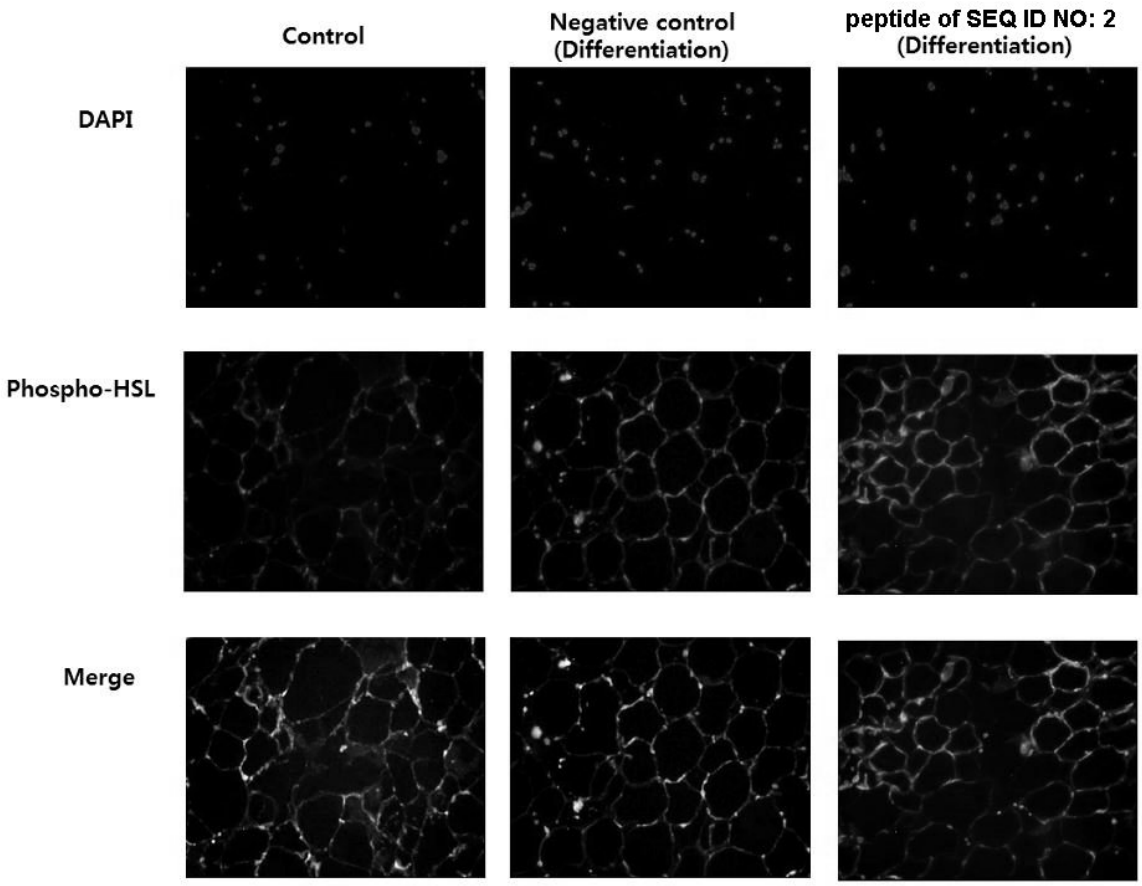

Control
Negative control
(Differentiation)
peptide of SEQ ID NO: 2
(Differentiation)
DAPI
Phospho-HSL
Merge

FIG. 8B

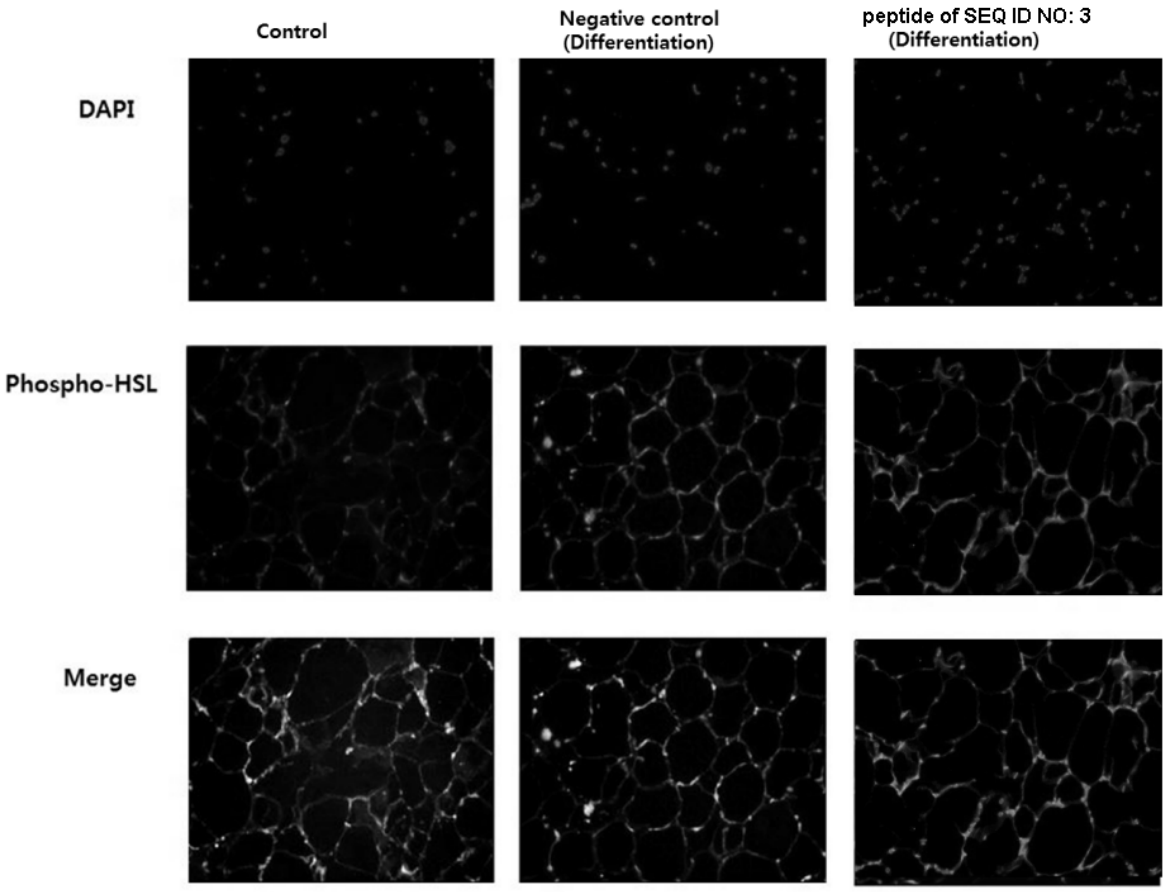

Control
Negative control
(Differentiation)
peptide of SEQ ID NO: 3
(Differentiation)
DAPI
Phospho-HSL
Merge

FIG. 8C

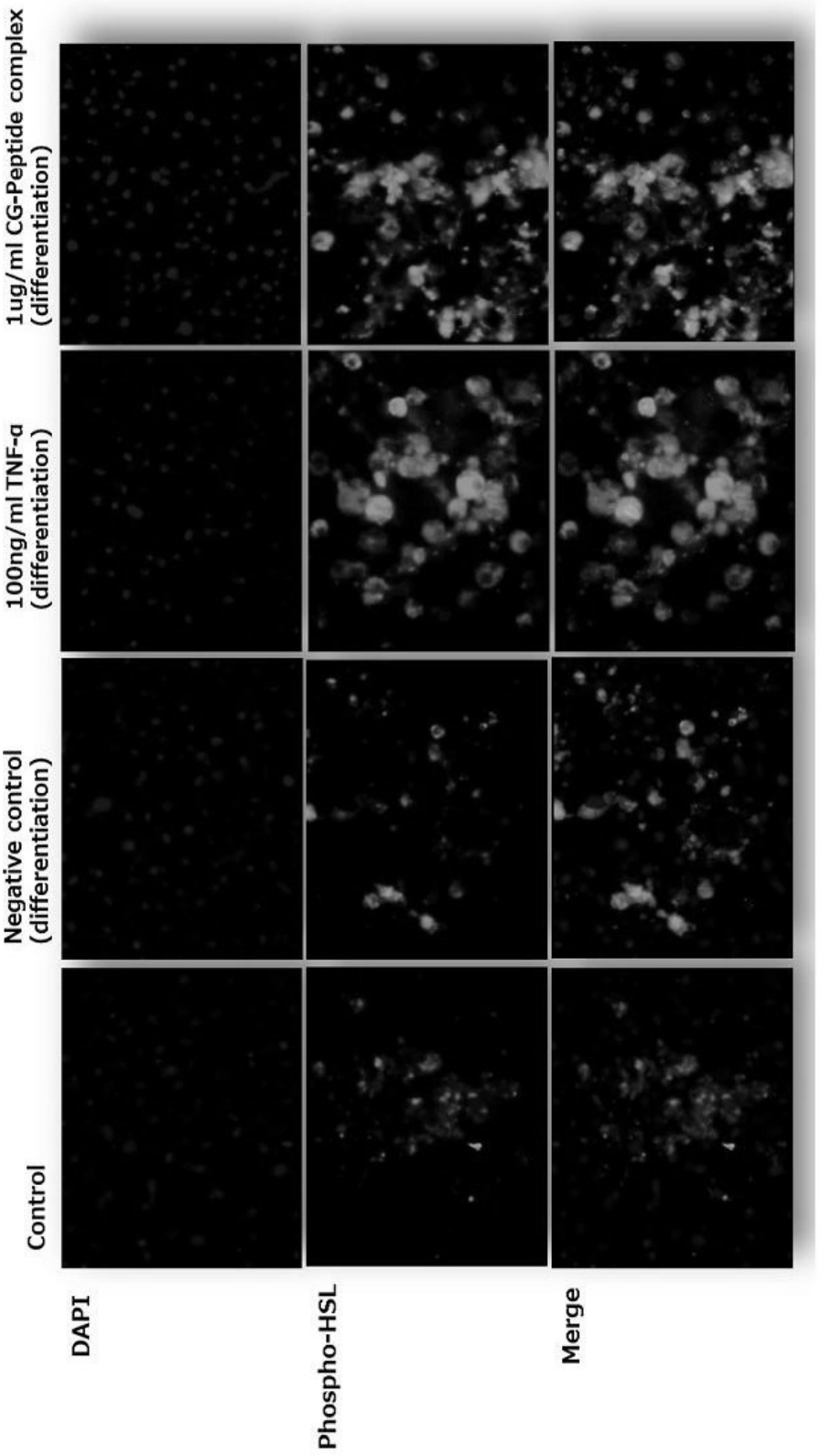

Control
Negative control (differentiation)
100ng/ml TNF-α (differentiation)
1ug/ml CG-Peptide complex (differentiation)
DAPI
Phospho-HSL
Merge

FIG. 8D

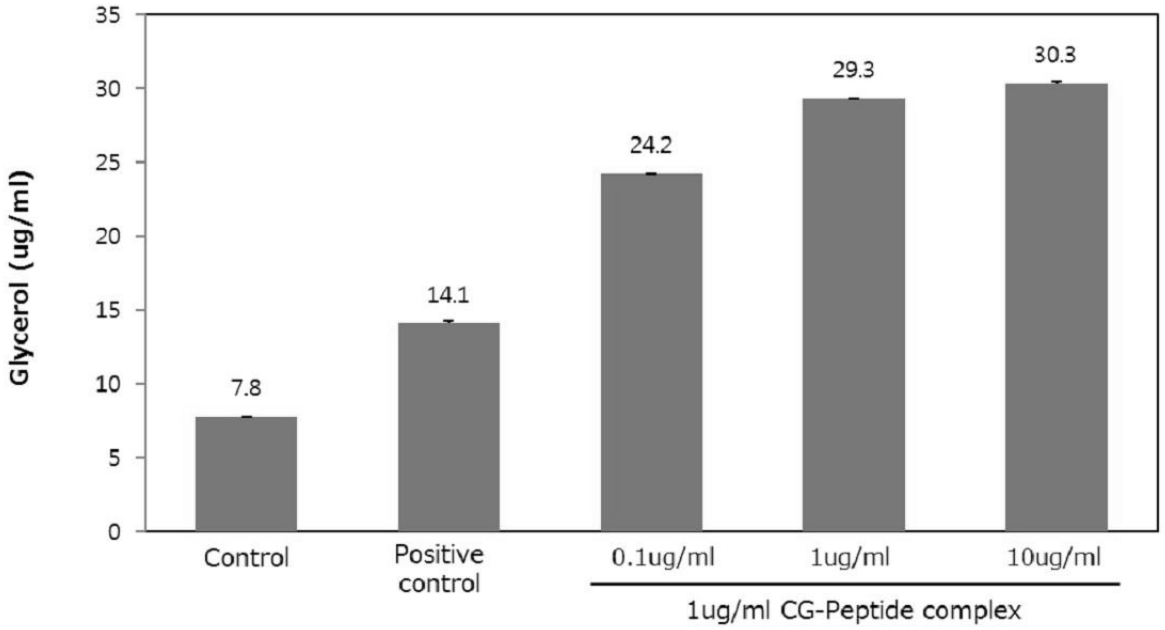

Glycerol (ug/ml)
35
30
25
20
15
10
5
0
7.8
14.1
24.2
29.3
30.3
Control
Positive control
0.1ug/ml
1ug/ml
10ug/ml
1ug/ml CG-Peptide complex

FIG. 9

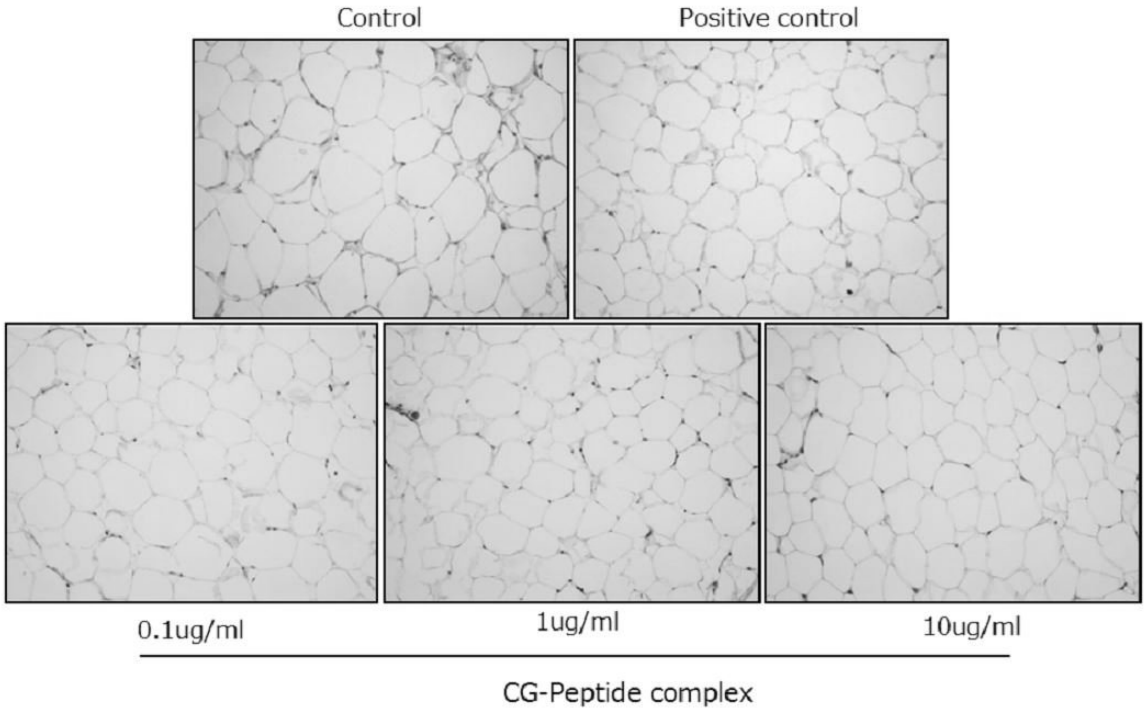

Control
Positive control
0.1ug/ml
1ug/ml
10ug/ml
CG-Peptide complex

FIG. 10A

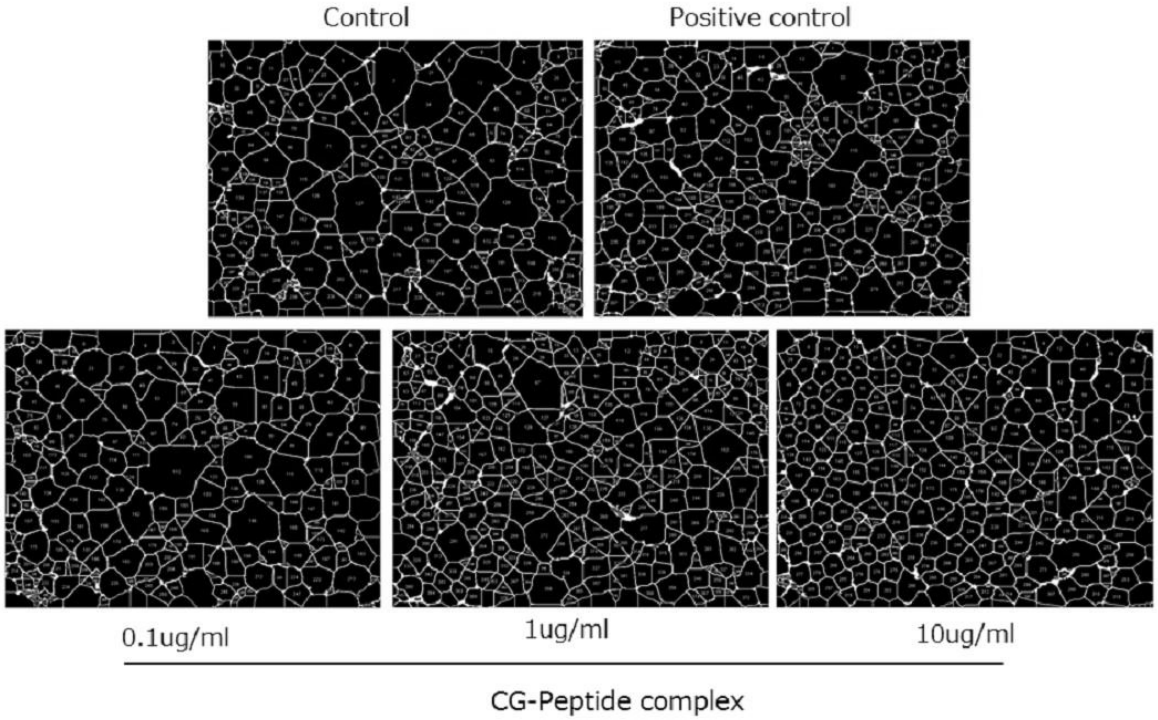

Control
Positive control
0.1ug/ml
1ug/ml
10ug/ml
CG-Peptide complex

FIG. 10B

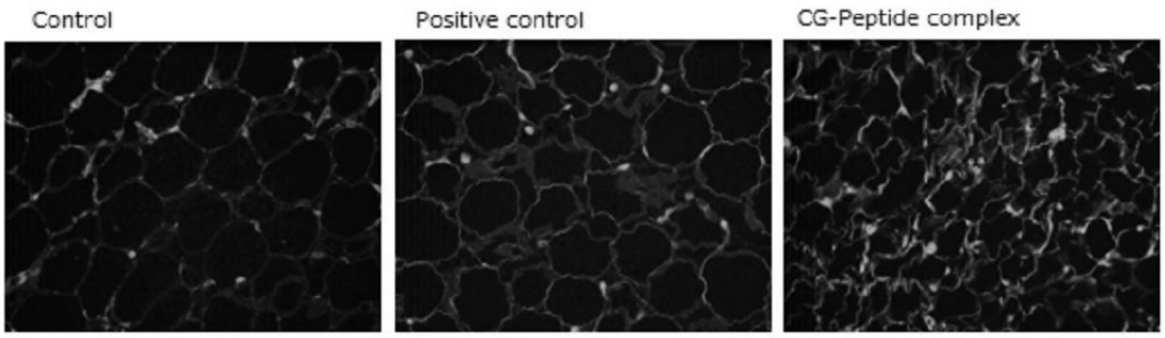


FIG. 11

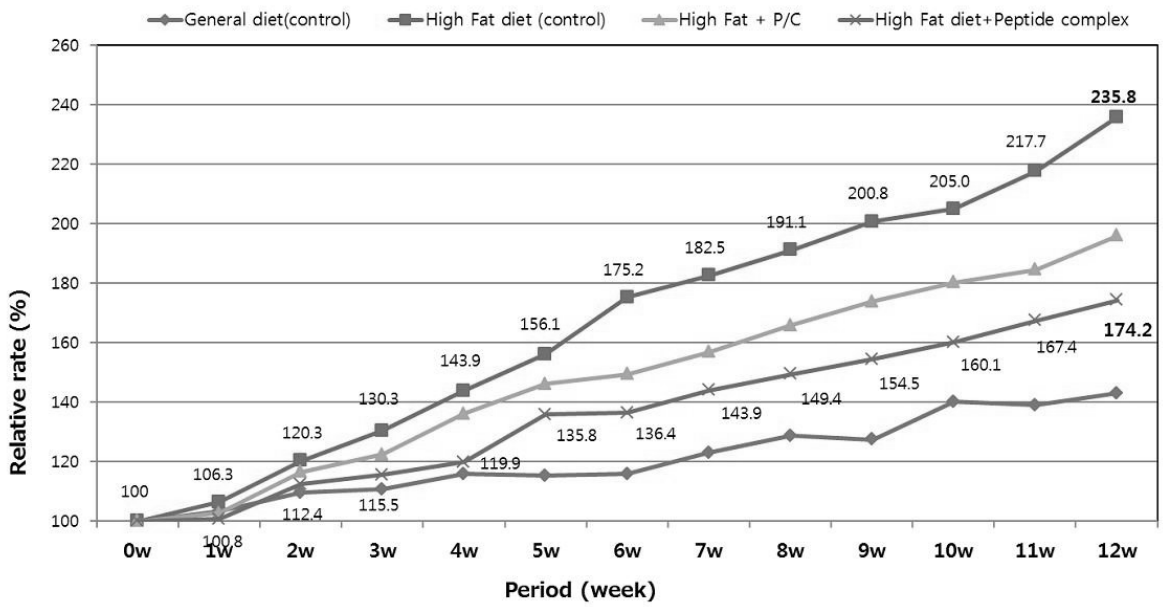

General diet(control)
High Fat diet (control)
High Fat + P/C
High Fat diet+Peptide complex
Relative rate (%)
Period (week)
0w
1w
2w
3w
4w
5w
6w
7w
8w
9w
10w
11w
12w
100
106.3
120.3
130.3
143.9
156.1
175.2
182.5
191.1
200.8
205.0
217.7
235.8
100
100.8
112.4
115.5
119.9
135.8
136.4
143.9
149.4
154.5
160.1
167.4
174.2

FIG. 12

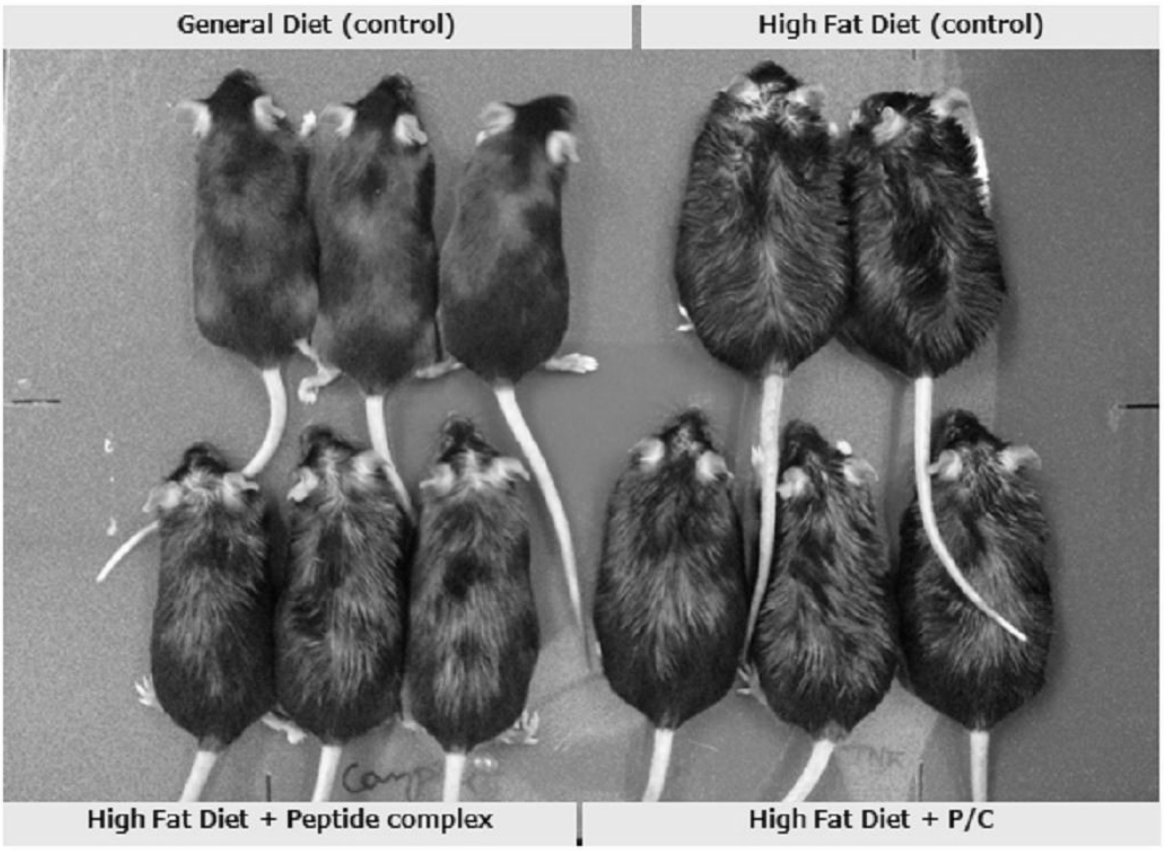
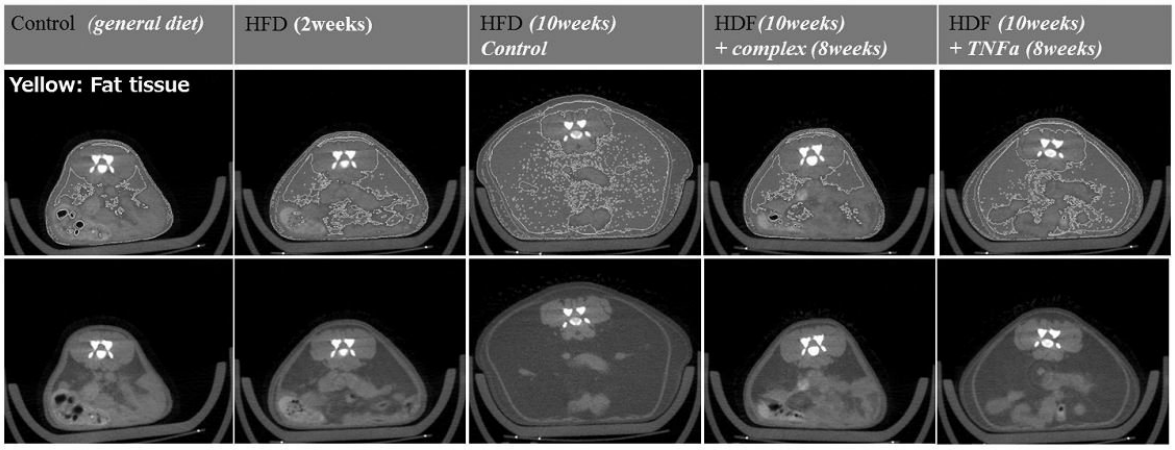
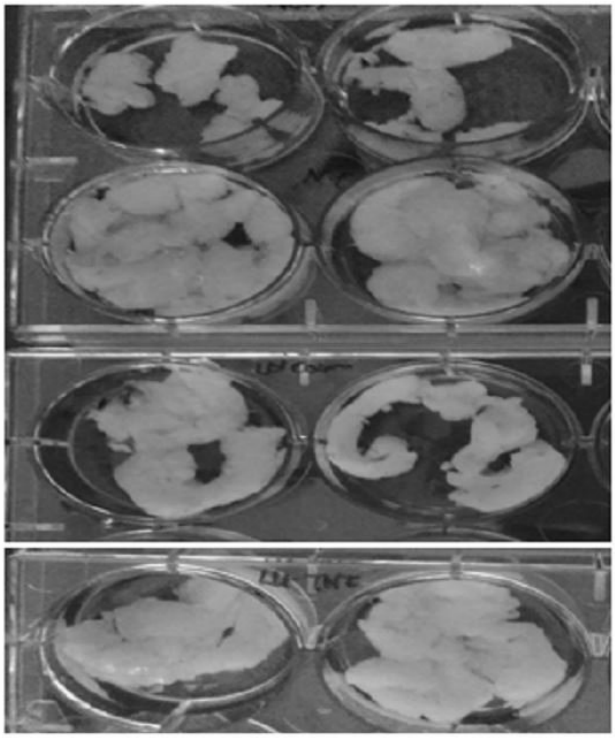

General Diet (control)
High Fat Diet (control)
High Fat Diet + Peptide complex
High Fat Diet + P/C

FIG. 13



	Total Volume(mm^3)	Total Fat(mm^3)	Visceral Fat(mm^3)	Subcutaneous Fat(mm^3)
Control (*general diet*)	4958.25	702.72	380.09	322.63
HFD(2weeks)	6530.09	2084.98	1411.14	673.84
HFD(10weeks)	12464.91	8014.03	5821.27	2192.76
HDF(10weeks) + complex (8weeks)	**6012.12**	**1391.75**	**871.15**	**520.60**
HDF(10weeks) + P.C (8weeks)	8240.67	4165.80	2833.72	1332.08

FIG. 14



General Diet (control)

High Fat Diet (control)

High Fat Diet + Peptide complex

High Fat Diet + P/C

FIG. 15

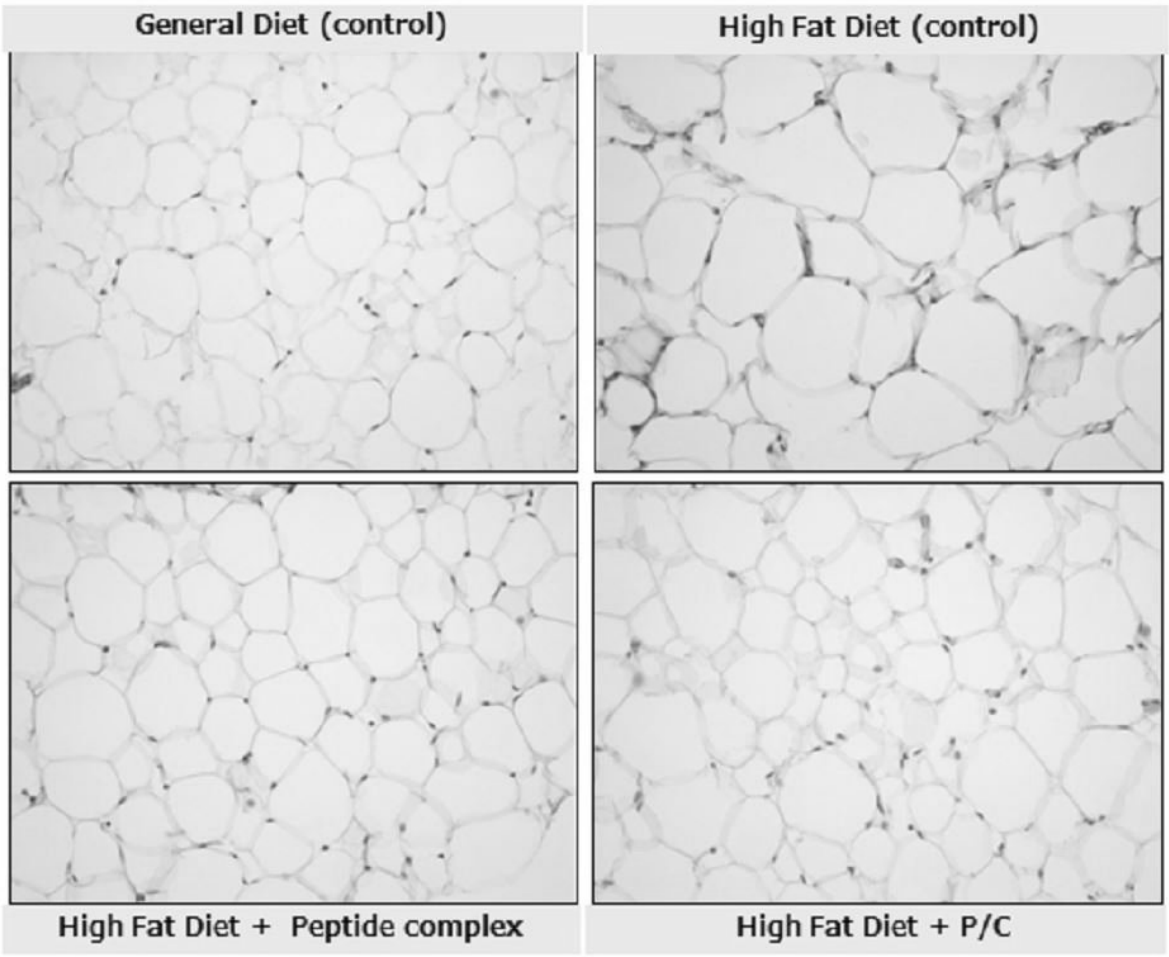

General Diet (control)
High Fat Diet (control)
High Fat Diet + Peptide complex
High Fat Diet + P/C

FIG. 16A

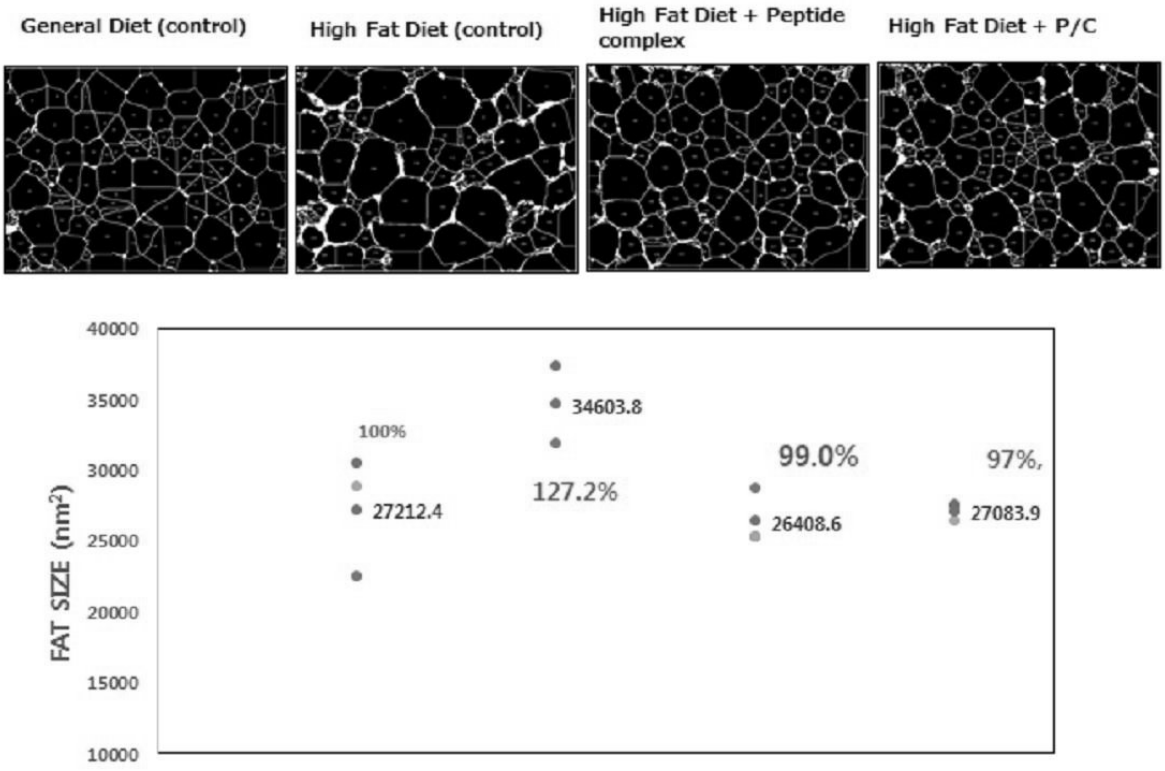

General Diet (control)
High Fat Diet (control)
High Fat Diet + Peptide complex
High Fat Diet + P/C
40000
35000
30000
25000
20000
15000
10000
FAT SIZE (nm²)
100%
27212.4
34603.8
127.2%
99.0%
26408.6
97%,
27083.9

FIG. 16B

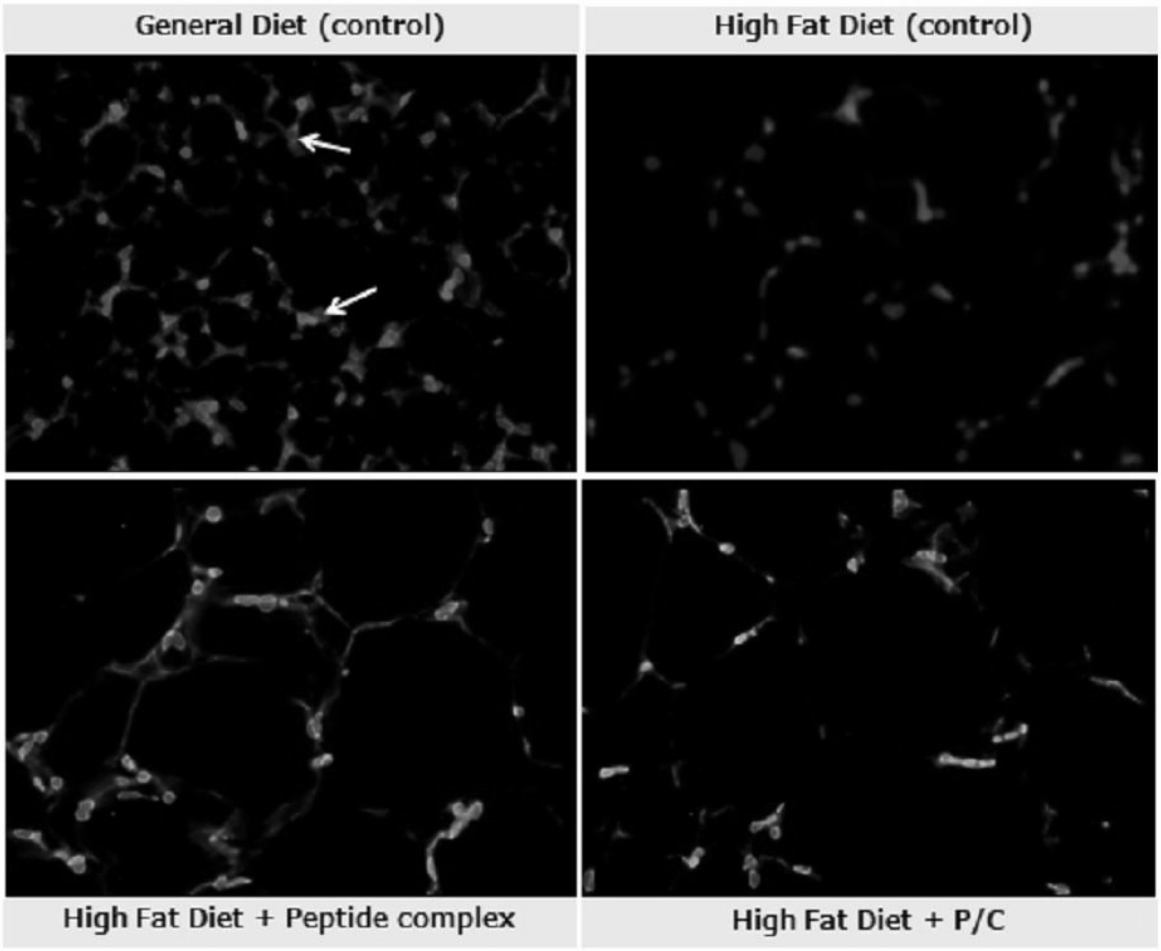

General Diet (control)
High Fat Diet (control)
High Fat Diet + Peptide complex
High Fat Diet + P/C

FIG. 17

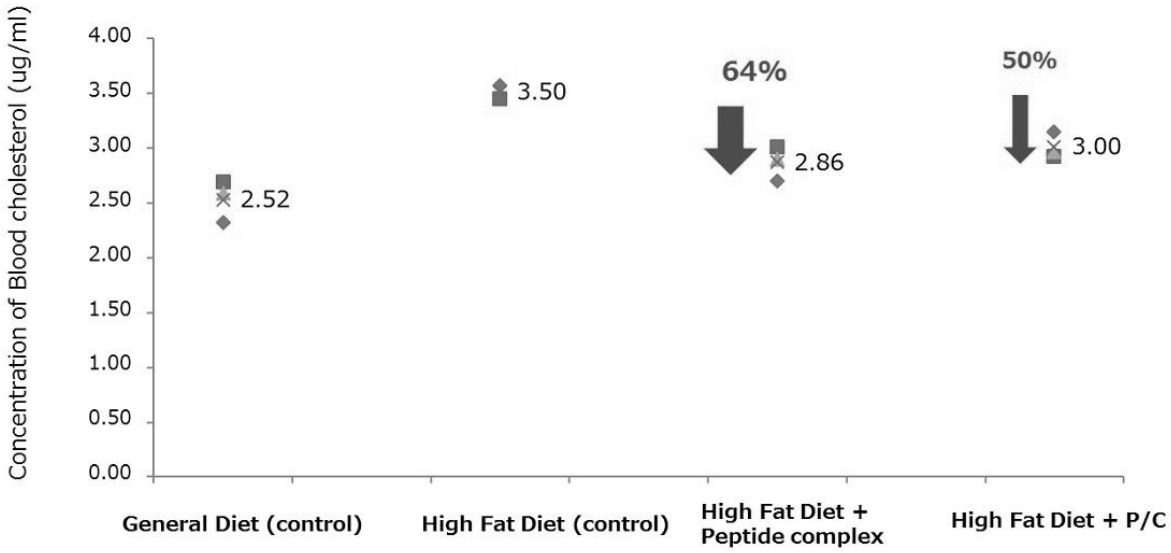

Concentration of Blood cholesterol (ug/ml)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
2.52
3.50
64%
2.86
50%
3.00
General Diet (control)
High Fat Diet (control)
High Fat Diet + Peptide complex
High Fat Diet + P/C

FIG. 18

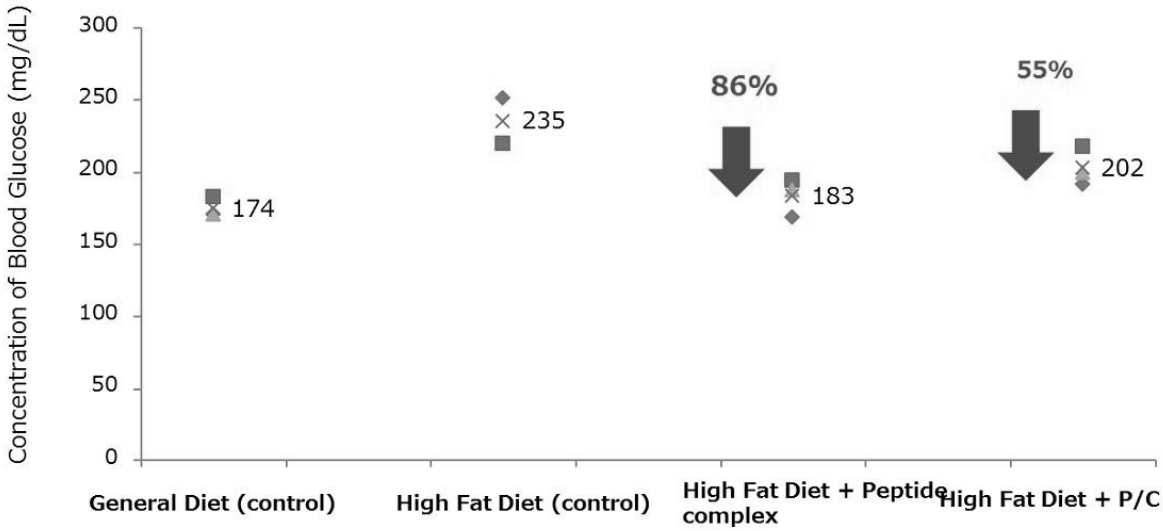

Concentration of Blood Glucose (mg/dL)
300
250
200
150
100
50
0
174
235
86%
183
55%
202
General Diet (control)
High Fat Diet (control)
High Fat Diet + Peptide complex
High Fat Diet + P/C

FIG. 19

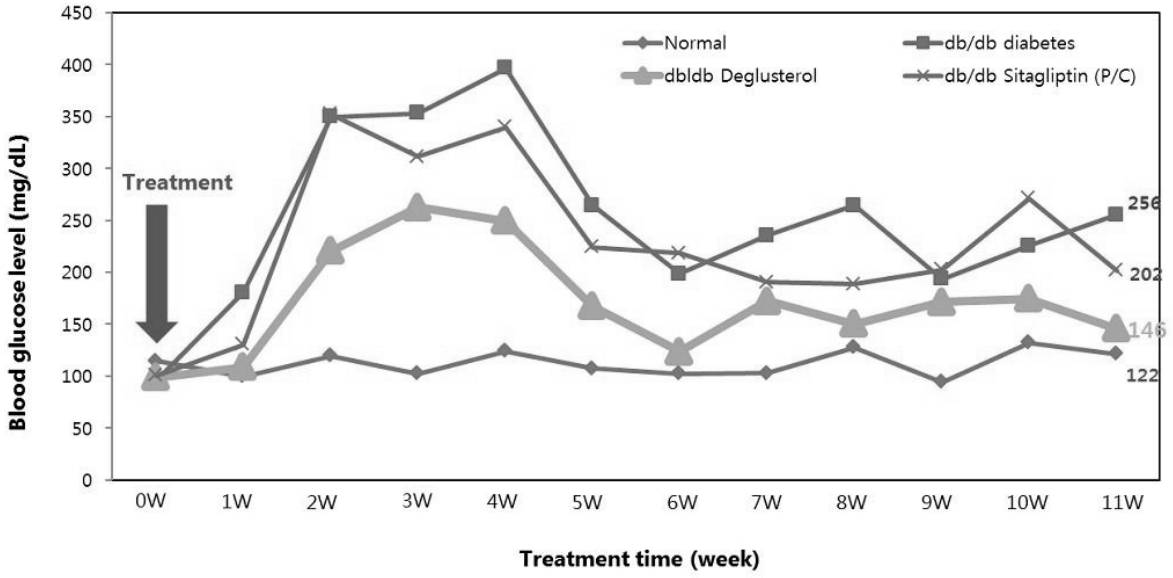

Normal
db/db diabetes
dbldb Deglusterol
db/db Sitagliptin (P/C)
Treatment
Blood glucose level (mg/dL)
450
400
350
300
250
200
150
100
50
0
0W
1W
2W
3W
4W
5W
6W
7W
8W
9W
10W
11W
Treatment time (week)
256
202
146
122

FIG. 20A

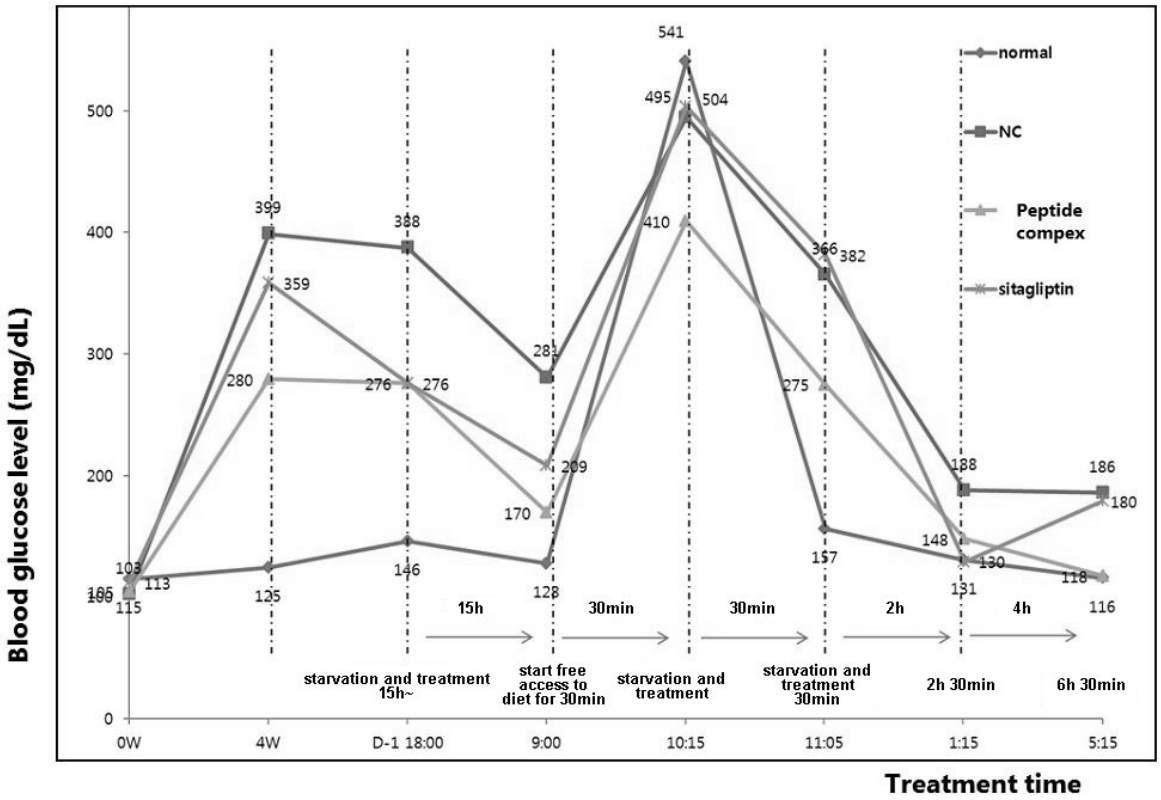

Blood glucose level (mg/dL)
Treatment time
normal
NC
Peptide compex
sitagliptin
starvation and treatment 15h~
start free access to diet for 30min
starvation and treatment
starvation and treatment 30min
2h 30min
6h 30min
15h
30min
30min
2h
4h
0W
4W
D-1 18:00
9:00
10:15
11:05
1:15
5:15

FIG. 20B

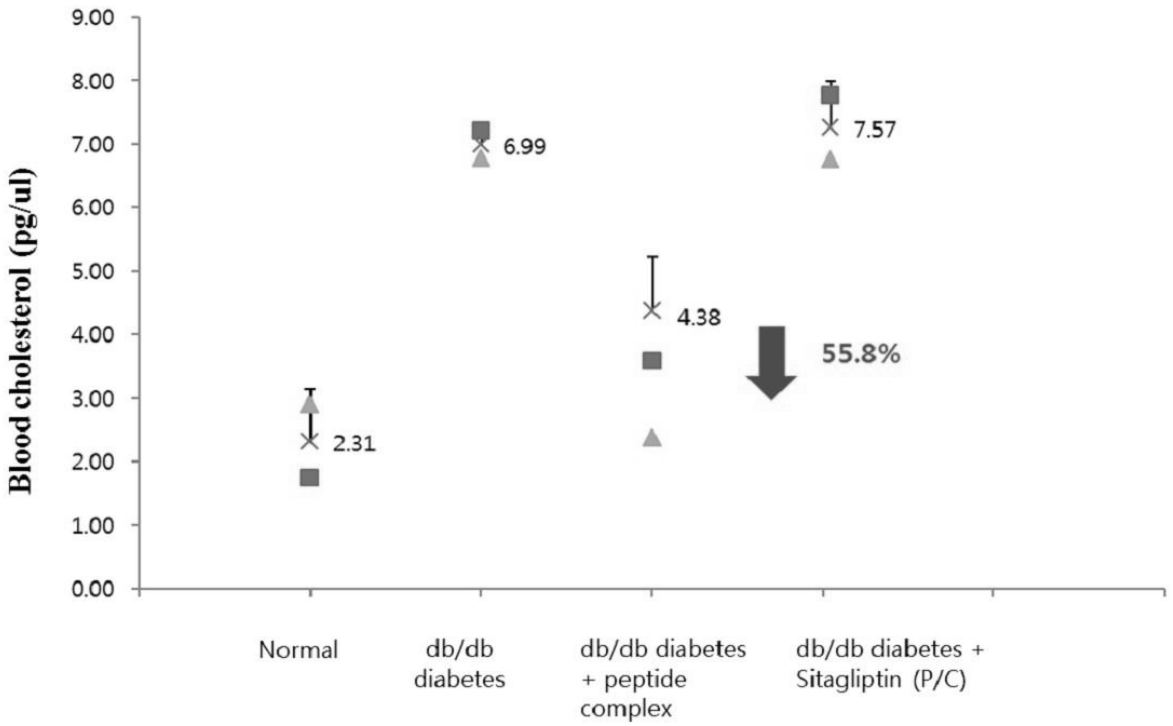

Blood cholesterol (pg/ul)
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
2.31
6.99
4.38
7.57
55.8%
Normal
db/db diabetes
db/db diabetes + peptide complex
db/db diabetes + Sitagliptin (P/C)

FIG. 21

blood sugar level (mg/dL)								
		fasting blood sugar level	intake and diet	30min post-meal	60min post-meal	120min post-meal	240min post-meal	300min post-meal
Normal	Normal	105		184	181	147	151	135
high fat diabetes	PBS	178		227	250	301	247	200
	peptide of SEQ ID NO: 1	172		212	225	163	147	145

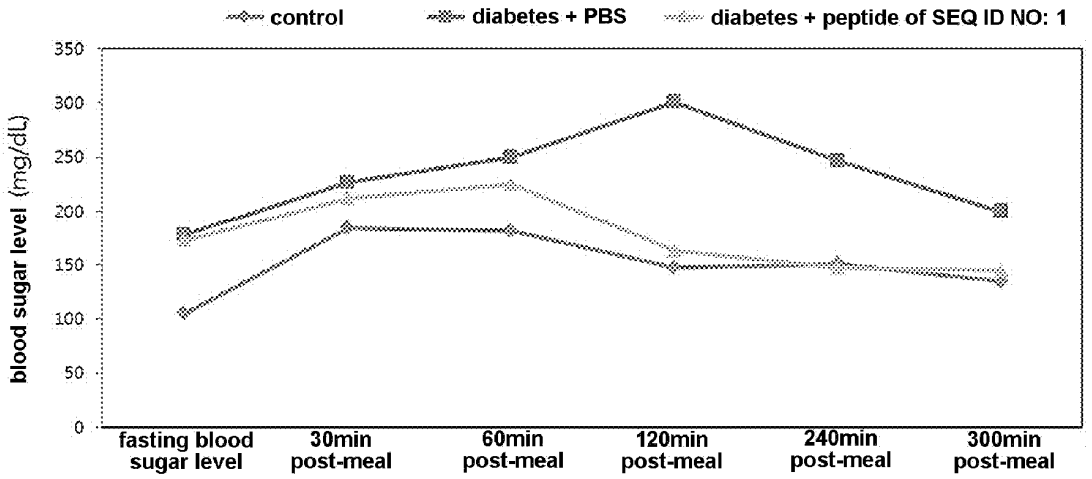


FIG. 22A

blood sugar level (mg/dL)								
		fasting blood suar level	intake and diet	30min post-meal	60min post-meal	120min post-meal	240min post-meal	300min post-meal
Normal	Normal	105		184	181	147	151	135
high fat diabetes	PBS	178		227	250	301	247	200
	peptide of SEQ ID NO: 2	181		219	231	174	158	152

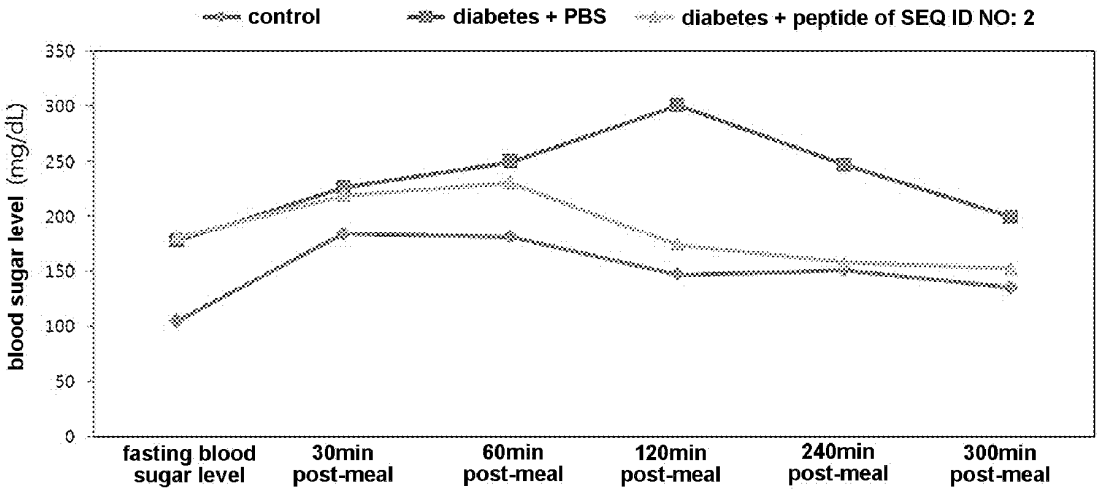


FIG. 22B

blood sugar level (mg/dL)								
		fasting blood sugar level	intake and diet	30min post-meal	60min post-meal	120min post-meal	240min post-meal	300min post-meal
Normal	Normal	105		184	181	147	151	135
high fat diabetes	PBS	178		227	250	301	247	200
	peptide of SEQ ID NO: 3	165		220	231	198	172	166

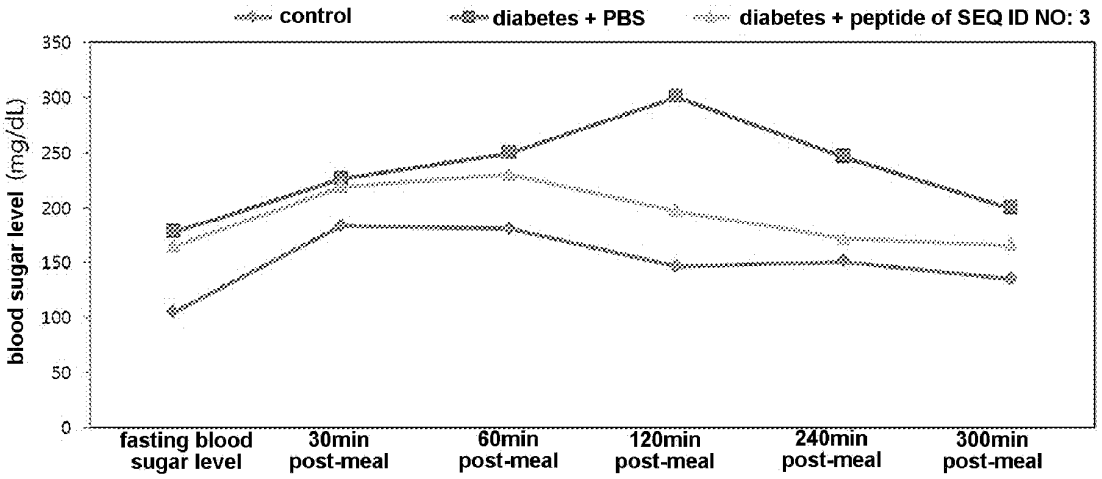


FIG. 22C

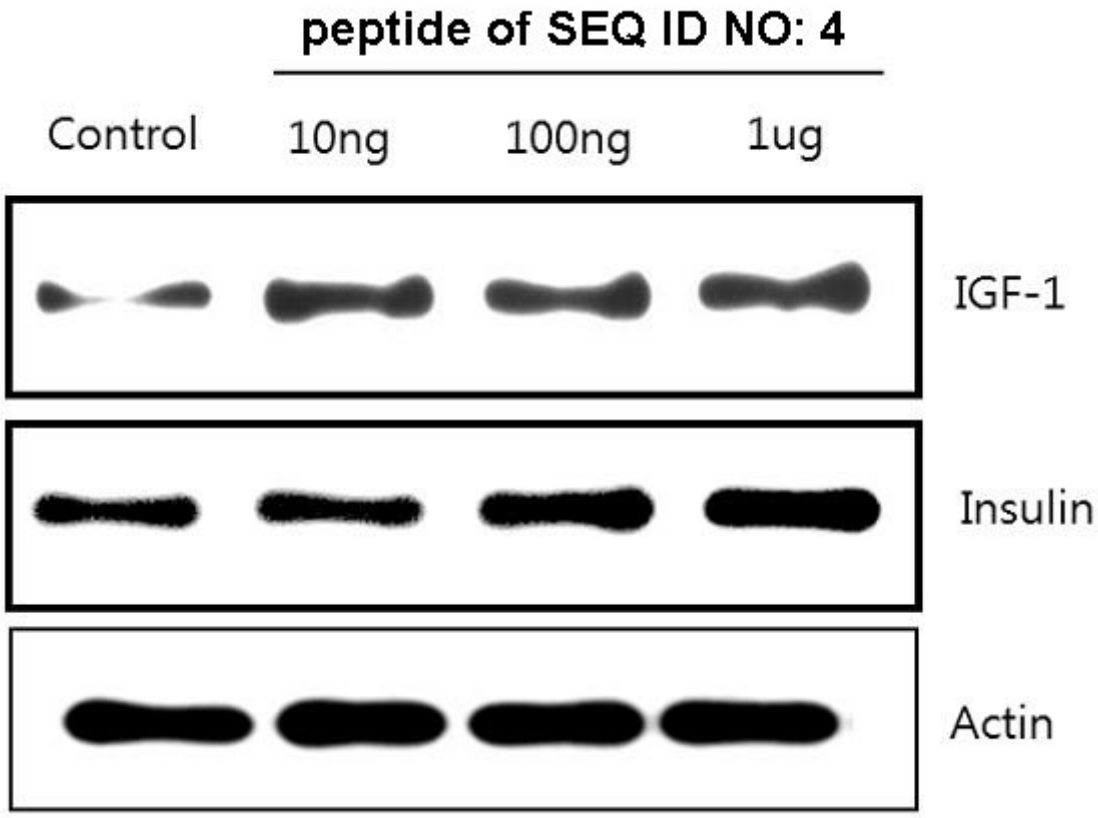

peptide of SEQ ID NO: 4
Control
10ng
100ng
1ug
IGF-1
Insulin
Actin

FIG. 23

blood sugar level (mg/dL)								
		fasting blood sugar level	intake and diet	30min post-meal	60min post-meal	120min post-meal	240min post-meal	300min post-meal
Normal	Normal	105		184	181	147	151	135
high fat diabetes	PBS	178		227	250	301	247	200
	peptide of SEQ ID NO: 3	185		219	223	171	169	163

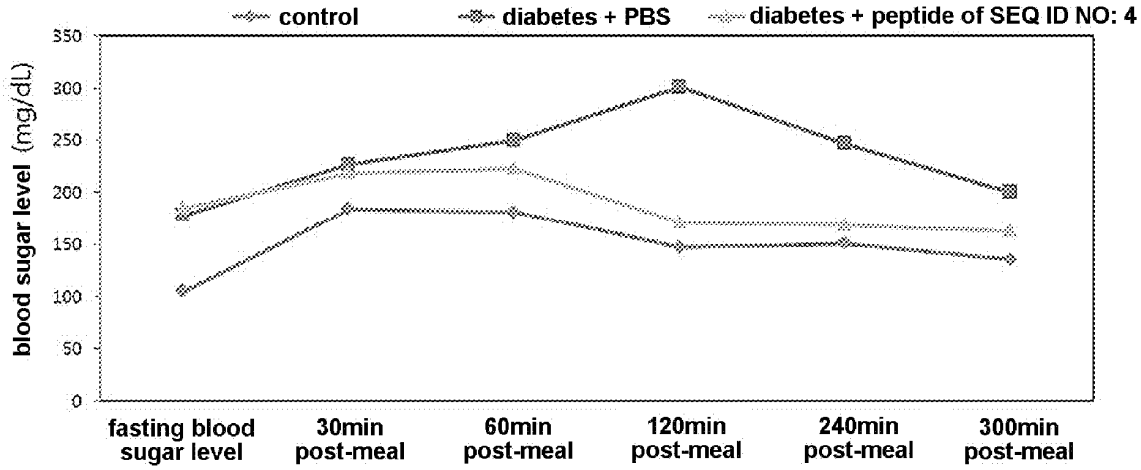


FIG. 24

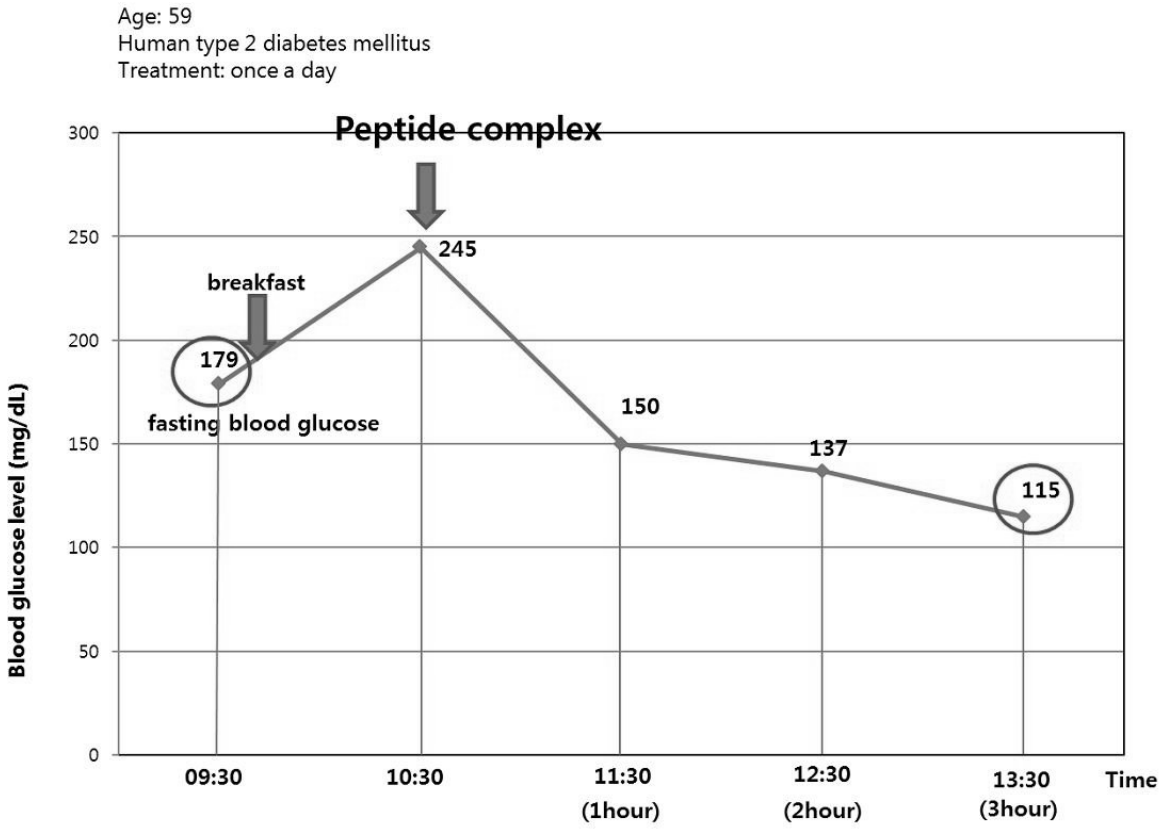

Age: 59
Human type 2 diabetes mellitus
Treatment: once a day
Peptide complex
breakfast
179
fasting blood glucose
245
150
137
115
Blood glucose level (mg/dL)
300
250
200
150
100
50
0
09:30
10:30
11:30
(1hour)
12:30
(2hour)
13:30
(3hour)
Time

FIG. 25A

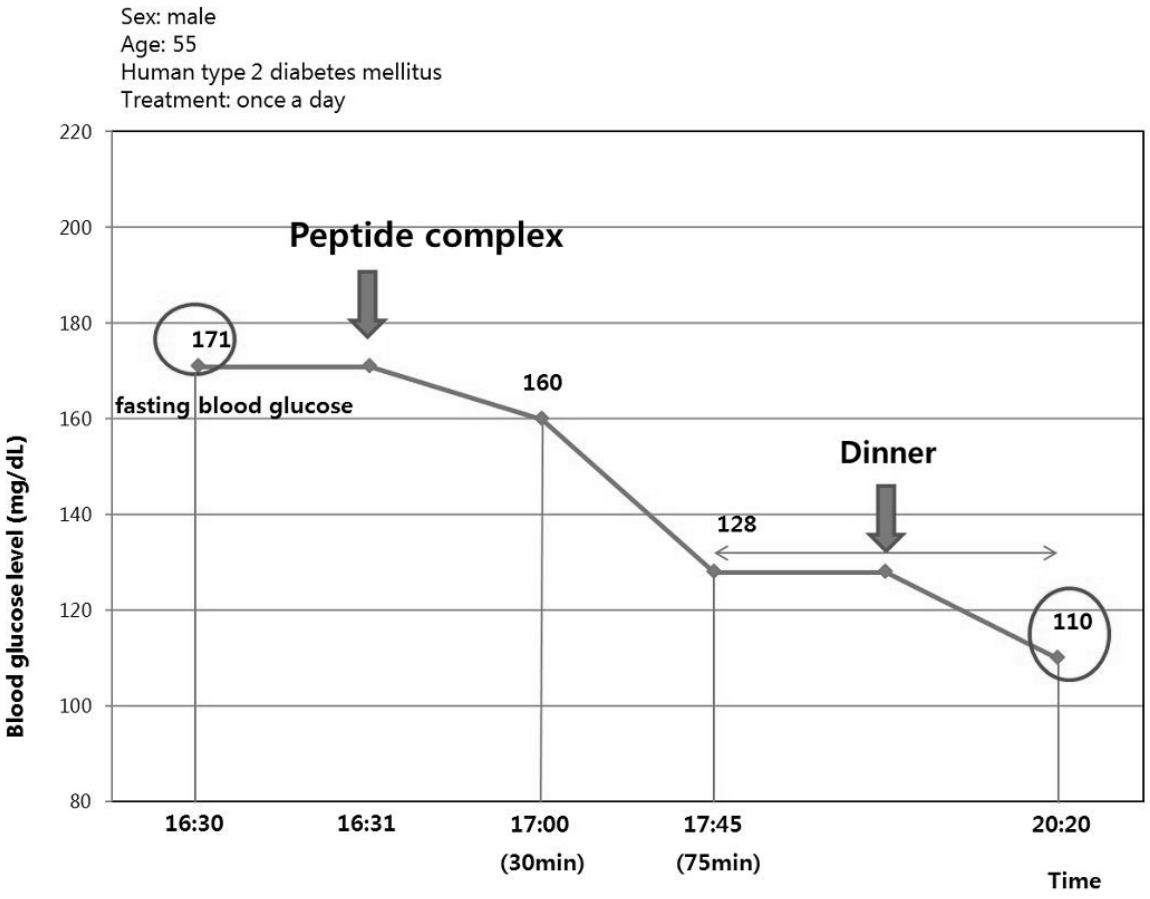

Sex: male
Age: 55
Human type 2 diabetes mellitus
Treatment: once a day
Peptide complex
171
fasting blood glucose
160
Dinner
128
110
Blood glucose level (mg/dL)
220
200
180
160
140
120
100
80
16:30
16:31
17:00
(30min)
17:45
(75min)
20:20
Time

FIG. 25B

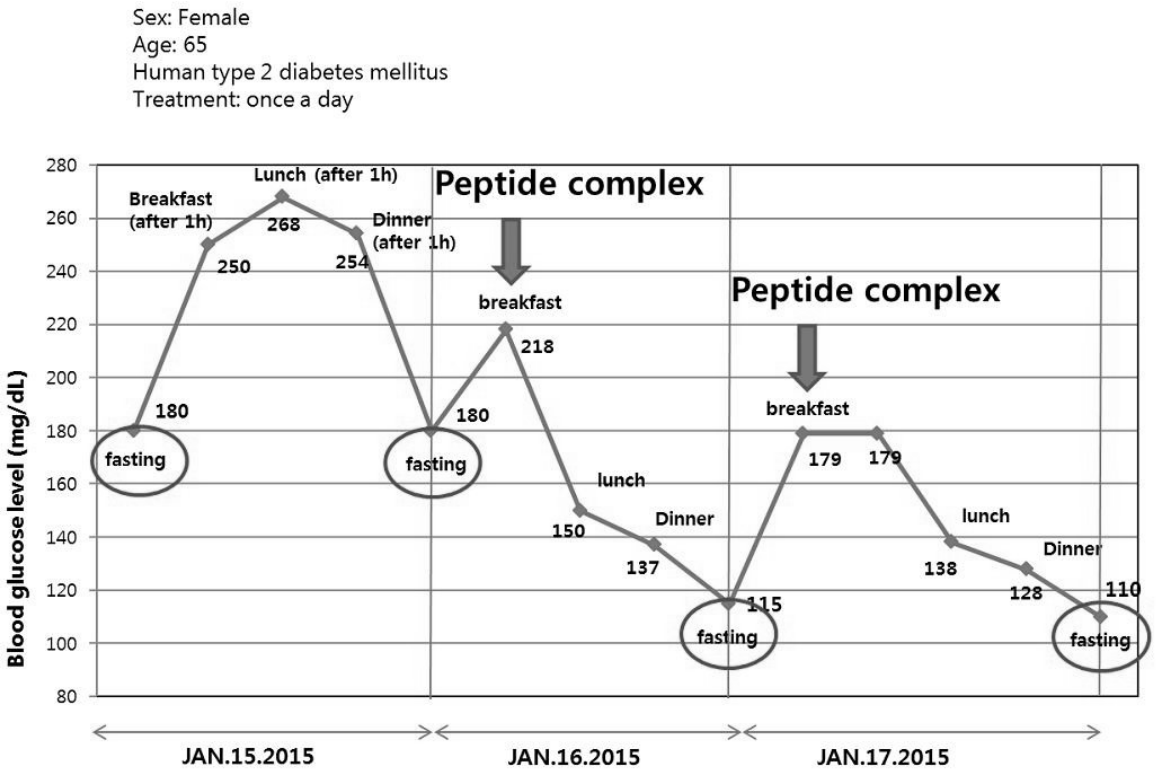

Sex: Female
Age: 65
Human type 2 diabetes mellitus
Treatment: once a day
Blood glucose level (mg/dL)
280
260
240
220
200
180
160
140
120
100
80
Breakfast (after 1h)
Lunch (after 1h)
Dinner (after 1h)
Peptide complex
Peptide complex
breakfast
lunch
Dinner
fasting
180
250
268
254
180
218
150
137
115
179
179
138
128
110
JAN.15.2015
JAN.16.2015
JAN.17.2015

FIG. 25C

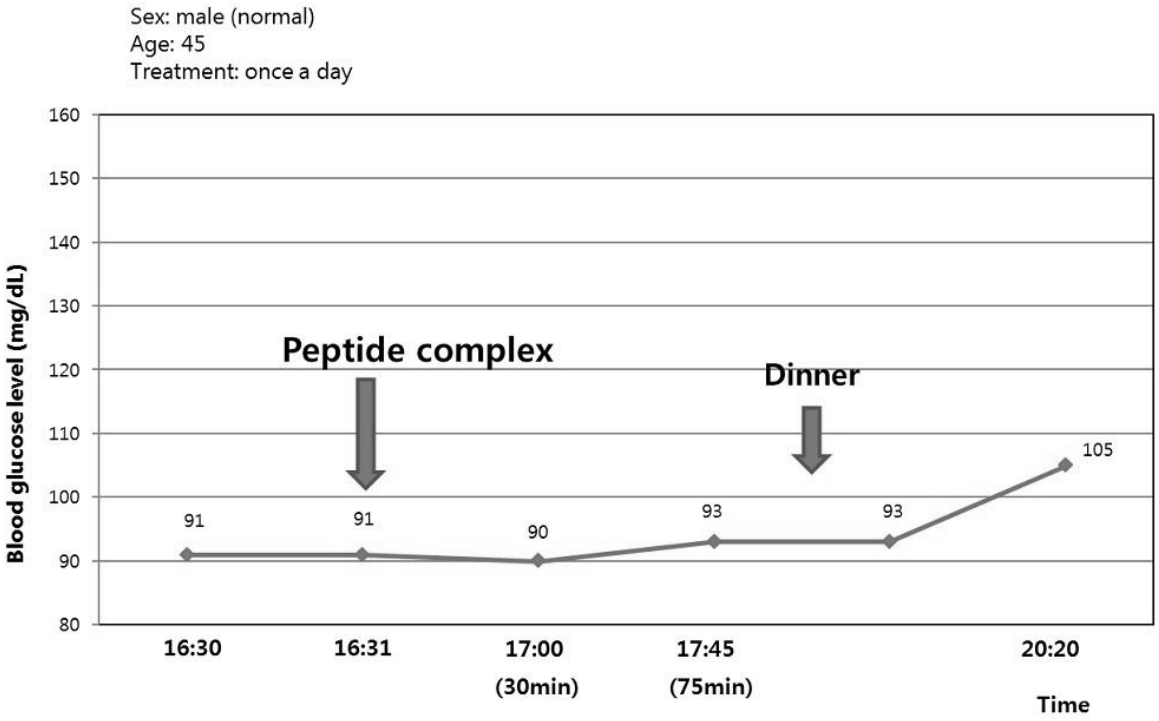

Sex: male (normal)
Age: 45
Treatment: once a day
Blood glucose level (mg/dL)
160
150
140
130
120
110
100
90
80
Peptide complex
Dinner
91
91
90
93
93
105
16:30
16:31
17:00
(30min)
17:45
(75min)
20:20
Time

FIG. 25D

SEQUENCE LISTING

<110> CAREGEN CO., LTD.

<120> Peptides having Anti-obesity and Anti-Diabetes Effects and Use Thereof

<130> 2017OPA9781

<160> 17

<170> KopatentIn 2.0

<210> 1
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<213> Artificial Sequence

<220>
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<400> 1
Leu Lys Thr Arg Asn
1 5

<210> 2
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<220>
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<210> 3
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<210> 6
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<210> 11
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<220>
<223> AMPK-a1 R

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<210> 16
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<210> 17
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