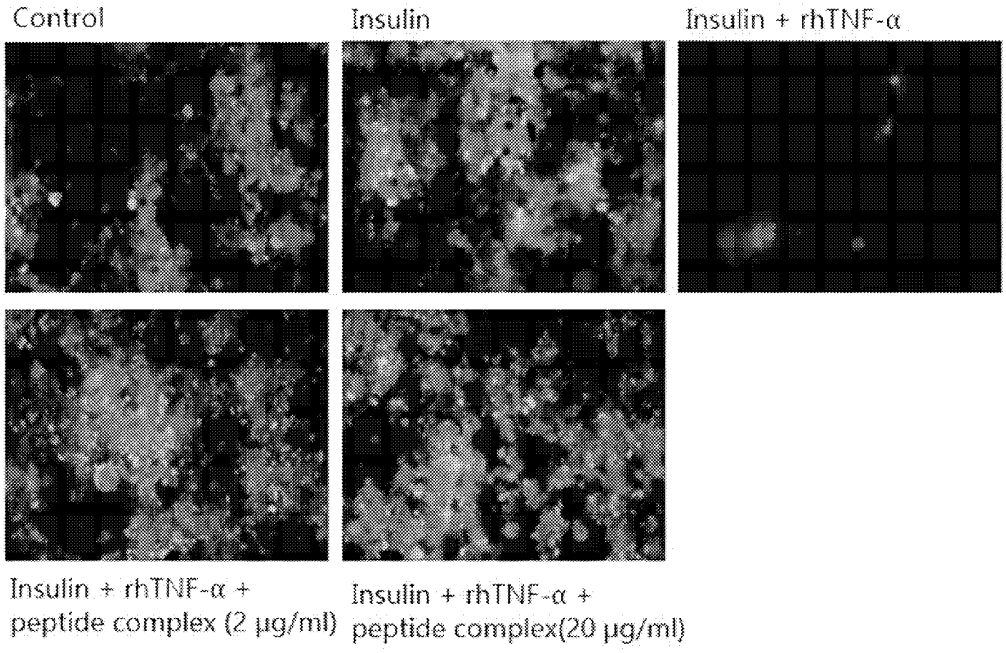
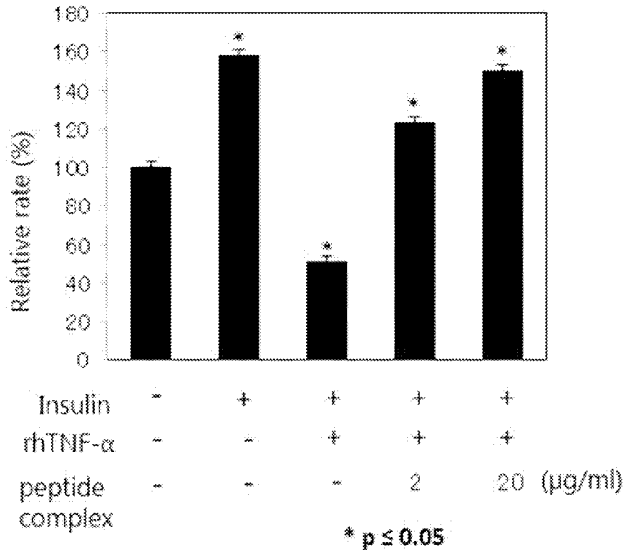
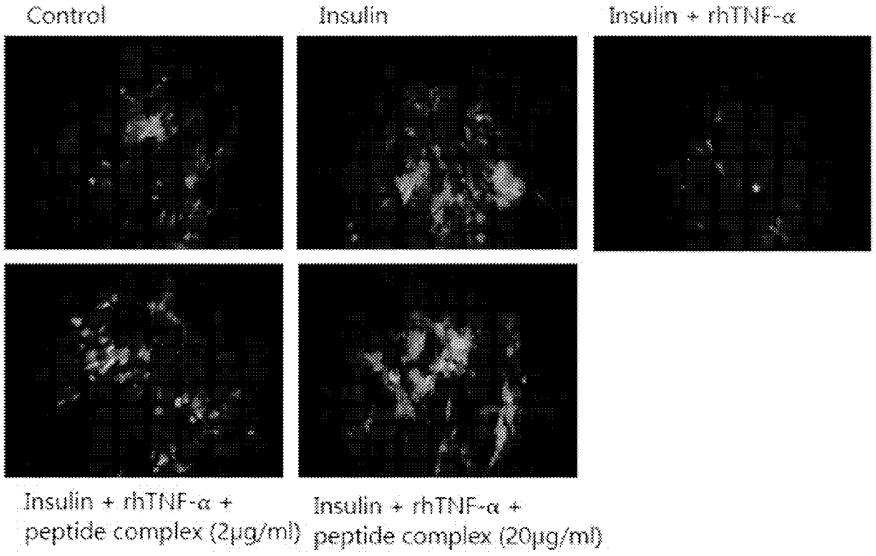
[도1a]


Control
Insulin
Insulin + rhTNF-α
Insulin + rhTNF-α + peptide complex (2 μg/ml)
Insulin + rhTNF-α + peptide complex(20 μg/ml)

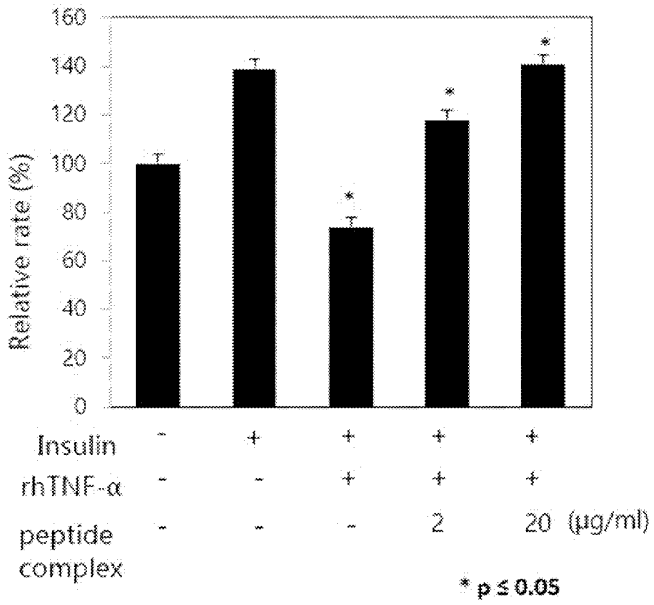
[도1b]


Relative rate (%)
180
160
140
120
100
80
60
40
20
0
Insulin - + + + +
rhTNF-α - - + + +
peptide complex - - - 2 20 (μg/ml)
* p ≤ 0.05

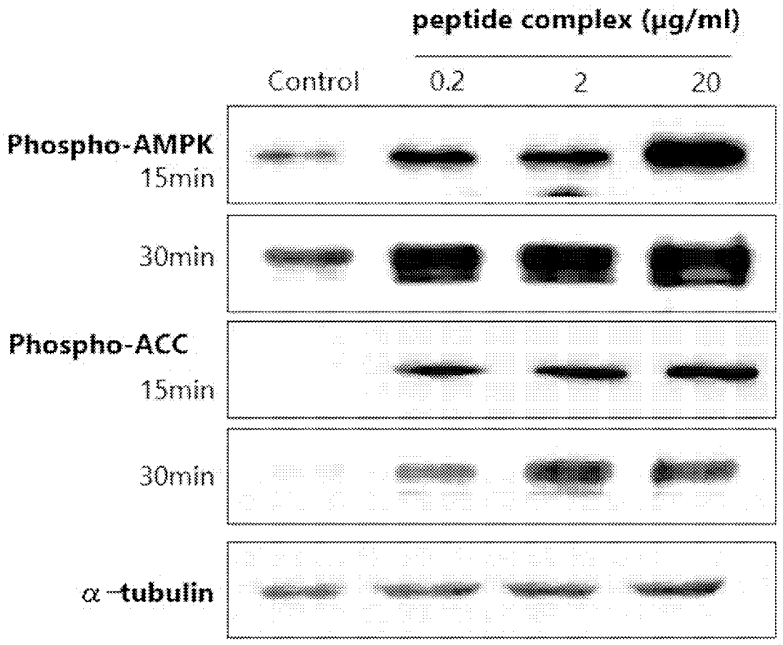
[도2a]


Control
Insulin
Insulin + rhTNF-α
Insulin + rhTNF-α + peptide complex (2μg/ml)
Insulin + rhTNF-α + peptide complex (20μg/ml)

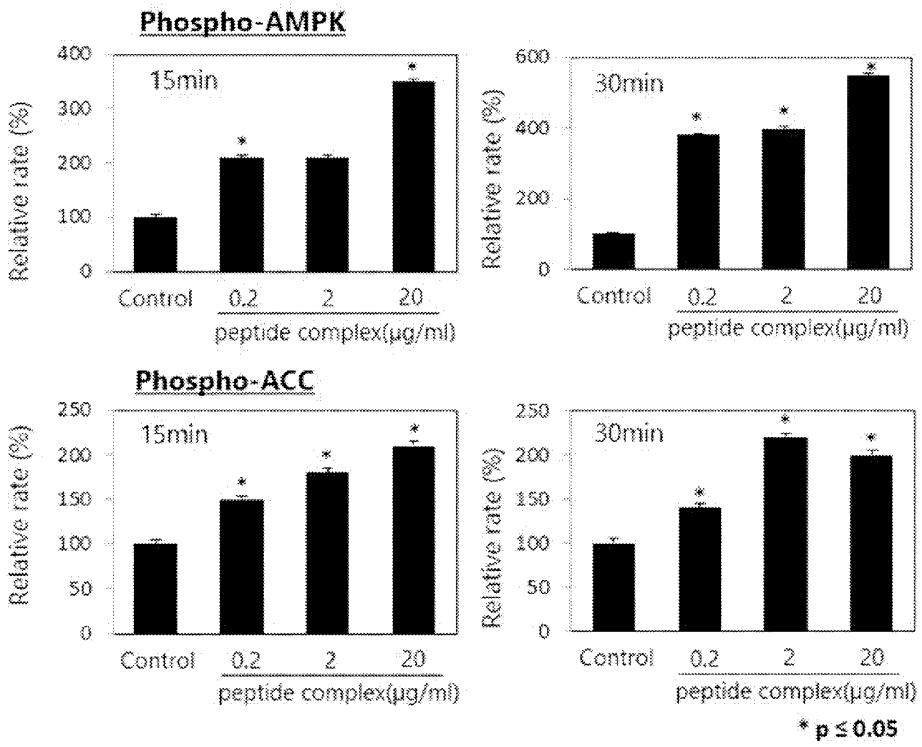
[도2b]


Relative rate (%)
160
140
120
100
80
60
40
20
0
Insulin - + + + +
rhTNF-α - - + + +
peptide complex - - - 2 20 (μg/ml)
* p ≤ 0.05

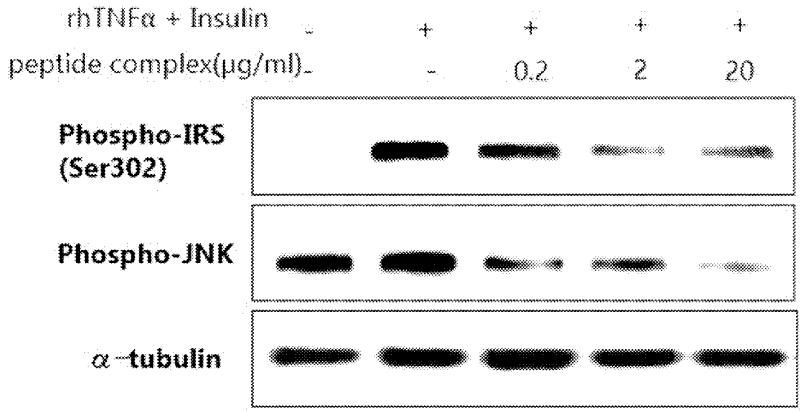
[도3a]


peptide complex (μg/ml)
Control
0.2
2
20
Phospho-AMPK
15min
30min
Phospho-ACC
15min
30min
α-tubulin

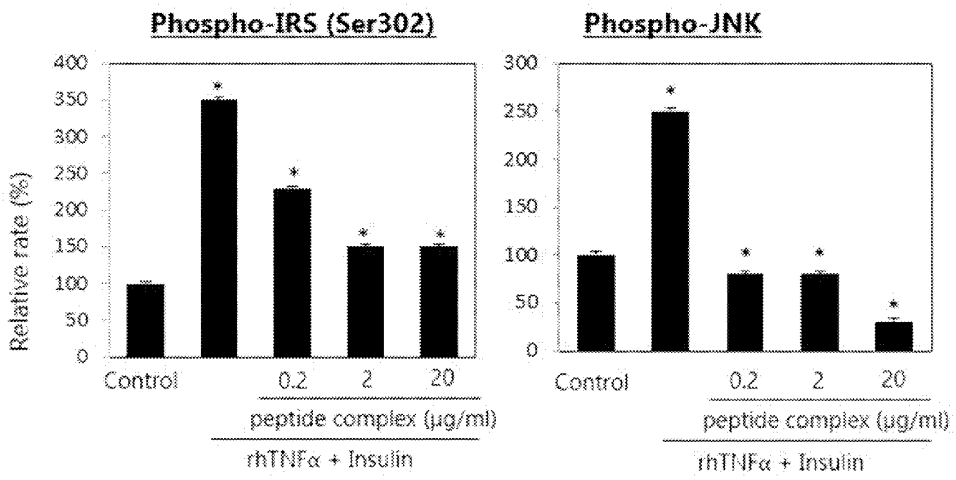
[도3b]


Phospho-AMPK
15min
30min
Phospho-ACC
15min
30min
Relative rate (%)
Control
0.2
2
20
peptide complex(μg/ml)
* p ≤ 0.05

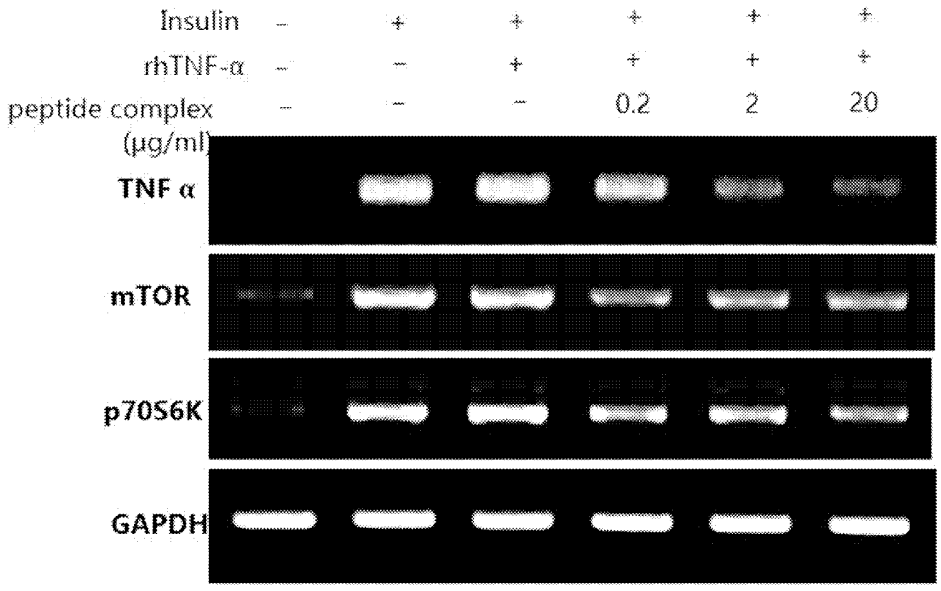
[도4a]


rhTNFα + Insulin - + + + +
peptide complex(μg/ml) - - 0.2 2 20
Phospho-IRS (Ser302)
Phospho-JNK
α-tubulin

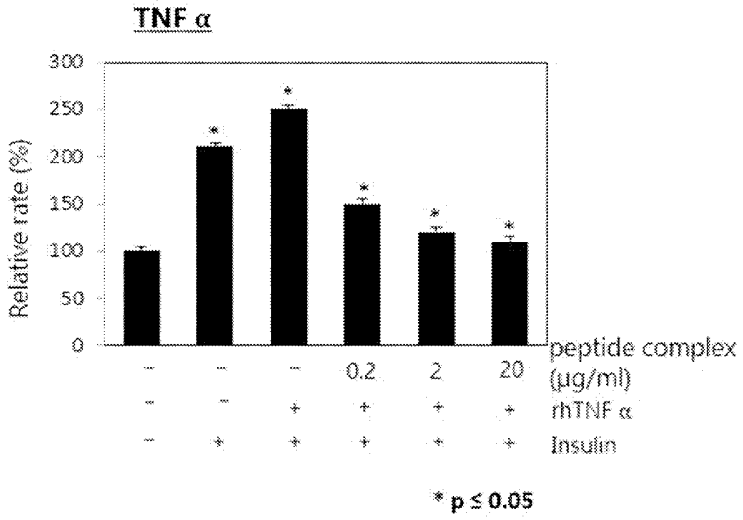
[도4b]


Phospho-IRS (Ser302)
Phospho-JNK
Relative rate (%)
Control
0.2
2
20
peptide complex (μg/ml)
rhTNFα + Insulin
* p ≤ 0.05

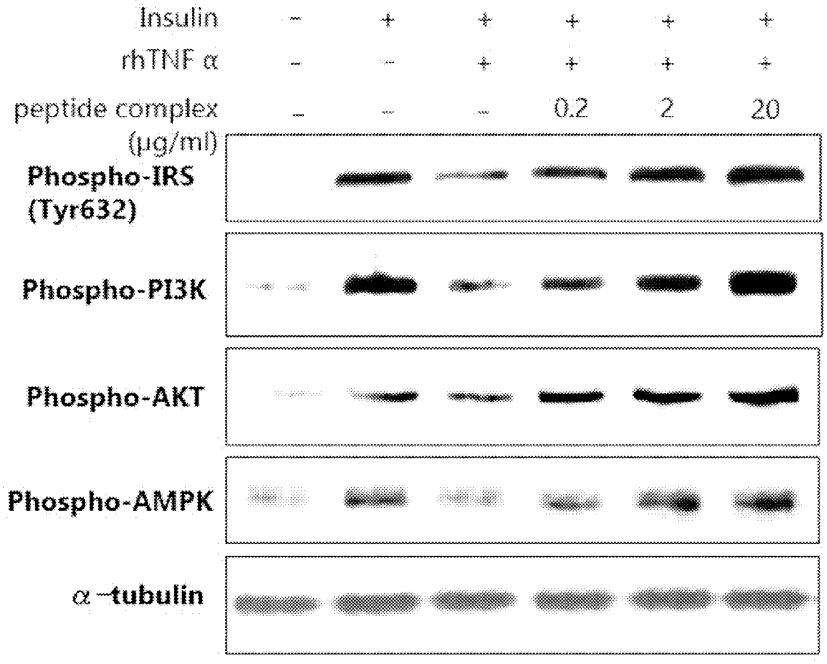
[도5a]


Insulin - + + + + +
rhTNF-α - - + + + +
peptide complex (μg/ml) - - - 0.2 2 20
TNF α
mTOR
p70S6K
GAPDH

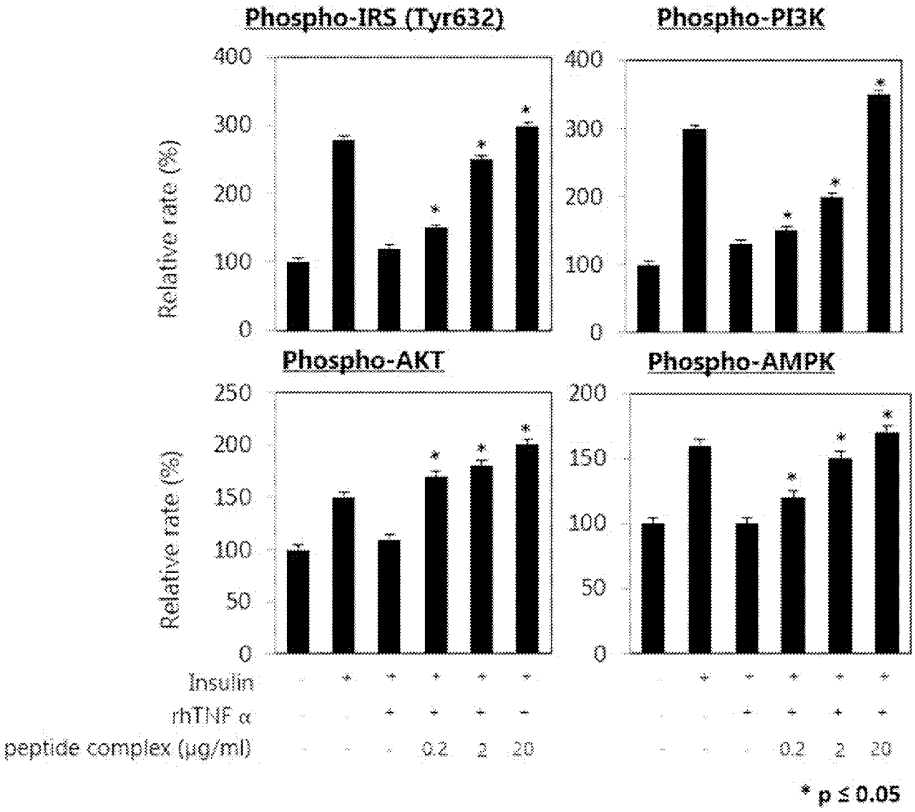
[도5b]


TNF α
Relative rate (%)
300
250
200
150
100
50
0
peptide complex (μg/ml)
rhTNF α
Insulin
0.2
2
20
* p ≤ 0.05

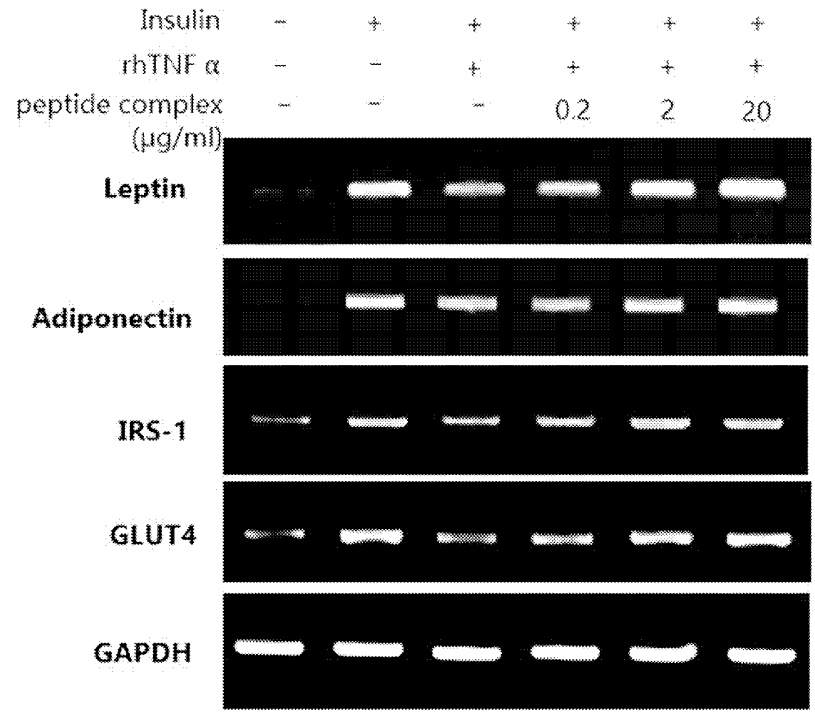
[도6a]


Insulin
rhTNF α
peptide complex (μg/ml)
0.2
2
20
Phospho-IRS (Tyr632)
Phospho-PI3K
Phospho-AKT
Phospho-AMPK
α-tubulin

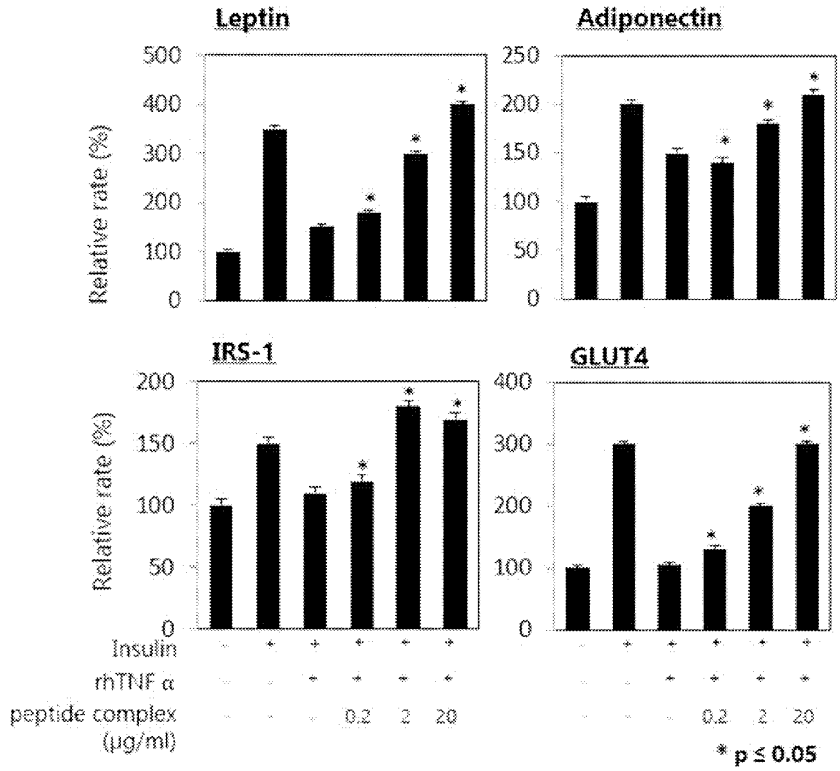
[도6b]


Phospho-IRS (Tyr632)
Phospho-PI3K
Phospho-AKT
Phospho-AMPK
Relative rate (%)
Insulin
rhTNF α
peptide complex (μg/ml)
0.2
2
20
* p ≤ 0.05

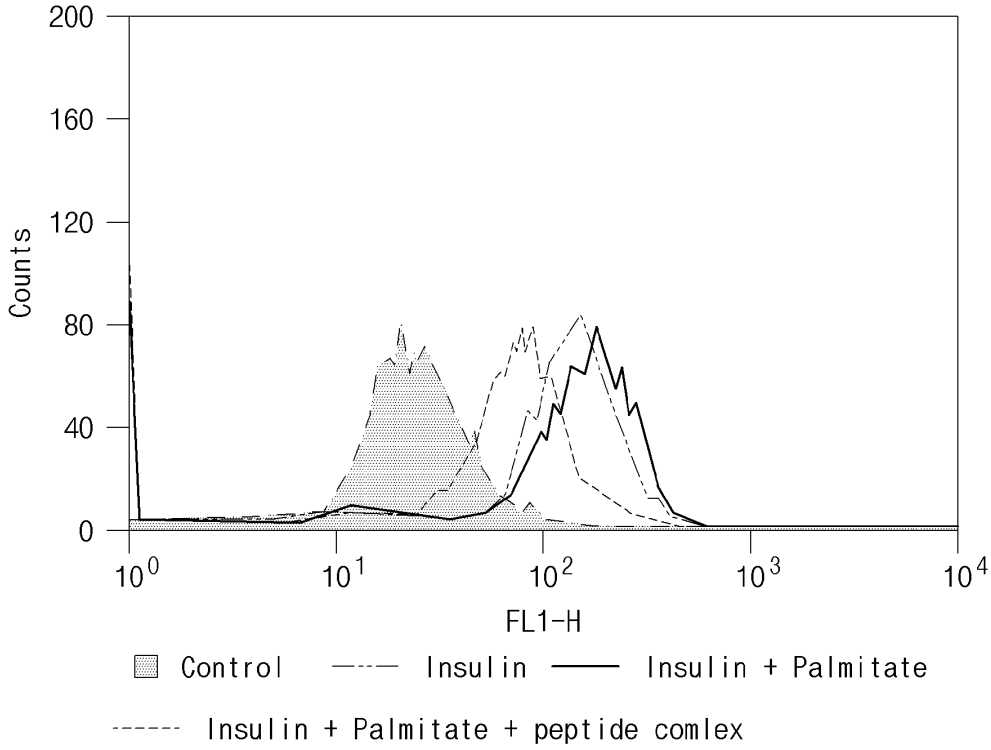
[도7a]


Insulin
rhTNF α
peptide complex (μg/ml)
0.2
2
20
Leptin
Adiponectin
IRS-1
GLUT4
GAPDH

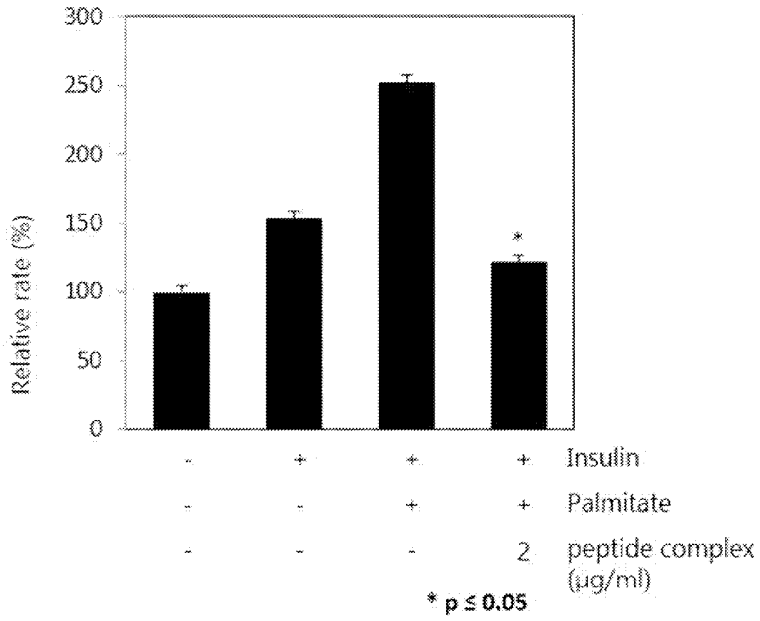
[도7b]


Leptin
Adiponectin
IRS-1
GLUT4
Relative rate (%)
Insulin
rhTNF α
peptide complex (μg/ml)
0.2
2
20
* p ≤ 0.05

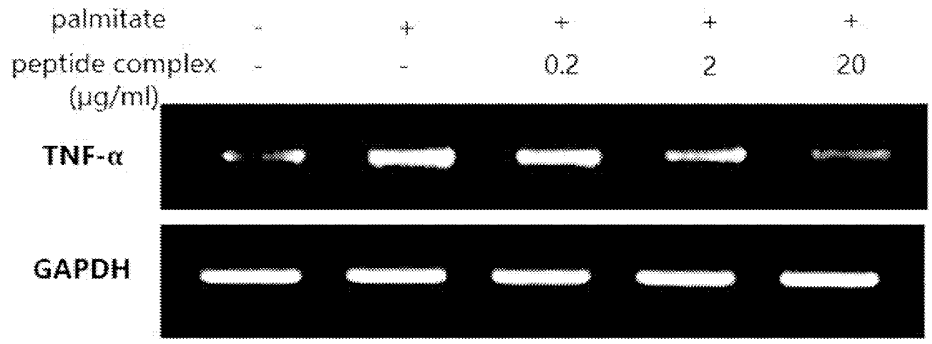
[도8a]


Counts
FL1-H
Control
Insulin
Insulin + Palmitate
Insulin + Palmitate + peptide comlex

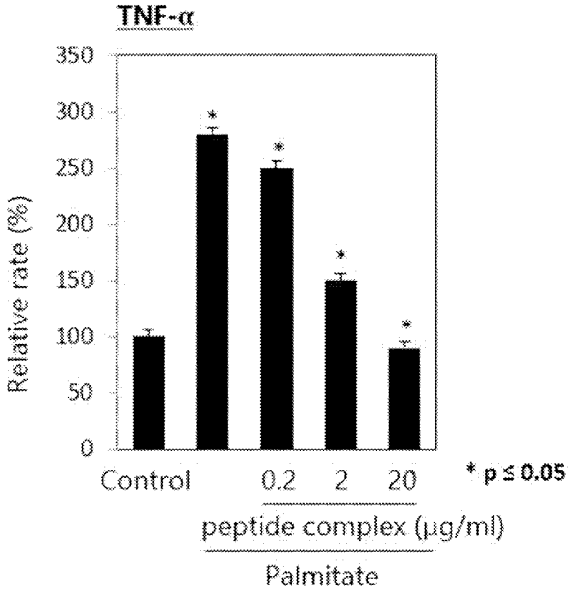
[도8b]


300
250
200
150
100
50
0
Relative rate (%)
*
- + + + Insulin
- - + + Palmitate
- - - 2 peptide complex (μg/ml)
* p ≤ 0.05

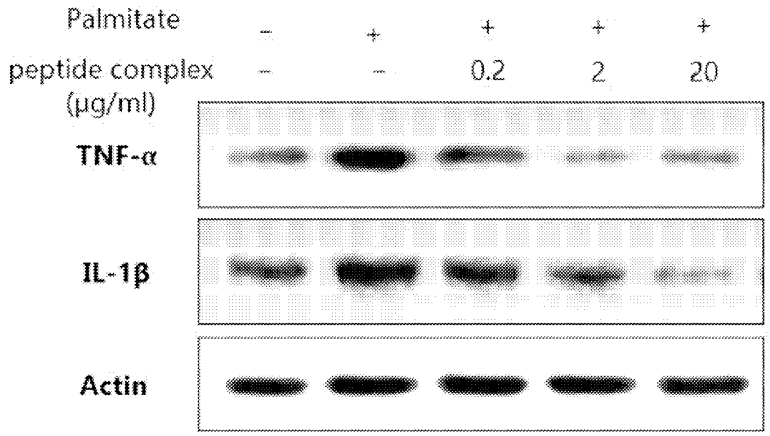
[도9a]


palmitate - + + + +
peptide complex (μg/ml) - - 0.2 2 20
TNF-α
GAPDH

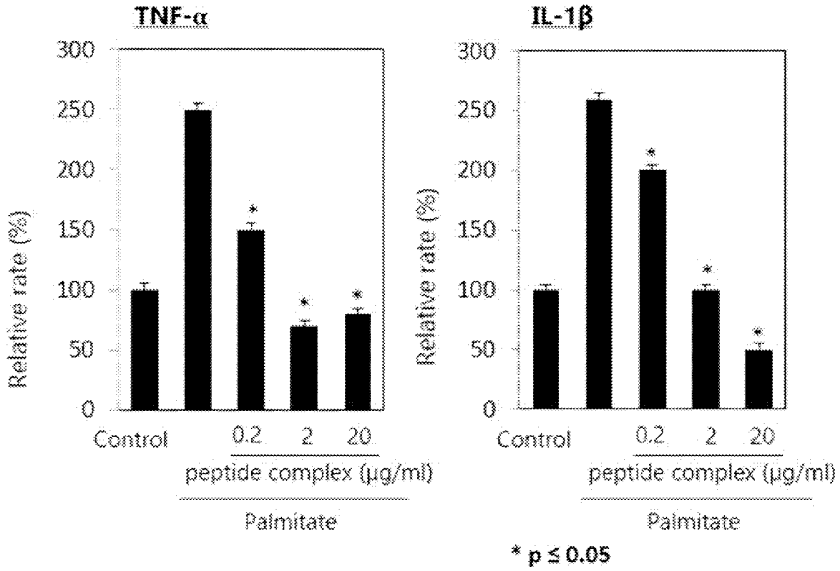
[도9b]


TNF-α
350
300
250
200
150
100
50
0
Relative rate (%)
*
Control 0.2 2 20
* p ≤ 0.05
peptide complex (μg/ml)
Palmitate

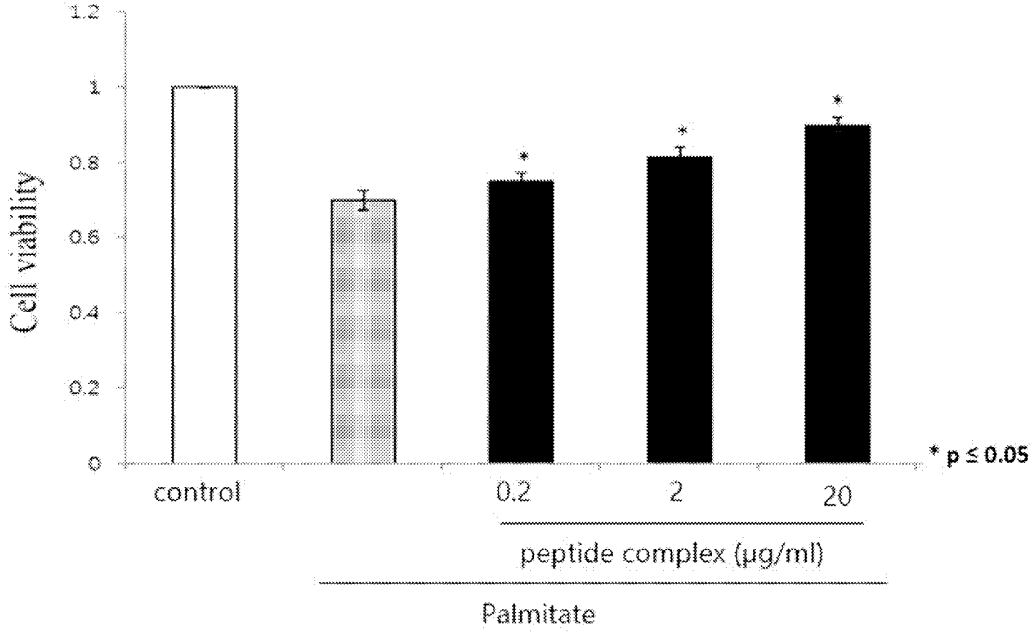
[도10a]


Palmitate
-
+
+
+
+
peptide complex (μg/ml)
-
-
0.2
2
20
TNF-α
IL-1β
Actin

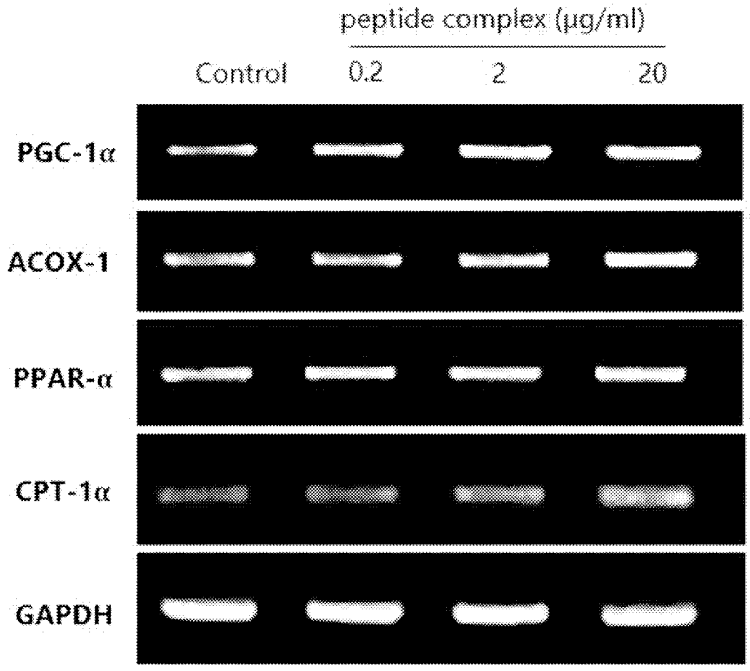
[도10b]


TNF-α
IL-1β
Relative rate (%)
300
250
200
150
100
50
0
Control
0.2
2
20
peptide complex (μg/ml)
Palmitate
* p ≤ 0.05

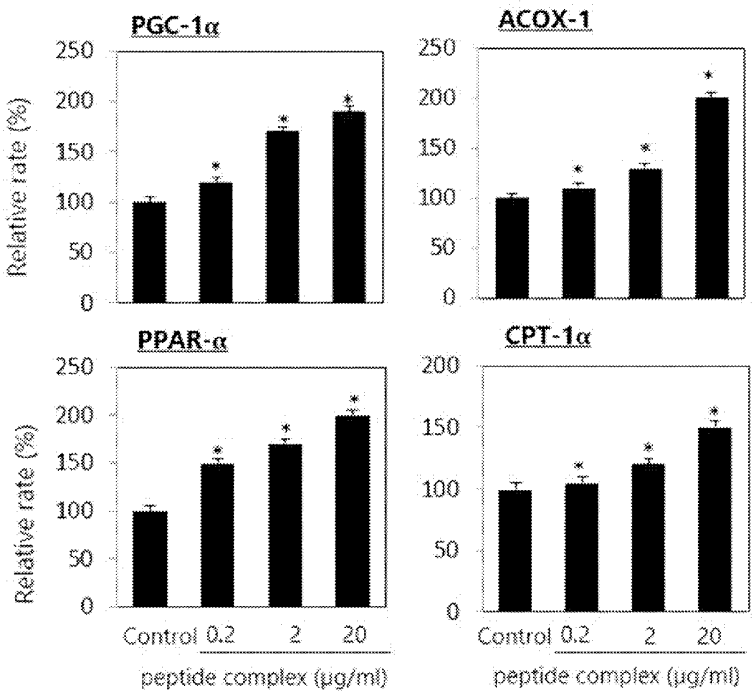
[도11]


1.2
1
0.8
0.6
0.4
0.2
0
Cell viability
*
*
*
* p ≤ 0.05
control
0.2
2
20
peptide complex (μg/ml)
Palmitate

[도12a]

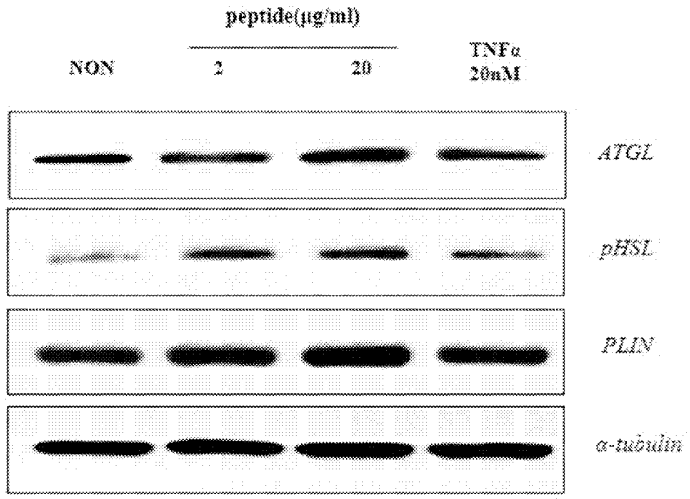

peptide complex (μg/ml)
Control
0.2
2
20
PGC-1α
ACOX-1
PPAR-α
CPT-1α
GAPDH

[도12b]

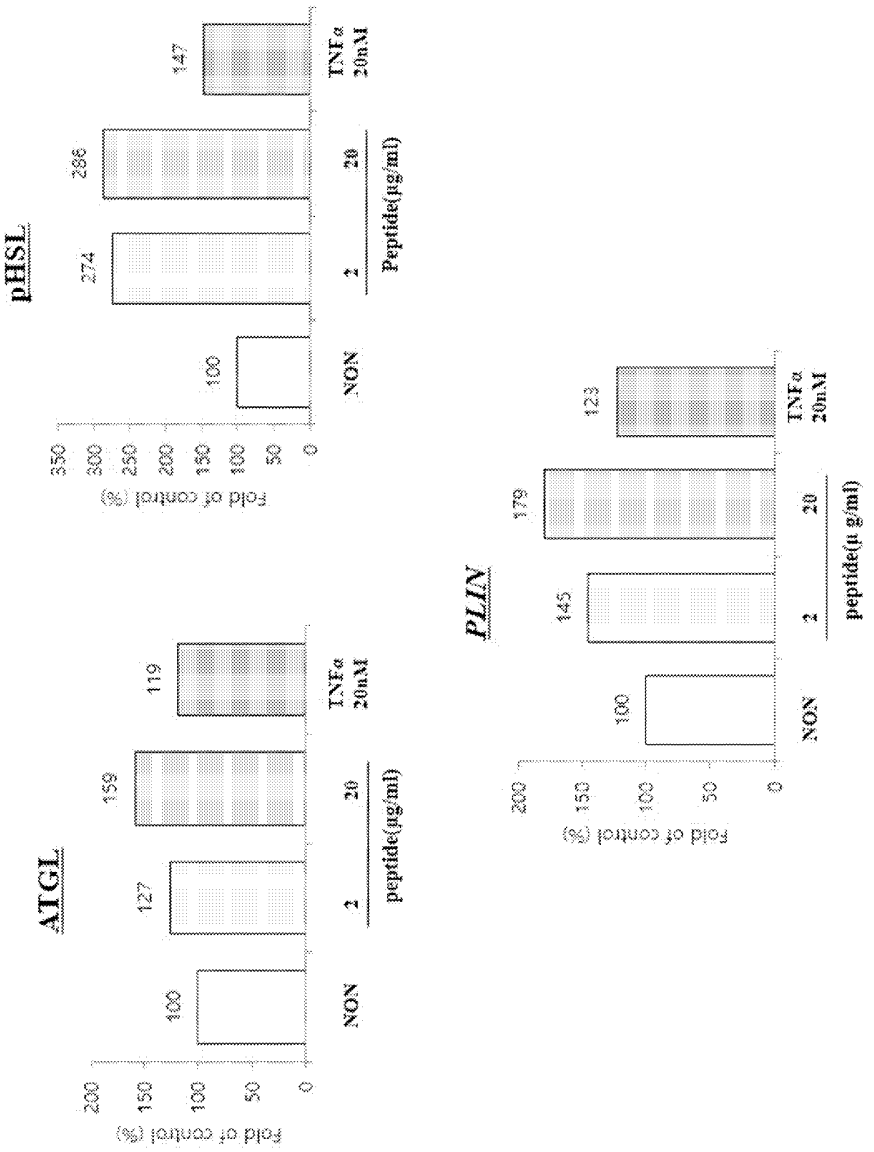


* p ≤ 0.05

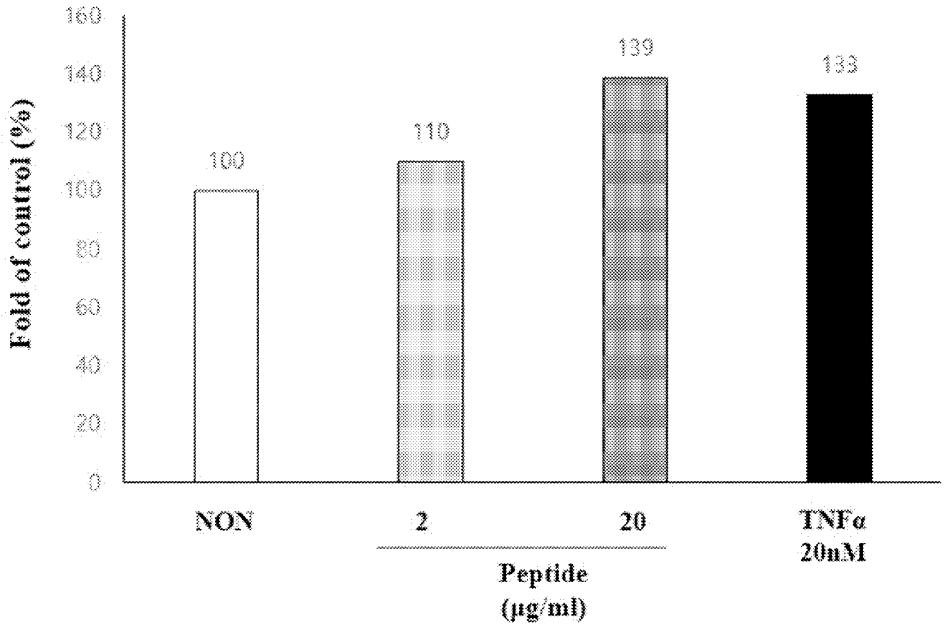
[도13a]



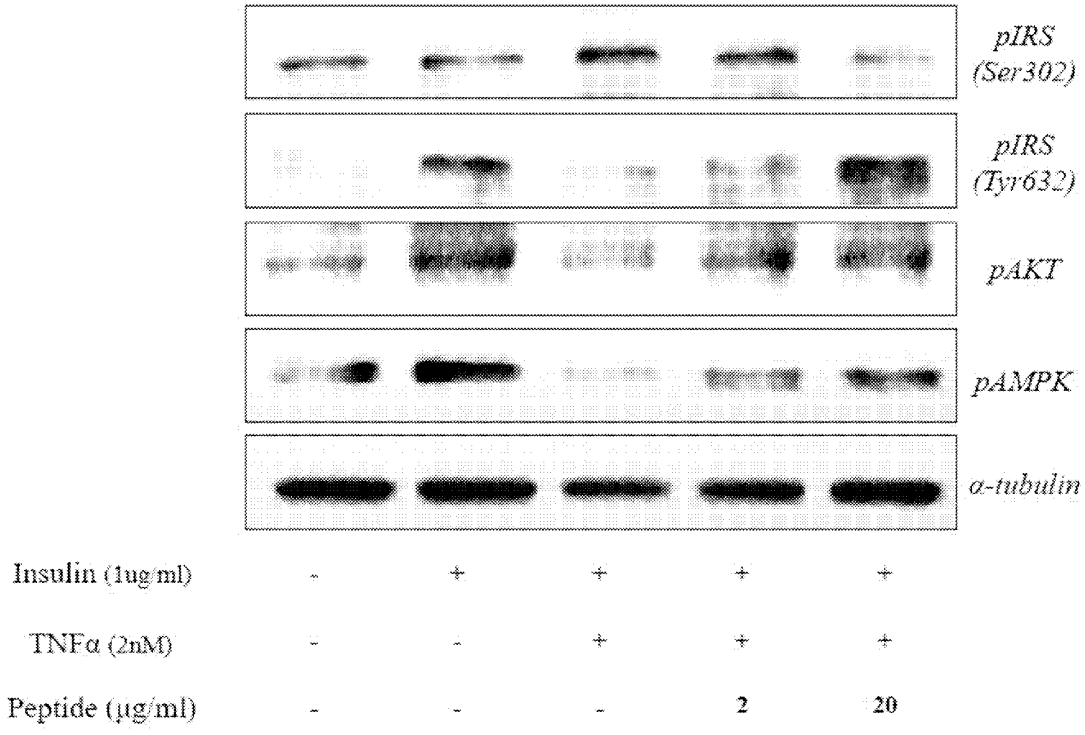
[도13b]


pHSL
Fold of control (%)
350
300
250
200
150
100
50
0
100
274
286
147
NON
2
20
TNFα 20nM
Peptide(μg/ml)
ATGL
Fold of control (%)
200
150
100
50
0
100
127
159
119
NON
2
20
TNFα 20nM
peptide(ug/ml)
PLIN
Fold of control (%)
200
150
100
50
0
100
145
179
123
NON
2
20
TNFα 20nM
peptide(μ g/ml)

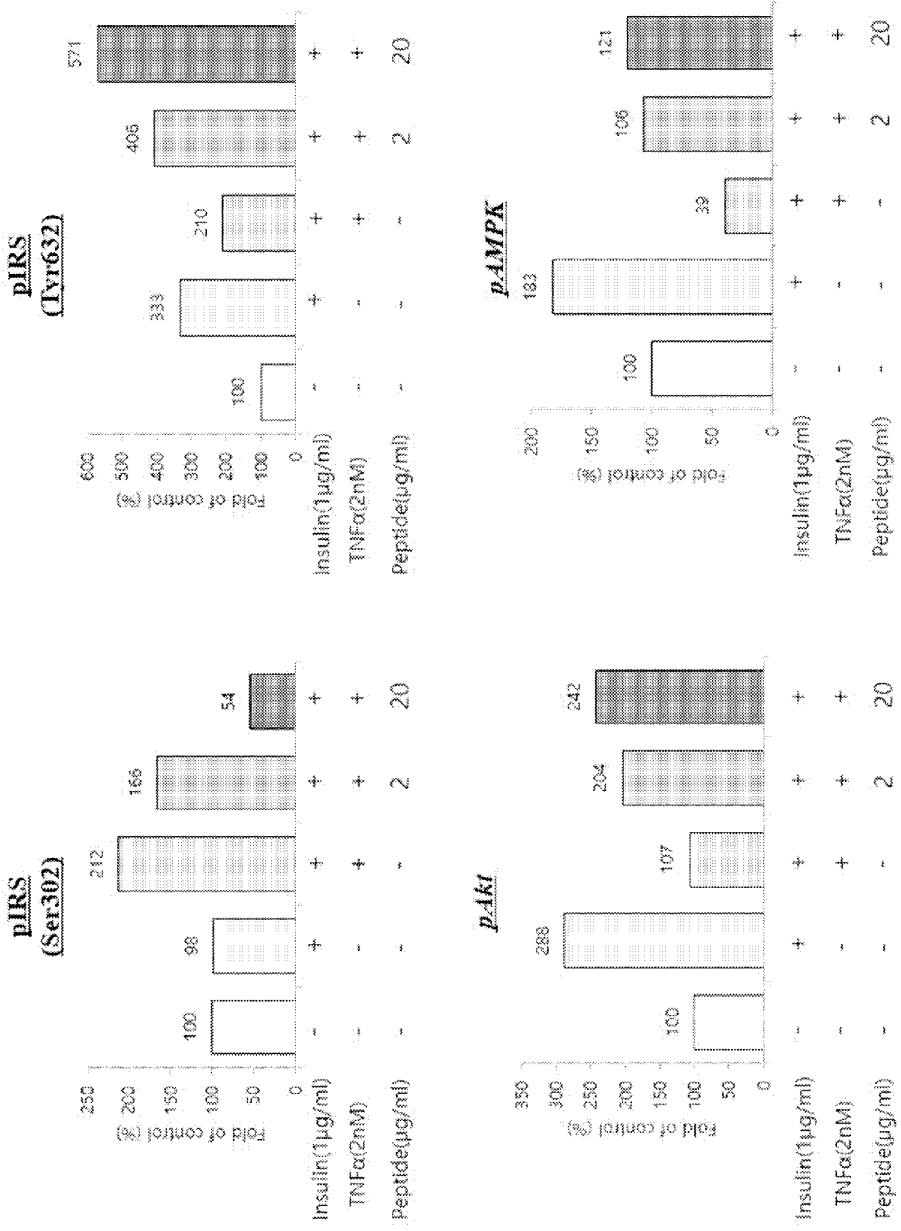
[도14]


160
140
120
100
80
60
40
20
0
Fold of control (%)
100
110
139
133
NON
2
20
TNFα
20nM
Peptide
(μg/ml)

[도15a]


pIRS
(Ser302)
pIRS
(Tyr632)
pAKT
pAMPK
α-tubulin
Insulin (1ug/ml) - + + + +
TNFα (2nM) - - + + +
Peptide (μg/ml) - - - 2 20

[도15b]


pIRS (Tyr632)
fold of control (%)
100
333
210
406
571
Insulin(1μg/ml) - + + + +
TNFα(2nM) - - + + +
Peptide(μg/ml) - - - 2 20
pIRS (Ser302)
fold of control (%)
100
98
212
165
54
Insulin(1μg/ml) - + + + +
TNFα(2nM) - - + + +
Peptide(μg/ml) - - - 2 20
pAMPK
fold of control (%)
100
183
39
106
121
Insulin(1μg/ml) - + + + +
TNFα(2nM) - - + + +
Peptide(μg/ml) - - - 2 20
pAkt
fold of control (%)
100
288
107
204
242
Insulin(1μg/ml) - + + + +
TNFα(2nM) - - + + +
Peptide(μg/ml) - - - 2 20