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Essen ial amino acid a ios and mTOR affec lipogenic gene ne o ks and miRNA e p ession in bo ine mamma epi helial cells

[1], [2], [3], [4], [1*] . [2*]

Abstract

B : , , ( ) .

** :** " " ( ) (2.9 1 1.05 1 1.8 1 2.38 1 1.23 1) ( ), , 2.1 1 (2.1), 1.3 1 (1.3), 3.05 1 (3.0), 1.62 1 (1.6) 12 . 15 7 . 2.1, 1.3, 3.0, 1.6 ( ) - *ACSS2, FABP3, ACACA, FASN, SCD, LPIN1, INSIG1, SREBF1, PPARD,* *NR1H3* (*LXR-α*). , 1.6 - *ACSL1, DGAT1,* *RXRA* - *PPARG* . *PPARG* , , - *ACSS2, FABP3, ACACA, FASN, SCD, LPIN1, INSIG1,* *SREBF1*. , - 27 - , 2.1, 1.3 3.0. , , - 21 - 2.1, 1.3, 3.0, 1.6.

C : - .

K : , , ,

Background

AA (AA) - 1 . . 2 " " AA ; , , AA

AA 3 . , AA - 4–7 . - - 8 . B , - , β- (C) 5, 6 . C , , AA- ,

* @ . . @ .
[1] , , 866, 310058, '
[2] , 1207 , , 61801,

6 1 4 -B 1
AA
1 (C1) 9 .
C
AA A ,
5–7 . , -
AA C
-
. C1
A - B -1
10 -
AA . , -

AA,

A ( ) −80 C
A .
A -
4 , 4 -
1, (/ -
), ,
6 -1, 1 (
).
-
0
.
D A (9.1, A ,
C , C) , ,
A
. (0, 1,
6, 12), (– AA, AA C,
AA),
. ( )
12- -
A . C ,
.

M e e e

-
, .
, 50-
37 C
75 2 .
, ,
.
B ,
(24) 2
, ≥ 90 % . ,
-
. AA,
AA C, 2.1, 1.3, 3.0, 1.6
(“
” -
(. ., 3)
12 .

NAe

A
(, , CA). C -
A D
D-1000 (D ,
, D). A ( )
A 2100 B (A ,
C , CA). 7.5. A -
A 100 /μ

. A D A
. D A
100 A, 1 μ
(, B ,), 9 μ .
65 C 5
3 . A 9 μ , 4 μ
5 - B (,), 1 μ
18, 2 μ 10 / 5′- -
( ), 0.25 μ
( ), 0.125 μ ( ),
1.625 μ .
:
25 C 5 , 42 C 60 , 70 C 5 .
C D A 1:4
.
C A
384- (A B , C ,
CA) 4 μ D A 6 μ
5 μ 1 B
(, , D), 0.4 μ 10 μ /
, 0.2 μ
. 6-
. AB
7900 D (A B)
: 5 95 C, 40
1 95 C, 30 60 C. -
C -
95 C 15 ,
65 C 15 , 95 C 15 . D
7900 D
(2.4, A B).
18 . A -
C
A 1: 1.

C

A
13 . C
(*GADPH*, *UXT*, *RPS9*)
21 . D A (9.1, A
, C , C) -
A (-)
(AA C).
,
($n = 3$ /).
- -
.
D A -
’ . D
- $P < 0.05$.

Results

Ge e ₂ e FA e b

A
. 1. A -C A
- 1 (*ACSL1*)
1.6 ($P < 0.01$) -
. C (AA C), -
-C A -
2 (*ACSS2*) - 3,
(*FABP3*) AA,
2.1, 1.3, 3.0 1.6. 1.3
- *ACSS2*
3.0 ($P < 0.01$) 1.6 ($P < 0.01$), 1.6 -
ACSS2 3.0 ($P < 0.01$). -
AA *FABP3*
3.0 ($P = 0.04$) 1.6 ($P < 0.01$),
1.6
2.1 ($P < 0.01$) 1.3 ($P < 0.01$).
A A -
, - A
(*ACACA*), (*FASN*) -
C A (*SCD*)
AA, 2.1, 1.3, 3.0 1.6 -
. 3.0 -
FASN
($P < 0.01$), *SCD* -
AA 3.0 ($P < 0.01$).
1- -3- -
6 (*AGPAT6*) - 1.3 ($P < 0.01$)
3.0 ($P < 0.01$) .
A 1
(*DGAT1*) - AA
($P < 0.01$),
1.6 ($P = 0.01$).
A 1 (*LPIN1*)
($P = 0.04$) AA, 2.1, 1.3, 3.0 1.6
, 3.0
($P < 0.01$) AA 1.6.

Ge e ₂ e e g

. 1.
1 (*INSIG1*)
- 1 (*SREBF1*)
- ($P < 0.05$) AA, 2.1, 1.3,
3.0 1.6 . -
, 1.3 - -
INSIG1 3.0 ($P = 0.02$)
1.6 ($P < 0.01$), 1.6 -
3.0 ($P < 0.01$). B 1,
1.6
($P < 0.01$).
A -
(*PPARG*) 1.6

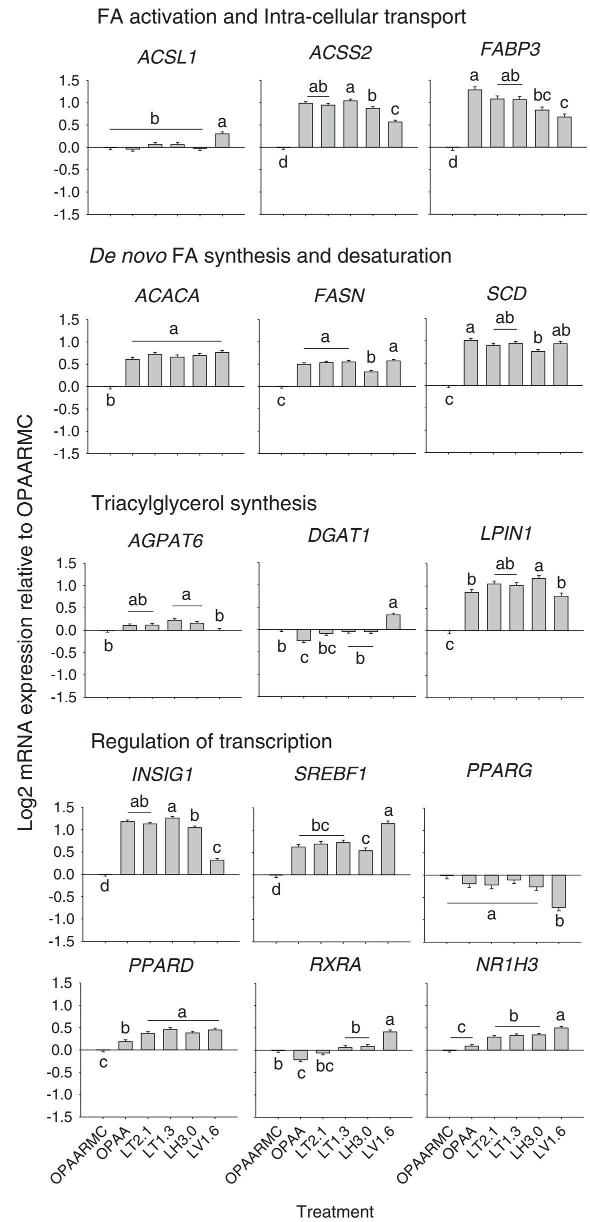

Fig. 1 ( )
, *de novo* ,
, .
(*P* 0.05).
( )
2.1 2.1 1.3 1.3 3.0
3.05 1.6 1.62. *ACSS2* -
- 2 *ACSL1* - -
1 *FABP3* - , *ACACA*
- *FASN* *SCD*
- *AGPAT6* 1- -3-
- 6 *DGAT1* 1
LPIN1 1 *INSIG1* 1 *SREBF1*
- 1 *PPARG* -
PPARD -
NR1H3 α *RXRA*

($P < 0.01$). C
,
(*PPARD*) -
AA, 2.1, 1.3, 3.0 1.6 ($P < 0.01$).
, AA 2.1,
1.3, 3.0 1.6 ($P < 0.01$). -
(*RXRA*) -
AA ($P = 0.01$) - 1.6 ($P < 0.01$)
. -
α (*NR1H3*) - ($P < 0.01$) 2.1,
1.3, 3.0 1.6 ,
1.6 ($P < 0.01$) 2.1,
1.3 3.0.

M NA

A -
. 2. , 2
7 A -
(. 2). C AA ,
21 ($P < 0.01$) -
2.1, 1.3, 3.0 1.6.
1.6 ($P < 0.01$)
21 2.1, 1.3 3.0. C -
, 27AB
($P < 0.01$) AA, 2.1, 1.3
3.0, 1.6
.

Discussion

24 . C 24
ACSS2, FABP3, SCD, *LPIN1*
SREBF1 -
A .
. ,
- *SREBF1* AA -

A A .

SREBF1, . 25
C1 (1) -
, -
B 1. ,
, -
A 26 . ,
LPIN1
,
A -
. B -
,
- .
A -
6 - -
- -α (*NR1H3*),
, - - -α
(*RXRA*) *SREBF1, FASN,*
SCD *ACACA* 27 . - - -α (*NR1H3*)
-
A
C 1 3 0901317 28 .
D
1 3, C1
1 3 , -
- -α. , *RXRA*
AA AA C -
1 3 -
- , *NR1H3*
RXRA -
29 . , -
- -
,

1 3
.
- *NR1H3* AA,
A
(*ACACA* *FASN*)
(*SCD*) -
SREBF1 *INSIG1.*
- . 30 ,
SCD A *SREBF1*-
- 30 . , -
INSIG1, ,
B 1,

CA - 1
31 , .
-
,
- 32 . , -
PPARG

A γ 13 . A (α, δ, γ) -
- (C A)
C, , -
33 . .
19 A -
(*ACACA, FASN*), A (*AGPAT6, DGAT1,*
LPIN1),
(*SREBF1, INSIG1*) -
A ( ).
D *PPARG,* -
AA
AA C AA
A , , A A
33 .
, B . 34

A
PPARG A .

A / -
34 . , A -
PPARGC1A *LPIN1* -
,
13 . ,
LPIN1 -
.
- *PPARD*
A -
(*ACACA, FASN*), (*SCD*), -
A (*FABP3*),

- 35 . -
PPARD A

SREBF1 35 .
A
AA ,
(*ACACA, FASN, SCD*)
AA AA
. -
AA
(. . *FASN, SREBF1*)
11, 36 . ,
AA - *FASN*
SREBF1
AA C
- 36 . D

, ,

- *FASN* 13 .
B
- 37 , . .

, -
(1 A 1),
, -
38 , . . -
. A

(. .
)
-
38 .

EAA
Lys to Thr ratios

6 1 9 . C , A -
A . 7

. ,

PPARG .
130A
130B.

PPARG *PPARG-* A -
A
, ,
- - .
, A
A. 27AB
130A AA AA C -
-
.
27AB 130A, 21 -
- 47 . ,
21 B 1- 53 -
, , *SREBF1* 47,
48 .
2.1, 1.3, 3.0, 21 *SREBF1*
- .
A , 1.6 *SREBF1*
, 21
2.1, 1.3 3.0. -
,
AA B 1- 53-
B 1 48 . , -
,
27AB, 130A 21
, AA
. D
(103, 378,
34A; 45 , A
.
A -
. , -
A -
-
(D) 49 . B A
, 7 A
D.
(-199 , -199 -3 , -98, -378, -148
-21-5) - , 1 (-200)
- . ,
A
AA
.

Conclusions

-
A
-
AA -
.

Additional file

Additional file 1: Table S1. ,
, , [1]. (18)

Abbe
, , - 1,
- - 1 2, -
- 2 6, 1- -3-
- 6 1, 1 ,
4 , 4 4 1,
4 - 1 ,
3, - , ,
, 3- 1,
1 , - 1, 1 - ,
- , 103, 103 130 ,
130 21, 21 27 , 27 34 ,
34 378, 378 448, 448 ,
, (/) 1,
1 1 3, α -
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9 , , -
1, - 1 ,
1, 1 ,

A e e
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F g
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2011 100801).
(-538-914 . .).
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A b e
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A b
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A
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, 96010–900 , , . . .
, , ,
310058, . . .
, , , , 61801, .

C e g e
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C e b
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866, 310058,
, 1207 , 61801,
37200-000,
96010-900

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6. ( ) ( ) . 2014 97 419–29.
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9. 6 1 2008 105 1038–47.
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11. . 2011 141 75–80.
12. . 2002 269 3742–50.
13. . 2008 9 366.
14. -27 . 2009 390 247–51.
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17. -21 1- 53- 1 . 2015. 10.1136/ -2014-308430.
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38. , .
. . 2011 5 83–98.
39. , , , .
,
- . . 2005 21 1052–8.
40. , , , , -103
( ) .
. 2013 8, 79258.
41. , - , , . -373
.
. 2008 105 1608–13.
42. , , .
- . . 2007 318 1931–4.
43. , , . ,
,
. . 2005 120 15–20.
44. , , , , , . -27
. .
2013 521 15–23.
45. , , , , , , .
2011. -130
- . . 2011 31
626–38.
46. , , , , , , . 130 -
γ -1α
. . 2015 10, 0142809.
47. , , , , . -21
-
1- 53- 1 . 2015 10.1136/
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. . 2013 5 147–1450.
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. 2015 16 884.