

FABP2

Dr_Mahboob@hotmail.com :

PCR-RFLP () PPAR α FABP2
BMI (Gas Chromatography)
 ω -3 ω -6 (PUFA) (SFA)
 ω -3 ($p < /$) FABP2
PPAR α ($p < /$)
Thr54 PPAR α Lue162 Val162 FABP2 Ala54
Lue162 Ala54 Val162 Thr54
Thr54 ω -3 ω -6 PUFA SFA
DNA Ala54

(Lusis 2000)

Hokanson)

(1995; Bingham 2002; Arab 2003

(and Austin 1996

Steinberg et al.)

1997; Kooner et al. 1998; Carlsson et al.
(2000; Lind et al. 2000
(Jouven et al. 2001)

(Masson et al. 2003)
(FABP)

Agostoni et al. 1994;)

(Scaglioni et al. 2006

(FABP2)

TG

(A54T)

HDL-C

A54T

(Wajchenberg 2000;Denke 2001)

FABP2

(Baier et al. 1996; Levy et al. 2001)

Garaulet et al. 2001;)

(Vessby 2003; Tremblay et al. 2004

(Georgopoulos et al. 2000; Ribalta et al. 2005)

FABP2

(Aro 2003)

Vessby)

FABP2

(2000; Riccardi et al. 2004

:

)

(

MUFA Saturated Fatty Acid SFA)

(Monounsaturated Fatty Acid

()

(Polyunsaturated Fatty Acid (PUFA)

Ma et al.) .

n = (([Z 1- α/2] + [Z 1-β]) / d) ^ 2 where / (/ /)

d = (D1 - D2) / sqrt(2 * sigma_d) if D1 - D2 = 2mm / l : (/ /)

d = 2 / 3.3 = 0.61 n =

(Germany) Seca BMI

Ala54Thr

FABP2

×g μL

C C

(FABP 2

Thr 54 Ala/Ala

()

HDL-CL LDL-CL

VLDL (Roche, Germany) Optima TL X (d<1.006 g / L) rpm (fixed-angle, BECKMAN, USA 16 °Cflnj 2

ApoB (Ordovas 1998)

() ApoCIII (Randox, England)

Gas) (chromatography : (GasChoromatography)

Folch

Ala/Ala

Ala/Thr

Folch et al.)

(1957

(H0 = D1 = D2) 1- β = 0.80 α = 0.5 α = / β = /

Thr54 allele
Ala54 allele bp KOH (0.5 N)

bp bp
: PPAR α Lue162Val (BF3)

PPAR α Lue162Val
(C) (G) °C

Mismatch PCR (/) HCl

Forward : 5-GAC TCA AGC TGG TGT
Reverse – Misatch : 5- ATG ACA AGT -3
CGT TGT GTG ACA TCC CGA CAG AAT
Mismatch) -3

Vohl et al.)(Reverse Primer
() Hinf I .(2000
bp PCR
Allele bp
bp Allele
: PPAR α
PCR – RFLP
DNA
(Amplification)

Forward : 5-ACA ATC ACT
Reverse : CCT TAA ATA TGG TGG -3
TAG GGA CAG ACA GGA CCA 5-AAG
(Jamshidi et al. 2002) GTA -3.)(24 l
Taq I
GG
CG bp
bp

Genamic DNA : DNA ()
Qiagene ,) Flexi Gene DNA Kit
(GmbM, Germany
DNA
: FABP2 Ala54Thr
Polymerase)
Chain Reaction –Restriction Fragment
Length Polymerase) PCR-RFLP
PCR DNA Amplification ..
Forward : .
5-ACA GGT GTT AAT ATA GTG AAA
Reverse : 5-TAC CCT GAG AG -3
Vimalleswaran) TTC AGT TCC GTC -3
 μ L .(et al. 2006
 μ L hin61 / μ L PCR
 μ L X Tango
°C (overnight)
°C

% PCR

One Sample Kolmogrove–Smirnov
Doc System
50 bp ladder

Kunesova et al. 2002;) (t .
 (Dwyer et al. 2004 -

) n-16 () n-14 FABP2
 Thr54 () n-18 () PCR-RFLP
 Ala54 % / .
 Ala54 Thr54 % / Val162
 Thr54 (AA) ,FABP2 GC
 Ala54 Thr54
) Thr54
 .(Thr54 Ala54

Finn EPA ($p < /$) α ($p < /$)
 ($p < /$) PUFA ($p < /$) SFA ($p < /$)
 $\omega - 3$ ($p < /$) $\omega - 6$ ($p < /$) MUFA
 Ala54 Thr54 ($p < /$)
 .()
 Val162 Lue162) PPAR α
 (GC GG

Rossner et al. 1989;)
 (Tremblay et al. 2004
 in-vivo FABP2

Finns de novo
 Pima (Vidgren et al. 1997) Ma et al. 1995; Salo)
 Thr54 Ala54 Vessby ;et al. 2000; Warensjo et al. 2006
 .(2003

(AA) .(Pratley et al. 2000))
 Ala54 Thr54

(SFA)

ω -3 ω -6 (PUFA)

Ala54 Thr5 Decsi et al. 1996; Samuelson et al.)

FABP2-Thr54 (2001

FABP2-Ala

(Marin et al. 2005) (LCPUFA)

Decsi

(Decsi et al. 1996)

SFA

PUFA /SFA TG (AA/ LA)

(PUFA)

TG (AA/DGLA)

(Klein-Platat et al. 2005)

n-3 PUFA SFA Thr54 n-6

Klein-Platat). Ala54

(et al. 2005 n-6

(Decsi et al. 1996)

PUFA n-3

(Rossner et al. 1989)

PUFA n-3 (Phinney et al. 1994)

(Klein-Platat et al. 2005)

PUFA n-3

(Klein-Platat et al. 2005) (Nakamura et al. 2001)

n-3

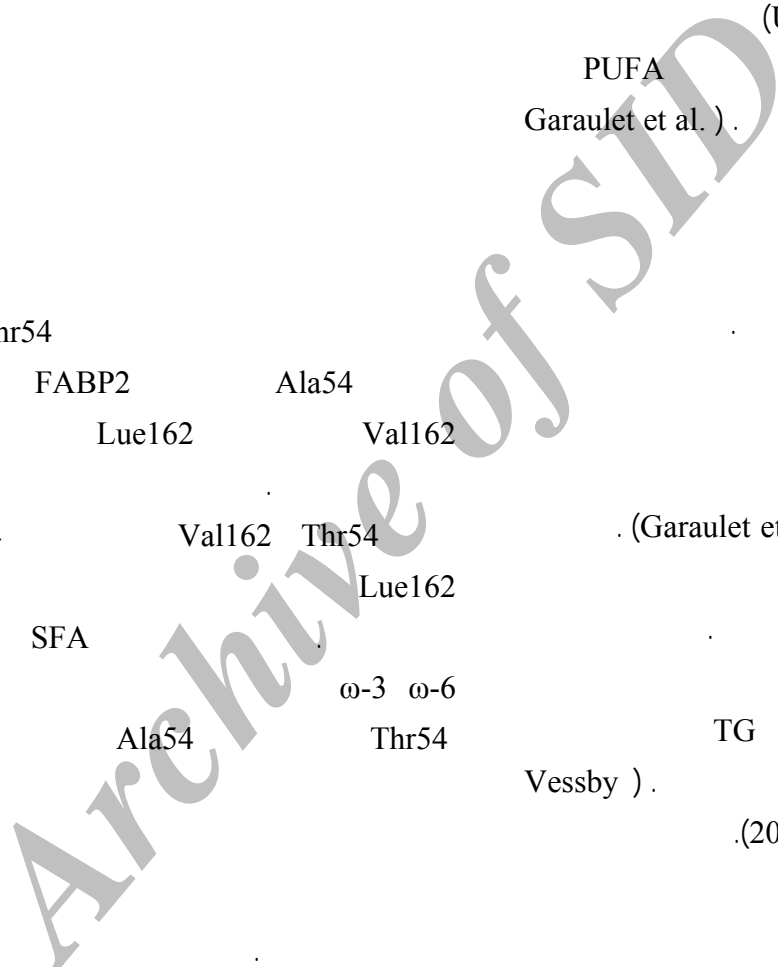
Thr54 EPA (AA)

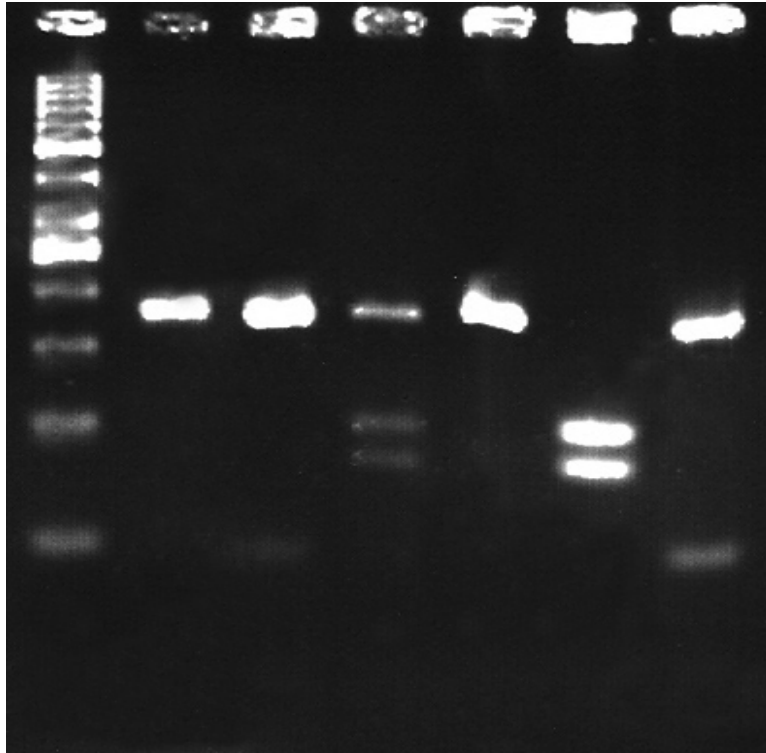
Ala54

Gasperikova et al.) (AA)

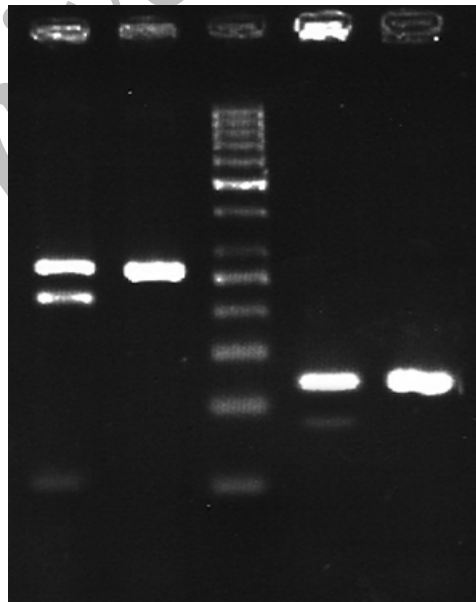
(2002

Lue162Val Thr54
 Baier et al.) Ala54
 val162 Lue162 . (1995
 Val162 Thr54
 PUFA n-3 22-6n-3
 .(Couet et al. 1997)
 Finn
 (Urban et al. 1989).
 PUFA
 Garaulet et al.) . SFA
 (2001
 Thr54
 FABP2 Ala54
 PPAR α Lue162 Val162
 Ala54 Val162 Thr54 . (Garaulet et al. 2001)
 Lue162
 PUFA SFA Thr54
 ω -3 ω -6
 Ala54 Thr54 TG PUFA n-3
 Vessby) . HDL-CL
 .(2003; Riccardi et al. 2004
 Lue162Val PPAR α
) FABP2
 () ()
 Val162 Lue162
 FABP2
 PPAR α Lue162Val





(B) PPAR α (A) FABP2 PCR-RFLP –
 Ala54 / Thr (bp) Thr54/Thr (bp) Ladder : (A
 (bp) Ala54/Ala (bp bp)



bp) Lue162/Val (bp) Lue162/Lue : (B
 (bp) GC (bp) GG (bp) Ladder (bp)

| P value* | | | | |
|----------|-------|-------|-------|-------------------|
| | () | () | () | |
| - | () | (/) | (/) | |
| / | () | (/) | (/) | Thr54 carriers(%) |
| / | (/) | (/) | (/) | V162 carriers (%) |
| / | (/) | (/) | (/) | C7 carriers (%) |
| / | / ± / | / ± / | / ± / | Age |
| / | / ± / | / ± / | / ± / | BMI |
| / | / ± / | / ± / | / ± / | TG (mg/dL) |
| / | / ± / | / ± / | / ± / | Total CL (mg/dL) |
| / | / ± / | / ± / | / ± / | LDL-CL (mg/dL) |
| / | / ± / | / ± / | / ± / | HDL-CL (mg/dL) |
| / | / ± / | / ± / | / ± / | VLDL (mg/dL) |
| / | / ± / | / ± / | / ± / | FBS (mg/dl) |
| / | / ± / | / ± / | / ± / | APOB (mg/dL) |
| / | / ± / | / ± / | / ± / | APOCIII (mg/dL) |

Mean±SD

t

*

FABP2

| P valve*** | (µg/ml) | | Fatty acids |
|------------|--------------------|--------------|-------------------|
| | Ala/Thr Thr/Thr | Ala/Ala = | |
| / | / ± / | / ± / | (C14:0) |
| / | / ± / | / ± / | (C16:0) |
| / | / ± / | / ± / | (C18:0) |
| / | / ± / | / ± / | (C18:1, n-9) |
| / | / ± / | / ± / | (C18:2n-6) LA |
| / | / ± / | / ± / | (C20:0) |
| / | / ± / | / ± / | (C18:3, n-6) GLA |
| / | / ± / | / ± / | (C20-1) |
| / | / ± / | / ± / | (C18:3, n-3) |
| / | / ± / | / ± / | (C20:2, n-6) |
| / | / ± / | / ± / | (C22:0) |
| / | / ± / | / ± / | (C20:3, n-6) DGLA |

| | | μg/ml | | | | Fatty acids |
|----------|-------|-------|----------|--------|----------|-------------------|
| P value* | GC | GG | P value* | Lue/Va | Lue/Lue | |
| / | / ± / | / ± / | / | / ± / | / ± / | (C14:0) |
| / | / ± / | / ± / | / | / ± / | / ± / | (C16:0) |
| / | / ± / | / ± / | / | / ± / | / ± / | (C18:0) |
| / | / ± / | / ± / | / | / ± / | / ± / | (C18:1, n-9) |
| / | / ± / | / ± / | / | / ± / | / ± / | (C18:2n-6) LA |
| / | / ± / | / ± / | / | / ± / | / ± / | (C20:0) |
| / | / ± / | / ± / | / | / ± / | / ± / | (C18:3, n-6) GLA |
| / | / ± / | / ± / | / | / ± / | / ± / | (C20-1) |
| / | / ± / | / ± / | / | / ± / | / ± 21/1 | n-3) |
| / | / ± / | / ± / | / | / ± / | / ± / | (C18:3, |
| / | / ± / | / ± / | / | / ± / | / ± / | (C20:2, n-6) |
| / | / ± / | / ± / | / | / ± / | / ± / | (C22:0) |
| / | / ± / | / ± / | / | / ± / | / ± / | (C20:3, n-6) DGLA |
| / | / ± / | / ± / | / | / ± / | / ± / | (C20:3, n-3) |

| | | Mean±SE | | | |
|------------|-----------|-----------|-----------------------|-----------|-----|
| Ala54Thr54 | Thr54/Thr | Ala54/Ala | Ala54/Thr + Thr54/Thr | Ala54/Ala | t |
| / | / ± / | / ± / | / ± / | / ± / | * |
| / | / ± / | / ± / | / ± / | / ± / | ** |
| / | / ± / | / ± / | / ± / | / ± / | *** |

| | | Mean±SE | | | |
|------------|-----------|-----------|-----------------------|-----------|-----|
| Ala54Thr54 | Thr54/Thr | Ala54/Ala | Ala54/Thr + Thr54/Thr | Ala54/Ala | t |
| / | / ± / | / ± / | / ± / | / ± / | * |
| / | / ± / | / ± / | / ± / | / ± / | ** |
| / | / ± / | / ± / | / ± / | / ± / | *** |

| | | Mean±SE | | | |
|------------|-----------|-----------|-----------------------|-----------|-----|
| Ala54Thr54 | Thr54/Thr | Ala54/Ala | Ala54/Thr + Thr54/Thr | Ala54/Ala | t |
| / | / ± / | / ± / | / ± / | / ± / | * |
| / | / ± / | / ± / | / ± / | / ± / | ** |
| / | / ± / | / ± / | / ± / | / ± / | *** |

| | | Mean±SE | | | |
|------------|-----------|-----------|-----------------------|-----------|-----|
| Ala54Thr54 | Thr54/Thr | Ala54/Ala | Ala54/Thr + Thr54/Thr | Ala54/Ala | t |
| / | / ± / | / ± / | / ± / | / ± / | * |
| / | / ± / | / ± / | / ± / | / ± / | ** |
| / | / ± / | / ± / | / ± / | / ± / | *** |

| | | Mean±SE | | | |
|------------|-----------|-----------|-----------------------|-----------|-----|
| Ala54Thr54 | Thr54/Thr | Ala54/Ala | Ala54/Thr + Thr54/Thr | Ala54/Ala | t |
| / | / ± / | / ± / | / ± / | / ± / | * |
| / | / ± / | / ± / | / ± / | / ± / | ** |
| / | / ± / | / ± / | / ± / | / ± / | *** |

| | | Mean±SE | | | |
|------------|-----------|-----------|-----------------------|-----------|-----|
| Ala54Thr54 | Thr54/Thr | Ala54/Ala | Ala54/Thr + Thr54/Thr | Ala54/Ala | t |
| / | / ± / | / ± / | / ± / | / ± / | * |
| / | / ± / | / ± / | / ± / | / ± / | ** |
| / | / ± / | / ± / | / ± / | / ± / | *** |

| | | Mean±SE | | | |
|------------|-----------|-----------|-----------------------|-----------|-----|
| Ala54Thr54 | Thr54/Thr | Ala54/Ala | Ala54/Thr + Thr54/Thr | Ala54/Ala | t |
| / | / ± / | / ± / | / ± / | / ± / | * |
| / | / ± / | / ± / | / ± / | / ± / | ** |
| / | / ± / | / ± / | / ± / | / ± / | *** |

| | / ± / | / ± / | / | / ± / | / ± / | (C20:4, n-6) AA |
|---|-------|-------|---|-------|-------|---------------------------------------|
| / | / ± / | / ± / | / | / ± / | / ± / | |
| / | / ± / | / ± / | / | / ± / | / ± / | (DDA, C22:2, n-6) (C20:5, n-3) EPA |
| / | / ± / | / ± / | / | / ± / | / ± / | (C24:1) |
| / | / ± / | / ± / | / | / ± / | / ± / | (C22:6, n-3) DHA |
| / | / ± / | / ± / | / | / ± / | / ± / | |
| / | / ± / | / ± / | / | / ± / | / ± / | |
| / | / ± / | / ± / | / | / ± / | / ± / | MUFA |
| / | / ± / | / ± / | / | / ± / | / ± / | PUFA |
| / | / ± / | / ± / | / | / ± / | / ± / | n-6 |
| / | / ± / | / ± / | / | / ± / | / ± / | n-3 |
| / | / ± / | / ± / | / | / ± / | / ± / | |
| / | / ± / | / ± / | / | / ± / | / ± / | AA EPA DGLA |
| / | / ± / | / ± / | / | / ± / | / ± / | n3 n6 |

**

t *

Mean±SE

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