

FABP2

Dr_Mahboob@hotmail.com :

FABP2

PPAR α FABP2

PCR-RFLP

(Gas Chromatography)

BMI

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

Ala54

DNA

(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;) (FABP2)
(Scaglioni et al. 2006

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

:

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(

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(

MUFA Saturated Fatty Acid SFA)
(Monounsaturated Fatty Acid
(Polyunsaturated Fatty Acid (PUFA)
Ma et al.) .

$$n = \left(\frac{[Z_{1-\alpha/2}] + [Z_{1-\beta}]}{d} \right)^2 \quad \text{where } d = \frac{D_1 - D_2}{\sqrt{2\sigma_d^2}}$$

$$d = \frac{D_1 - D_2}{\sqrt{2\sigma_d^2}} \quad \text{if } \bar{D}_1 - \bar{D}_2 = 2mm/l$$

$$d = \frac{2}{3.3} = 0.61 \quad n =$$

(Germany) Seca

l () 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.)

$$(H_0 = \bar{D}_1 = \bar{D}_2)$$

$$1 - \beta = 0.80 \quad \alpha = 0.5$$

(1957

$$\alpha = / \quad \beta = /$$

Thr54 allele
 Ala54 allele bp
 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
 :
 % PCR
 One Sample Kolmogrove–Smirnov
 Doc System
 50 bp ladder

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

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 Thr54 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

PUFA n-3 (Decsi et al. 1996)

(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

Gasperiikova 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

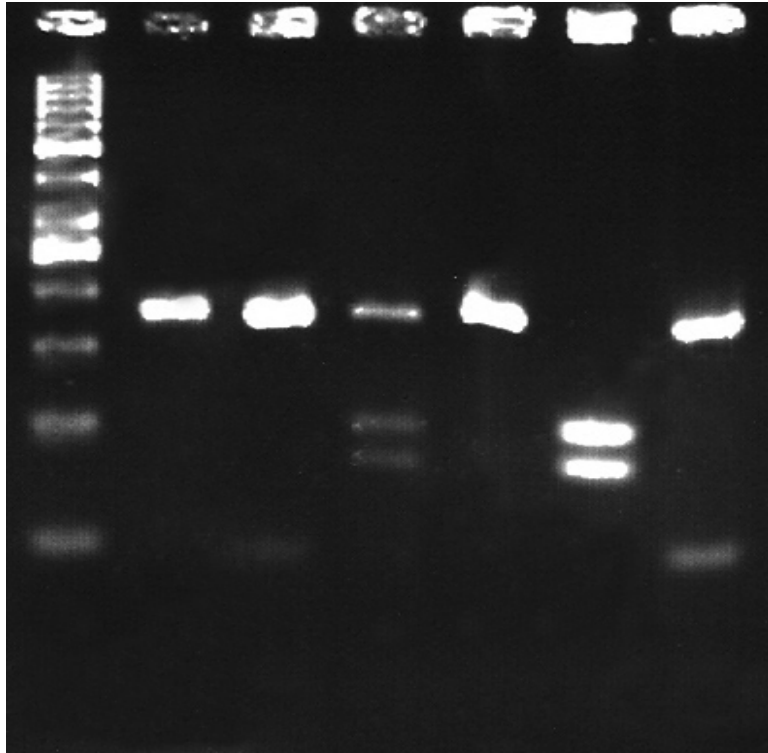
()

(

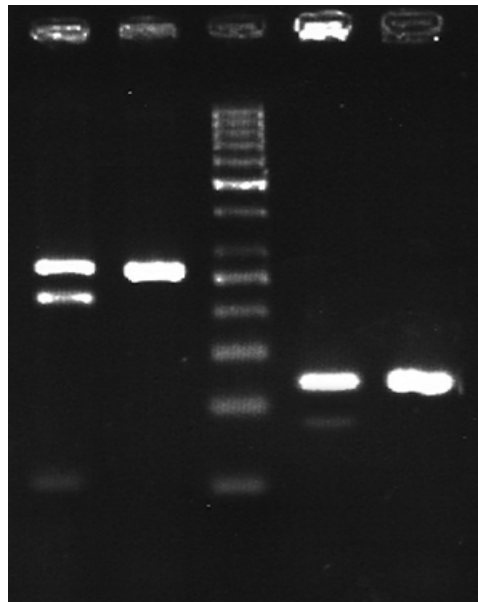
Val162 Lue162

FABP2

PPAR α Lue162Val



(B) PPARα (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	= = *	
/	/ ± /	/ ± /	(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

/	/ ± /	/ ± /	(C20:3, n-3)		
/	/ ± /	/ ± /	(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		
/	/ ± /	/ ± /			
/	/ ± /	/ ± /	EPA	DGLA	AA
/	/ ± /	/ ± /		n3	n 6
Mean±SE					
	Ala54Thr54	Thr54/Thr	Thr54 /Thr		*
		Ala54/Ala	Ala54/Ala		**
	Ala54/Ala	Ala54/Thr+Thr54/Thr	Ala54/Ala	t	***

(GC GG Lue/Val Lue/Lue)PPARα

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)

	/ ± /	/ ± /	/	/ ± /	/ ± /	(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

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t

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Mean±SE

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