

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
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;)

(Scaglioni et al. 2006

(FABP2)

TG

HDL-C

(Wajchenberg 2000;Denke 2001)

(A54T)

A54T

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.) .

/

$$n = \left(\frac{[Z_{1-\alpha/2}] + [Z_{1-\beta}]}{d} \right)^2 \quad \text{where } d = \frac{|\bar{D}_1 - \bar{D}_2|}{\sqrt{2\sigma_d^2}}$$

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

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

(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 °CfInj 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
 :
 One Sample Kolmogrove–Smirnov
 Doc System
 50 bp ladder

KOH
 (0.5 N)
 (BF3)
 °C
 (/) HCl
 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

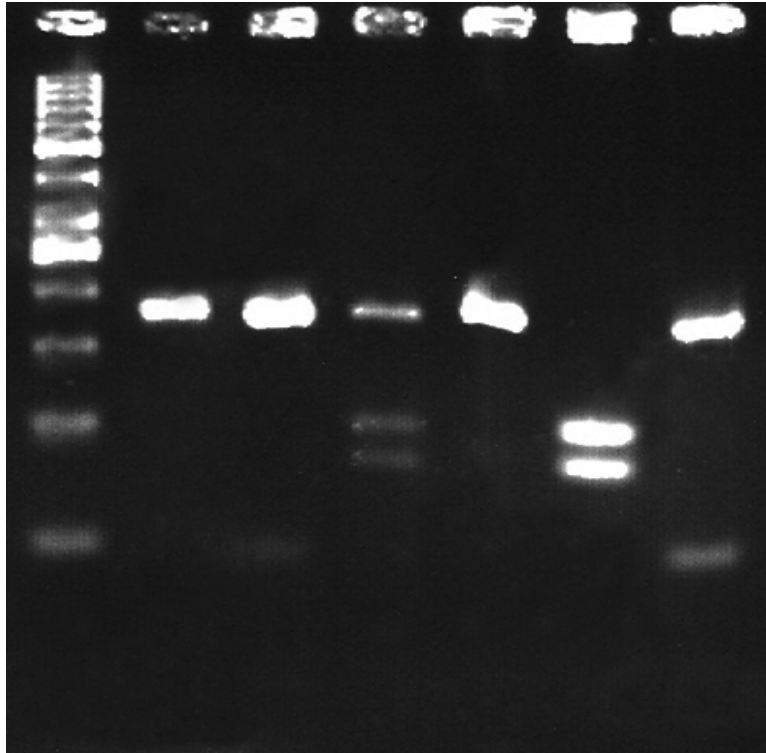
Finns de novo
Pima (Vidgren et al. 1997) Ma et al. 1995; Salo)
Thr54 Ala54 Vessby ;et al. 2000; Warensjo et al. 2006
(2003

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

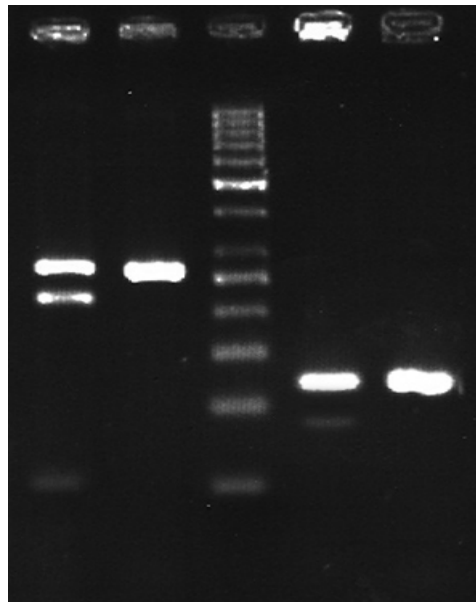
Ala54 Thr54

(SFA)			
	ω -3 ω -6 (PUFA)		
Ala54	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
	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	
			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
 Ala54 Thr54
 TG PUFA n-3
 Vessby) . HDL-CL
 .(2003; Riccardi et al. 2004
 Lue162Val PPAR α
) FABP2
 () ()
 Val162 Lue162
 FABP2
 PPAR α Lue162Val



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



(B) Lue162/Val (bp) Lue162/Lue : (B
 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/Thr +Thr54/Thr	Ala54/Ala	**
	Ala54/Ala		Ala54/Thr+Thr54/Thr	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

**

t

*

Mean±SE

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