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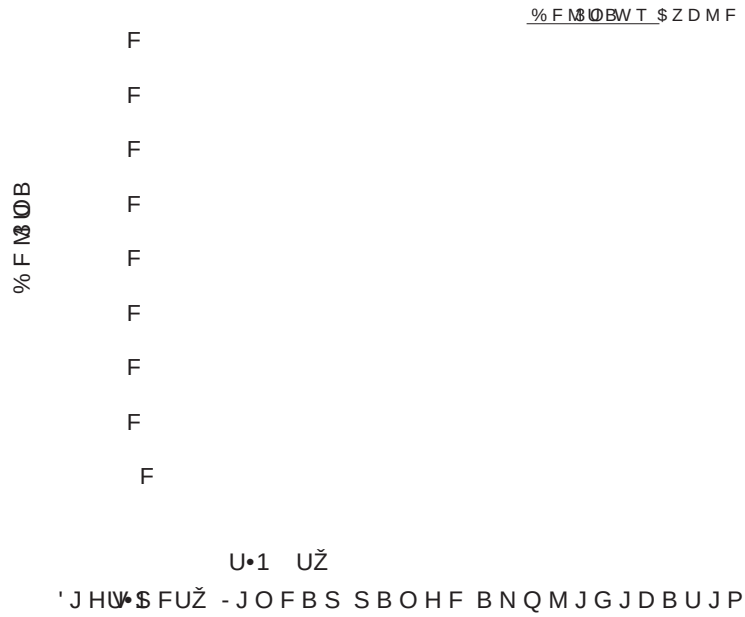

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分子诊断与治疗杂志

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SHAO Xiaomei YANG Yang HAN Lixia Ṇ

1.2 ᾤ FBT

FBT ᵐ Ė ├

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ت R _ o Ų k _ l N A P ϕ ی B L ?F @T
B L ? w Ḥ ẹ í ɵ ɟ ـٍ ـلله E c l c @Ψ_Fl@iT B Lنحا?
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ƒ Ψ ه ɨ ɨ

ϕ يى ه ל ɨ ɑ̃̈

2. ɞ/. ɞ3 ɞ2,3 IS-kJ ˜ ʊ̃ ɑ̈ ˘

Ȯ Mrɡɡɡn Qɡɡkoɡb_l Fɡt ´

Θ Ȯ ǻ Ḥ

ɥ Ȯ ɟ

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ƒ Ψ ه ɨ ɨ

ϕ يى ه ל ɨ ɑ̃̈

2. IS-kJ 2.

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kJ w ɔ ƒ Ḥ ẹ ɟ

/. ʁ ɑ̃̈ /Â/.7

/Â/.8 /Â/.5 /Â/.4 /Â/.3 /Â/.2 /Â/.3 /Â/.2

2. IS-kJ e ẹ Ȧ

e Ặ w Ḥ م

Ặ r2 ”.,78 ʊ̃Ω´ ɟ

/,2,8 Ỉ ɿ

í ɔ e ´ /Â/.8 IS-kJ

w ɔ ₱˜ Ạ ל ɨ Fa/ /Â/.8 IS-

kJ ˆ Ma/ /Â/.3 IS-kJ ˆ Ja/ ƒ

F@T ʊ̃A ɨ ɑ̃̈ 2.. IS-kJ Y ל ɨ

2. e ɔ̃

CT e CT ⁼3 #ʊ̃Ω Ỉ ´ ɟ

í ɔ ɔ̄m oy e ´ /Â/.8

IS-kJ w ɔ ₱˜ Ạ ל ɨ Fa2 /Â

/.8 IS-kJ ˆ Ma2 /Â/.3 IS-kJ ˆ Ja2 ƒ

F@T ʊ̃A ɨ ɑ̃̈ 2.. IS-kJ Y

ל ɨ 3 ɕ Y ל ɨ ˘

2 e ɔ̃ CT ⁼

3 #ʊ̃Ω ´ ɟ

/,2,7 يى ɑ̈

ه Qer_ C_re Jɡde Qaɡenae ǻ ˘ ϕ

ʊ̃ يى ל ɨ F@T Uorlbuɡbe AaasQetRM PerdorŲ

k_nae P_nel ƫ̃ A ɞ@ ɞC ɞB ɞC ɞF ɞF 5 يى ɑ̈ ƒ

/.. ʁ˜ ʊ̃ يى ɑ̈

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/,2,/. ʊ̃A

ƒ F@T ه ל ɨ Ψ ל ɨ P/ Ψ7 s

2.3 ӈ ʻO

ƒ Ψ ه ɨ ɨ

ϕ ى ه ל ɨ ɑ̃̈

2. ɑ1. ɑ5 ɑ2.5 G S - kʊ̃J ɑ̈ ˘ ʻO

1 ɟ Mpgeg l Qge k mgb_j Dgr

´ Θ ʻO ǻ ʻḤ

ӈ ʻO ه 2 ɟ ʻḤ

ε 1. G S - ƒk J

2.4 ӈ

ƒ FBT ه ל ɨ Ψ

ל ɨ ɑ̃̈ 2. G S - k J 2. Y

e ئۆ 1.3§..5 J mɛ̣ G S - k ɟ Ỉ

ج e ε 15.41 G S - k J ʻḤ ӈ

ε 2. G S - k Jه 3 ɟ

2.5 م

ך í ɔ FBT e 1Â1.9 G S -

k J w ɔ ƒ ʻḤ ẹ ˜ ƒ

ẹ 1. ʁ ɑ̃̈ 1Â1.9 ɑ1Â1.8 ɑ1Â

1.7 ɑ1Â1.6 ɑ1Â1.5 ɑ1Â1.4 ɑ1Â1.3 ɑ1Â1.2 ɑ2. G S - k J

e ʊ̃ ɑ̈ ε 8.817ɑ7.874ɑ6.977ɑ

5.812ɑ4.973ɑ3.881ɑ2.597ɑ2.11. ɑ1.424 J mɛ̣ G S -

k J ɟ e ẹ Á e Ặ

r2 ;.,772 ʻḤ ʼ م ε

2. | / Â/ .7 IS-k J ه 2 ɟ

2.6 Ỉ Á

ɕ Y Ỉ ל ɨ Fa1 Ka1 Ja1 ˘

2. Y ᵉ CT ᵉ ṹ ɛ̈

..88 # 2.53 # ʌ 3.86 # ه 5 ɞه 6 ɞه 7 ɟ Ỉ

ɟ

3 Y ל ɨ Fa2 Ka2 Ja2

5 3 Y ל ɨ ˘ 4 Y

Y ל ɨ ᵉ CT ᵉ ṹ ɛ̈

2.1. # 3.7. # ʌ 4.22 # 2 ɟ

2.7 ˝ ˀ ی غ نح

ɸ ṹ ی ל ɨ FBT Umpjbugbc AaasŲ

QcrRK Ncpdmpk_lac N_lɸ 7 ל ی غ نح ɨ

1.. ʁ ˜ ʄ Ḥ

A ɞB ɞC ɞB ɞC ɞD ɞF 7 Ж ی ã ɛ

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2.8 ˜Á

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	/83	/2	/73

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					)/QB					.,53
					Ave					.,24
				+						.,..
Ḥ					+/QB					+.,2/
					+/,74QB					+.,44
/,28	3,28	3,28	5,27	7,27	/,22	3,24	3,.7	4,73	8,54	
		Ḥ						ج e		

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ٹ ϕ ی F@T ۏ ۑ Ψ ө e ɟ ⁼ ه
ۑ ŏ ą̈ N A P N A P ɹ ɔ ה ẍ ŏ
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? k n j g N p c n - A m̃ ` _ q R _ o K _ l F @ T B Ɫ ? ٭ 3 / ٧ Ψ F @ q ? e
7 ٤ / 5 , 1 # F @ q ? e ŏ ε 3 G <3 . . G S - kɷG G / . . . ɟ 3 G S - kɷG G G
3 . . ɟ / G S - kɷG T / . . | G S -. kɹ J T . , . 3 Ɠ S ⁻. kG F @ T B L ? G ɷG G G G T
τ P<.,.3 ɟ 7. ٤ F@sAg Ψ /3 ٤ F@T BLA ҥ Ҍ PCP
ҥ ▌ /2,2 # ɟ F@T BLA 57 ٤ /3,2 # ę Ψ 2 ٤ F@sAg ε
CMIA ε 2,3 # ɟ /3 ٤ ‴m Poafe ã ~ /3 ٤
F@T BLA F@sAg F@T BLA ҷ ҥ Ҍ ҥ 2 ٤ F@T BLA
F@sAg F@T BLA Ҍ ҥ ɟ Ä Ã PCP F@T BLA
ө ө e PPT ɹ e LPT ҷ ε /. . ,. # CMIA F@sAg ө
ɷPPTɷLPT ŏ ą̈ ε 75,3 # ɷ75,. # ɷ83,4 # ɷ77,3 # PCP F@T ɹ PPT Ҍ CMIA
P<.,.3 ɟ ẉ PCP F@T BLA ' Ҍ ۏ Ɓ Ҍ ۏ ƒ CMIA
Ã א I Ǐ F@T Ä Ÿ ɹ K ۱ ה ┼ ├ K ɟ
Ψ ẉ PCP F@T BLA ɔ ה ẉ ẍ ŏ ۏ

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0 א ♣ ˟ ώ , ă ھ , א ˚ א ♣ 3 / . / 6 .
ρ I ω ı C ɠ k _ f g ` j 7 ./ 4 ⩾ 1 , a m k

1.3

1.3.1 NCP FBT BLA

ğ ٦ Ḥ 96 Ψ Ấ 4 J Ỉ ɷ2. J I ɷ2.. J ۱ ɨ ɷí ɨ ɷ ɨ ẇ 4 Y ẗA ɨ ẹ Ấ Qk_ɒ32 ╚ ٦ Ѧ ٦ Ḥ Ш ٦ ɟ ~ 4. J - Ấ NCP א Ψ ˉ א 2. J ɟ NCP א Ấ ABG TggAY ىي ẉ NCP ⇔ Ѧ FBT BLA ⇔ ε 5. Ÿ 2 kgI 1 Y 95 Ÿ 15 kgI 1 Y 94 Ÿ 15 q 55 Ÿ 45 q 45 Y ɟ

FBT BLA Ḥ ; ε 1. G S - k JDAK ⇔ Ύ Y TGC ⇔ ҥ Ҥ Ḥ ; ẗΩ ó DAK ۱ TGC ⇔ Ύ Cr e Ҥ 45 Ҥ Ḥ ; ẗΩ ó ɟ

1.3.2 CK GA FBqAe

ğ ~ Ấ ApafgrcarU2g..QPẍ ũ Ѧ O Ḥ Ш Ə Ѧ ɮ ɟ FBỤ qAe Ƽ ɱ ε .... | ...5G S - kFBqAe< ...5 ٦ ε ɟ

1.3.3 Pmafc ã FBT BLA

Ҥ ɔ Ά ˝m m Pmafc Cm`_q AknjgNpcn - Cm`_ãq FBT BLA ɟ Cm`_q AknjgNpcnã ٦ Ѧ ٦ NCP א I ậ Cm`_q R_oK_48 ã Ѧ ẉ NCP ɟ

FBT BLA Ḥ ; ε 2. G S - k J NCP ⇔ Ά Cr e ´ ó ҥ Ҥ 2. G S - kΩJó FBT BLA Ҥ 2. G S - kΩJó FBT BLA ɟ ẉ 2 m ۱ Pmafc ã ε ẗA ẉ ɵ NCP ۱ CK GA ɟ

1.3.4 ũ QNQQ22.. Θ ũ ẉ P3. P23 P53 I rssl_I $ U_llgs F ۱ M_nn Ụ U fgtnew S ũ ẉ # c7 P<.,.3 ε τ ɟ

2

2.1 NCP Ά CK GA 519 ٹ Ψ FBqAe 9. ٹ ε 17.3 # ẹ Ψ 13 ٹ ▌ 14.4 # FBT BLA ҥ Ҥ NCP ҥ FBT BLA 79 ٹ ε 15.2 # ẹ Ψ 2 ٹ FBqAe CK GA ε 2.5 # ɟ 15 ٹ ˝m ɟ c7 K ± M ± H B ¬ A ° Π P<.,.3 / ɟ

2.2 FBqAe FBT BLA 9. ٹ FBqAe FBqAe ũ ε 5 ậ...5# :

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P<.,.3 ɟ ʹY F@T BLA
ɥ ˘ F@eAg ɿ ʕ
ʻʼ ɥ † ɟ ẹ Ψ F@T BLA
F@eAg ɥ Ҥ /.|2. IS-kJ ɿ >3..
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ʻʼ CF@ Ψ ה
Ə ɟ F@T BLA ζ Ҥ ó
F@T ̈Ạ ʼ Ҥ
ʷ ó ³ ɟ
F@T BLA غ
22 ɿ F@T BLA ᵉ ʼ
TP 22 ɿ F@T BLA <2,3 log/. IS-kJ
3 TP ɑ̃ 78,4 # 22 ɿ F@T
BLA ᵉ ʼ F@eAg /. 22 ɿ F@T
BLA<43 IS-kJ 2 F@eAg
23,2 # // ɟ ʹY ɛ̀ í
ʼ Ҥ ɔ
/2+/3 ɟ З ʤ
ɿ F@T BLA ɿ
ɟ PCP Ҥ ᵐ
; c ε 3.. IS-kJ ̈ í ɸ
غ ̀Ω F@T BLA
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Ҥ ʒ ᵊ Ψ ɞ í
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Ψ Ҭ ε 2 ▌
̈Ω F@T BLA
í ɵ ᵉ Ấ ɿ
ɵ ɟ

A ʻʼ

/ Uorlb Fe_ltf Mrg_ngx_tgon, Esgbelgnes dor tfe prevenŲ tgon a_re _nb tre_tkent od persons ugtf afronga fep_tgŲ tgs @ gndeatgon, Uorlb Fe_ltf Mrg_ngx_tgon 2./3,

2 Rerr_slt LA Jo i AQF MaM_fon @H et _l, Spb_te on preventgon bg_gnosgs _nb tre_tkent od afronga fep_tgtgs @ AAQJB 2./8 fep_tgtgs @ gsgb_nae H , Fep_tologw 2./8 45 2 /34.Ų/377,

3 Csrope_n Assoag_tgon For Rfe Qtsbw Md Rfe Jgver, CA Ų QJ 2./5 Clgnga_l Pr_atgae Esgbelgnes on tfe k_n_geŲ kent od fep_tgtgs @ vgrss gndeatgon H , Hosrn_l od fep_Ų tologw 2./5 45 2 35.Ų378,

2 Q_rgn Q I I sk_r M J_s E I et _l, Asg_n Ų P_agdga algnga_l pr_atgae gsgbelgnes on tfe k_n_gekent od fep_Ų

6 Q M P H Z UÀ+

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3 ɟ F@eAg F@T BLA>/. IS-
kJ ʒ ε 7/,4# F@eAg Ψ
F@T BLA>/. IS-kJ ε 53# J
τ c^7_5 3 =P2>.,.3 ɟ

2,2 ʻ Á F@T
BLA
74 ʒ FCC ʻ AJR ʷ ƱƱER
52 ʒ ▌ 53,.# ɟ AJR ʷ ƱƱER
F@T BLA ɿ
AJR ʷ ƱƱER 2 J ǧ
ɔ Ė P<.,.3 ɟ

F@T BL? F@c?e

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ٍ ⅟ 6ʒ ϕ ىى c Ɗ F@c?e ǖ ǫ̈ ϰ ⅟

F@T ɟBL? ǖ F@ƒT BɟL? ⅟ F@T Ặ ǖ ɟ بم ⅟ 6ʒ F@c?e

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1.2.1 ʒ Ά NCP אʼ ǀ Ỉ -ú Á €ʼ ϕ 1Ë

ʒ ɔ Ḥ BA622 Ψ

غ نح oy ǎ ˘ 96 Ψ Ẩ

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			n #
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	`w 2 re_gents	n #	
		c^2	P e
			: 2 3 8 2 ., . . /

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1.2 ζ ʽḤ ɩ Ѧ ڑ

i FBT CMBAQ AkŲ

njgNpcn ך Ѧ ε 6.. J ﻣﻨﻪ ʽḤ ε

CMBAQ FBT Rcqr t2.. Pmafc ﻟ ﻫ У FBT

Qk_pr32 ã ך Ѧ

ε 2.. J ﻣﻨﻪ ʽḤ

NCP ﻣﻨﻪ ʽḤ ﻫ У Ψ غ ﻧﺤ oy

ắ ˘ Ѧ ڑ ﻫ ABG75..ﻳﻰ ẉ

NCP Ѧ ﻟ

1.3

514 ﺏ ǖ ǟ i ɩ ﻫ У ʽḤ

ʽḤ Ш ẞ ﻟ 2

FBT ﻧﺤ Ɑ m ﺟﺞ ẉ

NCP ϕ ж Ψ FBT

ﻟ 2 ʽḤ 1

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1.4

Cvacj e FBT

BLA jme1.

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˘ ʾ ʽḤ Ặ @l_nbŲAltk_n

ﻳﻰ ǖ ˘ ʾ m ʽḤ

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2.19 2 6 ﺋﺞ ├

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Ⅲm FBT ẹ ɧ Ɑ غ

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ﺟﺞ ʾ Ш ﻟ

2

2.1 2 ʽḤ

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ʽḤ e ǖ ε ɩ ǟ FBT Ń

117 ﺏ :2. G S - k J 11. ﺏ 2. | 1.7Â

1.8 G S - k J 287 ﺏ ẹ Ψ <1.7Â 1.8 G S - k J

33 ﺏ ﻟ ﻫ У ʽḤ Á i

ǖ 2 i ẊḤĐ X & 1@Đ

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¿=’UÀ+

4» 18 59ðˆ0Ð +2¤• 0 Â ¤ÁóSŸ ƒ ³*Hñ6 1'^ 18•Ð @E

P<.,.3 , For tfe /` Rwpe afronga Fep_tgtgs C ufo uere tre_teb ugtf _ntgvgr_l tfer_pw dor 2 uee i s nork_l ketfob f_s beteateb 4 a_ses /3# _s posgtgve ufgle tfe fggf Ų sensgtgve ketfob f_s beteateb 22 a_ses 7/,3# , For tfose tre_teb dor 2 uee i s tfe nork_l ketfob f_s beteateb . a_ses dor posgtgve fggf sensgtgve ketfob 2 a_ses 8,5# , Rfe /2 Ų uee i nork_l ketfob f_s beteateb . a_se dor posgtgve, Rfe fggf sensgtgve ketfob f_s beteateb / a_se 2,2# dor posgtgve, Rfe beteatgon od posgtgve r_te `Ш od posgtgv Þ ᴰ ȳ

1.5

2 ὲ ⅃ φ

46 ϡ 1`

r ;.,78 P<.,. . / , Rfe bgdderenae _n_lwsgs sfoueb tf_t tfe ke_n bgdderenae `etueen tfe o s_ntgt_tgve v_lses od gkporteb _nb bokestga re_gent re_gents u_s +,33 log/. IS-kJ _nb tfe 73# aondgbenae gnterv_l u_s +.,7/ 4|.,23 log/. IS-kJ, 74# /.7-//2 od tfe s_kple v_lses uere ugtfgn tfe 73# aondgbenae gnterv_l, Conalssgon Bokestga re_gent f_s _ fggf aorrel_tgon _nb aonsgstenaw ugtf tfe gkporteb re_gent,

I CW UMPBQ Fep_tgtgs C vgr_l lo_b aorrel_tgon aonsgstenaw

Γ یی Γ یی fep_tgtgs
C vgrss FCT Γ یی
Γ Ꝁ ɞ Ꝁ ɞ Ꝁ
ẹ ђ Ꝁ ɟ Γ یی ⊤
PLA Ꞓm سں ɟ ï ►
Γ m ã̃
ǿ ã̃ ï /,5 л ж FCT
3# ˆ Γ ה ʒ ǭ 3,3 ˛ ʒ / ʹY ˝ˀ
ɞ ǫ̈ ɞ ج FCT 2ʹ2 ɟ
Γ ï ʹY غ ε FCT
ʹA ẍ ʻ غ
ĩ l w w ɞ
ה ɞ Ҩ Γ یی ɿ
3 ɟ Ψ FCT PLA ʹẠ
ɿ ʹY ε FCT
ɬ ʹA Ń4 ɟ Ђ /32 ʒ ʾ
ه У Γ یی FCT
ه У ʹḤ ɿ i i ʹḤ 2
ʹḤ Ҩ ɵ ʊ̃ Ђ 2 Ặ
ɿm

2.2 2 ̓Ḥ ŭ

ه У ⅄ i ̓Ḥ ج Ҥ ; 114

ʒ ج FCT ŭ ̈ą ε 2.38Â

1.⁴ | 5.6Â1.⁶ G S - k J5.47Â1.⁶ | 1.39Â1.⁷ G S - k J

t Ξ Ė τ t ; 3,32

P ;.,. . / ه / ɟ i ̓Ḥ ŭ ̈ą

</ . . . IS-kJ ⅄ >/ . . . IS-kJ

t ɟ >/ . . . IS-kJ

2 ̓Ḥ τ t ; 2,23 P ;

.,.2 ه 2 ئۆ </ . . . IS-kJ ς

Ė τ t ; 2,3. P ;.,.3 ه 3 ɟ

2.3 2 ̓Ḥ m ŭ

2 ج Ҥ ; 114 Y

e ך ~ Ặ ŭ Ặ r ;

.,78 P<.,. . / Ξ Ė Ặ ه

2 ɟ ŭ i ̓Ḥ Á ه У ̓Ḥ e

ج e 74 # /.7-//2 e ئۆ 73 #

’ מ ┘ Ỉ i Á ه У Ė m

ه 3 ɟ

ه У ̓Ḥ ŲUE€˜]0 E } t Ð3Ų•U'= }& T } } } }

3

6 Q01 _) ØÐKqg `Î]• >v[illegible] U‘+D0 N

F@c ? e Ų F@c

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ـت φ يى c Ɗ F@c ?Ǻe Ų F@Fc@c ?Ǹ φ يى í

ـإ ـٍ ـلله 0 . / 4/ 0 . / 5/ 0 ئۆ φ يى 3 . ʒ. ε

ـإ F@c ?Ǻe Ų F@c ǖ ẹ Ψ Ǹ / 0ʒ0 c Ɗ / 5ʒ1 c l

0 . ʒ3 1 F@c ?ʒe Ų F@Fc@T B L ? ǖ Ỹ ˘ ' ʒ? D N

ʒ ـإ ـم Ǹ 4 6 , . # F@c ?ʒe/ | / A M,ˆG . , 6 # </ . .A,M.ǴA c Ɗ

τ P<.,.3 ـإ Ǹ 43,7 # Ų F@ʒe . | /,. CMI ˆ /2,3 # . | .,/ CMI Ǻ e

ed @ p HEd € 0Bˆ•I‰$€ „V@Ø

ǸA ǸǸ ǸǸ Ʒ ǒ ǸǸ 0 . / 5 X A1X7B/W0D

ω ˛ ν ǸǸ Ʒ' ˛˛ ˛ ـما ẑ ♠ ǸǸ 4 0 6 . . .

ρ I ω C ɡ k _j g j n g / 4 w r, p m k

Ä-€'9 €ÇG9 #*ò #Kd] ® F”#5U‘-A! F

n #

R_`le 2 Jgver dsnatgon gnbe v _nb AFP _`nor k_lgtw r_te n #

ą̈	n	AJR	AQR	AJP	EER	R@IJ	B@IJ	R@A	AFP
אָ	/22	27 2.,2	33 28,5	24 2/,3	3. 22,4	2/ 33,4	33 25,.	33 23,2	37 32,.
c Ɑ	/53	2/ 23,5	27 28,3	28 /4,2	27 28,3	27 28,3	24 24,4	32 3/,2	3. /5,3
c I	2.3	35 /8,.	42 33,8	25 /3,4	4/ 27,8	48 33,2	45 32,5	35 25,8	32 /4,4
c^2		2.,/23	.,/88	3,532	/,.24	/,32.	2,.24	8,585	/2,58/
P e		<.,.3	>.,.3	>.,.3	>.,.3	>.,.3	>.,.3	<.,.3	<.,.3

ɞ Ẩ I ئۆ Ặ ɟ

ئۆ ʊ̃ אָ Ξ

ɔɛ Ҩ ӈ Ҩ Ɑ ɞ I Ψ

Y ئۆ ɔ ɾ غ ʾ Ȯ ² ɟ

ɔ̄ F@T ה ל ʾ ʾ ӝ ɔ F@eAg

غ Ȯ Ụ F@ʾe ئۆ Ỹ /³ ɟ

F@T BLA ς אָ

ئۆ Ψ ӈ ж щ ئۆ Ạ̈ Ҡ

ʊ̃ ɟ RTG@ąQ̈ - RRvgÊ2Qf%oFä2H z÷ H‘ "¥P %'fsÂ `UÅQ•Â ð5:Ð,P…“R×•ó ;5ó s5ó ËÐpe@

A

/ρ / 0

ٹ ө A A w q A ۱ Ὼ F ? P ﷺ ө ɔ
ɔ í τ ɟ ۔ ۏ 0 . / 4/ 0 0 . / 67 ɔ ۱ 4 ⅓ ɔ Ə ε
~ 1 Ң ۱ ۊ └ ۴ ж ɟ ۴ ж ۱ ɔ
ө ⁞ ۱ Ỉ ɟ ﻡ Ἀ A ﷺ ɔ Ψ
╗ P ;.,.34 Ἀ .,43 §.,.3 FAPI ﺝ e ﻩ .,53 §.,./ P<.,../ ɟ
FAPI ۱ C φ ﷺ Ἇ r ;.,33/ P<.,../ ɟ PMC ; FAPI Ⱨ CwsC ɟ
CfglbỤPsgfŰ Ἀ C Ḕ Ἇ P ;.,.35 ɟ Ὼ m Y C
Ἄ ɔ ө ﷺ ɔ C Ὼ ө ɟ
Ψ C Ὼ ɔ ɔ

P ;.,.34 , Cokp_reb ugtf tfe aontrol grosp .,43 §.,.3 tfe ke_n v_lse od FAPI gn tfe stsbw grosp sggngdga_ntlw gnare_seb .,53 §.,./ P<.,../ , Rfere u_s _ sggngdga_nt aorrel_tgon `etueen FAPI _nb Cwst_tgn C r ;.,33/ P<.,../ , Rfe _re_ od FAPI gnbe v snber tfe PMC asrve u_s ksaf fggfer tf_n tf_t od Cwst_tgn C, Rfe CfglbỤPsgf st_ggng pf_se u_s aorrel_teb ugtf awst_tgn C levels P ;.,.35 , Conalssgon Rfe fep_tga _rterw resgst_nae gnbe v FAPI gs _ kore _aasr_te p_r_keter dor p_tgents ugtf lgver dg`rosgs tf_n Cwst_tgn C _nb Cwst_tgn C gs _ `etter gnbga_tor od agrrfosgs,

I CW UMPBQ Cwst_tgn C Fep_tga _rterw resgst_nae gnbe v Cgrrfosgs Fep_tga dg`rosgs

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Ἄ ⌉ ڟ ⌈ ⌈ ⁷ JỤ . / . / . 6
ω ۔ ν / ,⌉ ' ۔ ώ , ≠ ۔ ۔ ﻫ ﻣ ' ⌉ ⌉ ﺧ / / . . 1 0
0 ώ ۔ ώ , ≠ ۔ ۔ ﻣ ⌉ ώ / / 4 . 2 2
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ظط ẅ Ὼ ՝
ا ـ ɔ ɐ
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Ἄ Ἡ ɐ l ɐư ɔ l Ἡ ɐ ا
ת J Ụ ا J Ụ ɟ
ˀ Ш ├ Ң ا Ж
ɟ
1.2 Ⱥ ɮ ا Ἡ
ф ى ɔ ת Ң
FBqAe ɐFBcAe FBc ا FBaGeE ´
א ф ى NCP FBT
BLA ɟ Г ى ɔ FCT l
ﻮ Ẇ ´ א Г ى
NCP FCT PLA ╗
Ἡ Ң Ψ ת ġ oy
ǎ ˘ ɟ NCL GA ظظ ẍ
Ң CwqC QGCKCLQ ہ
K_p`spe ﻮ ẉ BL GGB_bcBcf
pgle ɔ ɟ ⁞ ε Z
⁞ ẋ ő . ɟ Ң Mjwknsq
cvcp_ G G ȢTҢO16 ɳ ى ɟ
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1.1
ﻮ 2.16 12 2.18 9 1Ɔ. ⁞
ا 63˜ ɔ Ə ε ę ɟ ɐ ع
Ψ ɔ 41 ʒ ▌ 65.1 # ɔ122 ƀ ɔ ا ﻮ
ʒ ▌ 34.9 # Г ى ɔ 13 ʒ ф ى ⁞ Ὼ
ɔ 9 ʒ ɟ ɾ 3.˜ ا ا ɟ ˀ m ж ɟ
ą̈ └ ɔ ɟ Ấ ẴA ˜ Ỹ ; ж Ң
ا ɟ ⁞Ω م ε Ң ε
e ƆƐ̆ w ⁞ e ՛Y ﻮ
Ỹ ; Ὼ ҥҤə . . Ỉ ɟ Cfgjb Ụ ɟ
Nsef ũ ⁵ ' ‴ ã ũ ε 3 Y A 1. . ɔ Ỉ
36.5 # B 33.3 # ا C 3..2 # ũ A ¯6 B7ɬ9 w ♥ l ا
C ”1. ɟ Ucqr F_tcl ũ Ẵ A ⁶ Ң ﻮ ا
Ţ O ى kmbcj ♥ ɟ
dmp clb Ụ qr_ec jgtcp bgqc_dɬCC J B ũ ⁷ Ϛ Ң ﻮ ɟ
Ţ ɔ ɟ ę ũ ε ɳ œ ɟ
Ẵ A ˜ ﻮ Ὸ 1. ũ
´ w Ẇ v̌ ă ٦ Ỉ ɟ QNQQ2. . Ө ũ

n # ɯ x ± s

ɟ ʄ t M_nn Ų U fgtnew S

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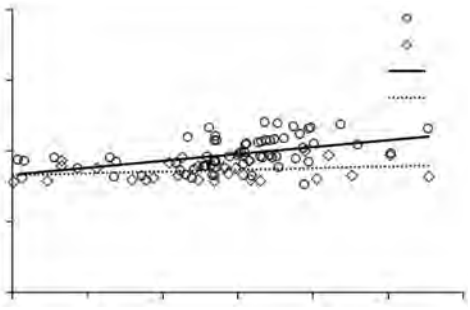
ʄ Qpe_r k_n Ặ ʊ̃ Ặ ɟ ɔ

Ə reaegverope đ ɒ ɣ ʒ̆ ɔ ɤ ɒ ᴰ ɣ ɔ ȳ ƀ ᵃ

r ɔ ʀ



vs FAPI Ὼ

WÖ•p æ!` €5Y V) # 7 UÂÙŸ ' u5'

V) # 7 UŸ5 X&u Ž7

5 " $ &) $ ¶ # 7 @ & % D æ) ! $ ÙÂ•!…p.W BåÙW & QÙÖÙ Ø ÈÙ @ ÓRV ƒ• X!…•\

1.4

QNQQ21.. ũ

x ± s t

c^{7}

x̄ ± s S - J

R_`jc 3  Amkn_pgsmn md jg t cp dsnatgmn `ctuccn tfc 0 epmsns x̄ ± s S - J

	AJR		AQR		EER	
	ѽ	~ 2 ٧	ѽ	~ 2 ٧	ѽ	~ 2 ٧
	83,32 §33,82	22,.3 §24,33-	/22,22 §4/,23	32,.3 §2.,33-	/83,8/ §//8,7/	/.2,.3 §2.,23-
	8/,33 §33,23	43,2/ §3.,2.	/22,28 §38,73	53,2/ §3.,.2	/85,55 §/22,38	//.,/2 §73,.2
t e	/,.43	2,327	/,.28	5,.2/	.,//4	4,/25

-P<.,.3 ɟ

3

k g P1 Ų 6 0

/ρ 0 1

ٮ P L ?1Ų/ 6k0g P1 Ų 6ؤ0 ἔ H ⅃ Ψ Ə ٮ̇
Ἄ ɟ ٍ ⅃ N A P A U c q r c p l ` j m r ٮ̇ Ψ k g P1 Ų 6 0 FAM83A
kgPŲ3/82 kgkgas Ά sgŲ FAM83A ὗ ᾷ Ἆ MFCC75F ẋ
kgPŲ3/82 Ά FAM83A ἴ ἔ H Uestern `lot
@alŲ2 ɞ@_ v מ kgPŲ3/82 ; ٮ غ ٮ̇ ẋ ẉ ʔ ٮ غ ٮ̇ ɞUestern
`lot m ɟ بم kgPŲ3/82 ئؤ Ψ ; FAM83A ɔ kgPŲ3/82
Ἄ FAM83A ~ ٮ̇ @alŲ2 ; @_ v ɔ kgPŲ3/82 ' ~ ´
FAM83A ' FAM83A FAM83A kgPŲ3/82 ἔ H ٮ̇
Ə ɟ kgPŲ3/82 ' ~ FAM83A ̣ ἔ H ɞ Ἄ
ẹ ъ ɟ
ψ kgPŲ3/82 FAM83A ἔ H

Ἄ ٮ̇ ' Ζ , ὁ Ὑ Δ F ? Q . / 4 / 2
ω ̣ ν / ٮ̇ ' Ζ ẑ__ ٮ̇ ' Ζ 0 0 1 . . 0
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1 ⅃ ♣ ̣ ὠ , ٮ̇ ⅃ ♣ 0 0 / . .
ρ I ω ̈ Q C ɡ k _d g.jq 0f0 ./ 74 >1 , a m k

p ¡EG5eDJ8s PE >eOÕ5e

FAM83A kPLA

ɟ

1.2.3 אָ ẉ ˆ ا غ نج

ˉ kgPŲ3182 ´ Ḥ DAK83A 3 ū SRP

ˇΩ ẇ ẹ ל l Ẩ ẉ ˆ ا غ نج l Ψ

ǖ ǟ ǟ URŲDAK83A ɞK SRŲDAK83A ǖ ǟ

Á kgPŲ3182 kgkgaqɞkgPŲ LCǍ

KFCC97F ˜ نج Ế 48 f ל אָ

ẉ ˆ ا غ نج ˈḤ Ш ˘

ẉ ɟ

1.2.4 ɛ̌ H

ǖ ǟ KFCC97F

ɔ Ҥ 6 NBQ

ǖ ǟ Ẩ 5 J Allcvgl TŲDGɞRC J NG

ẅ ǖ ₱ 1. kgl Ҥ 1 f Ỉ Ẩ

Ѧ ɛ̌ H Ỹ ɟ

1.2.5 ẋ

. ɞ2 ɞ4 ɞ6 ɞ8 EẇḤ نج Ế

Ҥ ʒ ˈḤ

1. . ak 1. ak Â1. ak ˥ ˈḤ 3. . aEw -

kgl KFCC97F ɔ

Ҥ 24 3Â1.⁴ Y - k J Ẩ PNŲ

KG164. نج Ế نج Ẩ 37 Ÿɞ5 # CM ˨ ˦ نج Ế

Ỉ نج Ế 1. | 15 NBQ ˥ ’ ẋ

نج Ế ẋ NC ẇ ǖ QD

NC ; ẋ - Â1. . # QD ;

NC - NC Â1. . # Ep_nfN_b

Npgqk7. . Θ ˥ ˇO ى ´ ɟ

1.2.6 ẍ ○ Ucqrcpl `jmr DAK83A ɞ

BajŲ2 ɞB_v

ˉ ˘ Ẩ PGNA

ˉ BCA

3. e ɨ } } . s

x̄ ± s n ;7

R_`le 2 Bs_l lsagder_se reporter e v pergkentx̄ ± s n ;7

	URŲFAM83A	MSRŲFAM83A
	/,.2 §.,.7	/,.2 §.,.8
	.,38 §.,.2 (	/,.3 §.,.7
t e	/7,273	.,227
P e	.,...	.,8.4

Ά kgPŲLC (P<.,.3

A B

i B_
2..
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8.
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3.
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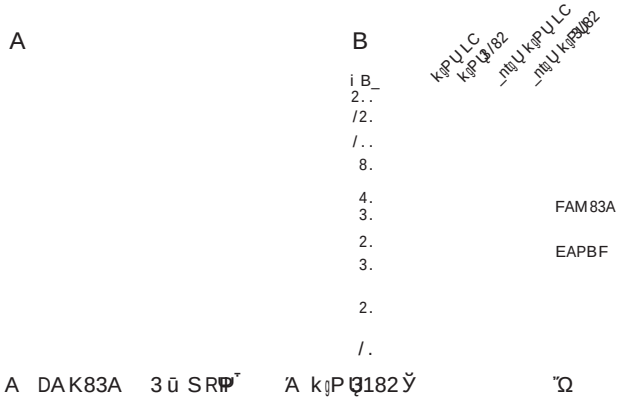
kgPŲLC
kgPŲ3/82
_ntgŲ kgPŲLC
_ntgŲ kgPŲ3/82



FAM83A

EAPBF

A DAK83A 3ū SRPŤ Ά kgPŲ3182Ў Ώ

B DAK83A

A Rfc3ū SRPkmsŲ DAK83D amlrz,g m DB3182,clr] c Ťkcuscl c am" njk 83D

	FAM 83A protegn	Apoptosgs r_te #	@al Q2 protegn	@_ v protegn	B. & Ew 'B. & Ew ' L	QF₂
	.,45 §.,.4	8,.4 §.,57	.,52 §.,.5	.,24 §.,.3	2,388 /,4.2 /,835	.,483
	.,3/ §.,.3(	2.,43 §2,/5(	.,33 §.,.3(	.,4/ §.,.4(	/,323 .,4.3 /,347	.,33.
	.,28 §.,.3	22,5/ §2,/3	.,33 §.,.3	.,43 §.,.3	/,225 .,332 /,35/	.,27.
	.,34 §.,.3!	/2,47 §/,34!	.,42 §.,.4!	.,38 §.,.3!	2,233 .,284 /,/33	.,233
F e	/43,2/8	/22,./.	/28,555	/83,322		/,835 خه ,. خه ,27. ﷺ ,23
P e	.,...	.,...	.,...	.,...		

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/ / ˝ , M

˜A ╗ Z˝ ˙ T ת˝ ,__ Ł ˜A0y
ω ¨ ν / , ╗ Z Z ˝ ما |˚ ╗ 0 4 4 . . .
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ρ I ω ڳ C ɠ k _/ ɠ 0 ɔ 5 . 5 . . . 4 3 > o o , a m k

P>.,.3 , C v aept dor REF Ų otfer awto i gnes uere sggngdga_ntlw bgdderent gn bgdderent st_ges P<.,.3 , IJ Ų2 IJ Ų4 _nb IJ Ų8 uere sggngdga_ntlw louer gn tfe IC grosp tf_n gn tfe tre_tkent grosp `edore tre_tkent P<.,.3 IJ Ų5 _nb IFL Ų Ʊuere sggngdga_ntlw fggfer tf_n `edore tre_tkent P<.,.3 _nb REF Ų ʉsfoueb no sggngdga_nt af_nges P>.,.3 , Conalssgon Pergpfer_l `loob awto i gnes IJ2Ų IJ Ų4 IJ Ų8 IJ Ų5 _nb IFL Ų Ʊf_ve _ aert_gn aorrel_tgon ugtf AJR F@sAg BLA _nb afronga fep_tgtgs @ gndeatgon st_ggng ufgaf a_n `e sseb _s potentg_l ev_ls_tgon gnbga_tors dor tre_tkent od afronga fep_tgtgs @,

I CW U MPBQ Cfronga F@T gndeatgon Cwto i gnes F@T BLA AJR

ф يى Fep_tgtgs @ vgrss F@T

m O ã̃ 2,2

л ж F@T 4. ˛ ж غ H ɟ ж

ئۆ F@T ŋ Ђ ӂ F@T

щ ɔ ζ Ɗ

غ /+3 ɟ F@T Ɓ ӧ ɔ gk Ų

ksne toler_nae IR ɞ ӧ gk ksne ale_r Ų

_nae IC ʅ gn_atgve vgrss a_rrgŲ

er IA ئۆ ˝ ˀ ӧ ӧ ˝ ˀ

Ȯ ˝ ˀ í ˀ ς ˝m

2ʊ3 ɟ غ l ӧ ה ˈ

ʊ̃ ẹ У ʅ Ə ˝ ӧ ئۆ F@T

ʅ ӧ Ψ ς ˝ ˈ ɥ Ə

4ʊ5 ɟ ɷ̈ í ɔ ф يى ӧ ʊ̃

ʅ ɵ ζ ˇ ф Ξ

╚ ɞ Γ Elst_k_te Ų pwrsv_te tr_ns_k gn_se

AJR ɞф يى BLA F@T BLA

ï ӧ ʖ Ά ɟ ئۆ

غ Ά AJR ɞF@T BLA ɞ ӧ ʊ̃

Ặ ʊ̃ ʅ غ Ə ε ф يى

ɵ ئۆ ɵ e ɟ

1

1.1 ʒ

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FBT 75 ʒ ε ʒ

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ф يى ╧ 2.15 ɧ 8 Ψ Ặ Ҥ ф

يى Ã ɟ ├ Ӊ

ʅ Ж Ӌ Ã Ẩ ʒ Ѡ ج

ˀ ɟ Ã ~ _ ´ ɞΓ ɞ

r ɞ يى _ ´ ɞ

ɞ ═ ´ ӧ

ɞ ӧ ~ ´ ɟ

1.2

1.2.1 ʊ̃

ˇ ф يى ӧ ʊ̃ Ã 8ʊ9 75 ʒ

FBT ʊ̃ ε GR 2. ʒ FBcAe) ɞ

A J R 6. S - ɞFBT BLA <1.5 - k JɞGC 3. ʒ

FBcAe) - ɞA J R 6. S - ɞFBT BLA <1.5 -

k J ɞGA 25 ʒ FBcAe + ɞA J R 6. S - ɞFBT

BLA :1.5 - k J ˀ 25 ʒ ф ´

ɟ ε ɟ ɟ ɷ̈ ɷ̈

ʒ ɞ ج τ Ẻ ˈ ɟ

ɔ 1. . ʒ ɔ FBT BLA ˝

ˀ ʊ̃ ε ɥ FBT BLA :1.5 - k Jɞ

Ψ 1.5 - k J̄FBT BLA :1.6 -

k J ɞ

ҔΨ P<.,.3 e m

IJ ษ Ҕ ẹ ђ ᾅ P<.,.3 ɟ IJ Ụ 5

1.2.4 2 ᠰ IFL Ụ Ʊ ⋡ .,ɔs ૐ † Ʊ+⊕ /,%)G4 ƜVsp ñ /w4I@ Í@ H 4 ä Ë! I +

3. ঽ GC 1

▌ ΰ Δ ắ ˘ ᶏ

Ẫ F2.1..141 Ḥ ε 5 ke - ƥ 12 Y

˜ Ố A J R ɞ ᠰ ἒ

Ά ῷ ΰ

1.2.5 ΰ

QNQ Q13.. ϴ ฿ ΰ

ɯ x ± s Ξ *t*

╥ ἒ ΰ ɟ Ə ᵭ ƒ E p_nf Ụ

P_b P pgs k5 ɟ P<.,.3 ε τ ɟ

2

2.1 ᠰ FBT BLA Ά ἒ Ặ

ΰ

FBT BLA ΰ Ẻ I ΰ

1.3 ΰ FBT BLA FBT

ᠰ ἒ 1 ɟ

ъ ᾅ G 4 ษ G 5 Ụ ᆨ ɔ

† ɔ ╗ ╗ ẹ

ʢ ╗ 2 Y ᾅ ε P<.,.3 Ẻ

τ ɟ ᠰ ӊ

IJ ษ ε P>.,.3 τ ӝ ӊ

w $ 0t %

L'aÒcScqrv&c'`‘r`3¡uC1Q9ˆ~)94`Kc'˜ â !  4Wè~‡ #  +±'`=•l„N´˜ ;'` <l€7ls ÕY U‘ÂÂ ñ „ØpóÂ òW Ð•5§` *l€ÅÔ˜ æv ¯
L'aÒcS`g¤b-„cSÑv$•Q9ˆ~) 4 •ÄÂp˜7 ' ,f2p˜D™4 •Gòp˜,%' €j$ •lâp˜ ú' €ÀÒp˜2M' ,» p˜-A' ,ú2p˜E @˜ , y2=U‘U‘ÂÂ ñ „Ø
* /FH

F A T P L ? F A T Ų a ?Qe M B D D ?

/ / / 0 / /ρ

ت Γ ی Ψ Γ P L ?F A T P L ? Ά Γ ی
Ɗ F A T Ų a ?Ψ e ɔ ɔ Q M Bɞ D D ? Ặ ɟ ِ ﻟﻪ 0 . / 3/
0 . / 70 / . ʒ F A T P L ? ε í ʾ ẹ F A T Ų a ?Ψ e M B D D ? ʿ ɟ
بم F A T P L ? Ά F A T Ų a ?Ψ e M B D D ? Ặ I Ỉ F A T P L ? ╗
F A T Ų a ? e ς φ ╗ τ P<.,.3 Ξ ∨ Ặ FCT PLA ʿʾ
QMB τ P<.,.3 QMB I Ỉ FCT ŲPLA ╗ ɦ Ξ
∨ Ặ Ặ ɦ ɞΨ FFA τ P>.,.3 ج Ά
τ P<.,.3 ɟ FCT ŲaAǵA FCT PLA Ặ Ό Ύ ´ نح
QMB ⅃ FFA ئۆm ɔ ʾ w א Ỹ ´ ئۆ Γ ی ⅃ ɔ
í τ ɟ
ψ Γ ی FCT ŲPLA ɔ ɔ

P<.,.3 Rfe QMB level u_s neg_tgve
_ssoag_tgon ugtf tfe FCT PLA P<.,.3 tfosgf tfere u_s no sggngdga_nt bgdderenae od tfe FCT PLA lo_b
`etueen tfe lou _nb kebgsk level od FFA grosps P>.,.3 fouever tfere u_s _ st_tgstga_llw sggngdga_nt
bgdderenae `etueen fggf Ų lo_b grosp _nb tfe rek_gngng2 grosps P<.,.3 ,
r ς Æ

Ã אָ ʾ , Ã 0 . / .21? . 1 / 1 . 5 .
ω ˛ ν /ʾ, | ώ ,ʿ ; ∨ ˛ ما אָ ʾ אָ ♣ 3 / . / 0 .
0 אָ ♣ ˛ ώ , אָ ʾ אָ ♣ 3 / / 2 1 4
ρ I ω شدی شم C ɡ k _/ ɡ 5 j 0 3 . / 0 0 6 7 a m k

FCT PLA	ŭ aopges-kJ	ʒ n	Jg FCT PLA	QMB S-kJ	FFA kol-J
ң	& /lÂ³| / Â/ .³ '	22	2,22 §8,27	/2/,25 §/8,/ /	33.,84 §/75,73
Ψ	& /lÂ³| / Â/ .⁴ '	32	3,43 §3,2/	/ /3,54 §/5,.2-	372,52 §283,7.`
	& /'Â/ .⁴ '	27	5,28 §5,3/	75,74 §/8,3/-	534,25 §2/8,84[a]
		/.3	4,73 §5,38	/ /2,8. §22,3/	424,83 §23/,34

-P<.,.3 ¯P>.,.3 Ά ң ۱ Ψ [a]P<.,.3

3

P<
.,.3 FCT PLA ۿ FCT ŲaAg
Ş ╗ Ξ ۷ Ą Ą ɟ ğ FCT PLA
ң Ψ FCT Ų aAg Ό ң c ε
2,3# ŭ ę Ɗ ė ' ė ε ğ FCT
FCT Ų aAg ң ǫ̃ ;

Ψ FCT ŲA۱ Ң Ɗ ╥ ẋ ۱
S ´ Ɗ FCT ŲaAg ɟ ɔ
Γ ى ۱ Ψ FCT Ų aAg FCT
PLA Ą FCT ɟ
/2 ىۋ ę ɔ
Ҡ Ɗ ė ɟ ج ğ
O ɔ Ҡ QMB ; ę
' w א ۱ Ǐ ىۋ ɟ
FCT PLA ** QMB
τ P<.,.3 ğ ' Ҡ
ىۋ ۿ QMB ң Ύ
ę QMB e ң Ξ ۷ Ą Ą ɟ ɔ
QMB ƀ ɔ * c ' Ə ε ó Γ ى
ƀ Ύ Ţ Ė í ө e ɟ
QMB ' Ë د Γ ى
Ҡ ɟ
FCT FCT ğ Ψ
Ä * c Ђ ۱ ӧ
ˀ Ş ה ۱ ӧ א /3
Ҡ ש ' ɟ FFA Ė
Ξ ŭ Ė
Ə /2 Ψ FFA ۿ
◑ ' Ҡ m ğ FCT
Ψ ה Ə ɟ FFA
Ά FCT PLA φ ğ Ą Ą FCT PLA ң ө
Ψ FFA τ P>
.,.3 ج Ά τ
P<.,.3 ɟ ŭ ę Ɗ ė ' ė ε ğ FCT PLA
ң ۿ Ψ ш Ė m ц ɣ

UU•UŽUŸ 2 2 Xy1 0 @

UÀ ÙÂ ÙŽ ÙŸ]) 7Ctdp0 M M pd¥P ‡ `€ Ð dG †# £p 5" 5" 5" U $ $ 7$ Q=)R U O u ÐP]•" $ M TR T QE ZU JU Z T5”òè@ €

k g P/ Ц 0 k g P/ Ц 3 .

/ρ 0

ت P L ?k g PЦ/ 0 1 0 k g P/ Ц 3 ئۆ ┼ ϕ ی ą̈ Ψ
ɟ ﻟﻪ ﻟﻪ 0 . / 61 0 . / 70 2 3ʒ ┼ ϕ ی ? ɞ4 .ʒ ϕ
ی @ 1 3 .ʒ ɟ ж A Ə ε ɔ k g P/ Ц 0
k g P/ Ц 3 . ɟ w k g P/ Ц 0 k g /P3 . A ɾ Ə ε ɔ w ı ε ┼ ϕ ی Ə ε غ ɔ
ɔ Ə P M A ǔ k g P/ Ц 0 k g P/ Ц 3 . ą̈ ┼ ϕ ی
Ą̈ P M A ᵉ ɞ ɞ ɞ ᵉ ɞ ᵉ 1 ´ ɟ
بم ? 1 @ k g P/ Ц 0 k g P/ Ц 3 . A ɾ ɦ A τ P<.,.3 A
1 @ J τ P>.,.3 ɟ kgPЦ22 ASC ε .,727 73 #CI .,7.3|.,77/
ȳ ᵉ ε Ct ;28 ɞ ɞ ɞ ᵉ ɞ ᵉ 1 ´ ǔ ą̈ ε 73,34 # ɞ
88,. . # ɞ

ω ̤ ν / , ′ Ʒ’ ̤ ̤ ما ʒʒ ̣ ′ . 4 2 2 . .
0 , ′ Ʒ’ ̤ ̤ Ɛ ʒʒ ̣ ′ . 4 2 2 . .
ρ I ω ئ C ɡ k _k g_ j ρ g l 2 e 2 q 4 m 3 l 3 4 e > 1 , a m k

1.3

1.3.1 ɨ

ɿ 4 k J ₱˜ Ҍ 2 f Ỉ

3 . . . Âg /3 kgn +8. Ÿ ӈ ǻ

ɟ

/,3,2 kgPŲ22 ɿ kgPŲ3.

˜ PLA ɿ FgPsre Jg o sgb PLA-kgPŲ

LA I gt ъ 23. J Ψ ɿ PLA ɟ _ aBLA

´ Fgrst Qtr_nb aBLA Qwntfesgs I gt w

PLA ε aBLA א l PLAŲ prgker

Mg v PLA / g ɞ23. kol-J olggo bR prgker /

J ɞ l /3 J ɞ3 Â PR Pe_atgon @sdŲ

der 3 J ɞ23 k kol-J bLRP / J ɞ23 S- J PL_se

gnfg`gtor / J ɞ2. . S- J MŲ MJ T PR_se/ J ɞ

2 J ɟ ₱ א ӈ̆ گ

ϕ يى Ė ⅄ ’ m
Ξ kgPLA ئۆ F@T ɞ Ą̈ ⅄ ϕ يى
Ψ Ə Ą̈ ɯ kgPŲ22 ⅄ kgPŲ3.
⅄ ã ɟ

A ۆ
/ , ┼ ϕ يى
H , Ψ ╞ 2./5 38 3
488Ų472,
2 , ϕ يى
┘ ϟ Ά ┼ ϕ يى Ą̆ H ,
├ 2./5 33 2 333Ų335,
3 . , ╞ Z ئىى┘ ж ┼
ϕ يى ϟ Q┘ ϟ Ũ H , Ψ ه
2./5 3. 5 542Ų544,
2 ĩ • • âŲÂÜ‡•Ð4 @ •UÀ UÀ
AŲ@Ð@ÖpÖ4ð÷•F O m U Ó `/ò :Ð†p ð‡•Ð @

P<.,.3 ɟ
ה R ɞ@ ɞ ه ÿ
Ψ kgPŲ3. ’ ئۆ ɞ ⅄ ÿ
; ⅄ /2 ɟ ӂ ω̆ kgPŲ3.
’ kgPŲ3.
Ą̈ aŲ kw`نح غ Ą̈ ه ӂ kgPŲ
/3. ئۆ ˝ ˀ Ψ ئۆ
Ỉ Ψ ئۆ Ψ Ω̃ ⅄ ɥ /2 ɟ
ϕ يى ⅄ ┼ ϕ يى
kgPŲ3. Ά ɟ Ҥ ɟ
/3 ɟ ς A ⅄ @
kgPŲ3. Ct e ɥ Ҥ ɟ
kgPŲ3. ɔ ɟ
PMC Ђ kgPŲ22 ⅄
kgPŲ3. ą̈ ┼ ϕ يى
kgPŲ22 ⅄ kgPŲ3. ą̈
┼ ϕ يى ȳ Ct e Ũ ą̈ ε 28 ⅄ 24
ɞ Ũ ą̈ ε 73,34 # ɞ88,. . # ⅄ 7/,38 # ɞ
7/,// # 2 Y ج Ė ɟ
ɔ kgPŲ22 ⅄ kgPŲ3. ą̈ ┼

ÃA ÁĄ ˚ ¸ ð ώ^ ¦ ˛ в ˯ Ї ѕ ɒ ɒ ϒ Ľ 0 . / 5 X V . 1 . . 3
ω ˍ ν س ح ل ώ , ' ˍ ˝ ط ˛ س ح ل 2 1 . . 5 /
ᵖ I ω ب ـ C ɠ k _ j g g j w ɒ ɒ ɒ ɒ ɒ ɒ ɒ ɒ 4 e 1 , a m k

U‘

TO 2

Γ ی f c n _ r g r g F q A T t g p s q ã ◑ ئۆ 0 . 1 φ ώ Γ ی

ã ζ Ɗ غ φ ᵐ ′ ɟ 0 . / 3 ΐ ה ; 7 . # H ; 4 3 7 . #

► U F M Ţ ã ΐ 5 / . ˛ ƀ . ǭ ǎ ɯ̄ 6 ʒ . ɔ # a _ p ʒ ǎ ǎ ǭ # ¾ ³ ǭ ǂ Ψ Ξ ص

Γ ی A f p m l g a f c n _ A r g r ã g q A ئۆ ώ 5 / . ˛ . A F A Ψ ˆ / 2 . ˛ ж

/ # ′ ⁰ 0 . . 4 ã ه

ه / | 3 7 ж Ų F A T ε . , 2 ¹ ɟ

F A T Ė ┼ ʹ Y ɔ ɔ

ε 3 3 | 6 3 ¹ 0 . # 1 | . # A F A Ж ئۆ 0 . |

1 . Ỉ ה ε ɔ ה ε ɔ

f c n _ r m a c j j s ɟ F _ A p a _ ה p a g l m k _

ε 0 | 2 ² ɟ ɴ ɴ Ь U F M ה Ъ

ω ˛ ν ˜ ′ ώ , ≠ ˛ ˜ ′ 5 / 4 . . .

ᵖ I ω ˥ ɥ ˛ C ɠ k _ w g _ j v s / e 4 f 1 > , a m k

ث ϕ يى F@T ϕ يى A F@ʎ Ɗ ה F A A Ɗ غ
φ ɟ Ч ʎ ʼ w Ӓ̣ F@T ɦ ה ɟ F@T
У Ӓ̣ Ђ ẹ Ӓ̣ ה ‖ ŭ Ӑ̣ ɟ
F@T Ə Ӓ̣ ɞ У Ӓ̣ שׂ w ε F@T
שׂ ה í w ל ɟ
ψ ϕ يى Ч

ω ̣ ν ψ | Ζ’ ̣ ̣ ما ̣ ̣ ,’ ʎ ̣ ̣ ̣ ψ | 3 0 6 . . .
ρ I ω ʹ ‹ ̣ ̣ C ɠ k _ 1 j 6 1 0 . . 5 7 > o o , a m k

1

2 FBT

2.1 FBT ɔ Ч ̈Ạ

LAq ƒ FBT У ɟ

LAq ̈ Ь Ч

̈Ạ Ə c Ч

ӈ Ψ FBT BLA ̄ ӂ

FBqAe ⅃ aaaBLA ̈E [13] ɟ í

ƒ LAq 1 w ɔ ϕ ی

4

←Ш ⊢ ⊢ ⊢

←Ш ⊢ Ɑ Ψ ⊢ Ḥ,Ḥ←Ш ⌟ 1 6

˝ 1 Z´ ɟ ⊢ 4˜ ẹ Ψ /˜ ɞ̀E 0˜ ɞΨ

1˜ ╪ 1˜ ɟ ˋ ã̃ Ẻ ɞʊ̃ ⅃ ˋ ɟ

غ ъ Ï Ɑ ɞ ̈Ạ ⅃ Ẻ Ɓ ж ⅄ ⅃

Ə ɟ ئۆ ϕ ی ɞ ⅂ Ƀᵐ ̈Ω ζ Ə

Ƀ F@T F@T P Lε? ₿ ẅ ⊢ غ P L ?Ψ ẹ ṇ ̀Y ⅃ I ᵐ

ה د Ƀ Ꙗ F@T ⅄ ⅃ ̀O Ƀ F@T P L ? Ḥ ɔ ;

φ Ţ Ƀ E N 5ε1˝ ̀ غ ɔ ɟ 3 ζ ه