

—
:
/ / :
/ / :

C4 , C3

Archive of SID

C4 , C3 ()
± / ± ± / ±
(T3) (T2) (T1)
(T3) (T1, T2, T3) C3 (T2) C3
C4 (P = /) (P =)
(P =)
C3 C4

Email : babk_hady@yahoo.com



.()

.()

) ()

(

.()

A

C

) CRP

C4 C3

.()

(

α 1 (

C3 C4

.()

-
- 1 - Acute Phase Response (APR)
 - 2 - Positive Acute Phase Protein
 - 3 - Negative Acute Phase Protein
 - 4 - Ceruloplasmi
 - 5 - C-Reactive Protein (CRP)
 - 6 - Rum Amyloid A
 - 7 - Proinflammatory
 - 8 - Anti - Inflammatory

(, ,)

(Natural Killer) NK

()

()

()

C3 C4

C4 C3

()

Archive of SID

	C3	C4	()
. () Ig			. ()
-) (,)	- C3	C4	(VO ₂ max % () () () () () () () ()

- 1 - Nieman
- 2 - Emet D, et al
- 3 - Wolach B, et al
- 4 - Chemotoxic

C3 C4

Archive of SID

,Seca

, Omron , HBF-306

,Digmed

,Polar

The Binding Site		Minineph Human C3,C4 Kit	
		C3,C4	
- /	g/l) C4 (/	- /	g/l) C3
(/		(/	
((
()		()	
) HRmax	()	()	()
()	()	()	()

Archive of SID

C4,C3

() T1
() T3 () T2 ,(T1
T3,T2
(
(ANOVA)
P ≤ / () SPSS

(±)

()	()	()	()	()	
/ ± /	/ ±	/ ±	±	±	()

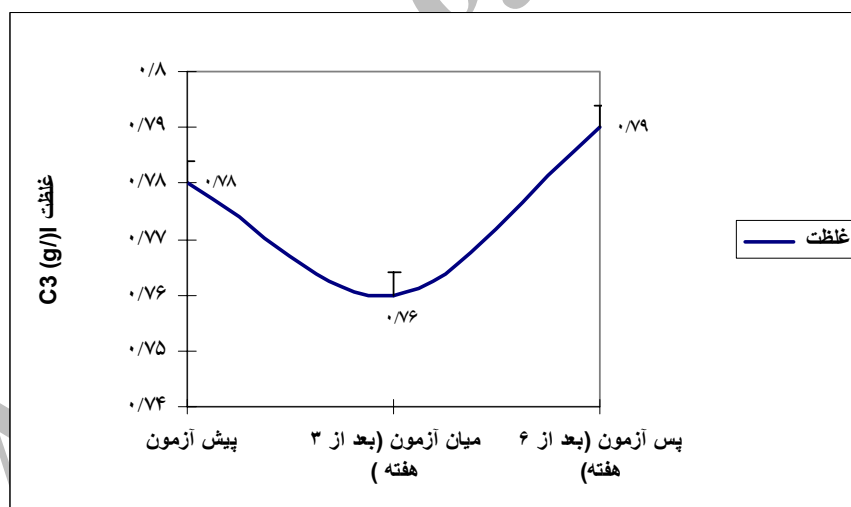
(*)
C3,C4

C3,C4

(sig)	(T3)	(T2)	(T1)	
/	/ ± /	/ ± /	/ ± /	(g/l) C3
* /	/ ± /	/ ± /	/ ± /	(g/l) C4

(P ≤ /) *

C3 (P ≤ ۰/۰۵) C3
(T3) (T2)
(p = /)



C3

C4

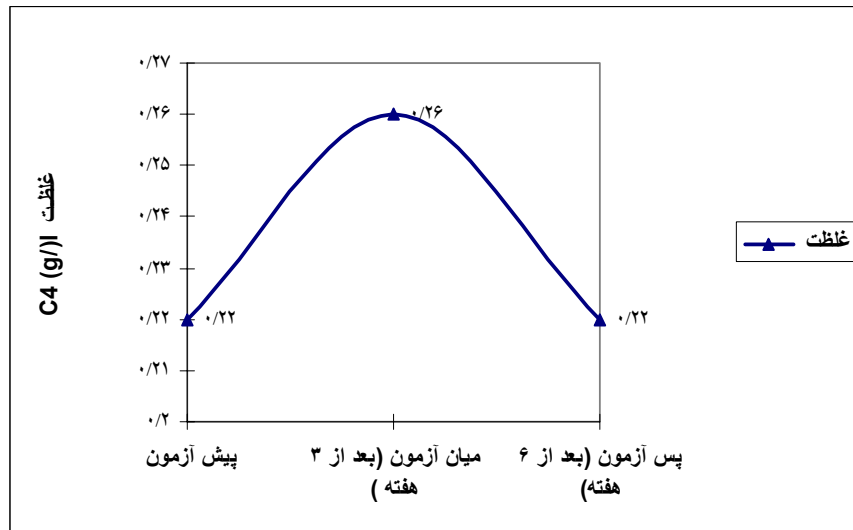
(P = /)

C4, C3

C4

() (P ≤ /)

C4



C4

(C3, C4)

()

()

()

()

C3,C4

()

C3,C4

()

C3

C3

C3

()

()

C3

C3

C3

()

C3,C4

C3,C4

()

C3

C3

C4,C3

(VO₂max%

: C3

,C3

()

()

C3,C4

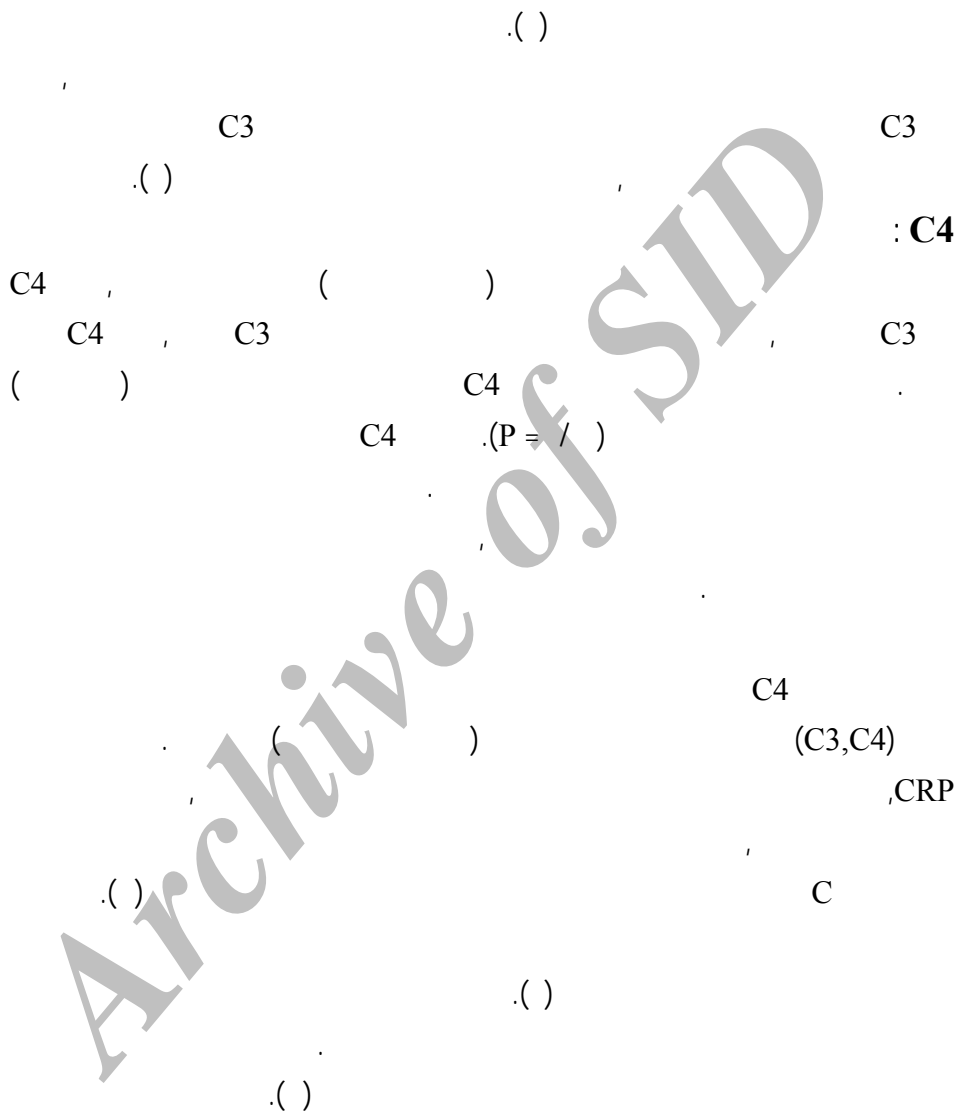
C3,C4

()

C3

C3

-
- 1 - Sawaka et al
 - 2 - Espersen et al
 - 3 - Hanson and Flaherty
 - 4 - Inflammatory /Complement Casecade



-
- 1 - Classical Pathway
 - 2 - Alternative
 - 3 - Lectin Pathway

()
IgA,IgM,IgG,C3,C4 ()
()
C3,C4 ()

()
()
()

Archive of SID

1 - Karacabey et al
2 - Semple et al

4. Castell, I.M., H.R. Portmans, R. Leclercq, M. Br SSEUR, J. Duchateau, and E.A. Newsholm (1997). "Some aspects of the acute phase response after marathon race, and the effect of glutamine supplementation". *International Journal of sport medicine*. (75) ; PP:47-53.
5. Camus, G., Duchateau, G. Deby-Dupont, J. Pincemial, C. Deby, A. Juchmes-Ferir, F. Feron, and M. Lamy. (1994). "Anaphyloatoxin C5a production during short-term sub maximal dynamic exercise in man". *International Journal of sport Medicine*(15); PP: 32-35.
6. Dafaux, B., U. Order, and H. Liesen. (1991). "Effect of a short maximal physical exercise on coagulation, fibrinolysis, and complement system". *International Journal of Sport medicine*. (12). PP:S38-S42.
7. Dafaux, B., U. Order, Geyer, and w. Hohhm N. (1994). "C-Reactive protein serum concentration in well-trained athletes". *International Journal of sport Medicine*. (5) : PP:102-106.
8. Expersen, G.T., E. Toft, E. Ernst, S. Kaalund, and N. Grunnet, (1991). "Change of polymorphonuclear granulocyte migration and lymphocyte proliferative responses in elite runners undergoing intense exercise". *Scandinavian Journal of Medicine and science in sport*. (1) ; PP:158-162.
9. Fallon K E, Fallon S K and Boston T. (2001). "The acute phase response and exercise : court and field sports" *Br. J. Sport . Med*. (35) : PP: 170-173.
10. Gabay cem, M.D., and Iruing Kushner, M D, (1999). "Acute-phase proteins and ogher systemic responses to inflammation ". *The New England of Journal of Mediine*. 340:1376.

-
11. Hanson, P.G., and D.K. Flaherty. (1981). "Immunological responses to training in conditioned runners". *Clinical Science*. (60) ; PP:225-228.
 12. Karacaby , K. Peker, İ.Saygin, ö. Cloglu, F.Ozmerdivenli, R.Bulut, V.(2005). "Effect of acute aerobic and anaerobic exercise on humoral immune system in elite athletes". *Biotechnology & Biotechnological Equipment*. (19); PP:175-180.
 13. Nemet D, Mills P J and Cooper D M, (2004). "Effect of intense wrestling exercise on leucocytes and adhesion molecules in adolescent boys". *Br J Sport Med*. (38) ; PP:154-158.
 14. Nieman, D., C., SA. Tan, J.W.Lee. and A. Berk. (1994). "Complement and immunoglobulin levels in athletes and sedentary control". *International Journal of Sport Medicine*. (10) ; PP: 124-128.
 15. Nosaka , J., And P. M. Clarkson. (1996). "Changes in indicator of inflammation after eccentric exercise of the elbow flexor". *Medicine and Science in sport and exercise*. (28) ; PP:953-361.
 16. Poortmans, J.R. (1987). "Serum protein determination during short exhaustive physical activity". *Journal of Applied physiology*. (30) ; PP: 190-192.
 17. Semple S J, Smith L L, Mckune A J, Mokgethawa B, San Juan A F, Lucia Wade A A, (2005). "Serum concentration of C reactive protein, antitrypsin, and complement (C3, C4, C1 esterase inhibitor) before and during the Vuelta Espana". *Br J sport Med*. (40) : PP:124-127.
 18. Sampietr . T, Bionda F, Dalpino , Rossi G, Chella E, Lusso S, Puntoni M, Touni M and Bionda A, (2004). "Up regulation of C3, C4 and soluble intercellular adhesions molecule co-express with high sensitivity C reactive protein : further evidence of inflammatory activation". *Heart* ; (90), PP:1438-1442.
 19. Strahan, A.R., T.D. Noakes, G.Kotzenberg, A.E.Nel, and F.C. De Beerl, (1984). "Creative protein concentration during long distance running". *British Medicine Journal* (289) ; PP:1249-1251.
 20. Wolach B, Falk B, Gavrieli Roint, Kodesh E and Eliakim A, (2000). "Neutrophil function response to aerobic and anaerobic exercise in female judoka and untrained subject". *Br J Sport Med*. (34) ; PP:23-27.