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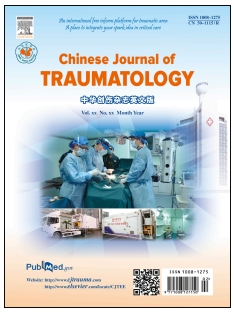

Response of Macrophages in Rat Skeletal Muscle after Eccentric Exercise

Qun Zuo, Shuchen Wang, Xinkai Yu, Weiwei Chao

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Response of macrophages in rat skeletal muscle after eccentric exercise

Qun Zuo*, Shu-Chen Wang, Xin-Kai Yu, Wei-Wei Chao

School of Kinesiology, Shanghai University of Sport, Shanghai 200438, China

**Corresponding author: Email: zuo_qun@sus.edu.cn*

Abstract

Purpose: Macrophages are known to be important for healing numerous injured tissues depending on their functional phenotypes in response to different stimuli. The objective of this study was to reveal macrophage phenotypic changes involved in exercise-induced skeletal muscle injury and regeneration.

Methods: Adult male Sprague-Dawley rats were conducted one session of downhill running (16 degree decline, 16 m/min) for 90 min. After exercise the blood and soleus muscles were collected at 0 h, 6 h, 12 h, 1 d, 2 d, 3 d, 1 w and 2 w after exercise, separately.

Results: It showed that $CD68^+$ M1 macrophages mainly infiltrated into muscle necrotic sites at 1-3 d, while $CD163^+$ M2 macrophages were present in muscles from 0 h to 2 weeks after exercise. Using transmission electron microscopy, we observed activated satellite cells 1 d after exercise. Th1-associated transcripts of iNOS and Ccl2 were inhibited post exercise, while COX-2 mRNA was dramatically increased 12 h after running ($p<0.01$). M2 phenotype marker Arg-1 increased 12 h and 3 d ($p<0.05$, $p<0.01$) after exercise, and Clec10a and Mrc2 were up-regulated in muscles 12 h following exercise ($p<0.05$, $p<0.05$).