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ABSTRACT SUBMISSION – DEADLINE 10 May 2013

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| Title (up to 30 words, Arial, 11 pt, single line spaced, in sentence case. Like this: | <u>The Variation Characteristics of the Thymus Cell Cycle Regulatory Proteins during Long-term Incremental Exercise</u> |
| Authors (Underline the presenting author) | <u>Xinlei Zhang, Fei Qin, Yang Ruan & Yanyan Sun</u> |
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ISEI Abstract – “Session theme number – 7”

The Variation Characteristics of the Thymus Cell Cycle Regulatory Proteins during Long-term Incremental Exercise

XINLEI ZHANG, FEI QIN, YANG RUAN and YANYAN SUN,

School of PE and Sport Science; South China Normal University; Guangzhou, China.

ABSTRACT

Objective: High-intensity exercise may lead to imbalance and retardation of T cell development. While orderly operation is the guarantee for the normal development of cell cycle. This study aimed to observe the changes of rat thymus cell cycle regulatory proteins related to G1/S phase and G2/M phase during long-term incremental exercise, explore the relationship among the proteins, to discuss how the exercise influence cellular immune.

Methods: 80 male SD rats, aged 6 weeks, were divided into sedentary group(S) and exercise group(E) randomly. E group is going to had an incremental treadmill exercise for six weeks. Rat thymus samples were taken at first day (WK0) and the end of WK2, WK4 and WK6. The positive expression of CyclinE, p21 and CyclinB1 were measured by immunohistochemistry.

Results: 1) CyclinE increased slightly in WK2 compared with WK0. While it reduced deeply and changed significantly($P < 0.01$) in WK4 compared with WK2. And then it increased statistically($P < 0.05$) in WK6 compared with WK4, but it still lower than WK0 and WK2. 2) Making p21 expression in WK0 as a reference, it increased extremely in WK2 ($P < 0.01$). WK4 reduced drastically($P < 0.01$) compared with WK2. The expression slightly increased in WK6. The cortex and medulla of thymus lobule become fused in WK6. 3) CyclinB1 in WK2 was higher than WK0. Then it reduced in WK4, while increased slightly in WK6. And the thymic medulla was smaller than previous weeks. The expression of CyclinB1 changed smoothly among every week($P > 0.05$).

Conclusions:

1) The cell cycle may be blocked in G1/S phase in WK2. The destruction of the cell cycle was relieved in WK4 to maintain the body balance. In WK6, the thymus cell cycle operation improved, but the atrophy of the thymus may also cause the decline of immune function. 2) The expression of CyclinB1 increase firstly and then decrease. The reason for this variation is the adaptable regulation of the body faced to exercise. 3) The block of thymus cell cycle due to high-intensity exercise mainly because the G1/S block.

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