

[*Jpn J School Health*, 39, 316-324 (1997)]

[Lab. of Health and Physical Education]

### **Influence of Bone Density Measurement at Entrance into Women's College on Their Subsequent Consciousness to Dietary Life and Bone.**

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In the present study, how the bone density that was measured when women entered college make influences on the consciousness to bone or life style was examined with respect to the differences of bone density. (1)The women found to be in a lower bone density were anxious about osteoporosis and were aware of the importance of life style to strengthen their bone. (2)The women in a lower bone density were inclined to take foods with high protein or calcium including meat. (3) What the way of life style should be is influenced by increase and decrease in bone density after one year.

[*Jpn. J. Hyg.*, 51, 734-741 (1997)]

[Lab. of Health and Physical Education]

### **Effects of Voluntary Exercise on Nonspecific Immunological Mechanisms In Mice.**

Haruo SUGIURA,\* Hiroyuki NISHIDA, Hiroko SUGIURA, Ryoichi INABA and Hirotoishi IWATA

We studied the effects of voluntary exercise on nonspecific immunological mechanisms in mice. In this study, 7 week male ICR mice were divided into two groups: non-exercise group (control) and a group given voluntary exercise (Vex group). Each mouse of the Vex group was kept in an individual cage equipped with a voluntarily revolving wheel that the mouse had free access to. The duration of voluntary exercise was 3 days per week for 8 weeks. By means of the carbon clearance method, phagocytosis of the reticuloendothelial system was increased in the Vex group. Glucose consumption capacity and O<sub>2</sub> production capacity of peritoneal macrophages were significantly increased in the Vex group compared to the control group. The acid phosphatase, β-glucuronidase and lactate dehydrogenase activities of peritoneal macrophages increased significantly in the Vex group. Con A-induced cell proliferation in the spleen was high in the Vex group. Based on the above findings, it may be surmised that voluntary exercise enhances nonspecific immunological mechanisms and thereby improves the host defense mechanisms in mice.

[*Environ. Health Preventive Med.*, 2, 35-39 (1997)]

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### **Dose-dependent Activation of Immune Function in Mice.**

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This study was carried out to evaluate the dose-effects of ingestion of Maharishi Amrit Kalash 5 (MAK 5), an Ayurvedic food supplement, on the immune function in 10 week female inbred BALB/c mice. Mice were given MAK 5 by gastric intubation of an aqueous emulsion at the doses of 10, 50, 100 or 200 mg/kg once a day for 20 days. Glucose consumption of peritoneal macrophages in the MAK 5-treated mice at all doses after 24 hours of incubation, and only at the doses of 200 mg/kg after 48 hours of incubation were significantly higher than those in the control group. Superoxide anion production of peritoneal macrophages in the presence of PMA was significantly higher in the MAK 5-treated group at the doses of 200 mg/kg than in the control group. Activities of GLU and LDH in the peritoneal macrophages were significantly increased in the MAK 5-treated mice at all doses. Stimulation indices in the MAK 5-treated groups at the dosed of 50, 100 and 200 mg/kg were significantly higher than that of the control group. These results indicate that gastric intubation of MAK 5 once a day at the doses of 50 mg/kg enhances not only macrophage function but also lymphocyte responsiveness in mice.

[*Health Care*, 39, 815-819 (1997)]

[Lab. of Health and Physical Education]

### **Effects of Long-term Physical Training on Serum Lipids and Immune Functions in Post-menopausal Women.**

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The effects of long-term physical training on serum lipids and immune functions in post-menopausal women were examined. The subjects were 24 post-menopausal women. The exercise group [n=11, mean age 56±3.8 years] was performed physical training (2 days per week) for 5 years. The other group [n=13, mean age 53±3.2 years] did not perform any particular physical training and was followed as the control. The serum total cholesterol (TC), triglyceride, lipid peroxidation and TC:HDL ratio in the exercise group significantly decreased compared to the control group. The HDL cholesterol was higher than that of control group. NK activity remained in the two groups. The PHA- and Con A-stimulated lymphocyte proliferative responses in the exercise group significantly increased compared to the control group. These results demonstrated that long-term physical training improves not only serum lipids but also lymphocyte responsiveness in post-menopausal women.