Modification of nycthemeral variations in body core temperature after daily exercise at a fixed time

1994 Fiscal Year Final Research Report Summary

MODIFICATION OF NYCTHEMERAL VARIATIONS IN BODY CORE TEMPERATURE AFTER DAILY EXERCISE AT A FIXED TIME

Research Project

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05670064

Research Category

Grant-in-Aid for General Scientific Research (C)

Allocation Type

Single-year Grants

Research Field

Environmental physiology (including Physical medicine and Nutritional physiology)

Research Institution

Kanazawa University

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Keywords

body temperature regulation / heat stress / training / circadian rhythm / adaptation

Research Abstract

The present study was conducted to examine how daily exercise for several hours at a fixed time modifies the pattern of day-night variations in body core temperature and behavior in rats. Spontaneous wheel running was adopted as a model of exercise to avoid any artificial stress on rats.
1. Male Wistar rats were acclimated to cages with a running wheels. Then, the running time of rats were limited to the first or last 3 or 6 h of the dark phase. After a 2-week activity restriction, the rats were again allowed access to the wheel freely. Wheel revolutions of rats during the period corresponding to the previous running time significantly increased after the activity restriction.
2. Male Wistar rats were kept in cages with a running wheel and allowed access to the wheel for 6 h in the last half of the dark phase. After a 3-week exercise period, they were denied to run in the wheel. Their body core temperature significantly increased for 2-3 hours in the last half of the dark phase.
The results suggest that, in rats, voluntary running limited to a fixed time daily alters the pattern of nycthemeral variations in body core temperature and locomotor activity, i.e., body core temperature and running activity increase during the period when the rats were previously allowed to exercise.

Research Products (11 results)

All Other

All Publications (11 results)

[Publications] Sakurada,S.: "Changes in hypothalamic temperature of rats after daily exposure to heat at a fixed time." Pflugers Archiv. 429巻. 291-293 (1994)

[Publications] Shido,O.: "Day-night changes of body temperature and feeding activity in heat-acclimated rats." Physiology and Behavior. 55. 935-939 (1994)

[Publications] Shido,O.: "Shifts of thermoeffector thresholds in heat-acclimated rats." Journal of Physiology(London). 483巻. 491-494 (1994)

[Publications] Sugimoto,N.: "Persisting changes in the 24-hour profile of locomotor cativity by daily activity restriction in rats." Japanese Journal of Physiology. 44. 735-742 (1994)

[Publications] Sugimoto,N.: "Thermoregualtory responses of rats acclimated to heat given daily at a fixed time." Journal of Applied Physiology. 78(in press). (1995)

[Publications] Shido,O.: "Temprature Regualtion recent physiological and pharmacological advances." Birhauser Verlag, 5 (1995)

[Publications] Sakurada et al.: "Changes in hypothalamic temperature of rats after daily exposure to heat at a fixed time." Pflugers Arch.429. 291-293 (1994)

[Publications] Shido et al.: "Day-night changes in body temperature and feeding activity in heat-acclimated rats." Physiol. Behav.55. 935-939 (1994)

[Publications] Sugimoto et al.: "Persisting changes in the 24-hour profile of locomotor activity by daily activity restriction in rats." Jpn.J.Physiol.44. 735-742 (1994)

[Publications] Shido et al.: "Shifts of thermoeffector thresholds in heat-acclimated rats." J.Physiol. (Lond.). 483. 491-494 (1995)

[Publications] Sugimoto et al.: "Thermoregulatory responses of rats acclimated to heat given daily at a fixed time." J.Appl.Physiol.78 (in press).

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