

subjective variables showed no differences. When participants slept with Cedrol, sleep onset was shorter ( $t(6)=2.92, p<.05$ ) and sleep efficiency was better ( $t(6)=2.92, p<.05$ ). The results showed that pillowcase impregnated with Cedrol facilitated the process into sleep onset and improved nocturnal sleep.

#### 1-4 Effects of Empathy on Stress Cognition in Communication

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The aim of this study was to clarify effects of received empathy in communicating for 9 stressed female students. After mental and physical tasks, the subject told a listener how she felt during the tasks. At this time two conditions were conducted that the subject received a reaction with empathy (empathy condition) or no reaction (control) from the listener. HRV and EEG were measured during experiments. Subjective stress cognition was estimated by visual analog scale. Results in empathy condition compared with control were significantly higher LF/HF and  $\beta$  on T3 and reduction of subjective stress cognition. Also correlations were found in empathy condition that cognition of sharing the same feelings and understanding reduced above physiological activities. These findings meant that comfort by establishing communication especially in empathy condition reduced physiological activities. Conversely, even in empathy condition, not establishing communication might be more uncomfortable than in control. In conclusion, cognition of empathy reflected cognitions of sharing the same feelings and understanding, which inhibited physiological activities and reduced stress cognition.

#### 1-5 Relationship between Daily Light Exposure and Melatonin Secretion Rhythm in Summer

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The salivary melatonin rhythms and light exposure levels in the daily life were measured in healthy female students ( $n=6$ , mean age  $20.9 \pm 0.2$  years) during a subsequent month from the summer solstice. On a day during experimental period, the subjects collected saliva samples by themselves at 10:00, 12:00, 16:00, 19:00, 22:00, 1:00, 4:00 and 7:00 h. Additionally, on seven consecutive days including saliva sampling day, the subjects were required to wear Actiwatch L (Mini Mitter Co, Inc) for measuring light exposure every 1 min, and to fill out the diary about bedtime and waking time, etc.

The hours of daylight exposure varied daily and among individuals. The peak levels of nocturnal melatonin were negatively correlated with the mean hours of  $\geq 5000$  and  $\geq 10000$  lux light exposure during the experimental days ( $p<.05$ ). These results suggest that there were chronic effect

of bright daylight exposure, and threshold of light intensity on nocturnal melatonin secretions.

#### 1-6 Air-Conditioner Algorithm for Pleasant Sleep and Long Life

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Sleep has important physical, mental and regenerative purpose in a lifetime, and a causal relationship between declining core body temperature ( $T_c$ ) and sleep quality has been well documented. In this study, we investigated the effect of the "V-shape" room temperature ( $T_r$ ) controlled air-conditioner system ( $T_r$  decreases  $2^\circ\text{C}$  from bedtime over 3 hours and fixes 1 hour and increases  $1^\circ\text{C}$  up to the time of rising) on  $T_c$ , sleep latency and sleep stage. Ten healthy male subjects participated in two experimental sleeping conditions (V-shape  $T_r$  condition and Fixed  $T_r$  condition). Initial  $T_r$  was set at  $29.5^\circ\text{C}$  in both conditions. The fall in  $T_c$  was greater in V-shape  $T_r$  condition than in Fixed  $T_r$  condition. The longer deep sleep was also observed in V-shape  $T_r$  condition. These results indicated that V-shape  $T_r$  control system improve sleep quality with lower  $T_c$  during sleep.

#### 1-7 Fundamental Study for Physiological Effects of Staying at Urban Rivers—Using Salivary Amylase and Cortisol as Indicators—

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Many urban residents have urban rivers near their living area, so they can go urban rivers a short time later. Such urban rivers are said to have some effects on us and one of these effects is the stress-relieving effect. So, urban rivers can be used as the stress-relieving spaces in urban residents' daily life. So we tried quantitative analysis of physiological effects especially the stress-relieving effect of staying at urban rivers. Measurement indexes are salivary amylase and cortisol, because subjects almost never get stressed by taking a saliva sample and we can measure in the open air. And we settled the measurement schedule in consideration for salivary cortisol's circadian rhythm and rate of reaction. We also carried out the questionnaire survey. As a result, when subjects stayed at urban rivers, salivary indexes have significantly lower concentration or lower concentration than at urban spaces. And "comfortable" and "peaceful" that are indexes of the questionnaire also have significantly-high. This study suggests the possibility that staying at urban rivers have the stress-relieving effect on us.