

# 入睡K-综合波产生的生理机制模型仿真研究

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在确定人类睡眠脑电客观分期的国际标准中，有两类脑电特征波可以用来确定入睡状态（睡眠第二期），即纺锤波和K-综合波。在前文中已提出了产生纺锤波的生理机制模型。按照1998年后对K-综合波形成的生理机制的看法，建立了微观神经元环路模型，其放电节律与实验中入睡时神经元放电的振荡节律相一致。而由大量这种相同环路组成的网络模型则在皮层处可产生符合K-综合波的波形。这一结果再次启示了脑信息处理中如何由微观神经元群放电特征整合为脑的宏观功能状态的过程。

## STUDY OF MODELING FOR MECHANISMS OF K-COMPLEX IN EEG DURING FALLING ASLEEP

In the international standard for human sleep electroencephalogram stages, there are two kinds of waves, spindle waves and K-complex, which can define falling asleep (also called sleep stage 2). Models for mechanisms of spindle waves production have been presented in previous paper. The circuit model of microscopic neurons was established, whose oscillation rhythms are accordant with rhythms of experimental neurons when falling asleep according to the researches for mechanisms of K-complex after 1998. Furthermore, the network model composed by many the same circuits may produce waves accord with the shape of K-complex. These results enlighten us again the courses of information processing in which the microscopic electrical activities of neurons can be integrated into the macroscopic functional states of human brains.

### 关键词

入睡EEG(Sleeping EEG); K-综合波(K-complex); 神经元环路(Neuronal circuit); 网络模型(Network model)