

Abstract: Sleep facilitates memory consolidation. A widely held model assumes that this is because newly encoded memories undergo covert reactivation during sleep. We cued new memories in humans during sleep by presenting an odor that had been presented as context during prior learning, and so showed that reactivation indeed causes memory consolidation during sleep. Re-exposure to the odor during slow-wave sleep (SWS) improved the retention of hippocampus-dependent declarative memories but not of hippocampus-independent procedural memories. Odor re-exposure was ineffective during rapid eye movement sleep or wakefulness or when the odor had been omitted during prior learning. Concurring with these findings, functional magnetic resonance imaging revealed significant hippocampal activation in response to odor re-exposure during SWS.

1. Please summary and translate the abstract shown above into Chinese. (10%)
2. Please design the experiment according to data shown in the abstract in Chinese or English. (25%)

Abstract: Paroxysmal 7- to 12-Hz high-voltage rhythmic spike (HVRS) discharges often appear in several particular strains of rats. However, functional hypotheses of these 7-12 Hz high-voltage cortical oscillations (absence seizure vs. idling mu rhythm) are inconclusive. The mu rhythm can be provoked by flicker stimulation (FS) in most people, but FS is less effective at eliciting absence epileptic activity. Therefore FS and antiepileptic drugs were used to verify the role of HVRS activity in rats. The occurrence of HVRS discharges was significantly reduced by anti-absence epileptic drugs, but anti-convulsive epileptic drug displayed little effect. On the other hand, many FSs (>60%) elicited small-amplitude mu-rhythm-like activity in the parietal cortex concomitant with FS-related rhythms in the occipital cortex and resulted in significant augmentation of 7-12 Hz power in the parietal region. Furthermore, a large portion of FSs (>60%) provoked increase of 7-12 Hz power of the parietal cortex after anti-absence drug administration in rats. Characteristics of FS-elicited mu-rhythm-like activities were consistent with those observed in humans, and they remarkably differed from those of spontaneous HVRS discharges. These results support the hypothesis that HVRS activity in rats may be an absence-like seizure activity rather than the mu rhythm.

3. Please summary and translate the abstract shown above into Chinese. (10%)
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