POSTER **ABSTRACTS**

CLINICAL-TRANSLATIONAL RESEARCH SYMPOSIUM

Tunable Somatosensory Stimulation for Selective Sleep Restriction Studies in Rodents

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of restricting Rapid Eye Movement (REM) sleep in mice. While 2. REM restriction in mice.

Many methods for sleep restriction in rodents have emerged in this system was effective, it was a crude prototype and did not the literature, but most are intrusive, lack fine control, and in- allow precise control over the amplitude and frequency of stimduce stress in the animal. A versatile, nonintrusive means of ulation applied to the animal. This paper details the progression sleep restriction that can alter sleep in a controlled manner of this system from a binary, "all-or-none" version to one that could be of great value in sleep research. In previous work, we allows dynamic control over perturbation to accomplish graded, proposed a novel system for closed-loop somatosensory stimu- state-dependent sleep restriction. Its preliminary use is delation based on mechanical vibration and applied it to the task scribed in two applications: 1. Deep sleep restriction in rats, and

Effect of Temperature on Sleep Regulation in an Animal Epilepsy Model

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viduals with epilepsy and may present as reduced sleep depth, that temperature does in fact significantly alter the proportions altered proportions of different stages of sleep, intermittent and durations of each vigilance state in this model, with possibly arousal, and other phenomena. Sleep loss can in turn precipi- correlated changes in seizure incidence. Manipulation of ambitate seizures, thus sustaining a vicious cycle. It is well known ent temperature therefore offers a simple and relatively unobthat changes in ambient temperature elicit thermoregulatory trusive way of titrating sleep quality and perhaps alleviating the responses that alter the dynamics of sleep. As a first step to- seizure burden in epilepsy. ward therapeutic sleep modulation for epilepsy, we assessed the effect of elevated ambient temperature on sleep dynamics and seizure yield in the chronic pilocarpine mouse model of

Besides recurring seizures, disordered sleep is common in indi- temporal lobe epilepsy. The results in a small sample indicate

A Mathematical Model of Ultradian Sleep-Wake Regulation in Rodents

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cally motivated mathematical models replicate the shorter time- ments on mice.

Rodent models are widely used for the experimental analysis of scale of arousal within sleep, but not the longer one represleep. While this is motivated by similarities in brain circuitry senting prolonged wakefulness. Here, we adapt a previously and electrophysiological rhythms, unlike the circadian sleep- published ``flip-flop'' model of human sleep to capture the ultrawake cycle in humans, rodent sleep is polyphasic, containing dian alternation of sleep and wakefulness in mice on the longer multiple bouts of sleep and wake minutes to hours in duration timescale. The resulting model reproduces both the mean duraover the course of a day. Each sleep bout is punctuated by sev- tions of alternating sleep and wake bouts as well as the circadieral brief arousals several seconds to minutes long. Physiologi- an trends in their bout durations documented in our experi-

8a

7b