Researchers create non-invasive sleep research system for mice

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A company founded by two University of Kentucky professors, Signal Solutions LLC, has successfully created a complete system for collecting and analyzing sleep/wake data in laboratory rodents.

This innovative concept-to-reality product, called "PiezoSleep Mouse Behavior Tracking System" is an entirely non-invasive and technologically advanced means of studying sleep/wake states in mice. Developing a non-invasive method was the primary motivation for managing partner Kevin Donohue, who is a professor in the UK Department of Electrical and Computer Engineering, and co-founder and sleep scientist Bruce O'Hara, who is a professor in the UK Department of Biology.

"We set out to get past the bottle-neck of EEG recordings that have limited our ability to use powerful genomic approaches in the sleep field, and limited our ability to screen and develop new drugs that influence sleep and in turn many other disease processes," O'Hara said.

"When we began this project, we knew it would be a complex undertaking involving a great deal of innovation to develop a robust and reliable system," Donohue said. "We knew this could have a profound impact on the research community worldwide."

The PiezoSleep Mouse Behavior Tracking System overcomes several obstacles traditionally present with invasive and costly electroencephalography (EEG) systems:

- Lowered barrier of entry: The PiezoSleep Mouse Behavior Tracking System costs less to buy and maintain than EEG-based systems.
- Automated scoring software allows non-technical and non-expert users to collect sleep/wake data in a laboratory setting.
- Scalability: Systems can be scaled to meet the needs of almost any project, without a linear rise in cost.

Signal Solutions LLC is a private technology company creating both software and hardware applications to perform various digital signal processing tasks. While originally focused on sleep/wake technology, Signal Solutions LLC is moving forward to develop digital signal processing solutions for a number of industries; including applications to other animals and general health monitoring systems.

Provided by University of Kentucky

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