

Wake Forest University Health Sciences

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Featured Technology

WIRELESS SYSTEMS FOR DETECTION, PROCESSING, AND ACTIVATION OF NEURAL EVENTS USING ONBOARD COMPUTER CONTROL

Inventors: Drs. Sam A. Deadwyler and Robert E. Hampson

OVERVIEW

Knowledge of brain function and the neurodevice market (\$5.5 billion) are both growing rapidly, as is the need for better and more convenient methods of observing and interacting with the brain. Unfortunately, the systems currently employed to record and stimulate neural activity directly through electrodes remain inconvenient and impede the collection of meaningful biological data.

INVENTION

Researchers at the Wake Forest University School of Medicine have developed a compact system that analyzes, compresses, and then transmits select neural action potential data wirelessly from subject to computer via Bluetooth technology. The system can transmit action potential waveform data and time-stamp data from identified neurons in awake, behaving subjects. In addition, it can be employed to wirelessly program stimulation of neural tissue in awake, behaving subjects. The system can be used for basic research, even for small mammals such as mice, or as part of a system to diagnose or treat brain disorders.

UNIQUE PROPERTIES

- Scientifically validated prototype (see *Neuroscience Methods* citation below)
- Record individual neuron firing data, and for longer intervals than previously possible.
- Configurable closed-loop stimulation and recording methodology
- Study the neural basis of natural behaviors previously inaccessible.
- Detect meaningful biological information reliably from a significant distance (30 meters)
- Develop better, more convenient brain-machine interfaces for neuromodulation systems (a **\$1.38 billion market**) and neuroprosthetics (a **\$540 million market**).
- Simplify surgical procedures that involve neural recordings

STATUS

[U.S. Patent 7,460,904 Issued](#)

[J Neurosci Methods Paper \(A wireless recording system that utilizes Bluetooth technology to transmit neural activity in freely moving animals\) \(PMID: 19524612\)](#)

MISSION

To maximize the value of Wake Forest University's intellectual assets through the creation of novel and effective models for commercializing technology.

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