

nVital Device

An advanced, fully implantable technology for monitoring rodents' physiological data.



The nVital device is a fully-implantable, wireless, and battery-free platform that can concurrently stream body temperature and 3-axis acceleration data captured in freely moving rodents. Custom algorithms convert the accelerometer data into heart and respiration rates, as well as intricate patterns of locomotor activity, body orientation, and behavior. Multiple animals can be run in a single cage, allowing both individual and group-housed experimental designs. Data can be streamed 24/7, promoting longterm circadian rhythm studies.

PRODUCT FEATURES

- Light weight
- Flexible design
- BLE 5.2 Communication
- Chronic lifespan (>8 weeks)

SURGICAL IMPLANTATION

- Ventral subcutaneous implantation
- Minimal 10 mm incision promotes rapid recovery

TRACKABLE METRICS

- **Heart Rate** - nVital detects mechanical vibrations from the heart using its mechano-acoustic sensor, and algorithms translate them into heart rate data.
- **Respiratory Rate** - The device captures chest wall movements associated with breathing, using the same mechano-acoustic principles.
- **Body Temperature** - A clinical grade sensor tracks minute fluctuations in body temperature with high temporal resolution.
- **Activity Monitoring** - Animal motion and body orientation are derived from the continuously streaming raw 3-axis accelerometer data.
- **Behavioral Characterization** - By combining motion data with physiological signals, nVital provides insight into behaviors such as grooming and eating, and states such as stress, anxiety, and sleep.
- **Social Interaction** - Up to 4 implanted animals per cage can be individually and simultaneously tracked for movement and physiological patterns.



REFERENCE

An implantable device for wireless monitoring of diverse physio-behavioral characteristics in freely behaving small animals and interacting groups. *Ouyang et al., Neuron, 2024*

