Animal Behavior and RFID

by Bob Scher, CEO, Dynasys

Any additional stimulus or alteration within a Laboratory Animal Care facility has the potential of affecting animal behavior. Extraneous causes affecting animal behavior may skew the test results of the research being conducted causing errors and inaccuracies to the resulting data. Benchmark testing should be performed as a due diligence measure to assure that the animal's behavior is not affected due to these changes in their environment.

Electro-magnetic energy throughout the entire spectrum exists in a typical laboratory facility. Low Frequency Radio Frequency Identification (LF RFID) animal transponders operate within a frequency band of 125 – 135 kHz. Some telemetry and control devices also share this band. Ultra High Frequency passive RFID devices (UHF RFID) operate at 900 MHz. At the higher end of the radio spectrum is data communications in the form of wireless Local Area Networks typically operating at 2.45 GHz. Microwave ovens and Bluetooth communication devices also share this band.

The Dynasys Animal Care Warehouse Management System uses UHF RFID tags operating at 900 MHz. These devices are passive, meaning that they do not have any internal power source. They derive a small amount of energy from the received signal emitted by an RFID Reader in its proximity. The tags reflect back a minute amount of signal that allows them to identify themselves to the reader. The RFID Readers operate at relatively low power and for very short duty cycles.

The "gold standard" used to determine if psychological or physical stress is being introduced is by monitoring the heart rate, systolic/diastolic arterial blood pressure and relative activity of the animal. Dr. Deborah Scheuer, Associate Professor of Physiology at the University of Florida, conducted stress tests to determine whether the 900 MHz emissions of the Dynasys RFID Animal Care System affected the rodents in her care. A Data Sciences International PhysioTel model PA-C40 implantable transponder provided telemetry signals indicative of the animal's arterial blood pressure and heart rate. The animal's relative activity was also monitored.

Heart rate, arterial blood pressure and the animal's relative activity are strong indicators of physical or psychological stress level. This testing verified that there was no change in stress to the animals when the Dynasys UHF RFID readers where introduced into their environment. Additionally, the tests showed that the UHF RFID emissions had no affect on the accuracy of the Data Sciences International PhysioTel PA-C40 telemetry monitoring.