About Echo Medical Systems, LLC.

Company Background

Echo Medical Systems is a Houston-based company that develops, manufactures, and markets NMR-MRI and CT-based whole body composition and tissue characterization equipment for use by metabolic research laboratories, the pharmaceutical industry and hospitals, and other medical facilities. Echo's class-defining EchoMRI™ technology is unique: it facilitates low-cost, rapid, highly precise, in-vivo measurements of humans and animals without anesthesia or sedation.

The EchoMRI™ proprietary method for tissue characterization provides measurements of whole body composition parameters: fat mass, lean tissue mass, free water, and total body water. The data obtained by EchoMRI™ are highly correlated to those obtained by DEXA, but the measurement procedure is faster and does not require anesthesia. In fact, the measurement duration is about 1 minute for mice and rats and about 3 minutes for humans.

Today, many EchoMRI™ and LaTheta™ systems are successfully used by more than 45 pharmaceutical companies and many leading research universities in the US, Canada, Europe, and Asia for preclinical obesity research in live animals. As drug development progresses from animal studies to human trials, there has been growing demand from Echo customers to apply EchoMRI™ in clinical trials for adult humans. As a result, Echo has developed a new EchoMRI™ system for adult humans, aimed at providing a solution to the pharmaceutical industry for testing the efficacy in clinical trials of anti-obesity and metabolic drugs and treatments.

Echo has a strong position in the underlying technology and methods of NMR-MRI-CT-based whole body and tissue composition analysis, and sophisticated proprietary know-how for tissue characterization applications in obesity, diabetes, nutrition research, pharmacology, osteoporosis, and cardiology. Beyond the existing applications, extensions of the technology are underway to measure additional body composition parameters.

Our Technology

EchoMRI™ Quantitative Magnetic Resonance Body Composition Analyzers for animals and humans take direct measurements of total body fat, lean mass, free water, and total body water. The measurement principle depends on the density of hydrogen nuclei and the physical state of the tissue.

More rapid, accurate, and precise than other methods, EchoMRI™ technology allows for fast measurements *(about 1min for mice and rats and less than 3min for humans)* in vivo without anesthesia or sedation. Unlike DEXA, Echo measurements are radiation-free, do not require the subject to remain still, and in a peer-reviewed study yielded 24 times DEXA's precision facilitating convenient, low-stress repeated tracking of small changes in body composition. Moreover, Echo instruments measure fat and lean mass as an independent characteristics, unlike DEXA, which measures the fat to lean ratio and is, therefore, prone to error propagation from lean to fat. The systems are much less expensive than conventional MRI, are completely silent, and do not require advanced training to use.

In short, EchoMRI™ is the only technology on the market today which allows body composition analyses to be conducted in such a short period of time, with such a high level of precision, without the need for anesthesia or sedation of the test subject(s), with the subjects entirely comfortable during and in preparation for the measurement, and with no radiation to be considered as a health issue.

To learn more about features and benefits of EchoMRI™ Systems, click here.

LaTheta™ CT Scanner: Designed for small animals and intended especially for the in-vivo small animal research, the LaTheta™ CT scanner possesses several distinctive features. Thus, its 60X-more sensitive detector than those of other micro CTs allows work to be conducted with a low energy x-ray source, thus reducing subject radiation exposure to 2-8 mSv and greatly increasing the ability to conduct longitudinal studies. Moreover, the scanner's detector is extremely fast in terms of scanning and reconstruction times (4.5 seconds to 8 minutes depending on the region of interest), enabling results viewing during an acquisition and the freedom to make parameter modifications even after the first slice is displayed. In addition, the high contrast and remarkably low noise level provide excellent resolution when comparing tissues of a similar density (i.e. visceral organs).

Furthermore, LaTheta™ accommodates a wide range of animals, including rats up to 1.5 kg. Its quantification of the scanned images implemented in the software includes visceral, subcutaneous and total fat volume, BMD, mechanical strength and morphology with automatic cortical/trabecular bone recognition, etc. The software is very easy to operate and does not require any special training. Finally, LaTheta™ is conveniently compact and mobile (four casters attached for high mobility), and its low outside radiation exposure enables researchers to use it in any room. Learn more about LaTheta™ CT Scanner here.

Publications by EchoMRI™ users

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