

New facility at Guelph gives researchers a different angle

The University of Guelph has become the first Canadian university offering veterinary and animal science programs to have the clinical and research capacity for magnetic resonance imaging (MRI), a non-surgical, radiation-free technology that offers new levels of diagnostic information.

The \$1.3 million MRI facility, under the direction of Prof. Edward Janzen, is located in the department of biomedical sciences in the Ontario Veterinary College.

Like X-rays or ultrasound, MRI offers researchers an opportunity to look inside the body without using surgery. But most similarities stop there.

Whereas X-rays involve low-level radiation and are essentially snapshots of dense matter such as bone, MRI "pictures" are obtained through the use of harmless magnetism, by recording how the body's hydrogens align in the presence of a magnetic field produced by the MRI unit. This alignment can be translated into unprecedented pictures of areas like the brain, heart or the lungs - wherever there's soft tissue or fat, which has high concentrations of hydrogens.

Like MRI, ultrasound also offers more than pictures of bone, but ultrasound technology has not advanced to the point where it can provide the kind of detail obvious in MRI images.

By using a sensor that can be pinpointed anywhere along the axis of an animal placed inside a magnetic chamber, magnetic resonance imaging can isolate and depict extremely thin "slices" of the subject. Tissue and fat appear as distinctly different bright areas in the MRI image.

Research projects directed by Prof. Janzen, Prof. Tammy Bray, department of nutritional sciences, and Prof. Fred Brauer, department of chemistry and biochemistry, are already under way at the university's MRI facility. The first series involves rats as models for liver and lung diseases, including the effect on

the liver of alcohol and toxic chemicals like the chlorocarbons found in dry cleaning fluids, and the influence of mineral-deficient diets on the lung. The availability of the MRI unit means the progress of diseases can be studied without having to euthanize the animals or conduct invasive surgery.

Prof. Janzen says magnetic resonance imaging will become an important tool for enhancing animal research and diagnostic work at Guelph.

"The procedures we are developing will advance the welfare of animals by enabling veterinarians to better and more quickly diagnose problems like neurological disease,"

he says. "Some of the problems that will be studied here could be models for human diseases and afflictions as well."

The limiting factor in the MRI facility's ability to conduct research and offer diagnosis is the size of the unit's magnet and its associated frequency. At present, the chamber where animals are placed can accommodate nothing larger than cats or puppies. Prof. Janzen is applying for funding to increase the chamber's size by 30 per cent, which he says will enable the facility to accommodate most pets requiring MRI diagnostic services and render better MRI images through the use of higher frequencies.


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