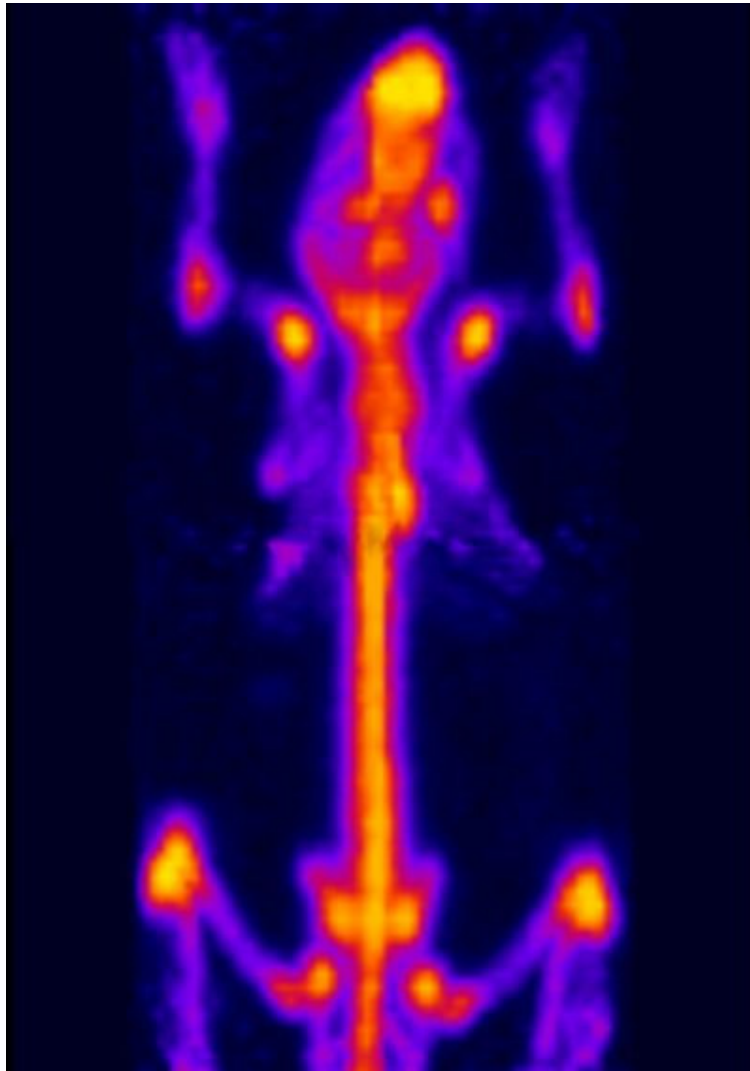


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Coming together for animal scans

Biological and biomedical researchers are increasingly using specialised scanning technology to investigate physiological activity in small laboratory animals. The IRC network has helped a Belgian and an Italian company to adapt their two different technologies to offer customers the advantages of both. The companies expect to capture a significant share of a fast-growing market.



Scan of a mouse during a study of bone metabolism

Scanning instruments, such as computerised tomography (CT) and magnetic resonance imaging (MRI) scanners, have become a familiar part of medical technology. Most of us have seen images from such instruments, and undergoing some kind of scan is now a routine part of many medical procedures. It is less well known, however, that various scanning techniques play a major role in laboratory research on small animals. This research can reveal important new information about mammalian physiology and biochemistry, which in turn can be used to develop new knowledge and procedures applicable to humans.

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Two important European players in the field of small animal scanning are Skyscan, of Aartselaar in Belgium, and ISE of Pisa, Italy. Skyscan has an established micro-computer tomography scanning system (micro-CT), which uses X-rays combined with complex computer-based analysis to generate images of the interior of living animals. ISE has a similarly well-established scanning technology based on detecting gamma ray emissions from radioactive substances injected into the animals being studied. The ISE system is called YAP-(S)PET because it uses crystalline Yttrium Aluminium Perovskite (YAP) as the basis of its gamma ray detector system, and can perform emission tomography (ET) both with positron-emitting (PET) and with single-photon-emitting (SPET) radioisotopes.

Finding each other

Skyscan and ISE became aware of each other's technology as a result of contacts with their local Innovation Relay Centres - IRC Flanders in Belgium and IRC Recital in Italy. This stimulated mutual interest in combining the two different technologies to create new and more versatile methods for scanning small laboratory animals such as mice and rats. The micro-CT scans provide the best information about the structure of the animal tissues, while the YAP-(S)PET scans provide good functional data about the physiological and biochemical processes within the tissues. Combining the data from both types of scan allows researchers to locate specific functional processes accurately inside the living bodies. This yields improved information about what is going on inside the animals being studied.

One seemingly trivial but actually crucial challenge when imaging the anaesthetised laboratory animals is the need to keep the animals properly positioned within the scanning machines. Skyscan achieves this using a special 'animal bed' system. The Skyscan animal bed has been adapted for use in ISE's YAP-(S)PET scanner, as a first step towards combining the advantages of both the micro-CT and YAP-(S)PET systems. The adaptation involved some redesign of the mechanical parts. Using the same animal bed with both systems allows the same animal to be scanned with both micro-CT and YAP-(S)PET, in a way that permits the data obtained to be properly correlated and compared.

Satisfying a growing market

The collaboration between Skyscan and ISE currently takes the form of a technical co-operation agreement, and each company has the right to promote the other company's products to their potential customers and business partners. The commercial advantage for each company is that they can now offer their customers the combined and correlated scanning procedure, which they refer to as PET/SPECT/CT scanning. The demand for this combined type of analysis is currently growing dramatically, so the agreement is allowing the companies to respond to a significant change in the market in which they operate. Both companies are offering entry-level systems in addition to more sophisticated versions. The entry-level option should be attractive to smaller research groups in universities and other research organisations. This may allow the scientific and commercial advantages of the technology to be spread among a wider group of customers.

Before starting this technology transfer, each of the companies had noticed the rising demand for the combined scanning technology, but the effort and investment to go it alone was prohibitive. By working together, each obtains a marketable solution quickly and with much less investment of time and money.

The market for this type of scanning equipment has until now been dominated by technologies and products developed in the USA. The unrivalled multi-mode capability achieved by this new co-operation between Skyscan and ISE will, they hope, boost market penetration by these European companies in the near future. Skyscan has already installed



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approximately 150 micro-CT instruments around the world. ISE presented its new YAP-(S)PET scanner at a major international medical imaging congress in Rome in October 2004, and intends to become a global player with a product and technology developed entirely in Europe.

A further option

A longer-term aim is to work together to develop a single scanning system combining both companies' technologies. This would maximise the commercial benefits for both partners, but it would require a high level of investment and more elaborate co-operation agreements. This more comprehensive solution to the growing market's requirements may be pursued if the success achieved from the current agreement justifies that next step.

"The level of complementarity among our technologies is complete," says Andrea Cremoncini, marketing manager at ISE. "We are already receiving a significant benefit from this co-operation. I see a tremendous potential for both companies, because there is presently no equivalent multi-mode capability on the market".

Alexander Sasov, chief executive of Skyscan, is similarly enthusiastic. He comments: "Our co-operation with ISE is an important first step to a partnership, where combining our technologies with minimum mutual efforts can expand application areas and create benefit for the customers in a very short timeframe."

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