

RESEARCH

Jun 6, 2008

European cell imaging project kicks off

A European research collaboration has begun work on a four-year project dedicated to developing imaging technologies for use in the area of cell therapy. The ENCITE project - European Network for Cell Imaging and Tracking Expertise - includes 21 partners from 10 countries, and is coordinated by the European Institute for Biomedical Imaging Research (EIBIR), in Vienna, Austria.

Cell therapy is defined as the transplantation of living cells for the treatment of medical disorders. Such cells can function, for example, as an 'active' drug or a drug-delivery vehicle. Transplanted cells can also be used to replace damaged and degenerated tissue. But while some promising results have been obtained in pre-clinical and clinical studies, success rates have been variable and clinical benefits limited.

One obstacle is the fact that the mechanisms by which cell therapy works in different disease areas are still poorly understood. The ability to non-invasively monitor the fate and modes of action of transplanted cells over time would provide insight into how cell therapy works. As such, the development of relevant imaging tools becomes mandatory. Appropriate imaging techniques could also offer the possibility of response monitoring in patients and assessing the safety of cell treatments.

Currently, there's no single imaging modality that meets the requirements of *in vivo* cell-therapy imaging. MRI, however, looks particularly promising: it's intrinsically non-invasive, has high spatial and temporal resolution capabilities, and can potentially assess functional aspects of tissues.

ENCITE plans to develop and test new MRI imaging methods and biomarkers, in order to get a more comprehensive picture of cell fate and the reaction of the immune system. Other imaging techniques, especially optical imaging, will also be considered in the course of the project. Ultimately, it's hoped that these techniques will be applied in the treatment of cancer, cardio-vascular diseases and diabetes.

The ENCITE project has the following objectives:

- developing new imaging methods to improve the spatio-temporal tracking of labelled cells;
- developing dual- and multimodality imaging procedures to cross-validate each individual approach;
- developing new contrast agents and procedures that will improve the sensitivity and specificity of cellular labelling;

- combining molecular biology, for the generation of molecular and cellular imaging reporters, with multimodal imaging techniques.

ENCITE is supported by €11 million financing from the European Commission's 7th Framework Programme. As the project develops, further partners will be needed to contribute research, or dissemination and training activities, for the newly developed methods. ENCITE will launch a Competitive Call in autumn 2008 to find these partners; interested institutions should contact ENCITE at office@eibir.org.