
ENCITE – A peek into the future of novel MR imaging reporter probes

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The consortium of the project “European Network for Cell Imaging and Tracking Expertise” (ENCITE) has the ambitious mission to develop and test new MR and optical imaging methods and biomarkers to draw a more comprehensive picture of cell fate and the reaction of the immune system. In the end cell therapy shall be improved for the benefit of the European patient.

To exploit the superb spatial and temporal resolution of MRI in Molecular Imaging applications, it is necessary to improve the sensitivity and specificity of the currently available probes:

- Sensitivity. A new high relaxivity tetrameric Gd-based agent has been shown to provide an impressive seven-fold sensitivity enhancement in respect to the commercial agents maintaining an analogous safety profile.
- Specificity. An enzyme responsive Gd probe has been synthesized and tested. It reports about the activity of beta-galactosidase, an enzyme largely used by biologists as reporter of gene expression.

Important advances have been made in the field of the new family of MRI-CEST agents (CEST= Chemical Exchange Saturation Transfer). These MRI probes have great advantages in respect to the classical relaxation agents. Being frequency-encoding systems, it is possible to visualize (using different colours) more probes in the same image as every CEST agent is responsive only to a specific irradiation frequency. In the project, a paramagnetic complex, present as a pair of nmr-detectable isomers, has been selected for its high sensitivity and its ability to act as pH sensor. Mapping pH appears to be an important task to get new functional information from MR images in the presence of relevant pathologies. Moreover, upon changing the Lanthanide ion in the complex, systems able to visualize different cell types have been prepared and successfully tested.

For details on the latest scientific findings, please visit: <http://www.encite.org>

ENCITE is a four year project co-funded by the European Commission under the 7th Framework Programme and co-ordinated by the European Institute for Biomedical Imaging Research (EIBIR). It started in June 2008 and consists of 29 international scientific partners from ten countries with outstanding expertise in cell imaging and tracking.

About The European Institute for Biomedical Imaging Research (EIBIR)

The European Institute for Biomedical Imaging Research (EIBIR) is a non-profit limited liability company dedicated to the co-ordination of research. The network has the aim of co-ordinating and supporting the development of biomedical imaging technologies and the dissemination of knowledge with the ultimate goal of improving diagnosis, treatment and prevention of disease. The platform supports networking activities in research and is key to spreading good practice, promoting common initiatives and interoperability in the field of biomedical imaging research. This will generate critical mass and help coordinate research into new instrumentation, new methods, concepts and technologies.