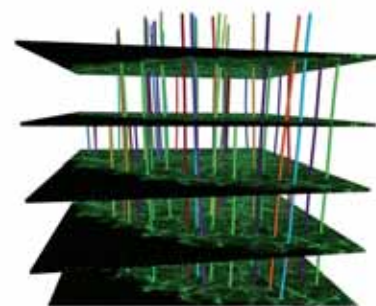


Mission of the European Institute for Biomedical Imaging Research

Create a network of European biomedical imaging institutes, co-ordinate the development of biomedical imaging technologies within Europe and support the dissemination of knowledge with the ultimate goal of improving diagnosis, treatment and prevention of disease.



Dear Members, Dear Colleagues, Dear Partners,

After almost two years of the existence of EIBIR, we are pleased to come back to you with a brief report on the ongoing activities and envisaged projects of our initiative.

We are particularly delighted with the success of our research projects submitted to the Research Framework Programmes of the EU, FP6 and FP7. The consortia for these projects consist of EIBIR member institutions, representing the leading research groups in Europe. In all these projects EIBIR either acts as coordinator or is in charge of project management and dissemination. You will find a summary of the current projects on the following pages.

The organisational and management structures of EIBIR have been further established. Additional European organisations committed to the support of biomedical imaging research in Europe have become involved in EIBIR. The European Society for Magnetic Resonance in Medicine and Biology (ESMRMB) and the European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry (COCIR) have officially joined EIBIR as co-shareholders. The European Association of Nuclear Medicine and the European Federation of Organisations of Medical Physicists have received formal invitations to become co-shareholders and will follow shortly. The contribution of these organisations to the endeavours of EIBIR will strengthen ESR's efforts to create an active, multidisciplinary service organisation facilitating biomedical imaging research in Europe. In the future, we hope to enter partnerships with the European Society of Molecular Imaging, the European Association of Medical Bioengineering Societies, and many more.

The structure of the EIBIR website has been reviewed, and now offers some new features such as the members' area and a new training sec-

tion. All EIBIR member institutions now have the possibility to log on to the web space and search for other members, including their fields of expertise. This is another major step towards facilitating networking activities and synergies.

In addition to the cell imaging platform and image processing network that have been established within the framework of EIBIR and are gradually maturing, new networking projects include the creation of a chemistry platform for the development of new probes under the auspices of Silvio Aime from Torino, Italy (see page 04).

Close collaboration with the pharmaceutical industry, system manufacturers and information technologists is a key element in translating new insight gained through biomedical imaging research into biomedical and clinical applications. EIBIR will provide input in the early stages of industrial development to translate new discoveries into industrial innovation. In this respect, we very much hope that we will be able to intensify the relationship with our supporting industry partners in the future and would like to encourage them to initiate research projects in the field of biomedical imaging in close collaboration with EIBIR.

We look forward to further expanding EIBIR's activities and welcome your feedback and ideas for new initiatives and projects.



Prof. Gabriel Krestin
ESR Research Committee Chairman



Prof. Jürgen Hennig
EIBIR Scientific Director

Industry Panel allows EIBIR to realise important networking activities

EIBIR would like to express its gratitude towards its industry partners who have supported the establishment of the network right from its beginning.

The supporting companies who contributed with an annual amount of EUR 50,000 each in the years 2006 and 2007 include, in alphabetical order:



Bayer HealthCare
Bayer Schering Pharma



GE Healthcare



PHILIPS
sense and simplicity

SIEMENS

The support has been used wisely and in a profitable way, for setting up the office structure, developing the EIBIR web space and for strategic planning meetings in order to identify synergies of expertise among EIBIR members, as well as to develop a coordinated research plan.

This EIBIR Report reflects an overview of the recent activities and planned projects of EIBIR, which provide tangible evidence that EIBIR is progressing well and is on the right track.

We very much hope to continue the partnership with industry in the coming years and look forward to a continued fruitful cooperation.

EU supports establishment of EIBIR structures with FP6 grant

EIBIR's project 'European Institute for Biomedical Imaging Research' submitted within the 6th EU Framework Programme 'Life Sciences, genomics and biotechnology for health', has been accepted by the EU Commission and granted funding as a Specific Support Action (SSA). The official start of the project was July 1, 2007. During the 2-year project lifetime, EIBIR will further coordinate its research policy and activities by taking account of the national research programmes and policies in place.

One of the deliverables of the project has been the development of a coordinated European research plan in the form of a research policy document. The document will shortly be available at www.eibir.org.

Other work packages of the project focus on the definition, organisation and management of joint or common initiatives, the exchange and dissemination of good practice, the creation of databases on technical infrastructures, scientific expertise and activities, as well as on the coordination of multi-centre trials and conferences, meetings and training courses.



SIXTH FRAMEWORK PROGRAMME

EIBIR's European Network for Cell Imaging and Tracking Expertise gets green light from EU Commission

The European Commission has officially invited EIBIR to start contract negotiations for its large integrated project proposal submitted to the EU FP7 call HEALTH-2007-1.2-4 In vivo image-guidance for cell therapy. The project, entitled ENCITE – European Network for Cell Imaging and Tracking Expertise – consists of 21 project partners with leading expertise in the field of cell imaging, with EIBIR being the coordinating partner. If contract negotiations run smoothly, the 4-year project will begin in early 2008.

Cell therapy can be defined as the transplantation of living cells for the treatment of medical disorders. Three different principles underlie the increasing interest in cell therapy.

1. Transplanted cells used as an 'active drug'
2. Transplanted cells used to replace damaged and degenerated tissue
3. Cells used as a drug delivery vehicle

Promising results have been obtained in pre-clinical and clinical studies, however, success rates have been variable and clinical benefits have been limited. A major issue is the fact that the mechanisms by which cell therapy works in the different disease areas are still poorly understood. The ability to non-invasively monitor the fate and modes of action of transplanted cells over time is mandatory. The development of relevant imaging tools will lead to a better understanding of how cell therapy works, the possibility of response monitoring in patients, and sufficient safety of the treatment.

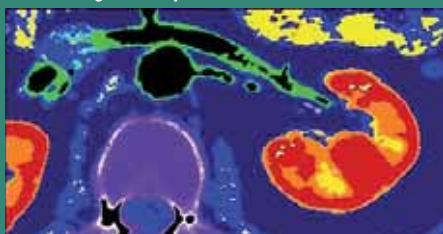
ENCITE will provide tools to allow this by developing:

- New imaging methods to improve the spatio-temporal tracking of labelled cells
- Dual- and multimodality imaging procedures to cross-validate each individual approach
- New contrast agents and procedures that will improve the sensitivity and specificity of cellular labelling
- Combining of molecular biology for the generation of molecular and cellular imaging reporters with multimodal imaging techniques

Labelled cells visualised in a rat tumour model



Colour coding of tissue perfusion





EIBIR consortia participate in FP7 ICT call “Virtual Physiological Human”

EIBIR members with neuro and breast imaging as their core disciplines have joined forces and established strong consortia for the submission of two Small and Medium Scale Focused Research Projects (STREPs) to the EU's FP7 Information and Communication Technologies call early October.

Pending positive evaluation by the Commission, EIBIR will be in charge of the project management as well as dissemination and training activities for both proposals.

Below you will find a brief description of the two submitted projects.

Brain Atlases for Biomarker discovery from Longitudinal MR

Neuro-imaging data (BABYLON)

The consortium of nine leading research institutes and SMEs submitted this STREP under the scientific coordination of Prof. Wiro Niessen from Erasmus Medical Center Rotterdam.

Neurodegenerative diseases, such as dementia, constitute a major burden for society, both in monetary costs and suffering of patients and their relatives.

The ideal treatment would be intervention in a pre-symptomatic stage, in order to prevent the occurrence of cognitive decline. In order to target preventive intervention to the people who can benefit from it, it is crucial to identify people at risk. Once identified, it is also important that methods for assessing the efficacy of disease-modifying treatment are available, both in clinical trials and in individual patients, and in advanced, early and pre-symptomatic disease.

To accomplish this, biomarkers are required that provide accurate diagnosis of neurodegenerative disease, especially early in the disease process before clinical symptoms of cognitive decline are apparent. Project BABYLON will increase the diagnostic value of non-invasively derived MRI markers of neurodegenerative pathology, with a beneficial effect on early detection, diagnostic specificity and progression monitoring, required for the proper administration and monitoring of pharmacological treatment.

BABYLON will focus on the following key objectives:

- To develop a comprehensive, 4D brain atlas, based on longitudinal multimodal MR imaging data from a large population-based study, of normal aging and pathology.
- To use this atlas to develop and validate novel quantitative imaging biomarkers of neurodegenerative disease, for early detection of disease
- To compare the usefulness of these atlas-derived biomarkers to currently used predictors, and quantify any added value provided by the 4D atlas in AD and differential diagnosis
- To use this atlas to develop and validate novel quantitative imaging biomarkers to assess the effects of disease modifying strategies
- To assess the additional value of these imaging biomarkers in combination with other risk factors, to predict later development of neurodegenerative disease.

Highly Accurate Breast Cancer

Diagnosis through Integration of

Biological Knowledge, Novel

Imaging Modalities, and Modelling (HAMAM)

Breast cancer diagnostics is in a phase transition. This is characterised by the fact that new imaging technologies specially designed for breast imaging, such as 3D ultrasound or tomosynthesis, complement the conventional imaging technologies like mammography and 2D ultrasound. A rational use of these new modalities is currently the major challenge of breast cancer diagnosis.

To meet this challenge, EIBIR has put together a consortium of 9 excellent European centres for imaging science, with strong skills on breast imaging, under the scientific coordination of Prof. Gabriel Krestin, Chairman of the ESR Research Committee and Chairman of the department of radiology at Erasmus Medical Center Rotterdam. To ensure the clinical impact, leading European clinicians in the area of breast cancer diagnosis are contributing as members of the clinical advisory board of the project.

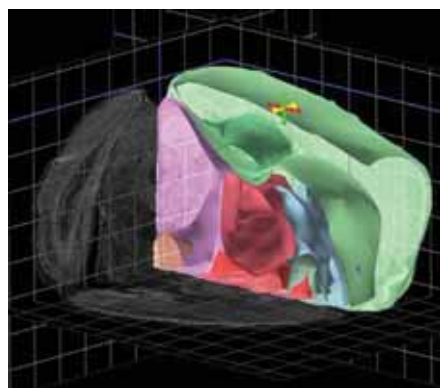
Despite tremendous advances in modern imaging technology, both early detection and accurate diagnosis of breast cancer are still unresolved challenges. Today, a variety of imaging modalities and image-guided biopsy procedures exist to identify and characterise morphology and function of suspicious breast tissue. However, a clinically feasible solution for breast imaging, which is both highly sensitive and specific with respect to breast cancer, is still missing. As a consequence, unnecessary biopsies are taken and tumours frequently go undetected until a stage where therapy is costly or unsuccessful.

HAMAM will tackle this challenge by providing a means to seamlessly integrate the available multi-modal images and the patient information on a single clinical workstation. Based on knowledge gained from a large multi-disciplinary database, populated within the scope of this project, suspicious breast tissue will be characterised and classified.

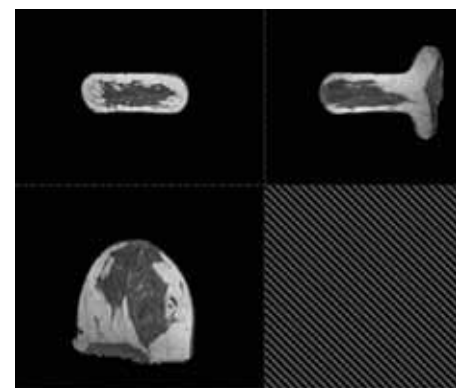
HAMAM will achieve this by:

- Building the tools needed to integrate datasets / modalities into a single interface.
 - Providing pre-processing / standardisation tools that will allow for optimal comparison of disparate data
 - Building spatial correlation information datasets to allow for new similarity and multimodal tissue models. These will be key in the detection and diagnosis of breast cancer
 - Building in adaptability that allows for the integration of other sources of knowledge such as tumour models, genetic data, genotype, phenotype and standardised imaging.
- The exact diagnosis of suspicious breast tissue is ambiguous in many cases. HAMAM will resolve this using the statistical knowledge extracted from the large case database. The clinical workstation will suggest additional image modalities that may be captured to optimally resolve these uncertainties. The workstation thus guides the clinician in establishing a patient specific optimal diagnosis. This ultimately leads to a more specific and sensitive individual diagnosis.

Brain Atlas



Orthogonal slices of MR breast image after simulating a compression by 56% of initial breast thickness. Image © Christine Tanner, University College London.



EIBIR implements Chemistry Platform

EIBIR has implemented a Chemistry Platform with the involvement of top-class European research teams in the field of probe development for the different imaging modalities. The Platform will contribute to strengthening the liaison between basic research and biological and clinically oriented teams within EIBIR. The core group is formed by: Silvio Aime (University of Torino, IT), David Parker (University of Durham, UK), Helmut Maecke (University of Basel, CH), Nico de Jong (University of Rotterdam, NL) and Robert N. Muller (University of Mons, BE). From this core group, the Platform will grow through gathering highly qualified laboratories with well documented skills in developing imaging probes for medical applications.

The Chemistry Platform aims at tackling the following tasks:

- to support EIBIR activities with highly skilled teams in the design and fabrication of innovative imaging probes;
- to offer EIBIR teams access to specialised equipment for the physico-chemical characterisation of probes/new formulations developed in the core laboratories;
- to disseminate information inside the EIBIR community on relevant achievements related to the development of imaging probes;
- to implement contacts between chemistry groups active in the synthesis of new tracers/contrast agents and bio-medical research teams interested in their pre-clinical assessment.

The Chemistry Platform will devote special attention to activating initiatives with European companies active in the production of diagnostic probes for medical imaging. In particular EIBIR laboratories may offer industry an array of pre-clinical collaboration to explore new applications for the products of their research as well to extend the use of established materials.

An update from the Office

2007 has been a very busy year for the EIBIR office based in Vienna, at the premises of the European Society of Radiology (ESR).

The database of EIBIR member institutions, which had originally been set up in 2005, has been thoroughly updated in order to include detailed information on fields of expertise, research infrastructure, number of research personnel and amount of funding, as well as a list of their publications. We would like to take this opportunity to thank all members for their efforts and their support and are confident that these data will be extremely useful in creating synergies and identifying opportunities and resources for joint projects.

The information collected is currently being integrated into the new password protected members' area of the EIBIR website. Soon, all member institutions will be able to log on to a restricted area on our website to retrieve detailed information on research activities of other members, in order to facilitate networking activities among them or just to edit their own institution data.

In July, the EIBIR office started with the coordination of the accepted FP6 project and familiarised itself with all rules and regulations governing EU supported projects. As a coordinator, the EIBIR office is in charge of running the day-to-day administrative work related to the project, of monitoring the work being carried out, the results and the necessary changes to the workplan as a result of those findings, according to project milestones and indicators. The financial administration, i.e. establishing and maintaining financial records, distribution of partner shares etc. also lies within the responsibility of the EIBIR office.

One of the current activities within the framework of the FP6 project is the implementation of a training survey among EIBIR members, collecting information on current training topics and requirements as well as on teaching facilities and the willingness to host educational activities at our member institutions.

EIBIR members will shortly have the possibility to announce their training events on the EIBIR website.

