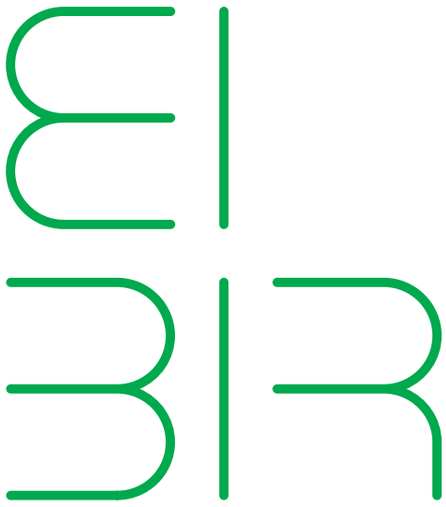

EUROPEAN INSTITUTE
FOR BIOMEDICAL
IMAGING RESEARCH

ANNUAL REPORT 2012

ANNUAL REPORT 2012

IMPRINT

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Editorial

Dear Network Members, Colleagues and Friends,

We are pleased to present the 2012 Annual Scientific Report of the European Institute for Biomedical Imaging Research (EIBIR). As you will see, this year has been very busy with finishing some of our first-hour research projects as well as with supporting our members with applications for new research grants. We hope that you enjoy the read and will feel encouraged to join EIBIR's activities in the field of biomedical imaging research in the coming year.

Before giving you an outlook of what you may expect for next year, we would like to thank our Network Members who continued to support EIBIR during this year with bottom-up initiatives and active involvement in our activities.

In 2012 the last Health Call under FP7 was published with a couple of topics of relevance to the biomedical imaging community. It has been a highly competitive call; EIBIR members were supported with the drafting and submission of proposals, and we are happy to announce that a number of projects have been invited to submit proposals to the second round. The beginning of 2013 will be busy as EIBIR, coordinator of the invited submissions, will guide the consortia through the final preparation phase.

The Scientific Advisory Board (SAB) continued to follow with great interest developments in the European Union surrounding the preparations of Horizon 2020 and encouraged the community to speak up against intended cuts in Europe's future research budget in order to underline the importance of investing in health-related research. In that context EIBIR endorsed and disseminated the statement of the European Society of Radiology (ESR) on Horizon 2020 with a particular view to the role of medical imaging. Investing in and developing medical imaging can have tremendous impact for patients in the future and transform medicine towards a tailored oriented approach - for the benefit of the patient as well as reducing health-care costs. To achieve this, clinicians, basic researchers and engineers need to join forces in a collaborative effort, which should ideally be supported by European crosscutting and multidisciplinary funding schemes.

In addition, EIBIR participated in a consultation on the envisaged inclusion of public-private partnerships in Horizon 2020, welcoming this initiative as an important step to overcome fragmentation and lack of coordination in biomedical imaging research, as well as emphasising the need for stronger involvement of academia in defining Europe's strategic research agendas. Such a joint programme with industry will also potentially open up a new window of opportunity for our Industry Panel members to co-shape Europe's research agenda and join forces with academia.

We are also pleased to report that EIBIR started support of an industry-initiated investigational study on MRI as an initiative of EuroAIM and we hope that other industry partners will follow suit with similar projects.

EIBIR has also put forward a proposal to the Innovative Medicines Initiative to consider image-guided drug delivery in its future research agenda, as a powerful tool to combine diagnosis and therapy to improve clinical care and to foster drug development.

As Europe's research funding is likely to be cut down in the future given the overall economic situation, EIBIR continues to plan on a strategy that will allow the network to thrive, and the activities of its multi-disciplinary thematic working groups to continue, independent of EU funding. This certainly continues to be a major challenge and we would like gratefully to acknowledge the support provided by our Industry Panel and its members, which allowed EIBIR to invest in some new initiatives and to support the application phase for new projects.

We are very thankful, of course, to the European Society of Radiology, which once again contributed significant funds to EIBIR over the past year, as support and commitment from shareholder organisations still have not developed to its full.

One change that we have been looking forward to without reservation is the update of the EIBIR website. Not only has the visual aesthetic been improved, but the content has been reorganised and restructured, fully capturing all the services that EIBIR offers and making navigation easier. We encourage you not only to visit www.eibir.org, but also to contribute content and information of interest to the biomedical imaging research community.

Before concluding, we would like to once again call upon EIBIR's nine shareholder organisations and our industry partners to bring in their own ideas and engage in the activities of EIBIR in order to empower this network, which heavily relies on the individuals' input.

In the following pages you will find a series of interviews illustrating the activities of the EIBIR community including on-going research projects, an update on our joint initiatives as well as an outlook into the future.

We look forward to working with you over the course of a productive 2013!

Jürgen Hennig
EIBIR Scientific Director

Gabriel Krestin
Chair of EIBIR
General Meeting,
ESR President

Highlights

EIBIR Services & Decision Making and Guidance

Ugo Salvolini

The positive aspects of working with EIBIR's staff were their competence and availability, at any time, via both e-mail and telephone, and also their enthusiasm in encouraging our work! (p. 8)

Milan Hajek

It is interesting to meet members of the Advisory Board and to hear their opinions and information. Also, the pleasant atmosphere of all networking opportunities should not be forgotten. (p. 43)

Myriam Hunink

I was wondering if we could, within EIBIR, create a CRO that's really focused on, firstly, radiological studies, and secondly, that's focused on utilising the know-how and the expertise, available at the academic centres. (p. 46)

EIBIR Projects

Stefan Schönberg

It is well known that ground-breaking achievements are typically made over 5–10 years. Sustainability requires that one generation of researchers can be seamlessly integrated into the next generation, without losing critical competence in the specific field. The key to the solution is, indeed, a concept like Euro-BioImaging: large scale infrastructure built with common goals in mind, also ensuring sustainable operation of such infrastructure in terms of competence, training, management of the facility and access regardless of borders, local politics or financial issues. (p. 20)

Erik Aarntzen

Many questions in cell therapies still need to be resolved; however imaging is the ultimate tool to address at least two of these. The first is mechanistically, we often do not fully understand the failure of cellular therapy in one patient and the success of cellular therapy in the other. Every individual patient is therefore a unique opportunity to understand these underlying critical processes and using cell tracking techniques, we can now start to understand and manipulate these processes. Secondly, we can individualise cellular therapies to the need of a specific patient. (p. 15)

MIPA
Pre-op Breast MRI

Rubina Manuela Trimboli

EuroAIM in cooperation with EUSOBI, designed the MIPA study, an observational multicenter study which will analyse individual female data of two concurrent cohorts of patients newly diagnosed with breast cancer, defined as receiving/not receiving preoperative breast MRI. Surgical primary outcomes, such as re-excision rate for positive margins and change in surgical planning will be assessed. Moreover, clinical outcome at five years will be evaluated in the two cohorts. (p. 34)

VPH-PRISM

Horst Hahn

As a physicist, I am looking forward to the quantitative challenges presented in both radiology and pathology to, via the available data, develop tools which hold some promise of robustness and reproducibility and provide meaningful insights for breast cancer phenotyping. (p. 24)

PEDDOSE.
NET

Manuel Bardiès

The iApp itself is very simple. It's based on a database that contains the radiopharmaceuticals considered within the EANM paediatric dosage card, and recommended activity values as a function of the patient's weight. (p. 18)

COST Action – Arterial Spin Labelling Initiative in Dementia

Xavier Golay

I really hope that at the end of this project, we will be in a situation where ASL could become part of the potential diagnostic, or even better, prognostic, biomarkers to be used in several types of dementia. I really think that this technique could play a significant role in the diagnostic and prognostic criteria, and also be part of the tools used in clinical trials for early response to therapy, for example. (p. 32)

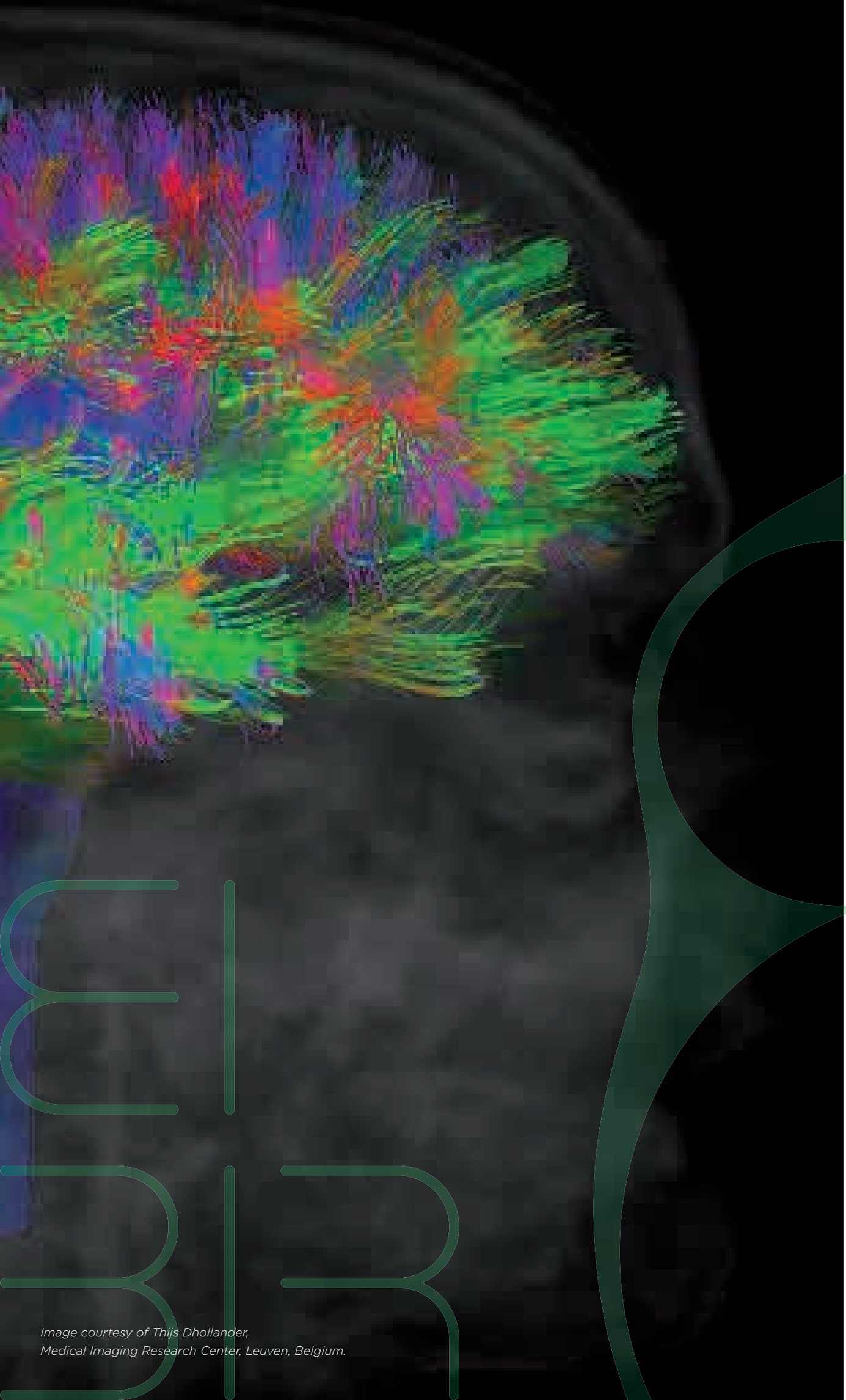


Image courtesy of Thijs Dhollander,
Medical Imaging Research Center, Leuven, Belgium.

EIBIR Services

As a service organisation for scientists, run by scientists, EIBIR offers a variety of project management and member services attuned to the needs of its Network Members.

EIBIR Services

EIBIR is dedicated to the co-ordination of biomedical imaging research. By disseminating knowledge and co-ordinating and supporting the development of biomedical imaging technologies, the ultimate goal is to improve diagnosis, treatment and prevention of disease.

EIBIR also supports networking activities in research and plays a central role in spreading good practice, promoting common initiatives and interoperability in the field of biomedical imaging research.

A few large EIBIR coordinated projects have wrapped up in 2012 (ENCITE, HAMAM, Peddose.net) while work continued on Euro-BioImaging and two COST Actions. A number of proposals successfully evaluated (VPH-PRISM and VPH-DARE@IT) or soon-to-be evaluated ensures that EIBIR and the participating project partners will continue to be busy in 2013.

As a service organisation for scientists, run by scientists, EIBIR has well-attuned its core research-related services to help its members achieve successful research results. EIBIR's expert team is able to offer their professional guidance and support in a wide variety of areas, from first stage proposal preparation to financial management.

EIBIR's services can be divided into two broad categories:

Project Related Services:

» Proposal preparation
» Contract negotiation
» EC reporting
» Financial management
» Communication and dissemination

Member Servcies

» Meeting organisation
» Members' database
» Events calendar

EIBIR at Work

How do services EIBIR offers translate into support for members? As EIBIR members who have received support for a recent project submission, Prof. Ugo Salvolini and Prof. Myriam Hunink share their experience about working with the Vienna office from the pre-proposal stage to EIBIR's possible future involvement in the interviews on the following pages.

Ugo Salvolini
Organisation: Università Politecnica delle Marche, Department of Radiology
EIBIR Regular Member Since: 2010
Country: Italy

"The positive aspects of working with EIBIR's staff were their competence and availability, at any time, via both e-mail and telephone, and also their enthusiasm in encouraging our work!"

The COST Action Disorders of Consciousness European Network Trial, proposed by Ugo Salvolini, will unify research efforts across Europe and deliver statistically sound data regarding the residual cognitive abilities of patients in a vegetative state.

Included with Prof. Salvolini in the initial project stages are nine other organisations from five European countries who will address the recent challenges to the care paradigm for patients with Disorders of Consciousness (DOC). The COST Action sets out to organise a European Network of relevant stakeholders with expertise in managing post-coma patients; standardise low- and high-cost assessment techniques that complement state of the art clinical assessments and propose a prospective prognostic evaluation of post-coma patients, with the intent that it becomes the subject of a subsequent European Grant application.

Prof. Salvolini shares his experience about working with the Vienna office.

What motivated you to start the COST proposal?

I already had the research idea, which came from a deep and careful bibliographic review of f-MR and from my previous studies on CT and MRI of patients in persistent vegetative state: I noted that there were many papers dealing with the interest of f-MRI but always stating that the number of subjects examined was not enough for statistical analysis to validate the results. At the same time my interest for this topic increased, also considering the ethical aspects, I became aware that it was not possible to achieve results inside a single research site or group. For these reasons I decided to contact the EIBIR staff in Vienna, and I was informed that the solution could come from a Networking activity focused on this idea, including the most relevant research groups. This suggestion was the beginning of developing the COST Action – Disorders of Consciousness European Network Trial.

Why did EIBIR become involved?

EIBIR became involved because I am a member of the organisation and the mission to "support networking activities in biomedical imaging research, helping to generate critical mass and coordinate research" ideally fits with the topic of this project. Since the idea for the proposal came out at an EIBIR meeting, it was easy to have them involved throughout the proposal process.

What were the benefits of having EIBIR involved in the proposal?

EIBIR helped me by sending the necessary instructions about submitting a COST proposal and provided me directly with step-by-step support for the completion of the submission form.

The positive aspects of working with EIBIR's staff were their competence and availability, at any time, via both e-mail and telephone, and also their enthusiasm in encouraging our work!

How will EIBIR contribute to the COST Action?

If our pre-proposal is selected, EIBIR's specific tasks will be, to contribute to the general project management, to identify associated research projects and to disseminate the results.

If the pre-proposal is not selected to continue, I will continue my involvement with EIBIR to prepare a new pre-proposal to submit in March 2013!

Do you have any suggestions about how EIBIR could improve its services?

I am very satisfied with the support I received from EIBIR for this proposal.

Title:
Disorders of Consciousness European Network Trial

Funding Source:
COST Action

Current Status:
Resubmission in March 2013

Chest pain is a common symptom that may indicate the presence of coronary artery disease (CAD). Patients suspected of having CAD are managed using a variety of different testing strategies, incorporating multiple different imaging tests. **DICAD** aims to provide personalised evidence-based guidance for the effective and efficient use of diagnostic imaging tests in patients presenting with non-acute chest pain who are suspected of having CAD.

Myriam Hunink
Organisation: Erasmus University, NL & Harvard University, US
EIBIR Active Member Since: 2010
Country: The Netherlands

What motivated you to submit this topic?

There were a couple of things. First of all I am very interested in the imaging of coronary artery disease (CAD) because it is a very common problem. There are a lot of people who present with chest pain or other symptoms that make you think of CAD. Secondly, there are lots of imaging techniques out there that are being used in different combinations and to different extents. We're finding that more and more, people are using imaging in low-risk patients who probably don't have the disease, but want to have it excluded. And then there are all these different imaging techniques, and there always seems to be more techniques added but none seem to be dropped from the list.

Also, I am seeing that across the globe people are using different algorithms. Even though there are guidelines, people say "oh, there are guidelines, but I am just going to do what I want because our setting is different," or "our patients are different and I will do something specific for this patient." So I thought, well let's try and get a handle on this and find out what is the right thing to do. And if we actually find out what the right thing to do is, can we actually implement it?

And of course there was the opportunity to actually do it because of the EU FP7 call for proposals. Finally, I had this consortium from a project that we just completed – so we decided this would be a nice way to move forward.

How did EIBIR support you during preparation of the proposal?

EIBIR is wonderful at keeping track of deadlines, sending me the information that I need, helping me plan the writing and the proposal, as well as preparing the budget, which is also no small feat. And then looking at the proposal itself, and getting feedback from external reviewers and discussing the necessary changes in response to the reviews.

We have about 18 centres participating in the project, so keeping in touch with everybody that is part of the proposal, getting the partners administrative data, the letters of intent and then ensuring that all the partners agree and sign off on the budget are necessary tasks. And for all of these things EIBIR was really wonderful.

And how could I forget actually submitting it! Actually filling in the forms and pushing on the button!

Although the project is still in an early phase, is there a specific aspect of the project you are especially looking forward to?

The scientific part is a real challenge because I've come up with a study that combines four different approaches all in one study design, which I think is very different from what other people are doing. Scientifically, I am also looking forward to developing and testing algorithms personalised for the patient. It will be really fun to see if that works because everyone is talking about personalised medicine, but nobody actually has an idea about how to do it or if it's a good thing to do. These things are really scientifically interesting.

On the other side, I really enjoyed writing the proposal, and it was so much fun getting the responses from the people and their ideas and trying to put it all together. DICAD is a big project, but it will be nice to get all these sites working together – it's just a wonderful group of people and I really hope it comes through.

"DICAD is a big project, but it will be nice to get all these sites working together – it's just a wonderful group of people and I really hope it comes through."

Title:
Diagnostic Imaging in suspected Coronary Artery Disease: Comparative effectiveness in patients with stable chest symptoms (DICAD)

Funding Source:
FP7

Current Status:
Preparation phase for 2nd stage proposal application

Working at EIBIR

How are the goals of EIBIR translated into the day-to-day activities in the office? Two EIBIR staff members, Dr. Pamela Zolda and Dipl-Bw. Eva Haas, provide insights into how their work supports EIBIR Network Members and impacts biomedical imaging research.

Pamela Zolda
Working at EIBIR since: 2009
Country: Austria

Pamela Zolda

Your current focus is on the Euro-BioImaging project – what aspects of the project are you responsible for?

For Euro-BioImaging I am the project manager and work closely with Stefan Schönberg, the Scientific Coordinator, on reaching the strategic and technical objectives of the Preparatory Phase. In addition, I am responsible for consortium management and communication with all 38 partners which, at times, can be difficult!

Our current focus is preparation of the steps to lead to implementation; including the first open call for nodes.

Can you please describe some of the other projects you are involved in?

Among a number of other FP7 project proposals, VPH-PRISM is another project I am involved in, preparing the proposal and negotiating with the Commission. The projects that I am involved in are focused on different topics, from research infrastructures, to ICT and health programmes. There is a broad variety of projects that EIBIR works on.

I was also selected as a delegates' representative for RAMIRI 2 (Realising and Managing International Research Infrastructure), an FP7 project that aims at training the next generation of research infrastructure managers. Most recently I was involved in the preparation of the RAMIRI handbook, summarising the key issues in research infrastructure management.

What type of services does EIBIR offer for FP7 project proposals?

The type of work is very dependent on the project status. During the proposal preparation phase we source the necessary EC documents, evaluate if the project proposal is aligned with the call objectives, provide advice about the consortium composition, and manage the proposal preparation. The entire EIBIR service package allows our partners to focus on the science. Once the project receives funding EIBIR usually leads the work packages on Project Management and Dissemination.

What do you enjoy most about working at EIBIR?

What I like about working at EIBIR is the international environment and moving in a very large, already-established network. The opportunity to work with scientists is very appealing, but I also like that my work requires creativity.

Eva Haas
Working at EIBIR since: 2007
Country: Germany

Eva Haas

For the ENCITE project, how did EIBIR contribute?

As the co-ordinating Project Manager I was responsible for guiding 29 research organisations from 11 countries through the project, as well as the overall coordination of administrative, financial and reporting aspects – both a challenging and fascinating task. In close collaboration with the Scientific Director, Prof. Gabriel Krestin, and the five core partners, we monitored all strategic and scientific aspects for developing new technologies for novel imaging, probes and cell labelling into clinical practice. One of our key tasks was establishing an interdisciplinary training programme.

What aspect/accomplishment of the ENCITE project are you most proud of?

After 4.5 years it is easy to identify: a team of more than 60 individuals from nine different scientific backgrounds were able to create a strong bond and work together towards the big picture during the project – and afterwards. Continued collaboration is not always the case within EU-funded projects and this is surely a valuable outcome of

ENCITE, and for the future developments of cell imaging methods.

What is feedback that you typically receive from EIBIR members about projects coordinated by EIBIR?

Being responsible for various aspects of the organisation, members appreciate that there is always someone they can call up whenever and whatever questions occur, who handles coordination so they can focus on their research work. Even though administrative email reminders are not eagerly anticipated, they are grateful for being kept on-track. A typical comment is: "What would we do if EIBIR didn't do it?" I think this is a wonderful way of saying thank you to a service provider!

What future research opportunities will EIBIR members have to participate in?

I think there are two ways to be strongly involved with EIBIR:

One possibility is to become a member to discuss and brainstorm ideas with others on a European level. This also allows collaboration between science and industry. Industry-initiated studies are great steps towards research in practice and EIBIR has recently experienced this through the MIPA study. Of course, we are aware that these studies are not easily realised but there is a clear need, and both can benefit from each other and utilise synergies.

EIBIR's working groups are also excellent platforms to initiate research ideas and keep one step ahead.

What makes working at EIBIR interesting for you?

To me, it is being the guide for scientists, accompany them along their research and lettting them know that "there is no question without an answer". Dealing with the cultural diversity of communication, understanding and togetherness of business in Europe is fascinating.

EIBIR Team
Peter Baierl
(Managing Director)
Monika Hierath
(Executive Manager)

Angelika Benkovszky
Catherine Lloyd
Eva Haas
Pamela Zolda
Stephanie Hopf
Alena Morrison

A new look for EIBIR online

After a lot of hard work behind the scenes, the new EIBIR website went live at the end of 2012. Redesigned to provide visitors with more straightforward access to the content, updates to EIBIR news are easier to read and the full suite of services that EIBIR offers to its members is clearly laid out.

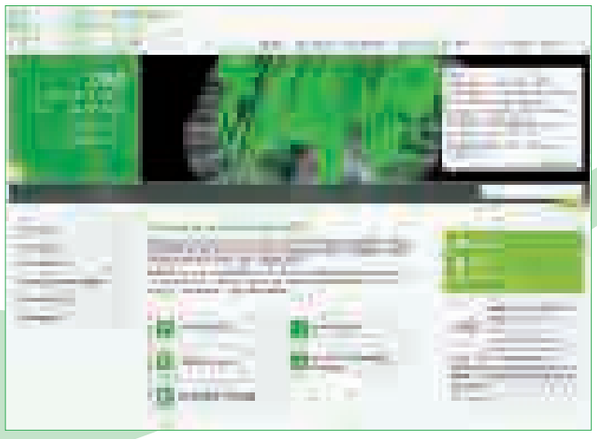
Additionally, more visuals have been added to showcase the research undertaken by EIBIR members.

The website will continue to be a work in progress as updates about news, funding calls and consultations will be added as they arise.

Some examples of the changes:

An example of the old and new services above.

Below, comparing the old and new Projects page.



Please **visit the website**
to **see the changes** for yourself!

www.eibir.org

EIBIR Projects

As a service organisation for its Network Members, EIBIR plays a proactive role in the development and definition of future research policies as well as in the implementation and coordination of research projects, infrastructure and training on a European level. Three projects came to successful conclusions in 2012 (ENCITE, HAMAM and PEDDOSE.NET), work continues on Euro-BioImaging and two new projects, VPH-PRISM and VPH-DARE@IT are planned to start in 2013.

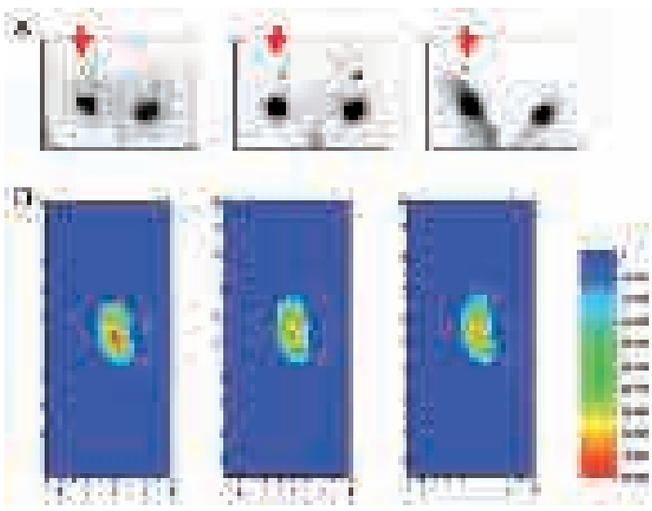
ENCITE

The 4.5-year project ENCITE began in June 2008, and was co-funded by the EC, within the 7th Framework Programme, with a financial contribution of €12m. It consisted of 29 project partners from 11 different countries, with extensive expertise in the field of cell imaging and tracking. EIBIR was delighted to have the position of the coordinating partner.

The vision of ENCITE was to develop and test new MR and optical imaging methods and biomarkers to get a more comprehensive picture of cell fate and the reaction of the immune system and to ultimately improve and further develop cell therapy for the benefit of the European patient.

In November 2012 the ENCITE project was concluded with a final workshop, highlighting the numerous achievements of the successful, goal-oriented research project: new labels and imaging techniques have been developed and progressed towards their clinical application, and a solid educational programme, the ENCITE Multi Centre Cluster for Training, has been established to offer individual and group training.

ENCITE will continue to represent a platform integrating groups working on translational imaging across Europe. In particular, the integration of physics, chemistry, cell biology, immunology and medicine, all centred on imaging, is unique. In addressing the questions "What are the clinical needs for imaging and improved disease diagnosis?" and "What are the best tools for translation to clinic?" significant achievements were greatly facilitated through this interdisciplinary collaboration within the consortium.



Optimising the migration of dendritic cells (DCs) to improve DC vaccine therapy. *The migration of DCs was measured and compared in patients (A) and in an in vitro assay that closely mimics in vivo conditions (B). In A, the cells were labeled with a radioactive agent before intradermal injection. A small percentage of cells migrated to the draining lymph nodes. The arrows indicate regions that received different pretreatment, such as cytokines, to see if this influenced DC migration. In all cases, no more than 4% of the total injected cells reached the lymph nodes. The same data was obtained in (B), where cells were followed in a special collagen matrix after labelling with a 19F agent for MRI. This assay also showed that migration would not exceed 4%, and furthermore histological analyses showed the extensive presence of hypoxic cells, which may explain the poor migration with these cells both in vivo and in vitro (paper in revision).*
Image provided by Mangala Srinivas

ENCITE

Carl Fidgor
Organisation: *Radboud University Nijmegen Medical Centre*
Country: *The Netherlands*

> *"The greatest advantage is that we will be able, at an early stage, to determine if a patient is responding to treatment."*

Title:
European Network for Cell Imaging and Tracking Expertise (ENCITE)

Funding Source:
European Union Framework Programme 7

Current Status:
Complete (2008-2012)

Participating Organisations:
- *Erasmus MC, NL*
- *King´s College London, UK*
- *Weizmann Institute of Science, IL*
- *Max-Planck Institut f. Neurologische Forschung, DE*
- *Tel Aviv University, IL*
- *Università di Torino, IT*
- *Institute for Clinical and Experimental Medicine, CZ*
- *University of Freiburg, DE*
- *University of Mons, BE*
- *University Paris Descartes, FR*
- *Friedrich-Alexander University, DE*
- *Leiden University Medical Center, NL*
- *The University of Milano – Bicocca, IT*
- *Radboud University Nijmegen Medical Centre, NL*
- *Foundation for Applied Medical Research, ES*
- *Institut Curie, FR*
- *BioSpace, FR*
- *Medres, DE*
- *Cage Chemicals, IT*
- *University of Navarra, ES*
- *The Hebrew University of Jerusalem, IL*
- *Westfälische Wilhelms-Universität Münster, DE*
- *Katholieke Universiteit Leuven, BE*
- *The Chancellor, Masters and Scholars of the University of Cambridge, UK*
- *Agencia Estatal Consejo Superior de Investigaciones Cientificas, ES*
- *Consorci Institut Català de Ciències Cardiovasculars, ES*
- *Vrije Universiteit Medisch Centrum Amsterdam, NL*
- *Universitätsspital Basel, CH*
- *Universitätsklinikum Erlangen, DE*

Dr. Carl Fidgor is Scientific Director of the Nijmegen Centre for Molecular Life Sciences (NCMLS) and Head of the Department of Tumour Immunology. Dr. Fidgor discusses his organisations, contribution to ENCITE.

During the project, what was the major focus of your research?

One of our first contributions to the project was to bring the partners together. In ENCITE, two groups who normally do not work together joined forces. On the one hand you have more MRI specialists and more clinically oriented radiologists and on the other, scientist who work with light and fluorescent imaging which are more oriented towards cell biology and immunology.

In addition to improving the collaborative part of the project, we had two major scientific contributions. The first was developing new tools to image cells in vivo in animal models as well as in patients. The second was focused on imaging and developing labels that would enable us to look at the function of the immune system using MRI.

What impact will ENCITE have on the experience of the European patient?

The greatest advantage is that we will be able, at an early stage, to determine if a patient is responding to treatment. There are both financial and ethical implications for this.

If, during the early stages, it is determined that a treatment is not effective, then the patient can be spared this burden, which is especially important if the treatment causes the patient discomfort or pain. Secondly, medical costs can be saved as ineffective, and often expensive, treatments can be stopped.

But if a patient is receiving a treatment that is proven to work, then the treatment can be increased or prolonged to ensure that the patient receives the most benefit from it.

How far away is this from being applied in the clinical setting?

To some degree it is already being done, but there are still some challenges that prevent it from being used in all settings. I think that one of the greatest ones is that the markers used are not easily available. For example, one of the markers we use, Sinerem, was taken off the market because the company that produces it decided it was not making enough profit. Many of these markers fit niche markets, but unfortunately the producers are always looking for the "next big thing". One of the next steps will be to encourage the companies to produce the necessary labels; however this will require raising the awareness of the public and government about their importance and benefits. Then, hopefully, lobbying from public and government will persuade the companies to continue or increase production.

When you think back upon the project, what left the biggest impression on you?

As I mentioned before, that the project had two different groups contributing, radiologists and more basic scientists. Being able to bring these two groups together, and having them work together was a highlight for me. Both radiologists and basic scientists bring their own knowledge and expertise to the table and while this can sometimes be challenging – it was also very rewarding.

How will you build upon the results of ENCITE in the future?

Of course now that we have achieved this collaboration it is easier to consult with people if you have a problem or a question. It would be very nice if we could continue the project in one way or another, e.g. by keeping the website alive. However, one must also be realistic that when the project ends and the financial benefits are gone, that things, to a certain extent, collapse.

One of the most important impacts the project had was the training it offered to young scientist who were able to learn from both imaging fields. Hopefully we will find funding to continue these teaching levels because I think that in the end, this educational part may be long lasting and there was a real need for it. Continuing to train the next generation of scientists is something we would still like to participate in.

Dr. Aarntzen created a video, Advances in image-guided cell therapy promise breakthrough in the treatment of cancer and diabetes, showcasing how in vivo image-guided cell therapy is revolutionising medicine, as well as how ENCITE had contributed to this revolution. To watch the video, please visit the ENCITE website (www.encite.org) or for the direct link go to YouTube.

What was your motivation for creating the video?

As a physician involved in one of the cell therapies supported by the work of ENCITE – dendritic cell based anti-cancer vaccination – I experienced that the development of these experimental therapies can only be successful when patients are willing to put effort in their treatment. Patients who undergo these experimental treatments often have to invest more than we realise. Moreover, the support of many European citizens, whether it be financial, scientific or by other means, has been critical to the achievements of ENCITE. Because the ENCITE project is officially ending this year, I felt that translating the scientific achievements to the broad European public could serve as a legacy and create future support for the project's ongoing work.

In your opinion, what were the advantages to creating a video rather than using another presentation technique?

A picture tells more than a thousand words; a video is dynamic and allows you to tell a story, and to convey a specific impression. Furthermore, it is low key, and hopefully people outside the field are attracted to it.

What were the goals you had in mind when you were creating the video?

The goals I had in mind were twofold: first, it should be an attractive and 'flashy' video, it should touch the viewers' emotions and make them curious about our work and about the outcome of these experimental cell therapies, which in the end could be used on them as well. Second, it should be scientifically sound, and represent the full scale of fundamental, preclinical and clinical work, providing the ENCITE partners with a tool that they can use to display their work and their role in novel therapies.

There are three patients presented in the video. Are they based on real-life cases?

The patients presented are actors, but closely resemble real-life cases and medical conditions that are nowadays major threats to health; diabetes, cardiovascular diseases and cancer. Due to ENCITE's work cancer patients who receive a cellular anti-cancer vaccine can now be monitored for response early after start of treatment and insulin-dependent diabetic patients receive diabetic islet transplantations. For these conditions it's true that cellular therapies are no longer something for the future.

As a medical doctor, how do you see cell imaging and tracking research benefiting the European patient in the future?

Many questions in cell therapies still need to be resolved; however imaging is the ultimate tool to address at least two of these. The first is mechanistically, we often do not fully understand the failure of cellular therapy in one patient and the success of cellular therapy in the other. Every individual patient is therefore a unique opportunity to understand these underlying critical processes and using cell tracking techniques, we can now start to understand and manipulate these processes. Secondly, we can individualise cellular therapies to the need of a specific patient: should we repeat transplantation with increased numbers of cells? Should we alter the route of administration? Have we already reached our treatment goals, or should treatment continue? Literally, keeping track of the treatment effects is essential for individual optimisation.

www.encite.org

Erik Aarntzen
Organisation: *Radboud University Nijmegen Medical Centre*
Country: *The Netherlands*

"We can individualise cellular therapies to the need of a specific patient."

SEVENTH FRAMEWORK PROGRAMME

Nico Karssemeijer
Organisation: Radbound Universiteit Nijmegen
Country: The Netherlands

"In some areas we made a very significant contribution."

This past year saw the official end of the ambitious HAMAM project. Coordinated by EIBIR, eight scientific and industrial partners from five European countries, plus the USA, contributed to the project.

The major outcome of HAMAM was a patient-centric workstation that allows physicians to quickly access all available patient-related imaging studies, as well as non-imaging information enabling accurate, early diagnosis of breast malignancy and consequently reliable treatment decisions. To facilitate this, a number of tools were designed to automatically correlate and jointly interpret information from a variety of sources, including the ability to automatically map spatially corresponding anatomical structures in 2D projection images (i.e. mammography) and 3D modalities (i.e. ABUS). Additionally, a novel system to classify lesions as probably benign or malignant using image descriptors from mammography jointly with kinetic and morphological descriptors from MRI was developed, as well as a computer-aided diagnosis (CAD) system to assist radiologists in characterising suspicious lesions in ABUS (automated 3D ultrasound).

Early diagnosis is an essential part of effective breast cancer treatment, and accurate differential diagnosis is vital for physicians to tailor treatment procedures to the individual patient. In a comprehensive and diagnostically robust breast imaging protocol, clinicians prefer a multi-modal approach. The outcomes of the HAMAM project have made a major contribution to improving breast cancer diagnosis and treatment, offering the potential to dramatically improve the efficiency of breast cancer care.

As well as leading work packages 4 (Model based analysis of integrated imaging data) and 7 (Clinical validation and verification), Radbound Universiteit Nijmegen contributed to 3 additional work packages. Nico Karssemeijer, associate professor in medical image analysis at Radbound Universiteit Nijmegen, reflects on the outcomes of the HAMAM project.

What were the major contributions of your work packages to the project?

Because we are both a hospital and a research centre, we had a double role and were active both in the technical aspects and in the data collection/validation. Our focus was mainly on developing computer aided diagnosis algorithms, as well as clinical validation of everything that was developed in the other work packages. For a number of applications we were able to perform a clinical validation and determine if the technology would be useful for clinical practice.

Do you enjoy one role more than the other?

Personally, I like to develop and investigate new applications of computer aided diagnosis. Initially, you have to be creative and understand where in a clinical application the clinical work flow could be improved. The next step is implementing and testing the improvement; that's where our work mostly lies. But in the end, doing a clinical validation is really rewarding if the clinicians are happy with what we've developed.

Looking back, were there any unexpected challenge encountered by you/the consortium? How were these challenges overcome?

Well, a very big challenge for us was the data challenge. Initially it was planned to take place at a number of clinical sites; the coordination was difficult but something we had to do. From a legal perspective, it was quite difficult to get patient data from one centre to another centre, even if it was anonymised.

Because we were working on multi-modal breast imaging data, with data coming from different imaging modalities taken roughly at the same time, the data was quite complicated in structure. That data had to be gathered from the different archives and annotated, meaning the abnormalities visible in the images had to be located and described, based on the radiology and pathology reports. As well, we had

Title:
Highly Accurate Breast Cancer Diagnosis through Integration of Biological Knowledge, Novel Imaging Modalities, and Modelling (HAMAM)

Funding Source:
European Union Framework Programme 7

Current Status:
Complete
(2008 – 2012)

Participating Organisations:
- *University College London, UK*
- *Fraunhofer MEVIS, DE*
- *MeVis Medical Solutions AG, DE*
- *Eidgenoessische Technische Hochschule Zuerich, CH*
- *Radboud Universiteit Nijmegen, NL*
- *The University of Dundee, UK*
- *Charite-Universitätsmedizin Berlin, DE*
- *Boca Raton Community Hospital, Inc, US*

to make the correspondence between the different imaging modalities accurate. The amount of effort planned in the beginning of the project for this activity was far too limited; we had to put in a lot more effort and it took much longer than expected.

Another challenge was that the intention of this project was to develop methods to make the whole diagnostic and screening workflow easier and more convenient for radiologists. There are many different modalities used in breast imaging and we could not spend equal efforts on all of them. However, there was disagreement between the advice we received from the Clinical Advisory Board and EU reviewers. On the one hand we had to focus our attention on what we thought was clinically the most relevant, while on the other hand, comply with what the Commission wanted us to do. Finding a good balance in where we spent most of our efforts wasn't always easy.

Overall, how will the outcomes of HAMAM contribute to breast cancer treatment and research?

I think in some areas we made a very significant contribution that will hopefully be implemented in clinical products – and to some extent this is already happening. We think through the SME that was involved, MEVIS Medical Solutions, much of what we developed will make it into clinical practice.

Can you provide an example of a product that has already been incorporated into clinical practice?

One thing that we developed here that made it very quickly into clinical practice was a method to find corresponding locations in tomosynthesis views. When using tomosynthesis, most radiologists still usually take two views of the breast, a CC and a MLO view, and it is not easy to navigate between these two. Through a relatively simple model, we developed methods that help with the navigation by accurately synchronising the locations within the two views. We have already seen this demonstrated in a Siemens product at radiological conferences which was really nice.

Now that HAMAM has finished, what is the focus of your current research?

Personally, my focus in the next few years will be on breast and prostate imaging. The radiology department at the University Medical Centre in Nijmegen where I am working is very active in development of prostate MRI and we support the clinical research and patient care with development of a workstation and CAD tools.

On the other hand, in breast imaging there are a few new projects starting. VPH-PRISM, in particular, is building on the HAMAM project with partly the same partners. HAMAM was very focused on screening and diagnosis. What we would like to achieve in PRISM is move the technology we developed to the domain of therapy: develop techniques that assist radiologists in determining which therapy would be best for a particular patient. We would also like to gain more understanding about what is going on in the various imaging modalities: what exactly we are imaging and can adjust protocols/ procedures to reveal more relevant characteristics of the breast tissue. Another big new project funded by the EU is ASSURE, which is aimed at development of tools and models for personalised breast screening. It just started in December and I am coordinator of the project.

www.hamam-project.org

SEVENTH FRAMEWORK PROGRAMME

eHealth

PEDDOSE.NET

Manuel Bardiès
Organisation: *INSERM*
Country: *France*

> *"However, the fact is that (with exceptions, of course) these recommendations are seldom used in practice. Our guess was that – beside the necessity to advertise for the existence of the paediatric dosage card – an iApp that would be very simple to use might increase the degree of awareness on this subject – and eventually lead to more wide-spread use of the EANM recommendations."*

PEDDOSE.NET, a 22 month project covering the research on Dosimetry and Health Effects of Diagnostic Applications of Radiopharmaceuticals with particular emphasis on the use in children and adolescents was successfully finalised in 2012.

The main objectives of the project were to summarise and evaluate the current knowledge on the impact on patients' health of small and non-or little repetitive doses (amounts) of radioactive, biological and/or chemical substances, as currently used in diagnostic imaging procedures, and to develop recommendations and guidelines. The number of procedures will increase in importance and number in the coming years, in particular with the increasing number of installed positron emission tomographs (PET) or PET/CT systems and the introduction of new molecules and radiopharmaceuticals through rapid developments in molecular biology and medicine.

A remarkable outcome of the project is the PedDose iApp, developed during the project and downloaded more than 600 times from iTunes.

EIBIR talked to Manuel Bardiès, leader of the PEDDOSE.NET work package on phantoms and pharmacokinetic modelling for dose delivery and driving force behind the development of the iApp.

What were the major contributions of your work packages to the project?

We were mostly involved in the analysis of the computing models (phantoms) that were used to derive absorbed doses in the context of diagnostic nuclear medicine.

The recent (2009) endorsement by ICRP of a new set of phantoms (ICRP 110) is a major change, as these phantoms are voxel-based as compared to the previous mathematical phantoms.

The change is that now the models "really look like" humans – as if based on medical imaging – when compared to the equation-based phantoms where organs and tissues were represented by simple, stylised shapes. The problem is that these new phantoms only consider the adult male and female, and therefore a new set of phantoms for children is still to come. Also, the dosimetric data needed to derive new values for reference dosimetry are not accessible yet.

During the project, you developed PedDose, an iApp version of the EANM paediatric dosage card. Can you tell more about it?

The EANM has derived recommended activity to inject for children for nuclear medicine diagnostics. This depends on the tracer, obviously, but also on the weight of the child (rather than the age) as two children of the same age do not necessarily have the same weight, and weight is more relevant to govern radiotracer pharmacokinetics and image quality.

The goal is to minimise the activity to inject (radiation protection concern) while preserving image quality (and diagnostics capability). Therefore, for each radiopharmaceutical, there is a baseline activity, i.e. a minimum activity to inject to grant a sufficient image quality, and then a correcting factor to account for the patient's weight.

All required values are provided in the "EANM dosage card", and the clinician has to perform a simple calculation to derive the recommended activity. Additionally, there is an online calculator on the EANM website.

However, the fact is that (with exceptions, of course) these recommendations are seldom used in practice. In clinical routine, people may not have direct access to internet and however simple the dosage card may be, having to use a calculator to derive the recommended activity is a limit to the dissemination. There comes the decision to design a simple to use iApp that can be used anywhere in the nuclear medicine department and might increase the degree of awareness on this subject - and eventually lead to a more wide-spread use of the EANM recommendations. Also, the "sexyness" of the iApp was felt to be an incitation for using it - and therefore participate to the dissemination of dosimetric concepts in clinical practice. The iApp itself is very simple. It's based on a database that contains the radiopharmaceuticals considered within the EANM paediatric dosage card, and recommended activity values as a function of the patient's weight.

Title:
PEDDOSE.NET

Funding Source:
European Union Framework Programme 7

Current Status: *Complete (April 2010 – January 2012)*

Participating Organisations:
- *University Wuerzburg, DE*
- *INSERM, FR*
- *Universiteit Gent, BE*
- *Bundesamt für Strahlenschutz, DE*

We added the effective dose delivered by the injection, as this was available in ICRP reports, so that the iApp performs very simple operations, but adds to the existing EANM dosage card.

Also, it is possible to print, via wifi a summary of the procedure that includes radiopharmaceutical, patient's weight, recommended activity and effective dose.

The development was given to a computing science engineering student as an end-of-study project, and supervised jointly by our INSERM group and Michael Lassmann's team in Wuerzburg, as Michael is one of the leaders of the paediatric dosage card project.

We put a lot of efforts on the interface, as in our opinion, this impacts directly on the usability of the iApp. For example, I made it clear that I did not want the user to input a number using the iPhone or iPad keyboard: the iApp can be used by just clicking and rotating wheels, whereas the result is displayed online as you go. As an iPhone and iPad user, I have seen too many "bad" iApps, that in fact are overly complex to use.

We had some trouble explaining to Apple that this was a non-profit project, and that we had all clearance for using the EANM paediatric dosage card. Now the card has been online for some months, and we have nearly 600 downloads.

Therefore, I think we can claim that this dissemination project has reached its goal. However, it would be good to see someone developing the Android equivalent application, something I can't do in the lab.

In general, how do you think electronic devices and applications can facilitate daily life in clinics in the future?

I'm convinced that eDevices will change our clinical practice. We have so many information resources available on our computers. We also have computing capabilities that we could only dream of just some years ago. Smartphones, tablets and other electronic devices bring an extra dimension in terms of accessibility.

However, the "price" to pay is that one should pay an extreme attention to making the interface of these eApplications as simple as possible. Given the fact that there are no input devices (mouse/keyboards) that can compete with what's available on "real" computers, there has to be an added value in terms of their ease of use. I really like using my iPhone, iPad, however, I'm typing this message on a computer, not a tablet.

In conclusion, I think electronic devices represent a real opportunity in clinical departments, but should be seen as something extra – not a replacement of computers.

And again, iApps should be developed with great care as they will be used only if the user interface is simple and clear.

Now that Peddose.net has finished, what is the focus of your current research?

I've been changing labs – and cities – during the Peddose.net project. I'm now working in Toulouse, but still on the same topics related to radiopharmaceutical dosimetry.
Our main research project at this time is the set-up of a "virtual" dosimetry clinical trial, based on Monte-Carlo modelling of patient's images. The idea is to generate realistic scintigraphic images/data, in order to assess the uncertainty introduced all along the chain that leads from quantitative imaging to absorbed dose calculation. And obviously, this is based a lot on anthropomorphic phantoms.

www.peddose.net

EURO-BIOIMAGING

Stefan Schönberg
Organisation: *Ruprecht-Karls Universität Heidelberg*
Country: *Germany*

Title:
Euro-BioImaging: European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences

Funding Source:
European Union FP7

Current Status:
Preparatory Phase (2010-2013)

Participating Organisations:
- *European Molecular Biology Laboratory, DE*
- *Abo Akademi, FI*
- *Aarhus Universitetshospital, Skejby, DK*
- *Biotechnology and Biological Sciences Research Council, UK*
- *Agència d'Informació, Avaluació i Qualitat en Salut, ES*
- *Commissariat a l`Energie Atomique, FR*
- *Consiglio nazionale delle Ricerche, IT*
- *Centre National de la Recherche Scientifique, FR*
- *Fundacio Privada Centre de Regulacio Genomica, ES*
- *Deutsche Forschungsgemeinschaft, DE*
- *Erasmus Universitair Medisch Centrum Rotterdam, NL*
- *European Organisation for Reserach and Treatment of Cancer, BE*
- *Ecole Polytechnique Federale de Lausanne, CH*
- *Eidgenössische Technische Hochschule Zürich, CH*
- *Funadcio Privada Clinic per a la Recerca Biomedica, ES*
- *Novartis Forschungsstiftung, Zweigniederlassung Friedrich Miescher Institute for Biomedical Research, CH*
- *Fraunhofer-Gesellschaft zur Foederung der Angewandten Forschung, DE*
- *Hermann von Helmholtz Gemeinschaft Deutscher Forschungszentren, DE*
- *Instituto Europeo di Oncologia, IT*
- *Institute of Molecular Genetics- Academy of Sciences of the Czech Republic, CZ*
- *Imperial College of Science, Technology and Medicine, UK*
- *Institut National de Recherche en Informatique at en Automatique, FR*
- *Institut National de la Sante et de la Recherche Medicale, FR*
- *Ludwig Maximilians-Universitaet Muenchen, DE*
- *Max Planck Gesellschaft zur Foerderung der Wissenschaften, DE*
- *Instytut Biologii Doswiadczelnej im. M. Necnckiego Polskiej Akademii Nauk, PL*
- *Nederlandse Organisatie voor Wetenschappelijk Onderzoek, NL*
- *Otto-Von-Guericke-Universitaet Magdeburg, DE*
- *Ruprecht-Karls Universitaet Heidelberg, DE*
- *Universitaetsklinikum Freiburg, DE*
- *Universitair Medisch Centrum Utrecht, NL*
- *Universita degli Studi di Torino, IT*
- *University of Dundee, UK*
- *Universitat Pompeu Fabra, ES*
- *Uppsala Universitet, SE*
- *Weizmann Institute of Science, IL*
- *Westfälische Wilhelms-Universitaet Muenster, DE*
- *The Netherlands Organisation of Health Research and Development, NL*

Scientifically coordinated by EIBIR and the European Molecular Biology Laboratory (EMBL), Euro-BioImaging aims to establish a harmonised, pan-European Biomedical Imaging Research Infrastructure. The mission of Euro-BioImaging is to:

- create a coordinated and harmonised plan for biomedical imaging infrastructure deployment in Europe
- provide access, service and training to state-of-the-art imaging technologies
- foster the liaison and cooperation of all stakeholders (scientists, industry, regional, national and European authorities)

Currently in the Preparatory Phase (2010 – 2013), Euro-BioImaging completed a series of Proof of Concept Studies (PCS) in 2012. Together with the results of the Euro-BioImaging survey on imaging infrastructure needs, the PCS were used to develop the General Criteria for Nodes. Continuing infrastructure implementation, 2013 will also see the first call for node applications.

Stefan Schönberg from Ruprecht-Karls-Universität Heidelberg, represents EIBIR on the Euro-BioImaging Steering Committee and shares his observations and opinions about the project.

How do you explain the aim of Euro-BioImaging to politicians or potential funders?

Radiological imaging requires very large hardware installation if you want to pursue the top-notch field of science. This addresses three areas in particular. The first, going into higher areas of resolution, for example, how tissue is composed in tumours. Second, new types of contrast in radiology need to be obtained, meaning new underlying contrast mechanisms. Finally, functional and metabolic imaging, for example, how to display the organ blood flow to a tumour or to an organ.

So all these areas: resolution, contrast mechanism as well as metabolism and function require more and more radiological equipment, far beyond the potential that any single site can afford. Not only in terms of the expense, but also in terms of personnel and competence, and especially in terms of sustainability. It is well known that ground-breaking achievements are typically made over 5 – 10 years. Sustainability requires that one generation of researchers can be seamlessly integrated into the next generation, without losing critical competence in the specific field.

The key to the solution is, indeed, a concept like Euro-BioImaging: large scale infrastructure built with common goals in mind, also ensuring sustainable operation of such infrastructure in terms of competence, training, management of the facility and access regardless of boarders, local politics or financial issues.

This will vastly strengthen our competitiveness in the field of radiological imaging because we have a much better possibility to train younger generations of physicians/scientists, the engine driving clinical medicine. Ultimately this will help us to offer better medicine to society by translating science into coherent approaches for improving medical care, simply by allowing young researchers/radiologists to access this type of infrastructure.

What results from 2012 were you most inspired by?

We tested our concepts in so-called "proof of concept" studies where young scientists travelled across boarders using large pieces of radiological hardware, conducting science that would otherwise not have been possible. It is not just classical radiology techniques; of course it is absolutely encouraged to have a radiologist involved in molecular imaging. This was quiet impressive as it was much easier to facilitate via Euro-BioImaging than in the past.

The second most impressive thing was that national communities are now much more coherent. We see much more coherent approaches in terms of using imaging for research across boarders, across different disciplines in the field of medicine and trying to

address the urgent need in emerging fields of radiology, nuclear medicine, medical physics and molecular imaging.

What benefits will the medical imaging community realise from a successful conclusion to the project?

The greatest benefit will be to personnel sustainability. Because of Euro-BioImaging, we more coherently train a new generation of young scientists, but also at the same time we create new types of young scientists, learning to interact at the interface between different disciplines of science in the field of medical imaging. Right now the hardware for installations is such an expense, and the number of personnel needed to operate such an infrastructure is so great that without Euro-BioImaging we could not focus on interdisciplinary projects.

From your perspective, what are the advantages of the pan-European structure of the project?

First of all, because of the size of the entire European community, a much higher variety of scientists, with unique expertise in their fields, are contributing to the project. At the same time, we see that the variety of national interests and their particular culture can be very beneficial to a European approach because they organise in different ways; some have very focused infrastructure, others have ideas of building networks that can be very powerful by accelerating research from multiple, smaller sites. These are natural differences which previously were not used to the full benefit of the community. However, if they are aligned under a common strategy I think those different concepts can be complementary and synergistic.

For the upcoming year, what will be some of the challenges faced by the project? What are you most looking forward to in 2013?

The first challenge is that the interests of all involved stakeholders are represented. A lot of the components of the money have to come from the member states, but there is definitely value for the national nodes by having influx from international scientists. It is definitely challenging to see how the harmonisation between the European infrastructure and the national funding truly takes place. Euro-BioImaging must be attractive enough to give added value to the national initiatives – that it is appealing to become a European node, not just a national node. Of course, Euro-BioImaging needs the national funding commitments.

The second challenge is that the European infrastructure does not create too many regulatory restrictions; otherwise it might not be attractive for national initiatives to engage with Euro-BioImaging. I think as a European initiative, it is not only important to be attractive to the different imaging communities, but also to engage and be open to them rather than be over-regulatory.

The third major challenge is that imaging, overall, involves many, many different scientists from many, many different backgrounds. This is, of course a strength, but also a weakness because sometimes there are issues of different mentalities, different backgrounds about how research should be done that seems to result in different thoughts about how such an infrastructure should be built and maintained, how to ensure quality control, access as well as rate and score credentials.

What I am looking forward to is that the various initiatives that are applying for the open call actually succeed by making use of support from the national communities, and transferring this into a European approach. This means that funding investments that have been committed locally, in individual countries, become strong infrastructures utilising a European approach and provide open access to the entire European community. This is what I am excited about because it would bring a national funding commitment to a European scale and additionally be of benefit to the entire European scientific community. This is the key motivation for me brining these initiatives together for the interest of science in Europe.

> *"Because of EuroBioImaging we more coherently train a new generation of young scientists, but also at the same time we create new types of young scientists, learning to interact at the interface between different disciplines of science in the field of medical imaging."*

Pamela Zolda
Working at EIBIR since: *2009*
Country: *Austria*

EURO-BIOIMAGING

Pamela Zolda, from EIBIR, provides an overview of the Euro-BioImaging project.

How are the interests of the medical and biomedical imagining community represented in the project?

The entire consortium is working towards a harmonised infrastructure concept that is appealing for both the biomedical as well as biological imaging communities. To achieve this, we gather feedback from consortium representatives, national communities and stakeholders coming from both fields.

Can you describe how a node application is integrated within the goals of Euro-BioImaging and its current status?

The overall goal of Euro-BioImaging is to provide access, training and service in imaging technologies. In the first year of the project, we assessed, within the community, what imaging technologies and services they would like to access. Based on this, we invited European facilities to test the open access and European scientists were able to use these facilities for free. Utilising the results of the testing phase, Euro-BioImaging developed general and technology specific criteria for nodes that outline what is required from them if they would like to be part of Euro-BioImaging: for example that the technologies they provide are cutting edge, that they will host a significant number of scientists/ year, provide training and receive support from their country.

What are the upcoming activities that you will you be focusing on in the near future?

2013 will be focused on infrastructure implementation – finalising the legal concept, financial model and governance model. After a stakeholder meeting in January, 2013, the open call for nodes will be made. In parallel, preparation meetings with Member States will also take place.

What was the highlight of the project for you in 2012?

I enjoyed seeing Euro-BioImaging becoming more tangible. We focused on more concrete things, like defining the general criteria for nodes and the overall infrastructure model. Moving from the vision to the infrastructure picture is a very rewarding process.

www.eurobioimaging.eu

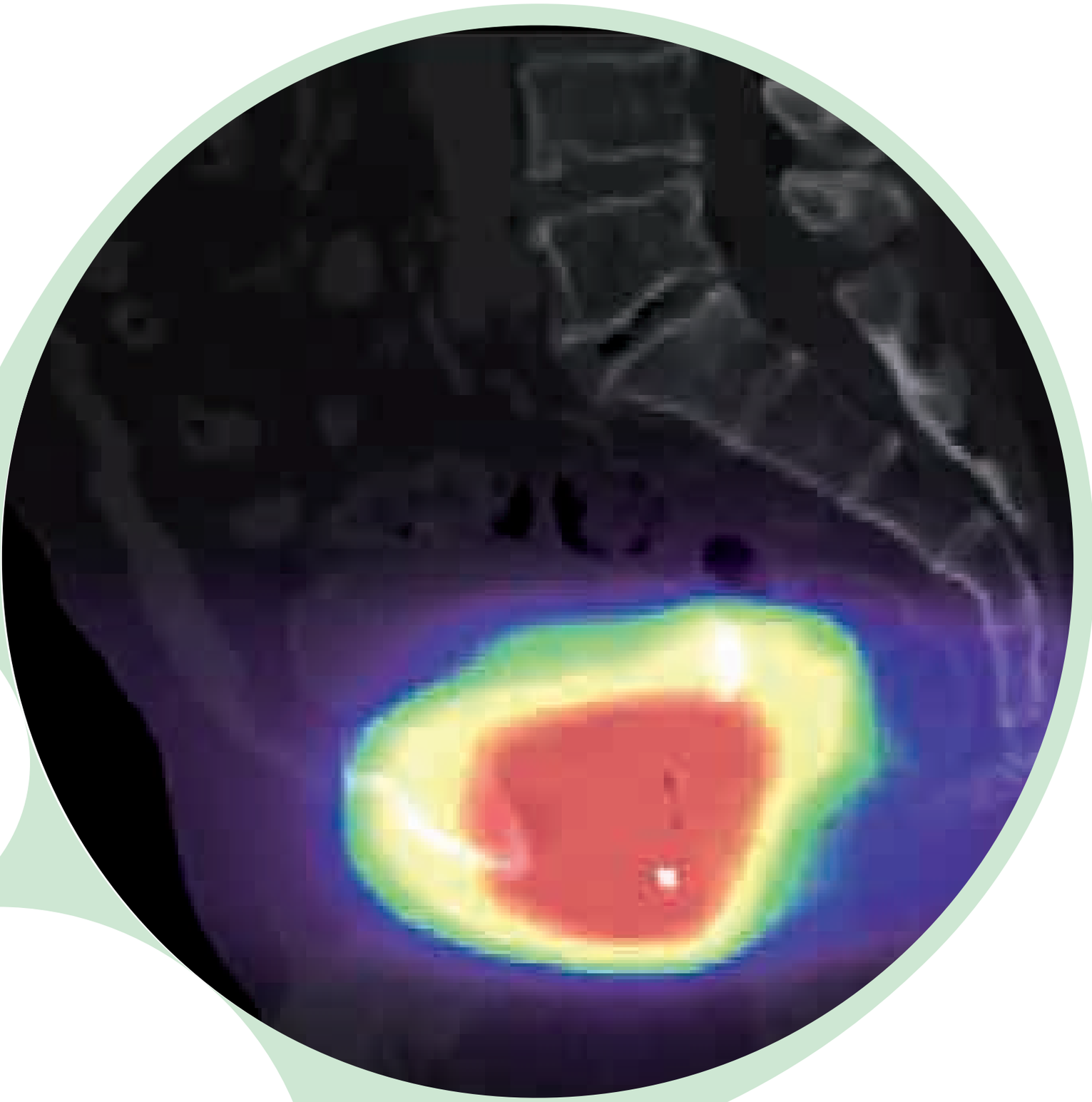


Image courtesy of Martin Hüllner,
Department of Medical Imaging,
Division of Nuclear Medicine,
University Hospital Zurich, Switzerland.

VPH-PRISM

Horst Hahn
Organisation: *Fraunhofer MEVIS*
EIBIR Regular Member Since: *2010*
Country: *Germany*

"I believe we have, with this project, the potential for great success, not only because we are exceedingly ambitious, but also because all partners bring in a strong basis of prior art to build upon."

The positive effects of breast cancer screening are unquestionable; however, breast cancer screening is not 100% accurate, nor is screening able to differentiate between invasive or non-invasive cancers, or predict the rate of transformation from one to the other. Because of the shortcomings of current diagnostic tools, many women in Europe are subject to overdiagnosis, overtreatment, and/or unsuccessful treatment. The key issue underlying these problems is poor individual phenotyping of highly heterogeneous cancers.

VPH-PRISM will substantially contribute to overcoming major obstacles that currently lead to overdiagnosis, overtreatment and unsuccessful treatment of breast cancer in women. By linking research and disciplines and integrating data from a variety of sources (clinical, biological, epidemiological and environmental), predictive models of beast cancer development and more accurate imaging will allow for early, accurate and effective treatment.

Scheduled to start in March 2013, the project will run for 36 months and will receive €3.7m of funding from the EC.

Horst Hahn, scientific coordinator of VPH-PRISM, shares his insights into the projects goals and objectives.

Why did you initiate the VPH-PRISM project?

There were three main clinical issues which were the motivation for starting the project.

The first was surgical. During discussions with surgeons and pathologists we realised that there is no, or very little, specific technology to comprehensively and efficiently translate all the different sources of information, from radiological to pathological, about the precise extent of a breast cancer to the surgeon.

Related to this was another gap in breast care information exchange, namely between the pathological and the radiological information. Pathologists are closest to the true tissue configuration with what they see under the microscope, while radiologists often argue based on the global picture as seen on multimodal images – often without consensus. Quantitative integration of the pathological and radiological analysis will allow the establishment of objective multi-disciplinary phenotypes of the disease.

Thirdly, taking a cue from the literature, we want to enable decision-making support for breast therapy by extracting quantitative, prognostic information from radiological and pathological imaging that reveals how the tumour will react to treatment such as radiotherapy or chemotherapy. A part of this also includes the supporting tissue around the tumour, so-called stroma, which is known to influence the progression of the tumour and its reaction to therapy.

Combining these three elements gives us the chance to integrate microscopic and multimodal radiological information for a systematic multidisciplinary and quantitative phenotyping and to translate this characterisation into an accurate realisation of disease extent, therapy monitoring, and even outcome prediction, providing decision-making tools for the clinician.

What will be the projects major contribution to imaging research?

There are two major contributions.

First off, tissue characterisation in images will become reproducible, localised and quantitative across different hospitals and diverse scanners as well as various radiological levels such as MRI, ultrasound, and mammography. This will serve as a basis for both decision-making and follow-up therapy, as well as disease extent mapping.

Secondly, a new family of software tools will combine an automated, quantitative analysis of large-scale whole slide histopathology data of the breast. No tool, as such, currently exists. To date, digital pathology is in its infancy and we believe that we will see a tremendous development in this field over the next ten to twenty years.

Title:
Virtual Physiological Human: Personalised Predictive Breast Cancer Therapy Through Integrated Tissue Micro-Structure Modeling

Funding Source:
European Union FP7

Current Status:
Under Negotiation

Participating Organisations:
- *Fraunhofer MEVIS,DE*
- *Stichting Katholieke Universiteit, NL*
- *University College London, UK*
- *Philips Technologie GmbH, DE*
- *The University of Chicago, US*
- *University of Dundee, UK*
- *Medizinische Universitaet Wien, AT*
- *Boca Ration Regional Hospital, INC., US*

How does the consortium help to realise the projects goals?

EIBIR was instrumental in setting up the very successful HAMAM project that brought together some excellent partners from five European countries plus the USA who looked at breast cancer from very different points of view. Six of these partners return to participate in VPH-PRISM, and three new partners come on board: University of Chicago, Medical University Vienna, and Philips Research Hamburg. Besides a strong background in quantitative image analysis and modeling, strongly supported by our industry partner Philips, we have a set of outstanding radiological, pathological, and surgical teams that focus on all aspects of breast cancer diagnosis and treatment at the highest available standards including all variants of modern pathological staining and immunohistopathology.

The project also purposefully included two sites from the USA. Boca Raton Regional Hospital, a huge cancer center in Florida with a strong focus on efficiently translating solutions into routine application, and the University of Chicago, which, together with Nijmegen, who is also partner in VPH-PRISM, certainly belong to *the* centres for breast imaging research in the world.

What role will EIBIR play in the consortium?

EIBIR had played an excellent role in HAMAM, bringing the partners together and building a platform. However, the real strength of the organisation is that they have an independent view of the consortium, integrating partners from different disciplines, all the while remaining neutral. Additionally, EIBIR is well known in Brussels and provides an excellent link to the European Commission. For me, it was no question that I wanted EIBIR as a partner again. I am happy to coordinate the project scientifically, but I am also happy to have EIBIR coordinate the management – for me it is an ideal situation.

What are you looking forward to?

Without question, I am extremely enthusiastic about collaborating with the different partners. As a scientist, the greatest honour you can have is to work with such a wonderful list of individuals. It is a tremendous compliment to be able to coordinate such a consortium.

As a physicist, I am looking forward to the quantitative challenges presented in both radiology and pathology to, via the available data, develop tools which hold some promise of robustness and reproducibility and provide meaningful insights for breast cancer phenotyping.

What are your personal expectations for the project?

I believe we have, with this project, the potential for great success, not only because we are exceedingly ambitious, but also because all partners bring in a strong basis of prior art to build upon. Realising our goal of data integrating over all different levels, from risk-assessment, to microscopy, radiology and even over time will provide us with a tool set that can be applied to a large range of other questions.

Related to this, each work package in the project has its own scientific challenge. Compare this to “regular” projects where everything cumulates in just one or two work packages and you realise again how challenging VPH-PRISM is.

I believe that we have the right partners to meet these goals. The consortium has also proven in many bilateral or multilateral situations that they can work together very efficiently.

This will be my favourite project for the next 3 years!

Alejandro Frangi
Organisation: *University of Sheffield*
Country: *United Kingdom*

"We hope that our project will enable earlier differential diagnosis of the disease, where there is a potential hope to at least delay, if not cure, the disease progression."

There are currently about 36 million individuals suffering from dementia and by 2050 that number is expected to rise to 115 million. Acknowledging the impact dementia is having worldwide, the WHO declared dementia a global health priority in 2012, highlighting the urgent need for improvement in this area.

Addressing these challenges, **VPH-DARE@IT** promises to shorten the current average time-lapse between the onset of cognitive and memory deficits and its specific clinical diagnosis.

Alejandro Frangi, Scientific Coordinator, discusses the history behind the proposal, and the impact the project will have.

Why did you initiate the VPH-DARE@IT project?

A few colleagues from EBIR were interested in research at the intersection between imaging and modelling. We wanted to respond to one of the EC priorities in the area of the Virtual Physiological Human in Call 10 that was calling for projects combating major diseases and where novel approaches to diagnosis were required to this end. Dementias are one of the most devastating syndromes in our aging population, still without a full understanding of its causes and, hence, without treatment. We thought this was a challenging problem for us and one that did not receive enough attention from the VPH community.

From your personal perspective, what aspect(s) of the project are you especially looking forward to?

There are two main aspects that I am particularly excited about. The first is the great opportunity of tackling a major societal problem and to do it through very interdisciplinary research, with experts of various countries and various areas of expertise. The fact that the EC has invested over €18m in this initiative and that it has been ranked in the top of the projects of its call is an anticipation of the responsibility we bear for its success.

The second aspect is the possibility to push new concepts into disease understanding and advanced diagnostics; where we seek to look at disease with more holistic eyes than before. This project involves experts in biology, metabolomics, genomics, clinical, imaging, lifestyle, and environmental factors. In particular, we seek to integrate such heterogeneous data sources through both top-down (mechanistic) and bottom-up (phenomenological) approaches. We would like to use a mechanistic, first-principles approach as much as knowledge of the disease allows us, and complement this strategy with a data-driven approximation of the problem where mechanisms are not well understood.

The project is composed of 20 various organisations, how will the consortium contribute to the project's success?

The partnership behind VPH-DARE@IT is represented by a consortium of 20 partners representing 9 countries (7 EU Member States and 2 Associated Partners).

The consortium constitutes a finely balanced blend of expertise and know-how, ideally suited to address the challenges of the proposed research programme. As a whole, the consortium exhibits certain unique strengths in medicine, biomedical sciences, engineering and physical sciences, and social sciences.

In the areas of medicine and biomedical sciences: it combines world-class expertise in various clinical and basic research aspects related to dementia research, ranging from its genetic and molecular basis, to biochemistry, metabolic pathways, cellular and tissue physiology, basic and clinical neurology, neuroscience, experimental neurobiology, diagnostic and interventional neuroradiology, geriatric and neuro epidemiology, among others. On the more engineering and physical sciences, our consortium gathers top groups in magnetic resonance imaging, molecular imaging, biomedical image analysis, computer science, computational mechanics, computational fluid dynamics, biomedical engineering, software

Title:
Virtual Physiological Human: DementiA Research Enabled by IT

Funding Source:
European Union FP7

Current Status:
Under Negotiation

Participating Organisations:
- *University of Sheffield, UK*
- *University of Oxford,UK*
- *VTT Technical Research Centre, FI*
- *Universitat Pompeu Fabra, ES*
- *Engineering Systems International S.A., FR*
- *ASD Advanced Simulation & Design GmbH, DE*
- *empirica Gesellschaft für Kommunikations- und Technologieforschung GmbH, DE*
- *University of Oslo, NO*
- *Erasmus MC, NL*
- *Hirslanden Klinik, CH*
- *Philips Medical Systems BV, NL*
- *ETH Zurich, CH*
- *INSERM U773 Paris, FR*
- *Philips Technologie GmbH Innovative Technologies, DE*
- *Sheffield Teaching Hospital Trust, UK*
- *University College London, UK*
- *University of Eastern Finland, FI*
- *University of Maastricht, NL*
- *Tomorrow Options Microelectronics S.A., PT*
- *Imperial College London, UK*

engineering, biomedical instrumentation and pervasive sensing technologies. In the domain of social sciences, we bring in expertise in market analysis, impact assessment, health economics, health technology assessment, and ethical and legal expertise.

In particular, EIBIR will provide dissemination channels to the relevant academic and industrial stakeholders to ensure adequate outreach to the scientific and industry communities, an essential pre-requisite for the development of the exploitation strategy and business plan within the project.

Together with USFD, EIBIR will contribute to training activities in the form of summer/winter schools to foster knowledge transfer and awareness of the VPH-DARE@IT results.

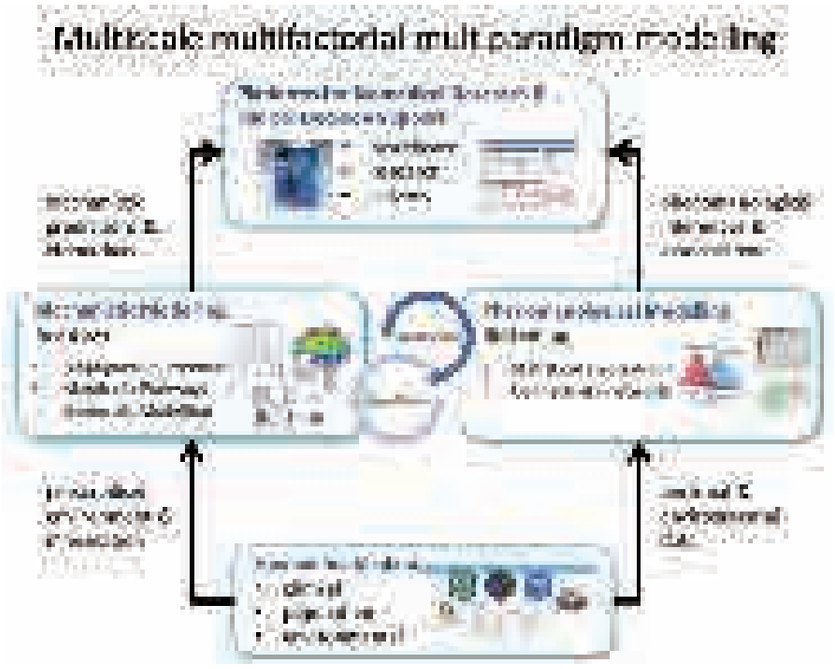
What are the next steps in the project? When do you expect the project to begin?

The project will start on March 1st 2013 and the first event will be the Kick-off Project Meeting scheduled for the same month.

What changes do you hope the project will enable in the diagnosis and treatment of dementia?

Recent research has shown that the delays from symptoms to diagnosis vary considerably in Europe and can range from 10 months in Germany to 32 months in UK. We hope that our project will enable earlier differential diagnosis of the disease, where there is a potential hope to at least delay, if not cure, the disease progression. We do hope, as well, to carry out research that will enable us to understand more the basis for this disease and therefore put us in the best position for identifying new ways of treatment in collaboration with the wider research community.

SEVENTH FRAMEWORK PROGRAMME



European Commission (EC) Tender Projects

EIBIR's expertise in project management and experience in EC-funded projects under the 6th and 7th Framework was advantageous during the application phase of three EC tender projects: MEDRAPET, Referal Guidelines and EMAN. All tender projects were published by the Directorate-General Energy of the EC. The ESR, with the support of EIBIR, participated in all three tenders and was accepted to implement the projects.

MEDRAPET

MEDRAPET is aimed at providing an improved implementation of the Medical Exposure Directive provisions related to radiation protection, education and training of medical professionals in the European Union (EU) Member States. In order to assure excellence in radiation protection and to implement programmes for optimisation in radiation protection in medicine, it is essential to approach education and training consistently with high-standard training programmes on a homogenous EU level. The project was composed of three major tasks.The outcomes and findings of a EU-wide study on radiation protection training and a European workshop formed the basis for a European Guidance document on radiation protection education and training of medical professionals. The working group that addresses the development of the European Guidance document was chaired by the European Federation of Organisations for Medical Physics (EFOMP).

The professional organisations involved include the European Society of Radiology (ESR) as coordinator as well as the European Federation of Organisations for Medical Physics (EFOMP), the European Federation of Radiographer Societies (EFRS), the European Society for Therapeutic Radiology and Oncology (ESTRO), the European Association of Nuclear Medicine (EANM), as well as the Cardio-vascular and Interventional Radiological Society of Europe (CIRSE), covering the main European stakeholders and professional groups with relevance to radiation protection training in the medical field.

www.medrapet.eu

Title:
MEDical RAdiation Protection Education and Training (MEDRAPET)

Funding Source:
European Commission tender

Current Status:
Ongoing (2010 – 2013)

Participating Organisations:
- *European Society of Radiology (ESR)*
- *European Federation of Organisations for Medical Physics (EFOMP)*
- *European Federation of Radiographer Societies (EFRS)*
- *European Association of Nuclear Medicine (EANM)*
- *European Society for Therapeutic Radiology and Oncology (ESTRO)*
- *Cardiovascular and Interventional Radiological Society of Europe (CIRSE)*
- *European Society of Radiology (ESR)*

Referral Guidelines

The European Society of Radiology (ESR), together with other partners, prepared a proposal in response to an invitation to tender published by the European Commission for the project ENER/D4/315-2011, Implementation of Council Directive 97/43/Euratom requirements concerning referral criteria for medical imaging in the European Union in April 2011. Started in December 2011, the project is screening whether the provision has been adopted into law on a national level. The obligation of Member States is "to ensure that recommendations concerning referral criteria for medical exposures, including radiation doses, are available to the prescriber of medical exposures" [Article 6.2 of Council Directive 97/43/EURATOM (Medical Exposures Directive, MED)]. Based on this requirement, a number of Member States have developed national referral guidelines for clinical imaging as guidance for the referring physicians to justify radiological imaging procedures and to ensure the highest possible safety of patients when submitted to radiation exposure.

The project is composed of three major tasks:

- The conduction of an EU-wide study on the availability, development and implementation of referral guidelines for radiological imaging in the EU Member States.
- The organisation of a European Workshop with relevant representatives from the EU Member States.
- The development of conclusions of the workshop regarding the need for national and/or Community action.

The overall aim of this project is to review the situation in European Union (EU) Member States regarding the fulfilment of their obligations under MED Article 6.2.

www.myesr.org

Title:
EC Tender – Referral Guidelines Study

Funding Source:
European Commission tender

Current Status:
Ongoing (2011 – 2013)

Participating Organisations:
- *European Society of Radiology (ESR)*
- *Royal College of Radiologists (RCR)*
- *Société Française de Radiologie (SFR)*
- *Cardiovascular and Interventional Radiology Society of Europe (CIRSE)*
- *European Society of Paediatric Radiology (ESPR)*

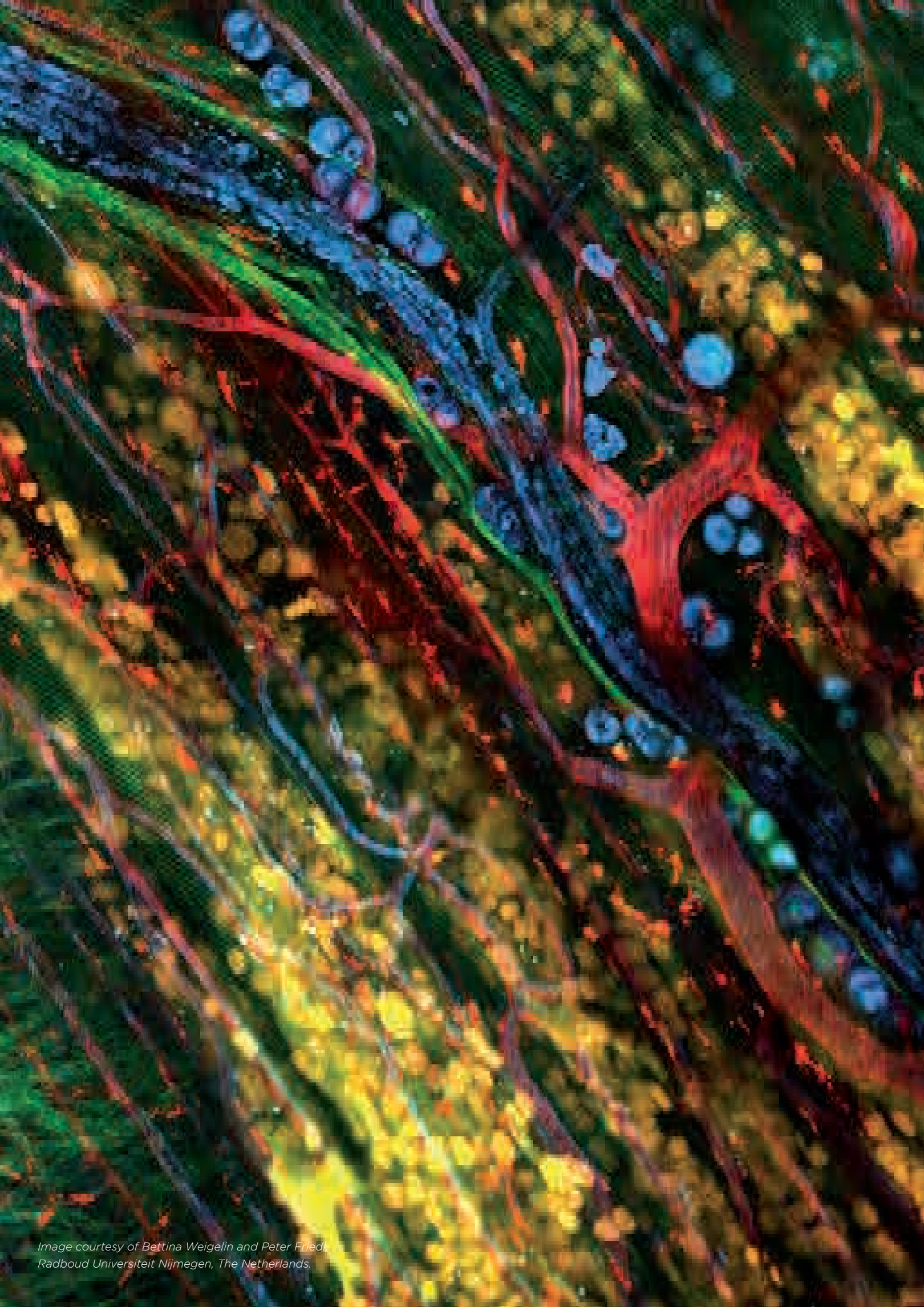


Image courtesy of Bettina Weigelin and Peter Friedl, Radboud Universiteit Nijmegen, The Netherlands.

EMAN – European Medical ALARA Network

The European Medical ALARA Network as it currently exists is based on the idea and the findings of an EC Tender Project (TREN/09/NUCL/S12.542127) of the same name which ended in October 2012.

The European Society of Radiology (ESR), European Federation of Radiographer Societies (EFRS) and the European Federation of Organisations of Medical Physics (EFOMP), former members of the project consortium decided to establish a sustainable European Medical ALARA Network (EMAN) with the goal to build a bridge between researchers, health professionals and policy makers.

A Letter of Intent was signed by the three mentioned professional organisations on September 20th, 2012, aiming at a collaboration in the three application areas of ionising radiation that were subject of the EC Tender project such as:

- **Computed Tomography (CT)**
- **Interventional procedures**
- **The use of x-ray equipment outside the radiology departments**

Within this network, different stakeholders working in the medical sector will have the opportunity to discuss and to exchange information on various topics relating to the implementation of the ALARA principle in the medical field.

Structure of the EMAN Network

Network Partners

Through their communication channels and networks, the three Network Partners are well placed to ensure dissemination of EMAN activities and visibility of the Network:

The ESR has over 53,000 individual members and acts as the umbrella organisation of all national radiological societies in Europe as well as Europe's subspecialty organisations in the field of radiology.

The EFRS has 33 radiographer societies from 31 countries in the geographical region of Europe as full members, one trade union as an affiliate member and 35 universities from 16 countries are cooperating as affiliate members. Through its member organisations the EFRS represents more than 100,000 radiographers in Europe.

EFOMP has 35 national organisations and 3 affiliated national organisations as members, which together represent more than 5000 physicists and engineers working in the field of Medical Physics.

Stakeholder Group

The network is open to all relevant medical professions with a potential interest in the scope of this Network and share the common interest to improve medical radiation protection. These professional organisations are invited to join the Stakeholder Group and contribute to the activities of the Network. The Stakeholder Group may also include other parties potentially interested in the activities of EMAN.

Observers

Interaction with European and international organisations and bodies (such as the European Commission, the IAEA, HERCA, and the other current partners of the EC Tender project) is deemed important. These organisations are invited to an observer and advisory role in the Network.

www.eman-network.eu

ALARA stands for the acronym As Low As Reasonably Achievable, which is a radiation safety principle for minimising radiation doses and releases of radioactive materials by employing all reasonable methods.

Title:
European Medical ALARA Network (EMAN)

Funding Source:
European Commission DG Energy Tender

Current Status:
Ongoing

Participating Organisations:
- *European Society of Radiology (ESR)*
- *European Federation of Radiographer Societies (EFRS)*
- *European Federation of Organisations of Medical Physics (EFOMP)*

COST Actions

COST Actions are interdisciplinary scientific networks that contribute to the scientific development of Europe. COST supports networking activities rather than funding research directly

Xavier Golay
Organisation: *University College London (UCL) Institute of Neurology*
Country: *United Kingdom*

> *"I really hope that at the end of this project, we will be in a situation where ASL could become part of the potential diagnostic, or even better, prognostic, biomarkers to be used in several types of dementia."*

COST Action – Arterial Spin Labelling Initiative in Dementia (AID)

The COST Action – AID will coordinate the development of an alternative and cost-effective tool based on ASL to obtain reproducible brain perfusion measurements in dementia patients. Chairing the consortium tackling one of the major societal needs of an ageing Europe is Xavier Golay.

The Action has been running for a year now. What were the highlights so far?

We set up each of the 3 Working Groups (WG) and held the first meeting in October in Amsterdam. During this meeting, the state of the art for the use of ASL (Arterial Spin Labelling) in dementia was presented from all three points of view: the MRI/physics point of view; the image processing point of view; and the clinical. Taking this as a basis, together with the ISMRM Perfusion Working Group, we have come up with a set of parameters that would be best suited for physicians and radiologists to follow during an ASL exam of patients with dementia, as well as in other neurological diseases. We have started drafting a position paper on it, which was actually one of the main goals of the first year of the Action.

Did you face any unexpected challenges in the first year of the project?

The only unexpected hurdle that we faced was that the COST Action is a very demanding type of project to manage. I have to say help from EIBIR has been a tremendous asset for us, allowing us to actually get through this challenge.

What will be the scientific focus of the second year?

During the next year, all three working groups will be working together on establishing the first prospective multicentre clinical trial using ASL in patients suffering from neurodegenerative diseases. The project will be lead by Prof. Rik Achten from Belgium, leader of the Clinical Working Group 3, with the help of the two other groups. Working Group 1 in particular will focus on pushing each of the vendors to make a certain number of sequences widely available, so that everyone willing to participate will be able to.

As for Working Group 2, several projects will be undertaken. On one hand, the Group will progress with the development of really robust research tools for image processing in ASL. On the other hand, contacts have been established with at least one independent manufacturer to provide a product version of these tools. This will allow a further widening of the number of participants to the project.

The precise layout of the working packages for the second year of the Action will be established in January in Brussels by members of each WG.

Can you describe the benefits of running the project with EIBIR?

Being able to delegate a lot of the administrative overheads, as well as having somebody dedicated as being the liaison between the COST Office, the finance office here at UCL (Grant Holder for this Action) and all project partners was really helpful. This has been really good and I am very happy with the services provided by EIBIR.

Looking ahead to 2015, what outcomes would you like to see resulting from the project?

I really hope that at the end of this project, we will be in a situation where ASL could become part of the potential diagnostic, or even better, prognostic, biomarkers to be used in several types of dementia. I really think that this technique could play a significant role in the diagnostic and prognostic criteria, and also be part of the tools used in clinical trials for early response to therapy, for example.

Title:
Arterial Spin Labelling Initiative in Dementia (AID)

Funding Source:
COST Action

Current Status:
Active (2011 – 2015)

COST Action – Theranostics imaging and therapy: an Action to develop novel nanosized systems for imaging-guided drug delivery

Bringing together researchers from fourteen European countries, the Action will further develop drug delivery technologies using molecular imaging techniques.

The COST Action had its annual meeting at King's College, London (UK) from 28–30 October, 2012. The workshop was attended by more than one hundred participants with about fifty oral presentations and thirty posters. The field of Imaging-guided drug delivery is growing fast and covers either the development of radiotherapeutic drugs as well as the use of nanocarriers as delivery agents. Although most of the work is at preclinical level, at the meeting it was outlined that "theranostics" may have a good chance to enter clinical practice. In this context, particular attention has been devoted to thermosensitive liposome formulations that activate drug release upon the ultrasound stimulii. The availability of HIFU-MRI scanners (for hyperthermia treatments) could likely catalyse the development of this application. Interesting results have also been reported in the field of matched nuclear probes in which one acts as imaging reporter and the latter as a therapeutic agent. Furthermore, multimodal imaging appears very useful to get a better understanding of the microscopic distribution of the drug molecules, thus allowing the acquisition of fundamental information on how the drug reaches its target, how it crosses biological barriers and finally how it achieves its therapeutic effect.

Silvio Aime
Organisation: *Department of Chemistry and Molecular Imaging Center, University of Torino*
EIBIR Active Member Since: *2010*
Country: *Italy*

Title:
Theranostics imaging and therapy: an Action to develop novel nanosized systems for imaging-guided drug delivery

Funding Source:
COST Action

Current Status:
Active (2011 – 2015)

MIPA
Pre-op Breast MRI

Collaboration with Industry: MIPA

Although preoperative breast MRI is increasingly used in clinical practice, two randomised controlled trials concerning preoperative breast MRI published in 2010 and 2011 did not support its use. In order to rectify the ongoing uncertainty concerning the use of preoperative MRI, the **MIPA** project (Preoperative Breast MRI in Clinical Practice: Multicenter International Prospective Meta-Analysis of Individual Data) sponsored by Bayer, will conduct a systematic evaluation of preoperative breast MRI, examining individual patient data in a multicenter international setting.

Rubina Manuela Trimboli
Organisation: *IRCCS Policlinico San Donato, Milan*
EIBIR Active Member Since: *2010*
Country: *Italy*

> *"We've published the call for centres to participate in the study this summer and received nearly a hundred applications from all over the world, not only from Europe but also North and South America, Asia, and Australia. Due to the success of this initiative we are trying to double the number of involved centres in order to achieve a large sample size."*

Providing further details about the MIPA study is Rubina Trimboli, responsible for data management and monitoring, as well as the development of the electronic case report form at the central unit of the MIPA study.

What was the catalyst to start this study?

MIPA's cue was taken from the ongoing debate on preoperative breast MRI. Bilateral contrast-enhanced breast MRI has been demonstrated to outperform mammography and ultrasonography in evaluating index tumour size as well as in detecting additional ipsilateral and contralateral cancers, showing otherwise undetected multifocal/multicentric disease in up to 20% and an incremental detection rate for contralateral cancers of about 4%. In this scenario, preoperative staging with breast MRI has essentially been advocated for improving surgical planning by a reduction in re-excision rate, reducing in-breast cancer recurrences and providing a screening tool in contralateral breasts. Literature shows conflicting results and there is still limited evidence for costs and benefits. Potential advantages are reduction in re-operation rate for positive margins and ipsi-/contralateral recurrence while overdiagnosis and overtreatment represent the main drawbacks. Moreover, association of increasing use of preoperative MRI and increased rates of mastectomies has been suggested but the impact on long-term clinically relevant outcomes is not yet demonstrated. Thus, EuroAIM in cooperation with EUSOBI, designed the MIPA study, an observational multicenter study which will analyse individual female data of two concurrent cohorts of patients newly diagnosed with breast cancer, defined as receiving/not receiving preoperative breast MRI. Surgical primary outcomes, such as re-excision rate for positive margins and change in surgical planning will be assessed. Moreover, clinical outcome at five years will be evaluated in the two cohorts. About 3,000 women will be enrolled and followed-up for 5 years to hopefully end this controversy.

Can you briefly describe the projects current status?

We've published the call for centres to participate in the study this summer and received nearly a hundred applications from all over the world, not only from Europe but also North and South America, Asia, and Australia. Due to the success of this initiative we are trying to double the number of involved centres in order to achieve a large sample size. So in the next weeks we will be able to end centres selection and to start with real patient enrolment. *(Editors note: 35 participating centres have been selected)*

How did Bayer become involved with MIPA?

Bayer had already started projects on breast MRI and wanted to increase interest in preoperative MRI. Prof. Sardanelli proposed to Bayer to support a large observational study on this topic and they accepted. Now, they also accepted to extend support for the study by doubling the number of centres. We want to thank this company for the unrestricted support.

What needs to be done to encourage more industry participation in research?

Companies should be closer to clinical practice and especially to clinical research. This is the only way to make them aware of what is really currently needed and where to invest their resources. What I mean is that, for example, EIBIR could arrange meetings between companies, medical facilities and researchers about specific topics in order to promote information exchange and especially free brainstorming. This is a way for combining companies' interest and the ideas of clinical researcher who have a global view of the current and future needs of clinical practice.

EIBIR | EUROPEAN INSTITUTE FOR BIOMEDICAL IMAGING RESEARCH

EUSOBI european society of breast imaging

Bayer HealthCare

Title: *Arterial Preoperative Breast MRI in Clinical Practice: Multicenter International Prospective Meta-Analysis (MIPA) of Individual Data*

Funding Source:
Industry Sponsored (Bayer healthcare-Medical Care-Radiology and Interventional)

Current Status:
Active (Summer 2012 – 2017)

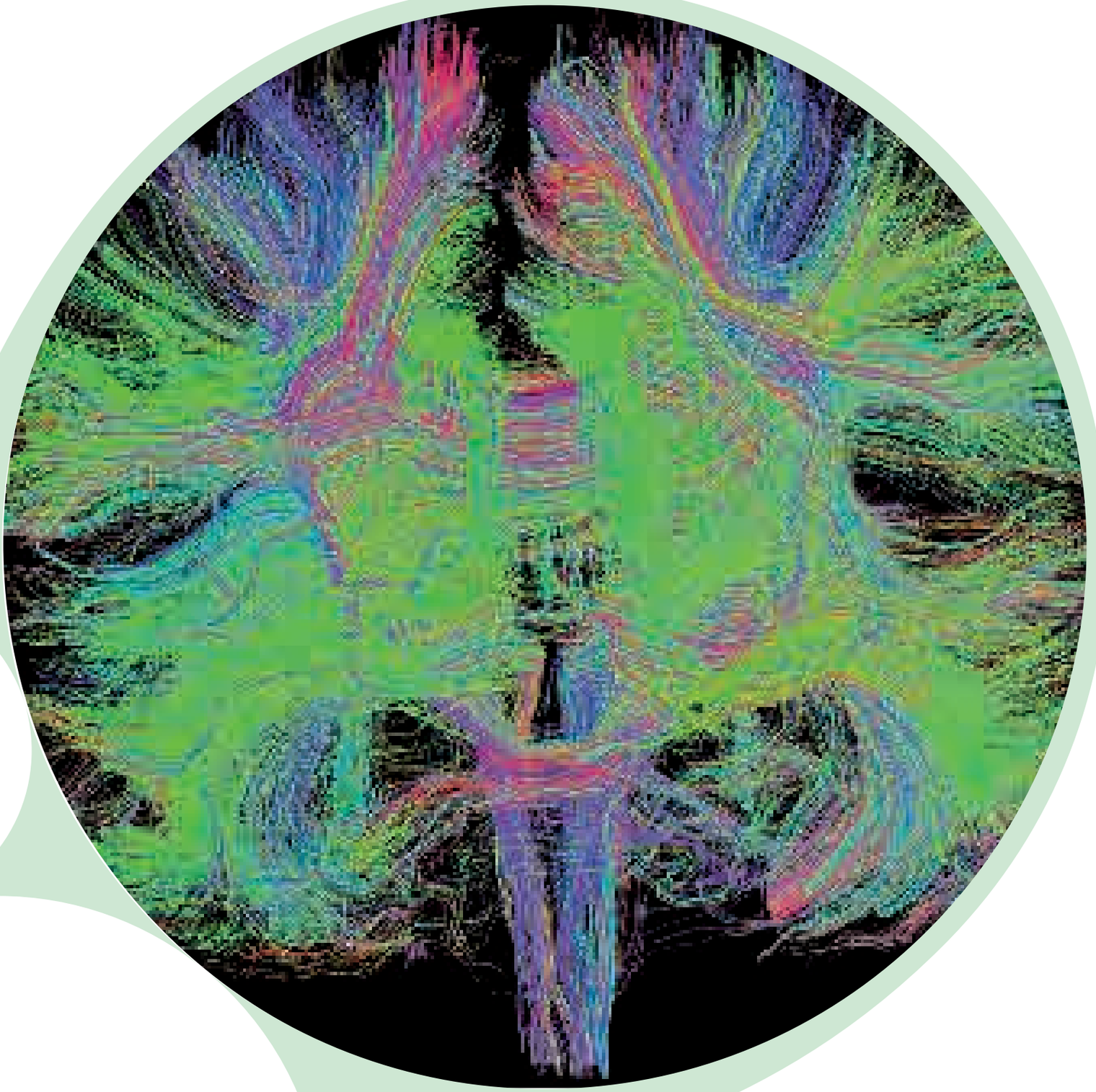


Image courtesy of Mark Bastin, Brain Research Imaging Centre, University of Edinburgh, UK

EIBIR's Joint Initiatives

The Joint Initiatives continued to develop their respective thematic focus in 2012.

Silvio Aime
Director of the Chemistry Platform

Chemistry Platform

Main advances in medical imaging science are based on research projects where different disciplines contribute. Therefore, for EIBIR to tackle key issues in bio-medical imaging, it has to continue its initiative aimed at attracting chemistry groups working in fields related to the development of chemical probes and formulations addressing current and future imaging needs. In this context, EIBIR took the initiative that led to the COST Action on "Theragnostics Imaging and Therapy: An Action to Develop Novel Nanosized Systems for Imaging-Guided Drug Delivery". Moreover, EIBIR promoted the intense collaboration between chemists and biomedical researchers in the EU ENCITE project devoted to the visualisation of cell tracking and cell therapy. For the future, work will be done to assemble into EIBIR more groups focused on the design and testing of the imaging probes; a research field that is growing very fast in Europe, not only in academia, but also in industry.

Peter Brader
Director of the Cancer Imaging Working Group

Cancer Imaging Working Group

What were the highlights of the Working Group activities in 2012?

The highlights were fostering the relationship between EIBIR and EORTC and preparing the EIBIR/EORTC symposium during ECR 2013. Additionally, a consortium composed of members of the Working Group prepared a proposal for the TRANSCAN call to be submitted in 2013. I will take the opportunity and thank all the members of the group for their active participation over the last years. I know that all members have a lot of clinical, administrative and research responsibilities, nevertheless they all find time for their valuable input in the Cancer Imaging Working Group.

Can you please describe the research focus of the Working Group's intention to submit a project to the TRANSCAN call?

The research project is focused on the microenvironment of cancer. A better understanding of the interplay between cancer cells and its stromal compartments may help to develop powerful therapeutic strategies. At the end of the project, profound knowledge will be available about the composition of the tumour stroma and its impact on tumour development and spread. Furthermore, a preclinical and clinical basis will be established for the development of new theranostics that may be highly effective to treat cancer alone or in combination with standard therapies.

The aim of the Working Group fits perfectly into the aim of TRANSCAN: to develop transnational, innovative projects in cancer prevention focused on the mechanisms responsible for maintaining a healthy status versus those underlying cancer development. There is also a clear orientation towards rapid translation of the existing and newly acquired knowledge into individual- or patient-tailored interventions.

EIBIR/EORTC will hold a joint symposium at ECR 2013. What are the goals of this symposium and the collaboration?

The symposium will focus on the use of imaging biomarkers, which will become more important for clinical trials in the future. These advanced functional techniques hold great promise, but qualifying these imaging biomarkers requires robust methodology. One needs proper study design following standardised procedures, correlation with pathology/outcome, reproducibility testing and optimal timing of observation, and sufficient statistical power.

The collaboration between EIBIR and EORTC has the potential to strengthen the competitiveness of both organisations, both heavily involved in biological and medical imaging with focus on cancer imaging. In addition, continuing improvement on the sensitivity of medical imaging techniques will have a strong impact on the diagnosis and monitoring of cancer allowing more personalised medicine. In the field of biomedical imaging, EIBIR has a leading research position. Several academic/industrial collaborations have launched inventions and innovations within EIBIR. Therefore, the collaboration between EIBIR and EORTC will foster the importance of the imaging technologies in biomedical science within Europe.

Looking into the future, where would you like to see the Cancer Imaging Group making its biggest impact?

The Working Group works on imaging biomarkers with respect to oncologic imaging and to improved diagnosis and personalised medicine. Major aims in the next years are, together with the ESR Subcommittee on Imaging Biomarkers and the EORTC Imaging Group, the development and establishment of standards and guidelines for advanced imaging techniques and imaging biomarkers in oncologic imaging for comparable results. And of course, the Working Group offers great opportunities for drug development and approval, as well as initiation of cooperation between academia and industry to build up consortia on the development, acceleration, and clinical transformation of pharmaceuticals and imaging devices. This will deepen the relationship between academic institutions and industries.

Biomedical Image Analysis Platform

The aim of this initiative is to represent biomedical image analysis research on a European level and to promote educational activities in that field. The IMAGINE Workshop at the 2012 ECR saw the chairmanship of the "EIBIR presents IMAGINE sessions" handed over to the next generation and Marleen de Bruijne from Erasmus MC Rotterdam/NL and University of Copenhagen/DK assumed responsibility for the role. The sessions focused on the development of quantitative imaging biomarkers, computer-aided detection and diagnosis, integrated and interactive visualisation, therapy planning, image-guided interventions and robotics as well as computer-assisted training. They featured innovative technological developments in, among other fields, diagnosis and therapy-planning guidance. The sessions featured research institutes, university groups and research departments of industrial companies who wanted to present novel and exciting technological developments in the field of diagnostic and interventional radiology. Members of the BioMedIA – Platform are pleased to present two events, already known in the biomedical image analysis community: The IMAGINE Workshop at ECR 2013 and the EIBIR Summer School on Neurology Imaging. For more details please see the "Events" section.

Wiro Niessen
Director of the Biomedical Image Analysis Platform

Image: Screenshot of the SMARTVis tool for CTA/SPECT fusion. The patient has significant disease in RCA. Image courtesy of Hortense Kirisli

Fancesco Sardanelli
Director of the initiative European Network for the Assessment of Imaging in Medicine

Giovanni Di Leo
Organisation: *IRCCS Policlinico San Donato, Milan*
Country: *Italy*

EuroAIM

What were the major activities performed by the Working Group in 2012? What results were revealed?

In 2012 we completed the data analysis of the main EuroAIM project. Moreover, a draft of a manuscript has been prepared at the central unit in Milan. Upon completion, we will submit the manuscript for publication.

Did any of the results surprise you? Did the results reveal any critical aspects that need to be addressed?

The main result of this study is that only 38% of systematic reviews and meta-analysis regarding imaging, to some extent, involve a radiologist or a nuclear physician. This means that clinicians and/or epidemiologists, without a real expertise on imaging, write articles and draw conclusion on our activities!

How does this shape what will be undertaken in 2013?

During 2013 we would like to enlarge this analysis from systematic reviews/meta-analysis to clinical practice guidelines and cost-effective analysis.

Once the necessary data is gathered, how will it be used to promote the principles of evidence-based radiology analysis?

Of course we will try to publish these data in a high impact (clinical) journal, in order to reach not only radiologists, but also other practitioners. Moreover, we should encourage radiologists to perform systematic review and meta-analysis by themselves, in collaboration with clinicians and epidemiologists.

What changes can be made in the short-term to improve the application of evidence-based radiology analysis?

Evidence based radiology should be applied "from the bottom" with radiologists curious to find out if their practice is supported by the evidence. Luckily, this is rapidly increasing among younger radiologists. In the short-term, while waiting for the evidence, we should strictly apply the ALARA principles regarding the use of ionising radiation.

Ideally, how would you like to see the principles of evidence-based radiology analysis applied to imaging and radiology?

As I said before, it would be great if evidence-based radiology was applied from the bottom up. Too many times, imaging examinations are performed for legal issues or just because the referring clinician has requested that examination. I would like to see radiologists involved in the clinical work out to determine if the imaging examination is necessary.

Interview with Giovanni Di Leo

Cell Imaging Network

The ENCITE project (p. 13) is an excellent example of the impact that the EIBIR Joint Initiatives can make. The work of the Cell Imaging Network led to the development of ENCITE and Mathias Hoehn describes his involvement in ENCITE and how the project will continue to impact cell imaging in the future.

Monique Bernsen
Director of the Cell Imaging Network

Mathias Hoehn
Organisation: *Max Planck Institute for Neurological Research*
Country: *Germany*

From your perspective, what was the highlight of working on the ENCITE project?

Sometimes, large consortia have been structured too artificially, mostly focused on the expectations of the EU call. In ENCITE I have appreciated from the very early preparation phase on, that the shared scientific interest was the primary motive, and the intense cooperation filled the spirit of the consortium during the past four years. My personal highlight from this period is the intense collaboration network established between my lab and several partners of ENCITE.

Can you please describe your major contribution to ENCITE?

We have long experience in experimental brain imaging with MRI and also more recently with optical imaging in my lab. Cell labelling and cell tracking aspects are a definite focus. One major nuisance in science is if one is forced to re-invent the wheel. I hope to be able to say that a major contribution from my lab has been to share our expertise, particularly for cell tracking in the neuro-imaging application.

What was the motivation behind your research?

Our own research has been dedicated for several years to the stem cell mediated regeneration of brain lesions. This therapeutic strategy requires longitudinal studies on individual animals, thus making cutting-edge molecular imaging modalities indispensible.

How will you build upon the results of ENCITE in the future?

Our collaborative activities with many ENCITE partners (Leiden, Weizmann, Nijmegen, Torino, Prague, to name just the most intense ones) will continue, simply driven by the wonderful experience of fruitful scientific interactions.

Was there an "aha" moment for you during the project?

ENCITE provided funding explicitly for the exchange of young scientists (PhD students, post docs) between partner labs. Three of my students profited from this privileged situation and spent several months at the Weizmann Institute, in Torino, or in Leiden. The new experience in those hosting institutions and the work performed there has resulted in extraordinary widening of the students' horizon and contributed further high quality substance to their dissertations.

What was the most important lesson that you took away from the project?

Consortia which are formed based on the scientific questions and expectations for mutual exchange of expertise are very profitable for all partners concerned. I have enjoyed very much the open and sharing atmosphere in the ENCITE consortium. It has set standards.

Interview with Mathias Hoehn

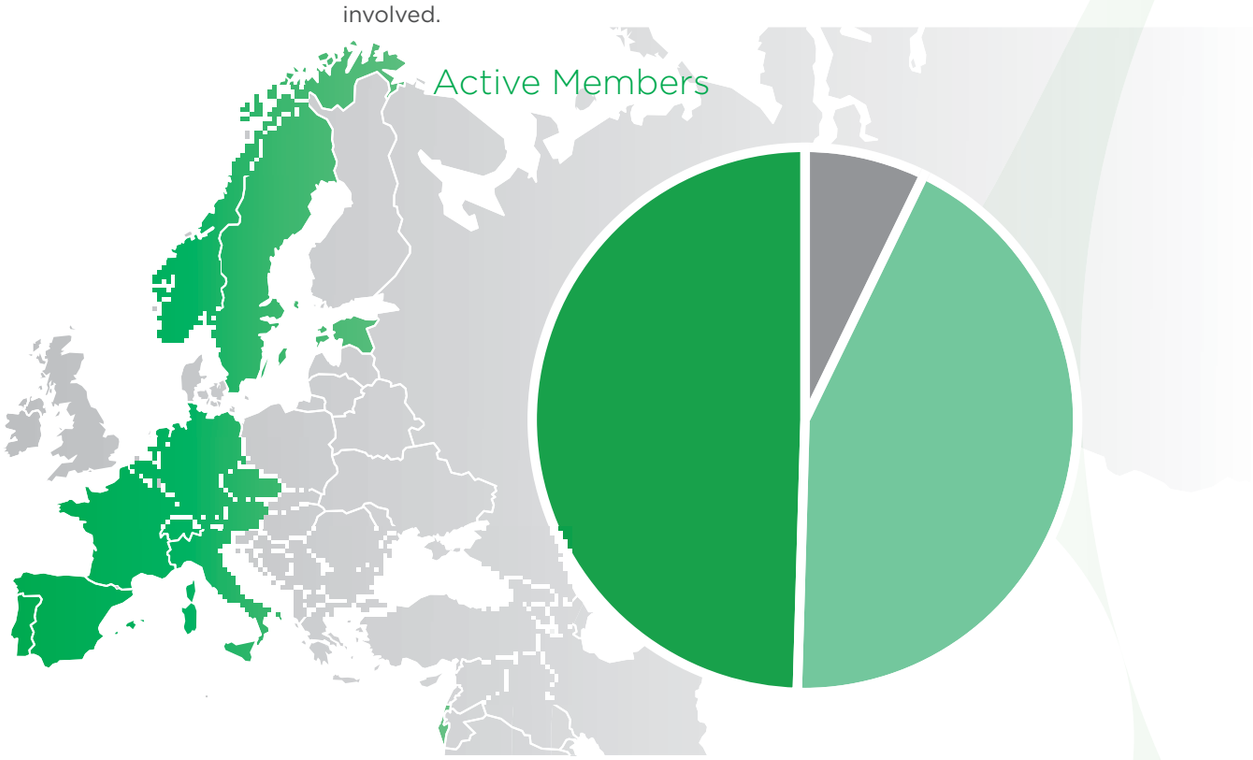
For questions about any of the joint initiatives, please contact **office@eibir.org**

Network Members: Continuing to demonstrate vitality

Open to all disciplines with an interest in biomedical imaging, the EIBIR Network has established itself as a vital link for the participating organisations.

The 111 Network Members represent a variety of different imaging focuses and more than 20 countries within and outside of Europe. Network Members are classified as active, regular and associate, depending on the level of EIBIR service required and the type of membership package enrolled in.

The Network is built upon the strength of its members and EIBIR would like to thank all those organisations and individuals who have recognised the importance of becoming involved.



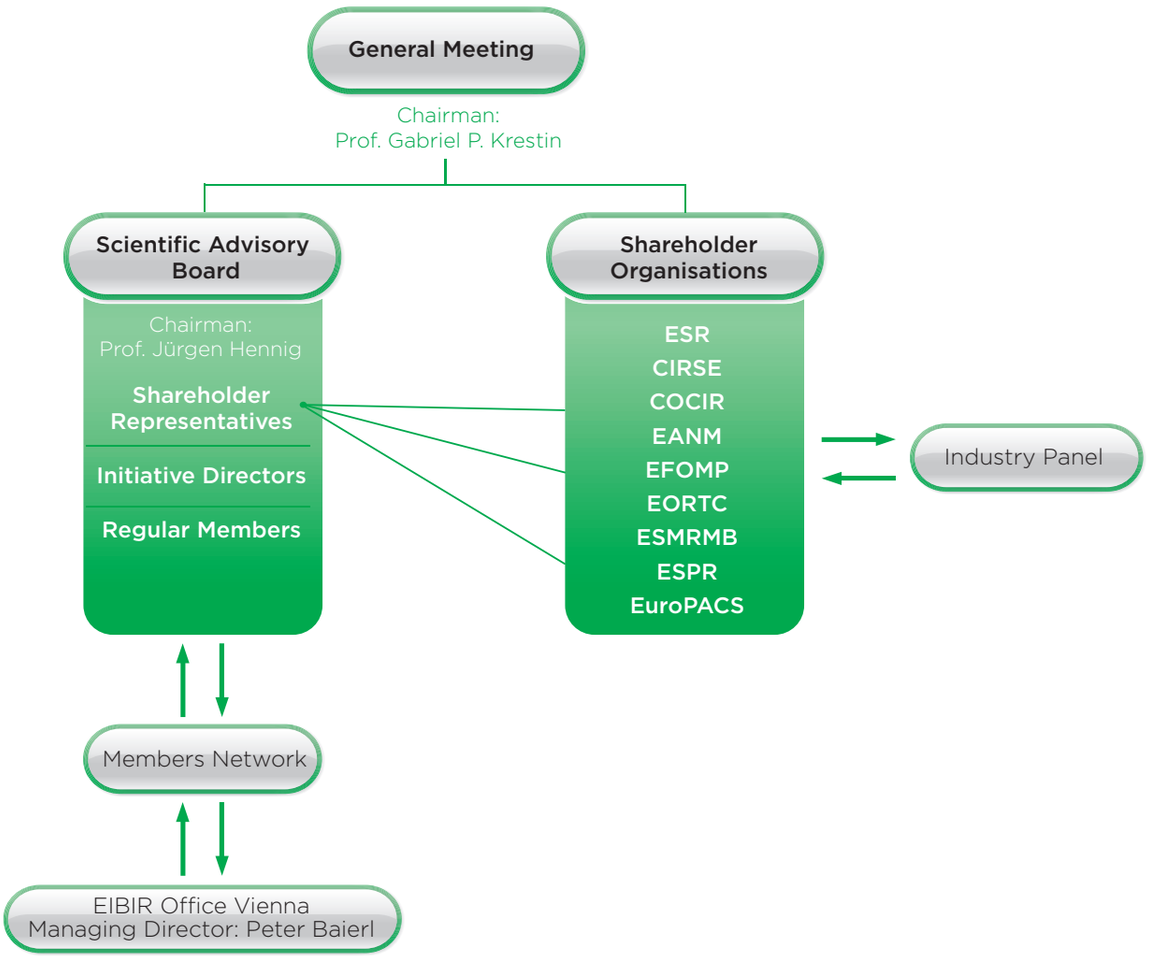
EIBIR Network Members as per December 21, 2012

Category of service package	including related departments
Active Service Package	55
Regular Service Package	48
Associate Service Package	8
TOTAL	**111**

EIBIR Decision Making and Guidance

EIBIR benefits from the guidance and support of a multi-faceted organisational structure. Combining the various expertise of the Scientific Advisory Board, advice from the multi-disciplinary Shareholder groups, input from the European Society of Radiology Research Committee and recommendations from the Industry Panel, EIBIR ensures that biomedical imaging is at the forefront of research activities in Europe.

Organisational chart



Scientific Advisory Board

At the heart of EIBIR, the Scientific Advisory Board, led by Jürgen Hennig, guides the long-term scientific strategies of the organisation, decides on the implementation of specific activities and provides advice to members about their research ideas.

A Scientific Advisory Board meeting was held at the beginning of March during the ECR. Jürgen Hennig was renewed in his post as the Scientific Director. Considered during the meeting were proposals to enhance collaboration with Network Members as well the establishment of a new working group on image-guided therapies and interventions with CIRSE (Cardiovascular and Interventional Radiological Society of Europe). Combining diagnosis and therapy to improve clinical care and to foster drug development was a further topic as it relates to the IMI consultation on imaging-guided drug delivery undertaken with the European Society of Radiology.

Prof. Jürgen Hennig
Scientific Director of EIBIR

Shareholder Representatives

» EuroPACS: Frits Binkhuysen
» EANM: Ignasi Carrió
» EORTC: Otto Hoekstra
» ESR: Gabriel Krestin
» CIRSE: Philippe Pereira
» ESPR: Karen Rosendahl
» ESMRMB: Oliver Speck
» EFOMP: Alberto Torresin
» COCIR: Heinrich von Wulfen

Initiative Directores

» Monique Bernsen (Cell Imaging Network)
» Peter Brader (Cancer Imaging Group)
» Wiro Niessen (Biomedical Image Analysis Platform)
» Francesco Sardanelli (EuroAIM)
» Stefan Schönberg (Euro-BioImaging)

Regular members

» Silvio Aime, IT (also representing the Chemistry Platform)
» Nicolas Grenier, FR
» Milan Hajek, CZ
» Luis Martí-Bonmatí, ES
» Anwar Padhani, UK
» Andrea Soricelli, IT
» Siegfried Trattnig, AT
» Bernhard van Beers, FR

Perspectives from two board members, Milan Hajek and Siegfried Trattnig, exemplify the expertise, enthusiasm and initiative that board members bring to EIBIR and the work undertaken by the Scientific Advisory Board. Future areas of activity for Scientific Advisory Board deliberation - the possibility of including CRO activities within EIBIR services – are outlined by Myriam Hunink.

Milan Hajek
Organisation: MR Spectroscopy, MR Unit, Department of Diagnostic and Interventional Radiology, Institute for Clinical and Experimental Medicine
EIBIR Active Member Since: 2010
EIBIR Scientific Board Member Since: 2010
Country: Czech Republic

> *"I think that EIBIR should concentrate on the cooperation with medical research of specific diseases that need imaging facilities"*

Scientific Advisory Board member Dr. Milan Hajek shares his vision for the future direction of EIBIR and the opportunities that should not be ignored.

How did you become involved with EIBIR?

I think that our Institute (our MR lab) was one of the first institutions involved in EIBIR. Later, I started, with a group of a few colleagues, the preparation of a study now known as the FP7 project ENCITE, which is, in my opinion, the biggest organisational success of EIBIR in the field of research projects. As I was also involved in organising numerous activities under ESMRMB, ESMI etc., I was invited to participate in the EIBIR Scientific Advisory Board.

What is your role on the Scientific Advisory Board?

My role is mostly related to the evaluation of new project proposals and I am also involved in projects focused on personalised medicine and a new COST project relating to bioimaging.

How does the Scientific Advisory Board ensure that EIBIR is prepared to address upcoming challenges?

This is a difficult question to answer, as the Scientific Advisory Board relies on the active contribution from the Shareholder organisations and EIBIR's Network Members. The SAB analyses upcoming calls for proposals and EC policy statements e.g. by participating in consultations.

Thematic working groups called Joint Initiatives are established often upon suggestion by the SAB and allow experts to join forces on specific hot topics at European level.

Are there specific projects/ collaborations/activities that you believe EIBIR should focus on in the future?

As there are only a few calls under the 7th and probably the next funding programme of the EU relating to biomedical imaging, I think that EIBIR should concentrate on the cooperation with medical research of specific diseases that need imaging facilities (diabetes, personalised medicine in neurodegenerative diseases etc.).

I also think that EIBIR should be partially transferred to some type of a grant agency which would be able to distribute funding for biomedical imaging. There is excellent staff at EIBIR who help prepare projects, so the second step is to fund projects. It can start with small support of individuals and move on to a higher level of granting. This area should be discussed.

Do you see any hurdles to EIBIR to achieving its long-term strategy?

I think that there is no long-term strategy in place at the moment, at least I do not know what it means in reality. There is clear support of several projects, the example being Euro-BioImaging (really big support for many institutions) - but the project will be dependent on national funding and I do not know how EIBIR can influence it. In any case, the long-term strategy – at least for the next decade should be specified.

From a personal perspective, what do you enjoy most about being a member of the Scientific Advisory Board?

It is interesting to meet members of the Advisory Board and to hear their opinions and information. Also, the pleasant atmosphere of all networking opportunities should not be forgotten :-) .

Siegfried Trattnig
Organisation: Medical University of Vienna
EIBIR Active Member Since: 2010
EIBIR Scientific Board Member Since: 2010
Country: Austria

"When I can demonstrate to my own university that in Europe, 1/4 of radiology departments offer their own PhD programme, I think this is a very strong argument in favour of establishing one ourselves."

In 2012 a survey of European imaging-related PhD programmes available to medical doctors (MD) was carried out under the guidance of Dr. Siegfried Trattnig from the Medical University of Vienna and member of the EIBIR Scientific Advisory Board.

One hundred responses were collected, providing insight into the programmes offered by universities and institutions from 24 European countries.

Dr. Trattnig shares his motivation for initiating the survey as well as his involvement on the EIBIR Scientific Advisory Board.

What motivated you to initiate the survey?

While the PhD was important in other countries, the UK and US, for example, in German-speaking countries, the habilitation (postdoctoral lecture qualification) used to be the most important scientific achievement. Because I am a radiologist and therefore interested in training in radiology, I realised that PhD's for MD's were becoming increasingly important everywhere as part of radiology education.

I believe more PhD's would also help attract more radiologists to universities. Generally, once they have finalised their radiology training people tend to leave the University and go into private practice because they are able to earn much more money. This scientific background provided through a PhD programme would help them to receive more academic honour so that they may be more motivated to stay at the University.

Another point for me was that I know the situation in our own hospital, but what is the situation like in all other countries in Europe? How many PhD programmes with relevance to imaging are offered by other Universities in Europe? Are their departments of radiology in other countries that offer their own PhD programme? There was no information available, so the best option was to start a survey allowing us to then estimate the European situation.

Why did you choose to do the survey with EIBIR?

This idea about PhD programmes for MD's was discussed at the Research Committee board meeting of the European Society of Radiology. Because EIBIR has a great service component, they could really support us with questions like this one, and we had our first discussion at the 2012 ECR in March. In July we closed the survey because we had already received responses from 100 different universities and institutions in Europe, involving almost all European countries.

EIBIR was very helpful when creating the electronic version of the survey, and Jürgen Hennig was also very helpful with the formulation of the questions. What we really tried to do was to find a compromise between the importance of our questions and keeping it short and simple, to ensure a high response rate.

What were the general results? Did any of the results surprise you?

Yes, I was really surprised by some of the results. First of all I was surprised with the high percentage of universities that responded to our survey that offer imaging-related PhD programmes for MD's. The second important surprise in my mind was the fact that 25.6% of radiology departments in Europe run their own PhD programme. I think this is amazing because our own large University Hospital of Vienna, our own large department of radiology, is not running its own PhD programme.

50.5% of the universities/institutions offer imaging-related PhD programmes.

25.6% of Radiology Departments run their own PhD programme.

In most cases (38.9%) the PhD runs in parallel to Radiology training.

PhD programme generally lasts 3 (27.8%) or 4 (27.8%) years.

What will be done with the results? How will these results be used to promote image-related PhD training for MD's?

I was asked by the Research Committee board of the ESR to prepare an opinion paper about the results of the survey. I believe once this is published, if other institutions or other departments of radiology realise that there is a tendency now to run a PhD programme, this will motivate them to think about, and possibly establish their own. When I can demonstrate to my own University that in Europe, a quarter of radiology departments offer their own PhD programme, I think this is a very strong argument in favour of establishing one ourselves.

As an EIBIR SAB member, how would you like to see the EIBIR strategy developed for 2013-2015?

I believe the main role of EIBIR should be as it has been so far, to support us with European Community projects, which I think is really important. EIBIR also has a really good networking function and can bring people together from different countries. Another important function is supporting proposal writing.

In addition, I believe EIBIR also plays a role in pushing different fields, for example molecular imaging. These new developments that are so important for radiology and should be driven, partly at least, by EIBIR.

From a personal perspective, what do you enjoy most about being a member of the SAB?

For me the best part is having contact to so many different fields of research. At the meetings we get reports from so many other fields in which we are not directly involved in, and you realise that some bridging is possible, that new ideas can develop – it is similar to a large brainstorming session. When so many skilled people come together, then brainstorming is always on a high level and creates a lot of new ideas.

Myriam Hunink
Organisation: Erasmus University, NL & Harvard University, US
EIBIR Active Member Since: 2010
Country: The Netherlands

"EIBIR has a couple of very important strengths which I think it could use really well for this purpose."

Contract Research Organisations (CRO's) provide outsourced research services on a contract basis within the biotechnological and pharmaceutical industries. Dr Myriam Hunink, Professor of Radiology and Clinical Epidemiology at Erasmus University and Adjunct Professor Health Decision Science at Harvard shares her thoughts about expanding EIBIR's services to include CRO activities.

What lead you to consider expanding EIBIR's services to include CRO activities?

While working on the DICAD proposal together with EIBIR, we realised that we needed support for the clinical trials; practical support like getting sites on board, recruiting patients, gathering data, cleaning data, reporting data back. These things need to be done, and if you do it through a commercial CRO, it can get really expensive. Also, they tend to want to take over, which doesn't make a lot of sense with academic partners. Academic partners are often interested in doing part of the clinical trial, designing of the study, the statistics, the analysis, the reporting. This is where I thought EIBIR could take care of logistics, management and administration while the academic partners take care of the academic part. I was wondering if we could, within EIBIR, create a CRO that's really focused on, firstly, radiological studies, and secondly, utilising the know-how and the expertise, available at the academic centres.

What puts EIBIR in a good position to be able to offer the CRO services?

EIBIR has a couple of very important strengths which I think it could use really well for this purpose.

EIBIR has a really good network of centres throughout Europe as well as a few in the US that are really interested in doing research. This is important for site recruitment because you need to have sites to participate in whatever clinical trial you're going to run.

Secondly, just the management and the administration of a trial is very large and there are a lot of tasks that need to be done. EIBIR is absolutely excellent at this and could handle it very well.

And then information technology - EIBIR and the European Society of Radiology, both together, are really strong in information technology, stronger than the CRO'S in that respect. If the technology wasn't already available at EIBIR, it would be worth buying it or to subcontract with academic partners for specific needs.

Another advantage is that EIBIR is not-for-profit and could provide a low-budget solution, which is useful for projects that are really trying to streamline their budgets. If you are funded via the EU or nationally, you want a low-budget solution and I think EIBIR could provide that.

Do you see any challenges to implementing this service?

We've talked about this idea a few years ago, but we felt that the timing wasn't right. Now I think the timing is right, but it's work. I am happy providing expertise as a clinical epidemiologists, but you may have to recruit other people; we'd have to think about how we get expertise like clinical radiologists and statisticians as subcontractors.

How does this go from an idea to an actual service. What are the next steps?

I think the management of EIBIR has to decide whether they are going to go ahead with this or not. Then someone is going to have lead the initiative, decide what the steps are, what needs to be done and when. Money will have to be invested upfront, and then we need a study to actually put the services to use. If the DICAD proposal is funded, this would be a wonderful opportunity to try out the CRO services.

Image courtesy of Bettina Weigelin and Peter Friedl, Radboud Universiteit Nijmegen, The Netherlands.

Shareholders

EIBIR is please to introduce a new Shareholder organisation for 2013: the European Society for Radiotherapy and Oncology (ESTRO).

EIBIR's co-shareholders exemplify the importance of a multi-disciplinarily approach in biomedical imaging research and inclusion of ESTRO will further enhance the diversity of EIBIR's decision-making bodies.

The co-shareholders are represented at EIBIR's General Meeting, where major strategic decisions are taken and recommendations are developed for EIBIR's other bodies and initiatives. Each Shareholder organisation is also invited to nominate a representative to stand on EIBIR's Scientific Advisory Board.

ESTRO -
European Society for Radiotherapy and Oncology

Founded in 1980, ESTRO's mission is to foster Radiation Oncology to improve patients' care in the multimodality treatment of cancer.

As a non-profit and scientific organisation with over 5000 members in and outside Europe, ESTRO promotes innovation, research, and dissemination of science through its congresses, special meetings, educational courses and publications.

www.estro.org

VISION

Every cancer patient in Europe will have access to state of the art radiation therapy, as part of a multidisciplinary approach where treatment is individualised for the specific patient's cancer, taking account of the patient's personal circumstances.

We look forward to the expertise this organisation will bring to EIBIR, complementing our current Shareholder organisations.

ESR
European Society of Radiology
www.myesr.org

CIRSE
Cardiovascular and Interventional Radiological Society of Europe
www.cirse.org

COCIR
European Coordination Committee of the Radiological, Electromedical and Healthcare IT industry
www.cocir.org

EANM
European Association of Nuclear Medicine
www.eanm.org

EFOMP
European Federation of Organisations in Medical Physics
www.efomp.org

EORTC
European Organisation for Research and Treatment of Cancer
www.eortc.be

ESMRMB
European Society for Magnetic Resonance in Medicine and Biology
www.esmrmb.org

ESPR
European Society of Paediatric Radiology
www.espr.org

EuroPACS
European Society for the Promotion of Picture Archiving and Communication Systems in Medicine
www.myeuropacs.org

Industry Panel: Partnerships to foster areas of joint interest

The Industry Panel is an important opportunity for EIBIR and its member industry organisations to identify shared interests and opportunities for collaboration.

Partnership with industry is well exemplified by the MIPA project (p. 34), launched by EIBIR (EuroAIM) and the European Society of Breast Imaging (EUSOBI) with a research grant from Bayer Healthcare-Medical Care-Radiology and Interventional.

EIBIR would like to thank the Industry Partners for their support and looks forward to continuing collaboration.

GOLD partners

Bayer HealthCare

BRACCO
LIFE FROM INSIDE

GE Healthcare

SIEMENS

SILVER partners

PHILIPS

BARCO

HITACHI
Inspire the Next

SIEMENS

At Siemens Healthcare we are committed to turning sustainable healthcare systems in all nations of the world into a reality. What is our definition of a sustainable healthcare system? A system of this sort needs to be able to fight the most threatening diseases. All people living within this system should have access to a state-of-the-art healthcare infrastructure. And, a sustainable healthcare system is also defined by its efforts to continuously raise its quality and productivity. This is the context of our work, every day.

Within the Siemens Imaging + Therapy Division, the medical image is our most powerful tool, it is our passion. Today's healthcare system is unthinkable without the clinical image. It serves as an early detection method, a strong diagnostic tool to identify and describe disease, a key monitoring instrument for disease progression and regression, and guiding treatment in a minimally invasive approach. Many important medical questions can be answered by visualising the root cause. This is one of many reasons for our dedication to the field of biomedical imaging as well – a dedication proven by over 1,100 successful clinical collaborations within this field.

The medical image is the core of our business: it not only directs care by diagnosis but also directs care in the sense of guiding treatment directly. It helps physicians to understand anatomy and function of the human body as well as it visualises molecular processes in order to detect diseases early. More and more the medical image is also used in the treatment of diseases: for planning treatment, carrying out procedures and monitoring the outcome of treatment. And it is within this context precisely, that we see a new clinical megatrend. The importance of the medical image is growing inside and outside radiology and new, interdisciplinary teams are defining the path of medical imaging technology. With a continuing deep commitment to collaborative research and development, together with our partners, we will continue to stand at the forefront of this clinical megatrend.

GE Healthcare

GE Healthcare, one of the largest companies in the healthcare industry, unifies a comprehensive set of solutions, combining expertise in imaging, diagnostics, information technologies with in-house capabilities in engineering, chemistry and molecular biology, to help manage the entire continuum of diseases from genomics to advanced diagnostics and information management.

Such a dynamic and wide innovative sector as healthcare requires collaborations for industry with external research resources to complement internal expertise. Research collaborations between academic researchers and industry are essential in helping to understand unmet clinical needs and in developing appropriate technology to address those needs, ultimately resulting in better patient care.

By collaborating with academic researchers, GE Healthcare strives to develop solutions that improve quality, reduce cost, and increase access to patient care. GE Healthcare recognises that these collaborations provide value to patients and society; and it appreciates that many investigators take immense pride in inventing and exploring new technology and applications.

There are several different types of research where academic and industry can collaborate, including Bench Research, Pre-Clinical Research and Clinical Studies. GE Healthcare sees opportunities of academic-industry collaboration in all these types of research and works with more than 500 research collaborators globally.

Horizon 2020

The future of European Union research funding

Background

Following the 7th Framework Programme, Horizon 2020 is the next European Union Framework programme for Research and Innovation and will run from 2014-2020. The Commission has put forward a total budget of €80b, of which €8b will be dedicated to health research.

Changes from FP7

Compared to earlier programmes, Horizon 2020 integrates the European Framework Programme, the Programme for the Competitiveness of Enterprises and SMEs (COSME) as well as the European Institute of Innovation and Technology (EIT) into a single Specific Programme, subdivided into four 'sections', with health research falling under 'Societal challenges'.

Tensions around negotiations of the overall EU budget 2014-2020 between European Parliament and Member States

The Horizon 2020 package is caught in the tensions around the negotiations of the overall EU budget between the European Parliament and Member States.

At the special meeting of the European Council on 22 November 2012 in Brussels, no agreement could be reached between the Member States on the 2014-2020 EU budget. However, disproportionate cuts for research in the new proposal are disturbing as it provides for almost 6% cuts on the total EU budget and 12% cuts on the research, innovation and education budget compared to the Commission's proposal.

The next meeting to try and find a solution will take place in February 2013. This means that an agreement on Horizon 2020 will not be reached before spring 2013. It is still unclear how this will impact the preparatory work on the call for proposals and if the European Commission will be able to launch the first calls in January 2014 as planned.

EIBIR's actions so far

EIBIR endorsed the European Society of Radiology's statement on Horizon 2020, asking that biomedical research is better recognised as an independent theme and not only a subcategory under Health, in addition to ensuring that the next framework programme removes barriers between research academia and the medical world. A key aim was to emphasise the role of imaging in biomedical research, not only as a final tool to improve diagnosis, but also as an intermediate means to provide a large set of information essential for developing early prediction, personalised medicine, quantitative biomarkers and cellular-molecular imaging.

Ensuring the full Horizon 2020 research budget was a theme. To further reinforce the budget considerations, EIBIR members were encouraged to sign a petition that underscored their support to guarantee an appropriate amount of funding was budgeted for research and innovation in Horizon 2020.

EIBIR and ESR also contributed a response to an EC open consultation on

plans for a public-private partnership in life sciences research and innovation under Horizon 2020. The results of the consultation and next steps have yet to be provided by the Commission.

More reasons to become an EIBIR member

The changes and uncertainty surrounding the transition to Horizon 2020 are even more reason to become an EIBIR member.

Uncertainty about the programme budget, and possible budget cuts will result in fewer funded projects, and increased competitiveness for those calls that are published. Giving your proposal the best chance for a positive evaluation is possible with EIBIR's assistance, allowing you to focus on your expertise - the science and ideas upon which the submission is built.

Furthermore, changes to the programm structure will require understanding of a new set of rules and regulations. Let EIBIR seamlessly guide your submission from the proposal writing to final reporting, making sure that the required criteria are fulfilled – without any unexpected surprises.

A final important point is that EIBIR's lobbying on behalf of the field of biomedical imaging ensures that funding is maximised and that the contribution biomedical imaging can make to improving the health of European citizens is fully recognised.

www.ec.europa.eu/research/horizon2020

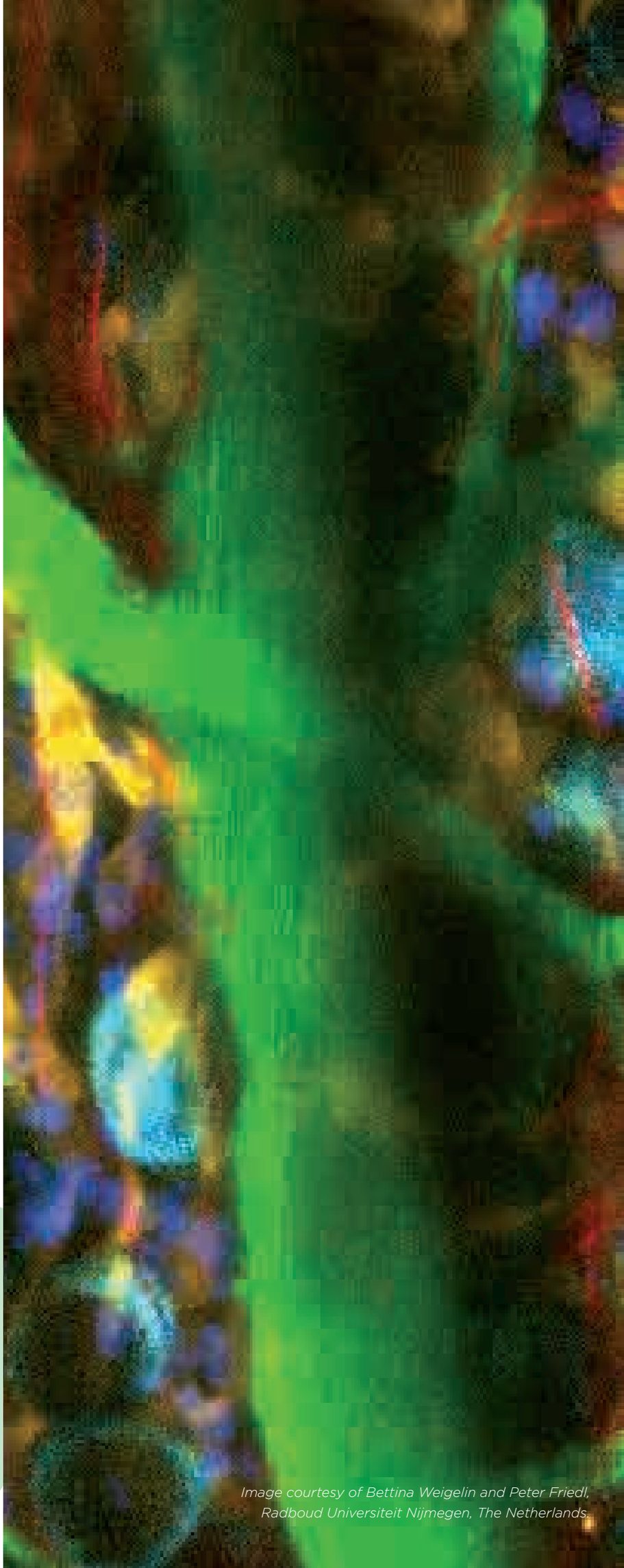


Image courtesy of Bettina Weigelin and Peter Friedl, Radboud Universiteit Nijmegen, The Netherlands.

Images courtesy of Lotfi Senhadji, University of Rennes, France.

EIBIR Financial Report

EIBIR's activities are financed by a number of sources, including Network Member service fees, Industry Panel service package fees, support from the European Society of Radiology (ESR) and EC funding for European research projects coordinated by EIBIR.

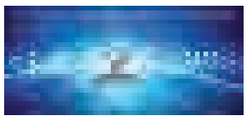
A detailed annual financial report is presented to and approved by the shareholder organisations at the annual General Meeting, usually held on the occasion of the European Congress of Radiology in Vienna.

The ESR continues to provide significant financial support to EIBIR, ensuring the maintenance of office infrastructure, allowing for the set-up of new initiatives and supporting the application and grant-writing processes for new projects. The amount of support provided by the ESR is determined every year according to need and has been between €150,000 and €250,000 in recent years.

EIBIR is working on ways to increase the involvement of its shareholder organisations and has opened dialogues to discuss how such interaction and commitment could be increased in the future, as until now the only shareholder contributing to the annual budget of EIBIR is the ESR. One proposal was to encourage shareholders to bring on-board a certain number of Network Members, partly in order to diversify a network whose Members are currently predominantly radiology departments. This proposal was considered difficult by some organisations, and therefore an alternative proposal has been made to introduce annual contributions per shareholder organisation, which will be debated further at the 2013 General Meeting.

Events in 2013

EUROPEAN INSTITUTE FOR BIOMEDICAL IMAGING RESEARCH



Euro-BioImaging Session @ ECR 2013

Towards implementation of a pan-European imaging research infrastructure

Date: March 9, 2013, 16:00 – 17:30
Venue: ECR 2013, Austria Center Vienna/AT, Room Z

Moderator: Jürgen Hennig, Freiburg/DE (EIBIR Scientific Director)

16:00 Euro-BioImaging- Towards implementation of a European open access imaging research infrastructure (Jürgen Hennig, Freiburg/DE)

16:20 Making the case: development of a node for UHF-MRI (Oliver Speck, Magdeburg/DE & Jürgen Hennig, Freiburg/DE)

16:40 Potential of Phase-Contrast Imaging as a node within Euro-Bioimaging (Fabian Bamberg, Munich/DE)

17:00 Discussion

www.eibir.org

EIBIR/EORTC Symposium @ ECR 2013

A radiologist with a ruler in his hand is a dangerous person: Seeking standardisation in multicenter imaging trials

Date: March 8, 2013, 8:30 – 10:00
Venue: ECR 2013, Austria Center Vienna/AT, Room N/O

The workshop will focus on the use of imaging biomarkers, which will become more important in clinical trials in the future. Non-invasive imaging enables associations between therapy and effect, providing morphologic but also functional information. Imaging biomarkers like apparent diffusion coefficient (ADC) reflect cell density/death/apoptosis, contrast enhanced magnetic resonance imaging (CE-MRI) or computer tomography (CE-CT) detect early changes of micro-vascularisation and perfusion in tumours, and magnetic resonance (MR) spectroscopy shows biochemical changes in the tumour tissue. Undoubtedly, these advanced functional techniques hold great promise, but qualifying these imaging biomarkers requires robust methodology. One needs proper study design following standardised procedures, correlation with pathology/outcome, reproducibility testing and optimal timing of observation, and sufficient statistical power.

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EIBIR Session @ ECR 2013

Horizon 2020

Date: March 9, 2013, 12:45 – 14:15
Venue: ECR 2013, Austria Center Vienna/AT, Room Z

The Framework Programme for Research and Innovation Horizon 2020 will run from 2014-2020. The session, moderated by Gabriel Krestin and Jürgen Hennig, will provide insight into the overall goals of Horizon 2020, and take a specific look at the impact of public private partnerships, the role of imaging in health research in an era of personalised medicine and how EIBIR supports biomedical imaging scientists with their grant applications and research management.

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EuroAIM Session @ ECR 2013

Evidence-based radiology

Date: March 9, 2013, 10:30 – 12:00
Venue: ECR 2013, Austria Center Vienna/AT, Room 14

The EuroAIM Session will focus on the status of a number of projects, including:

- Final results of the analysis of the authorship of secondary studies (systematic reviews and meta-analyses) on imaging tests;
- First results of the analysis of the authorship of guidelines on imaging tests;
- Illustration of a research project for a system of clinical decision support for an enhanced appropriateness of the use of imaging tests;
- The status of the MIPA study on preoperative MRI, now including 35 centers all over the world.

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Novel technology that shapes Radiology: EIBIR presents IMAGINE @ ECR 2013

Date: March 7 – 10, 2013
Venue: ECR 2013, Austria Center Vienna/AT, Room U

The core of the IMAGINE sessions are interactive session in which the presenters demonstrate their work and visitors get hands-on experience with developed techniques and tools.

This year's topics include:

- Oncological image and analysis
- Quantitative image analysis
- Image guided interventions and computer aided diagnosis

Five IMAGINE sessions give research institutes, university groups and companies a chance to present their novel technological developments in medical image analysis and image-guided interventions to the radiology community.

www.myesr.org/imagine2013

EUROPEAN INSTITUTE FOR BIOMEDICAL IMAGING RESEARCH

EIBIR Summer School 2013 on Neurology Imaging

Image acquisition, image analysis and translation to clinical practice

Date: August 26-30, 2013
Venue: Center for Advanced Academic Studies, Dubrovnik/HR

The EIBIR Summer School on Neurology Imaging is a multidisciplinary summer school, uniting 50 young researchers coming from a variety of backgrounds. The high scientific level and the relaxed atmosphere invite a close and fruitful interaction between all attendees, both participants and staff.

Topics of the Summer School include: imaging modalities (MR, PET, CT); quantitative image analysis; (open-source) tools for image analysis; neuro- and population imaging and image analysis in clinical practice; validation and open-source databases; atlases; applications in the clinic; and small animals and clinical trials.

Application deadline: April 12, 2013

Contact: **office@eibir.org**

Further information:
www.eibir.org/school

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