



Welcome to Action TD1007

Welcome to the 5th Action's TD1007 Newsletter.

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WG1, WG2 and WG5 meeting in Athens

A WG1, WG2 and WG5 meeting was organized in Athens on February 22, 2013. In this meeting all WG members with a hardware, software and clinical application background, had the opportunity to describe new results and ideas related to PET-MRI, present their own past work, as well as recent cooperation with the relevant COST groups members.

Interesting new concepts were presented in this meeting such as the new SiPMs developed at FBK with promising response; the measurement of digital SiPMs imaging properties and the development of resistive plate chambers as potential detectors for PET-MR. Regarding the software WG a new PET/MR 4D data set is being prepared from King's College London; a simulator of MR data has been presented, whose combination with already existing PET simulators could be of interest to the PET/MR community. Finally interesting clinical results were provided from a combined CT, PET, MR system.

It was decided that the next joint WG meeting will take place on the 8th of May 2013 in Aachen. Finally, it was suggested that in the future presentations should be only based on STSM results and this will determine, which

participants will be eligible for reimbursement. This issue will have to be further discussed among the MC. In addition it has been emphasized that the clinical WG should be strengthened.

PET/MR workshop in Athens

The 1st Hellenic Workshop on PET/MRI: "Sharing experience with experts" was organized by the Department of Medical Instruments Technology, Technological Educational Institute of Athens and the COST Action TD1007.



It included eight invited talks that covered all major technical aspects of the emerging field of PET/MR. The main goal of the Workshop was to allow the interaction between Greek academics, researchers, technicians, clinicians and students and foreign experts, already working in the field of PET/MR. The workshop was attended by more than 150 Greek scientists and students

Aachen PSMR 2013 Conference

The second Action Conference on PET/MR and SPECT/MR took place between May 6th - 7th, 2013, in Aachen, Germany. This Year the Conference was attended by more than 180 scientists and had a strong industrial participation. The program covered the whole spectrum of topics related to MR-PET and MR-SPECT in small animal, brain, and whole-body imaging from instrumentation, methodology, applications to bimodal tracers.



The 3rd joint MC and WG meeting took place after the conference, on May 8th 2012 in Juelich.

EMIM conference in Torino

During the European Society of Molecular Imaging Annual Meeting (EMIM 2013) a special session on PET/MR technology was organized. The session included 3 talks:

- *"State of the art and latest advances in dedicated hybrid PET/MR instrumentation", (Dr. Maria Giuseppina Bisogni, Italy).*
- *"Software challenges and opportunities in PET/MR imaging" (Prof. Dimitris Visvikis, France).*
- *"Advances in technology & probes to innovative PET/MR applications", (Balázs Gulyas, Sweden).*

Short Term Scientific Missions

Until the end of May 2013 eleven additional STSMs were. In total 31 STSMs have been approved and more applications are being received. The performed STSMs have provided several common results and a number of Action papers has been accepted for publication. These STSMs were:

Ms. Michaela Gaens

Forschungszentrum Juelich, Germany

Ms. Gaens visited the group of Prof. Dimitris Visvikis at LATIM, Brest, France, for one month in January 2013. The aim of the visit was to become involved in the ongoing developments

regarding the implementation of GATE for GPUs. The objectives were to obtain an overview of the current status of the development and learn how to set it up, discuss possible contributions and evaluate the usefulness for an accurate GATE-based scatter correction for the MR-BrainPET installed in Jülich.

Prof. Carlos Zaragoza

CNIC, Madrid, Spain

Prof. Zaragoza visited the group of Dr. Rafael Torres de Rosales at King's College London, for one week in January 2014. The aim of this visit was to develop effective non-invasive strategies to monitor by molecular imaging re-endothelization process. After quantifying this process by molecular MRI, bimodal reagents will be designed to detect the type of macrophages infiltrated in the damaged vessel, which will give a precise idea about the stage of healing of the vessel and the overall process of re-endothelization. The final goal is the pharmacological regulation of macrophage polarization by in vivo molecular imaging and delivery of specific reagents by using custom nanoparticles in an animal angioplasty model.

Mr. Benjamin Burke

University of Hull, UK

Mr. Burke visited the group of Prof. Raphael Tripier, Université de Bretagne Occidentale, Brest, France for ten days in February 2013. The objective of this STSM was to develop multimodal imaging constructs utilising nanoparticles and metal ion chelators. SPIO NPs were developed, coated for biocompatibility, with appropriate characteristics for attachment of azamacrocyclic chelating groups. The nanoparticles provided T2 contrast in magnetic resonance imaging experiments and the azamacrocyclics will allow for attachment of copper-64 or gallium-68 positron emitting isotopes to produce a multimodal imaging construct.

**Ms Begoña Lavin**

Centro Nacional de Investigaciones Cardiovasculares, Madrid, Spain

Ms. Lavin visited the group of Dr. Rafael Torres de Rosales at King's College London, UK for two weeks in February 2013. The main objective of her work was to study of the progression of endothelial remodeling in mice by using a non-invasive methodology, including MRI. Taking into account that King's College uses specific sequences for image acquisition, initially the T1 mapping, and the inversion recovery sequences from every image were analyzed.

Mr. Sebastian Fürst

Klinikum rechts der Isar, München, Germany

Mr. Fürst visited the group of Paul Marsden at King's College London, UK for one week in February 2013. The aim of this visit was to acquire appropriate motion models and incorporate this information into the PET image reconstruction. This was done on the basis of STIR and an image reconstruction framework under development at the Department of Nuclear Medicine in Munich.

Ms. Sophie Poty

Institut de Chimie Moléculaire de l'Université de Bourgogne, Dijon, France

Ms. Poty visited the group of Prof. Steve Archibald at University of Hull, UK, for ten days in March 2013. The aim of her visit was to exploit the synthesized AMD3100 and AMD3465 derivatives for nuclear imaging upon metalation with ^{64}Cu , ^{68}Ga (PET), ^{111}In (SPECT) and for MRI (Gd^{3+} complexes). These molecules are expected to be strong CXCR4 inhibitors and as a consequence potent imaging agents for cancer tumors and metastases. Competition binding assays with flow cytometry and calcium signaling assays were carried out. Using the unique experience and equipment of the host institution.

Mr. Fotios Kotasidis

University of Geneva, Switzerland

Mr. Kotasidis visited the group of Dr. Charalapos Tsoumpas at King's College London, UK for two weeks in March 2013. The aim of this visit was to develop image reconstruction software in PET and investigate the effects of patient motion during dynamic image acquisition on direct estimation of pharmacokinetic parameter which relate to biologic parameter using advance image reconstruction software. Work included software development to improve pharmacokinetic parameter estimation in the presence of motion by incorporating motion correction techniques to existing software.

Mr. Alessandro Ferri

Fondazione Bruno Kessler, Trento, Italy

Mr. Ferri visited the group of Marek Moszynski at the National Centre for Nuclear Research, Otwock-Swierk, Poland, for two weeks in April 2013. The aim of his visit was to measure the energy resolution of a system composed by a FBK SiPM and a scintillator with different crystal types and for different gamma ray energies. A full scan of bias voltage and integration time was performed to evaluate the best operating conditions for every crystal.

Dr. Charalampos Tsoumpas

King's College London, UK

Dr. Tsoumpas visited the group of Sibylle Ziegler at Technische Universität München, Germany, for one week in April 2013. The aim of his visit was to transfer simultaneous PET and MR data already acquired at TUM to KCL and to resolve data format issues so that they can be incorporated into the KCL reconstruction and motion correction packages, with appropriate/necessary data corrections. The work plan included reconstruction of PET data from the Siemens mMR scanner for one phantom and one patient. Finally, an attempt was made to



measure simple body movement with MR and reconstruct motion compensated PET data for a moving phantom and a patient.

Mr. Andreas Anderla

Faculty of Technical Sciences, Novi Sad, Serbia

Mr. Anderla visited the group of Gaspar Delso at University Hospital of Zurich, Switzerland, for two weeks in May 2013. The aim of his visit was to receive information regarding the possible ways of metal artifact reduction techniques performed on computed tomography (CT) images and discuss ways in which the host research group has worked. The visiting researcher benefit from the host's large patient database in order to conduct further research on extracting metal artifacts from CT images. The research expanded towards the improvement of existing tools for streak artifact reduction.

Dr. Charalampos Tsoumpas

King's College London, UK

Dr. Tsoumpas visited the group of Prof. George Loudos at the Technological Educational Institute of Athens, Greece, for five days in May 2013. The aim of his visit was to install the STIR Software package for reconstructing PET and SPECT data obtained from the

scanners of the host group. Dr. Tsoumpas taught the host researchers how to reconstruct motion compensated PET data for a moving phantoms or preclinical data.

Contact us

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