



**Welcome to Action TD1007**

Welcome to the 3<sup>rd</sup> Action's TD1007 Newsletter, the second for 2012.

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**Elba PSMR 2012 Conference**

The Action conference: PET/MR and SPECT/MR: New Paradigms for Combined Modalities in Molecular Imaging Conference was held between 26-30 May 2012 at La Biodola, Isola d'Elba, Italy. This first Conference on PET-MR and SPECT-MR was organized in sharing by the COST Action PET-MRI TD-1007, Pisa University-INFN, Juelich Forschungszentrum and TEI of Athens.

The conference covered all the technological and applicative aspects of both sequential and simultaneous PET/MR and SPECT/MR systems. Both clinical and preclinical applications were discussed. The latest results on the continuous search for new tracers and especially for bi-modal tracers that could give the greatest advantages for the hybrid systems were presented.



The conference opened with a session on "Hardware advances in PET detectors for PET-MRI" followed by a session on "Advances in Molecular Probes for MR and PET or SPECT". Two sessions on Hardware development, the first one in PET detectors for PET-MR and the second in SPECT Detectors for SPECT-MR concluded the first day.

The second day was devoted to organ dedicated PET-MR devices: from "Whole-body PET-MR Imaging", to "Human Brain PET-MR Imaging", to Other MR-PET Applications. In addition a dedicated and extremely interesting poster session was held. The second day was closed by the enlightening keynote lecture "The Search for the Killer Application in PET-MR" by Professor Bernd Pichler.

The third and final day was devoted to the Software problems covering the "Challenges for the Data/Image Processing in PET-MR" and the "Attenuation and Motion Correction for PET-MR". In addition, a special session on preclinical applications was held, i.e., on "Small Animal PET-MR". The last session of the conference addressed the technological advances in ultra high field MRI that represents the new frontier of MR imaging.

In total 1 keynote lecture, 7 invited talks, 41 oral contributions and 29 poster contributions were presented subdivided in 12 oral sessions and one dedicated poster sessions. More than 150 participants registered at the conference and shared great moments of intellectual stimuli and social venue.

**ESRs workshop**

During the Elba PSMR 2012 conference a special event, dedicated to the ESRs, was organized. This 1<sup>st</sup> Early Stage Researchers Workshop was entitled "Who is Who" and



aimed to bring together ESRs from Action participants.

In total 13 ESRs presented the results of their work, including their experience from STSMs in Action groups. The ESRs had the opportunity to meet each other, exchange ideas and experience. In addition, through their participation to this event, it was possible to partially support their expenses for attending PSMR conference and interact with world experts in the field of PET/MR.



The workshop was chaired by Action chair and was attended by several Action members and conference participants.

### 2<sup>nd</sup> joint MC and WG meeting

The 2nd joint MC and WG meeting took place on 30<sup>th</sup> May in the frame of the 1<sup>st</sup> PET/MR and SPECT/MR conference, in La Biodola, Isola D'Elba, Italy. A full day was dedicated to this event, although most of the participants have attended the PSMR conference and had already the opportunity to interact for three days.

Participants from all WGs presented their results of their activities, while new groups that joined the Action presented their status and plans for contributing to the Action. Taking into account the interdisciplinarity of the Action, the presentations were open to all WGs, in order to ensure circulation of information among all Action members and maximize the possibility to spark new collaborations.



The Action reviewed the status of the first year activities and discussed the strategy for the second year. It was agreed to continue and support Action conference PSMR, put more effort on STSMs, promote the Action by organizing activities in terms of international events, increase the number of WG meetings, plan a workshop for PET/MR users and plan an Action Training School for 2013.

### Publication of PSMR Proceedings in NIMA

More than 60 articles from the oral and poster presentation of the PSMR conference will be published this autumn in Nuclear Instruments and Methods in Physics Research A, following peer review. This special issue represents the state-of-art in PET/MR and is considered as a reference point, for the current status of PET/MR.



### Short Term Scientific Missions

Until the end of May 7 additional STSMs took place. In total 9 STSMs were successfully carried out in the first Year of the Action, showing that Action members are exploiting this tool. These STSMs were:

#### Ms Maria Georgiou

*Department of Medical Instruments Technology, Technological Educational Institute of Athens, Greece*

Ms Georgiou visited the group of Prof. Dennis Schaart at Delft University of Technology, Faculty of Applied Sciences, Netherlands, for 2 weeks in February 2012. The aim of the visit was to design and test preamplifiers for application in Silicon Photomultiplier Detectors (SiPMs), to improve readout of SiPMs and fast scintillators.

#### Mr Nikolaos Efthimiou

*Department of Medical Instruments Technology, Technological Educational Institute of Athens, Greece*

Mr Efthimiou visited King's College London, UK and worked under the supervision of Dr. Charalampos Tsoumpas for two weeks. The aim of this visit was to the optimization of reconstruction algorithm for PET/MR applications, with emphasis on planar head systems.

#### Dr Alkystis Phinikaridou

*Division of Imaging Sciences & Biomedical Engineering, King's College London, UK*

Dr Phinikaridou visited Kim Yong Won at Aarhus University, Aarhus, Denmark. The objective of this STSM that lasted five days was to image vascular disease in a swine model of accelerated atherosclerosis, which was developed at Aarhus University.

#### Mr Valerio Tabacchini

*Faculty of Applied Sciences, Delft University of Technology, Delft, Netherlands*

Mr Tabacchini visited the group of Dr. Stefaan Vandenberghe at Ghent University, Belgium for

one week. His work was on the design optimization of a whole-body PET system based on monolithic scintillator detectors, using mainly Monte Carlo simulations.

#### Ms Sarah Anne Peel

*Division of Imaging Sciences & Biomedical Engineering, King's College London, UK*

Ms Peel visited Kim Yong Won at Aarhus University, Aarhus, Denmark for five days. The aim of this visit was to test the accuracy of scar size quantification and transmural assessment of the novel dual-IR MRI sequence and compare with the IR sequence: 1) in pigs with myocardial infarction and 2) in pigs who have undergone radiofrequency (RF) ablation.

#### Ms Begoña Lavin

*Undacion Centro Nacional De Investigaciones Cardiovasculares, Madrid, Spain*

Ms Lavin visited the group of Dr. Torres at King's College London for five days. The aim of this visit was to attend The Home Office Course required by the Institutional Laws of UK to do animal experimentation, to prepare for common work on non-invasive detection of endothelial regeneration by molecular imaging using PET/MRI specific nanoprobes.

#### Mr Panagiotis Papadimitroulas

*School of Medicine, University of Patras, Greece*

Mr Papadimitroulas visited INSERM, U650 LaTIM, Brest, France and worked under the supervision of Prof. Dimitris Visvikis for two weeks. The aim of his visit was to work on GATE Monte Carlo PET simulation using anthropomorphic models and to develop new GATE classes incorporating the G4DNA physics of the Geant4 code and the biological effects in the cell cycle.

### New members

Five new countries signed the memorandum of understanding and became a member of COST Action TD1007. Those are Austria, Bulgaria,



Croatia, Serbia and Switzerland. The new MC members are: Prof Damir Bosnar and Prof Selma Supek for Croatia; Prof. Dubravko Culibrk for Serbia; Prof. Edoardo Charbon and Dr. Gaspar Delso for Switzerland.

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