

Welcome to Action TD1007

Welcome to the 7th Action's TD1007 Newsletter.

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Simulations meeting in Brussels

A thematic meeting entitled "*Bridging the gap between PET and MR simulations*" was organized by Prof. Dimitris Visvikis, leader of WG2 on April 3rd at the COST Office in Brussels. The meeting gathered a number of experts on simulations in PET and MR, not limited to Action members; seven speakers presented the existing technical approaches and trends, as well as different existing platforms. The aim of the meeting was to coordinate the work towards the development of a hybrid PET/MR simulator, which needs the synergistic work of different groups.

Core Group Meeting in Brussels

A Core Group meeting was organized on Thursday, February 13, 2014 in the COST Office in Brussels. The Action SO, the Chair, Vice Chair and the 5 WG leaders discussed the activities that the Action will carry out for the remaining 15 months till its end. Emphasis was given in the work that each WG must do, in order to meet Action objectives and prepare for the final evaluation report.

PET/MR Training School in Athens

The Action "1st International Training School on PET-MRI Engineering" took place in Athens, from May 13th to May 16th 2014. The school focused mainly on the software aspects of PET/MR technology and included also the key hardware aspects.

WG3 and WG4 meeting in Madrid

The joint WG3 and WG4 Action meeting was held on March 27th and 28th 2012, in University Francisco de Vitoria, in Madrid. The meeting was organized by Prof. Carlos Zaragoza, leader of WG4. On 27th March a workshop was organized by the Action, where 16 talks covered a wide range of subjects related to PET/MR biomodal tracers and applications. The workshop was attended by ~60 students and scientists. The WG meeting took place on 28th March and included planning of joint activities, as well as preparation of Horizon projects.



The school was open for Masters and early PhD students, interested in this interdisciplinary, emerging topic. Emphasis was given to the promotion of ESRs, thus nine young lecturers were selected, in order to share their experience on PET/MR basics, Multimodality

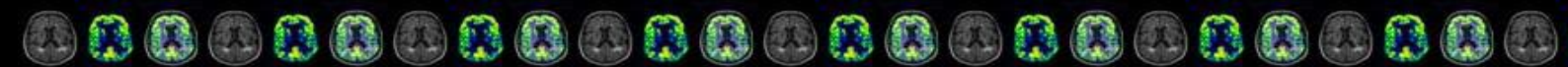


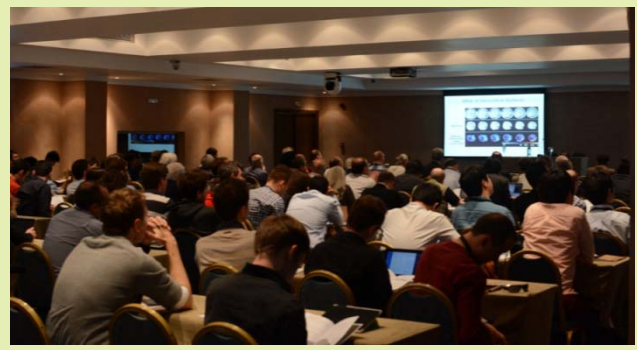
Image Processing, Simulation tools, Reconstruction & Corrections, Pulse Programming in MR, Kinetic Modeling for PET and MR, as well as their combination.



Thirty three students from sixteen (!) countries attended the school with the support of the Action; twelve were female. The Training School was held only a few days before the annual International Conference of the Action (3rd PSMR Conference on PET/MR and SPECT/MR) and 12 students were also present in the conference and benefit by also attending this event.

Kos PSMR 2014 Conference

The PSMR14 Conference took place between May 19 and May 21, 2014 at Kos Island, Greece. More than 180 scientists from 28 countries were present in Kos Island. The conference started with an invited lecture on MR spectroscopy by Prof. Andrew Maudsley and included 12 sessions, with 55 oral and 55 poster presentations.



The sessions were devoted to:

- *PET/MR Instrumentation*
- *SPECT/MR Instrumentation*

- *PET/MR Software and Quantification*
- *Bimodal Tracers*
- *Preclinical Applications*
- *Dedicated Organ Imaging*
- *Whole Body Applications*

A special pitching session devoted to Early Stage Researchers was organized, where 15 ESRs presented for 2 min themselves and their project to the conference participants.



The conference was under the Technical Sponsorship of IEEE and ESMI, while COST Office and 10 industrial partners supported it. The exhibition included booths from IEEE, Philips, Bruker, SensL, Raytest, RS2D and Weeroc. The industrial session included presentations from Bruker, Siemens, Philips and SensL, as well as a review of funding opportunities in terms of Horizon 2020.

The best oral and poster presentation, as well as the best pitching were awarded to five ESRs. The conference ended with a guided tour in Asklipeio and in Kos town.

All conference abstracts (300 words version) were published in the open access Journal European Journal of Nuclear Medicine and Molecular Imaging Physics. Full articles are being submitted in the IEEE TNS and following a peer review procedure, will be published in a special issue devoted to PSMR14.

Short Term Scientific Missions

Until the end of May 2014, 7 additional STSMs were implemented. In total 50 STSMs have been approved and more applications are still being received. The performed STSMs have



provided several common results and the number of joint Action papers continuously increases. These STSMs were:

Ms Michaela Gaens

Forschungszentrum Juelich GmbH, Germany

Ms Gaens visited the group of Prof. Dimitris Visvikis at LaTIM-INSERM UMR1101, Brest, France for 3 weeks in January 2014. The aim of the visit was to incorporate the Monte Carlo based scatter estimation into a list-mode reconstruction framework for fully quantitative GPU-based PET reconstruction in Brain PET/MR.

Ms Ottavia Bertolli

University of Pisa, Pisa, Italy

Ms Bertolli visited the group of Dr. Charalampos Tsoumpas at Faculty of Medicine and Health at University of Leeds, UK for 3 months. The aim of the visit was to integrate a positron range correction method within STIR reconstruction software library, which was made available to the scientific community at the STIR website and was presented at 2014 IEEE Medical Imaging Conference.

Mr Wuyuan Zhang

Delft University of Technology, The Netherlands

Mr Zhang visited the group of Dr. Rafael de Torres at King's College, St. Thompson Hospital, UK for 3 weeks. The objective of this STSM was to prepare Gd-nanozeolite-LTL co-loaded with Cu-64 and perform preliminary in vitro investigations, and in case successful, to complete the study with PET-MR imaging.

Ms Afroditi Eleftheriou

University of Athens, Greece

Ms Eleftheriou visited the group of Dr. Charalampos Tsoumpas at Faculty of Medicine and Health at University of Leeds, UK for 5 months. The main objective of her work was to systematically study the positron range effects for various emitters and environments such as water, air, human tissue etc, by

exploiting GATE Monte Carlo package for running PET simulations using various magnetic field geometries.

Mr Ioannis Theoharis

Department of Medical Instruments Technology, TEI Athens, Greece

Mr Theoharis visited the group of Prof. Jon Shah at Forschungszentrum Juelich GmbH, Germany for 2.5 months. The aim of this visit was to study the methodology and application of hybrid MR-PET protocols in human study of healthy and hepatic encephalopathy patients using anatomical and functional MRI together with FDG PET.

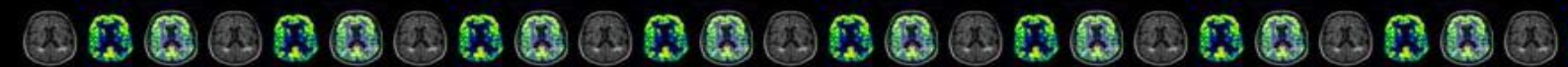
Ms Melissa Botelho and Ms Ana Morgado

IBEB, Faculty of Science, University of Lisbon, Portugal

During this joint STSM, Ms Melissa Botelho and Ms Ana Morgado visited Dr. Liliana Caldeira at Institute of Neuroscience and Medicine (INM-4), Forschungszentrum Juelich (FZJ) for four months. The aim of this visit was to implement methods to improve resolution and evaluate them in respect to PET image quality. These methods can be further compared with other partial volume correction techniques, already implemented in the FZJ.

Other Action activities

- The Action was presented by the Action Chair on January 30th, 2014 at Nano World Cancer Day in Athens, Greece during the workshop "Nanomedicine in the fight against cancer... did you know it?".
- An Action poster was presented at the large Annual Meeting of European Society of Molecular Imaging, at Antwerp, Belgium between June 4-6, 2014.



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