# 7<sup>th</sup> annual meeting January 16th 2015 Het Pand, Ghent



Program







## **Program Overview**

09.30h	Welcome with Coffee & Tea			
10.00h	Plenary Program: Welcome and Introduction - Refter			
10.20h	Parallel Session 1  Cancer - Refter  Spectroscopy - Rector Vermeylen			
11.15h	Break & Visit sponsors			
11.45h	Power Poster - Refter			
12.35h	Lunch (runs till 14.30h)			
12.35h Regular & Power Poster Session 1 (even numbers) 13.20h Regular & Power Poster Session 2 (odd numbers) Regular posters (even & odd) - Noordergang & Refter Power Posters (even & odd) - Sacristie				
14.00	h Annual Members Meeting - Rector Vermeylen			
14.30h	Parallel Session 2			
	14.30h <b>Neuro</b> - Rector Vermeylen <b>Muscle</b> - Refter			
	15.15h <b>Perfusion</b> - Rector Vermeylen <b>MR methods</b> - Refter			
15.55h	Break & Visit sponsors			
16.30h	Parallel Session 3			
	RF Engineering & High Field - Refter Diffusion - Rector Vermeylen			
17.50h	Closing ceremony - Refter			
18.00h	Reception			
18.40h	Gather at reception of Het Pand to walk together to the Marriott hotel			
19.00h	Dinner @ Marriott hotel (reservation required)			

### Cancer

#### Moderators of Oral Session

#### Petra van Houdt

**Benedicte Descamps** 

Department of Radiation Oncology, The Netherlands Cancer Institute. Amsterdam. the Netherlands Infinity Lab University of Gent, Gent, Belgium

O001 **Remy Klaassen** - Correlating post-operative whole mount immunohistochemistry to functional MRI parameters in pancreatic cancer

Department of Medical Oncology, Academic Medical Center, Amsterdam, the Netherlands

O002 **Nicolas Sauwen** - Hierarchical non-negative matrix factorization using multi-parametric MRI to assess tumor heterogeneity within gliomas

Department of Electrical Engineering (ESAT), KULeuven, iMinds Medical IT, Leuven, Belgium

O003 **Sophie Heethuis** - Potential of DCE-MRI for treatment response assessment in esophageal cancer

Department of Radiotherapy, University Medical Center Utrecht, Utrecht, the Netherlands

O004 **Ellis Beld** - Localization of an HDR brachytherapy source using MR artifact simulation and phase-only cross correlation

Department of Radiotherapy, University Medical Center Utrecht, Utrecht, the Netherlands

## Spectroscopy

### Moderators of Oral Session

#### Marnix Maas

Firat Kara

Radboud University Medical Center, Nijmegen, the Netherlands Bio-Imaging Lab, Antwerp, Belgium

O005 **Ece Ercan** - Can Diffusion Weighted Spectroscopy (DWS) in Brain White Matter Become a viable Clinical Tool?

C. J. Gorter Center for High Field MRI, Department of Radiology, Leiden University Medical Center, Leiden, the Netherlands

O006 **Lotte Houtepen** - The effect of software processing pipelines on 7T MRS metabolite quantification

Psychiatry, University Medical Center Utrecht, Utrecht, the Netherlands

O007 **Ronald Zielman** - Elevated glutamate concentrations in the visual cortex of migraine without aura detected at 7 Tesla

Department of Neurology, Leiden University Medical Centre, Leiden, the Netherlands

O008 **Desiree Abdurrachim** - Cardiac metabolic adaptations in diabetic mice protect the heart from pressure overload-induced failure: a combined in vivo MRI, MRS, and PET approach

Biomedical NMR, Eindhoven University of Technology, Eindhoven, the Netherlands

### Moderators of Power Poster Session

Leonie Paulis

Wim Otte

Universiteit Maastricht, Maastricht, the Netherlands

University Medical Center, Utrecht, the Netherlands

PP001 **Sharon Janssens** - Fructose increases de novo lipogenesis in the liver of rats: an in vivo <sup>1</sup>H-[<sup>13</sup>C] MRS study

Biomedical NMR, Eindhoven University of Technology, Eindhoven, the Netherlands

Excessive consumption of sugars in caloric sweetened beverages causes hepatic steatosis, which is attributed to de novo lipogenesis. In this study we implemented a non-invasive method for the direct in vivo measurement of de novo lipogenesis in the liver using localized 1H MRS with 13C editing to detect 13C-labeled liver lipids after oral administration of [U-13C6] glucose. Using this method we studied the effects of caloric and non-caloric sweeteners on liver lipid metabolism in rats. In contrast to glucose and aspartame, fructose increased liver lipid content, which was associated with an increased conversion of 13C-labeled glucose to liver lipids.

## PP002 **Bart Philips** - Spectral-Spatial-Spiral MRSI: Fast prostate MR spectroscopic imaging with low SAR on 7T

Department of Radiology and Nuclear Medicine, Radboud University Medical Center, Nijmegen, the Netherlands

Using spectral-spatial RF pulses in combination with a spiral MRSI acquisition the advantages of 7T (high SNR and greater chemical shift dispersion) can be exploited to perform prostate MRSI on 7T with high spatial resolution in feasible acquisition times. This method was tested on 8 prostate cancer patients using an 8 channel body array coil and B1 shimming for locally homogenous transmit field in combination with an endorectal receive coil. We obtained whole prostate MRSI with a true voxel size of 0.48 cc within 7 minutes of acquisition time.

## PP003 **Edmond Balidemaj** - In vivo reconstructed conductivity values of cervical cancer patients based on EPT at 3T MRI

Radiotherapy, Academic Medical Center, Amsterdam, the Netherlands

In this work we present in vivo reconstructed conductivity values of cervical cancer patients using Electric Properties Tomography (EPT) based on B1+ maps at 3T. Conductivity values of muscle, bladder and cervical tumors are presented. The results demonstrate the importance of accounting for conductivity values in living conditions when incorporating electric properties data into numerical models.

## PP004 **Kristof Govaerts** - Increased cortical volume revealed by atlas-based volumetry in a bigenic mouse model of Alzheimer's Disease

Imaging & Pathology, KU Leuven, Leuven, Belgium

Although atrophy is a well-established biomarker for Alzheimer's Disease (AD) in human patients, MRI-based studies on this subject in mice are scarce. We used 3-month-old and 1-year-old bigenic biAT animals and age-matched controls. Making use of an atlas-based registration protocol, we show through volume quantification and voxel-based morphometry that this model displays slightly increased rather than decreased cortical volume. Histological assessment also reveals decreased neuronal density in this region at 1-year timepoint.

## PP005 **Sau May Wong** - Intravoxel Incoherent Motion Imaging exposes abnormal parenchyma and microvasculature in cerebral small vessel disease

Radiology, Maastricht University Medical Center, Maastricht, the Netherlands

Cerebral small vessel disease(cSVD) affects the small vessels in the brain, which can potentially lead to ischemic stroke and dementia. The pathophysiology remains unclear. Intravoxel incoherent motion imaging(IVIM) was performed to examine both the parenchymal and vascular microstructure in cSVD. Significant higher microvascular perfusion fraction(f) and parenchymal diffusivity(D) were found for patients in normal appearing brain tissue compared with controls. Higher f might be related to more tortuous vessels and higher D might imply loss of parenchymal microstructural integrity in cSVD. We demonstrate the potential of IVIM in providing novel information of the brain tissue in cSVD.

## PP006 **Abdallah Motaal** - Carotid Pulse Wave Velocity Measurements Using Accelerated High Temporal Resolution MRI

Department of Radiology, Academic Medical Center, Amsterdam, the Netherlands

A common method to assess vessel wall stiffness is by measuring the velocity of the pulse wave (PWV) created by cardiac contraction. Using phase-contrast MRI based flow measurements, PWV can be determined by measuring the time delay between the flow curves at two different slice locations. These measurements require sufficient spatial resolution for accurate flow quantification, as well as high temporal resolution with respect to the travel time of the pulse wave between the two slices. Here, we present a new MRI method for carotid PWV assessment, where we combine retrospective triggering and compressed sensing (CS) reconstruction, resulting in flow measurements with in-plane spatial resolution of 0.85 mm and temporal resolution of 200 frames/cardiac cycle.

## PP007 **Joep van Oorschot** - Endogenous assessment of diffuse myocardial fibrosis with T1p-mapping in patients with dilated cardiomyopathy

Department of Radiology, University Medical Center Utrecht, Utrecht, the Netherlands

T1 and ECV-mapping provide information on diffuse fibrosis formation in patients with DCM. Main drawback of these methods is the need of a gadolinium contrast agent. Recently was shown that a significantly higher  $T1_{rho}$  is found in compact myocardial fibrosis after chronic MI. Here we show the feasibility of native  $T1_{rho}$ -mapping for detection of diffuse myocardial fibrosis.  $T1_{rho}$ -mapping was performed in three explanted hearts from DCM patients, and correlated with fibrosis quantification, and in vivo in six DCM patients, and correlated with ECV-mapping. A significantly higher  $T1_{rho}$ -time was found in DCM patients compared to healthy controls.

## PP008 **Tom Peeters** - Glutamate dehydrogenase inhibition reduces glutamine conversion into 2HG in IDH1-mutated cancer cells as detected by $^{13}$ C MRS

Department of Radiology and Nuclear Medicine, Radboudumc, Nijmegen, the Netherlands

Mutational changes in cytosolic isocitrate dehydrogenase 1 (IDH1) result in production of NADP+ and the oncometabolite D-2HG at the expense of αKG and NADPH. Replenishment of αKG from glutamine is one of the compensatory anaplerotic mechanisms that allow tumor cells to survive the induced metabolic stress. We investigated the effect of epigallocatechin gallate (EGCG), a known inhibitor of glutamate dehydrogenase 1 (GDH1), on the fate of 13C-glutamine using 13C MRS in IDH1wt/R132H and IDH1wt/wt cancer cells. EGCG significantly inhibits proliferation of IDH1wt/R132H cells. EGCG also prohibits the conversion of glutamine into D-2HG and changes intracellular glutamate and glutamine pool sizes.

PP009 **Nikki Dieleman** - Intracranial atherosclerotic lesion characteristics correlate with cerebrovascular lesion load after TIA or ischemic stroke: a 7.0 tesla MRI study

Department of Radiology, UMC Utrecht, Utrecht, the Netherlands

In this prospective study we investigated the presence of cortical microinfarcts (CMIs) at 7.0 tesla (7T) MRI in patients with a transient ischemic attack or ischemic stroke of the anterior circulation and explored the relationship between intracranial atherosclerosis (ICAS), CMIs and macroinfarcts. This study shows that in CMIs represent a relevant portion of the total cerebrovascular lesion load and coexist with macroinfarcts. Furthermore, specific ICAS characteristics correlate with a higher cerebrovascular lesion load suggesting that ICAS may be a shared etiology. These results shine new light on the spectrum of parenchymal damage caused by ICAS.

## PP010 **A.A. Harteveld** - Detection of intracranial vessel wall lesions in an elderly asymptomatic population using 7T MRI

Department of Radiology, University Medical Center Utrecht, Utrecht, the Netherlands

Development of atherosclerotic lesions occurs silently over a long period, before they become symptomatic. Most studies have attempted to target ICAD when it is already symptomatic. Additional information regarding the prevalence of ICAD in the asymptomatic population would provide us with better insight in its development. The aim of this study was to assess the presence of intracranial vessel wall lesions in an asymptomatic population using intracranial vessel wall MR imaging at 7.0 tesla. Intracranial vessel wall lesions were found in all elderly asymptomatic subjects. The total number of identified vessel wall lesions was high, especially for the posterior circulation.

### **Neuro & Perfusion**

#### Moderators of Oral Session

#### Katrien van Doorne

Pim van Ooij

Biomedical NMR, University of Technology, Eindhoven, the Netherlands Academic Medical Center, Amsterdam, the Netherlands

14.30h

O009 **Angelique Van Ombergen** - Regional brain alterations after parabolic flight: preliminary results

Antwerp University Research centre for Equilibrium and Aerospace, Department of Physics, University of Antwerp, Antwerp, Belgium

O010 Frank Van Bussel - Altered hippocampal white matter connectivity and memory impairment in Type 2 Diabetes Mellitus

Radiology, Maastricht University Medical Center, Maastricht, the Netherlands

O011 **Harm van de Haar** - Dynamic contrast-enhanced MRI for subtle leakage of the blood-brain barrier: optimizing acquisition time

Radiology, Maastricht University Medical Center, Maastricht, the Netherlands

15.15h

O015 **Lennart Geurts** - Assessment of blood flow velocity and pulsatility in cerebral perforating arteries with 7T phase contrast MRI

Radiology, University Medical Center, Utrecht, the Netherlands

O016 **Nathalie Doorenweerd** - Reduced cerebral blood flow in boys with Duchenne muscular dystrophy

C. J. Gorter Center for High Field MRI, Department of Radiology, Leiden University Medical Center, Leiden, the Netherlands

O017 **Lena Vaclavu** - T<sub>1</sub> blood correction for CBF in arterial spin labeling cannot be predicted from hematocrit in sickle cell disease

Radiology, Academic Medical Center, Amsterdam, the Netherlands

### Muscle & MR methods

#### Moderators of Oral Session

Froeling Martijn

Moerman Kevin

University Medical Center, Utrecht, the Netherlands Academic Medical Center, Amsterdam, the Netherlands

14.30h

O012 **Melissa Hooijmans** - Evaluation of skeletal muscle DTI in Duchenne Muscular Dystrophy

C.J.Gorter Cennter, Radiology, Leiden University Medical Center, Leiden, the Netherlands

O013 Valentina Mazzoli - Real Time fat suppressed MRI of the knee joint during flexion/extension allows the study of PCL motion

Biomedical NMR, Department of Biomedical Engineering, Eindhoven University of Technology, Eindhoven, the Netherlands

O014 **Linda Heskamp** - Quantification of the inflammatory process in muscles of patients with facioscapulohumeral muscular dystrophy

Radiology, Radboud university medical center, Nijmegen, the Netherlands

15.15h

O018 **Bjorn Stemkens** - Estimating dynamic 3D abdominal motion for radiation dose accumulation mapping using a PCA-based model and 2D navigators

Department of Radiotherapy, UMC Utrecht, Utrecht, the Netherlands

O019 **Vitaliy Khlebnikov** - Modulation and regulation of intracellular pH in healthy human brain studied by means of Chemical Exchange Saturation Transfer (CEST) at 7T

Department of Radiology, University Medical Center Utrecht, Utrecht, the Netherlands

O020 **Ronald Mooiweer** - Squashing the g-factor: Ultra high scan acceleration factors in reduced Field of Excitation imaging

University Medical Center, Utrecht, the Netherlands

## RF engineering & High Field

#### Moderators of Oral Session

Jan-Willem Beenakker

Jeroen Siero

University Medical Center, Leiden, the Netherlands University Medical Center, Utrecht, the Netherlands

O021 **Birgit Plantinga** - Structural connectivity mapping and parcellation of the human subthalamic nucleus using ultra-high field diffusion MRI

Department of Neuroscience, Maastricht University, Maastricht, the Netherlands

O022 **Diana Khabipova** - Human cortical surface maps of three quantitative imaging parameters:  $R_1$ ,  $R_2$ \* and Magnetic Susceptibility

Centre d'Imagery BioMédicale, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

O023 **Roy Haast** - Comparing different contrasts for myelin-related cortical mapping at 7T

Cognitive Neuroscience, Maastricht University, Maastricht, the Netherlands

O024 **Robin Navest** - Cardiac activity detection with noise variance of a receive array at 7T

Imaging Division, UMC Utrecht, Utrecht, the Netherlands

O025 Mark Gosselink - Converting digital MRI receivers built for 1.5T into 7T receivers using Surface Acoustic Wave filters

University Medical Center Utrecht, Utrecht, the Netherlands

O026 **MJ** van **Uden** - <sup>31</sup>P MRSI of the brain at 3T with an improved 8-channel receive array and whitened singular value decomposition for optimal combination of <sup>31</sup>P array signals

Department of Radiology and Nuclear Medicine, Radboud University Nijmegen Medical Center Nijmegen, the Netherlands

### Diffusion

#### **Moderators of Oral Session**

#### **Pullens Pim**

#### Heemskerk Anneriet

University Hospital, Antwerp, Belgium University Medical Center, Utrecht, the Netherlands

O027 **Gaetan Duchene** - Estimation of pore size distributions with diffusion MRI: feasibility for clinical scanners

Medical imaging department, Université Catholique de Louvain, Brussels, Belgium

O028 **Daan Christiaens** - Can label priors in global tractography resolve crossing fibre ambiguities?

Medical Image Computing, Dept. Electrical Engineering, KU Leuven, Leuven, Belgium

O029 **Gwendolyn Van Steenkiste** - Super-resolution structural connectivity and anatomy of the zebra finch brain

iMinds-Vision Lab, University of Antwerp, Antwerp, Belgium

O030 **Wieke Haakma** - Diffusion tensor imaging of the lumbar and sacral plexus in post mortem subjects

Department of Radiology, University Medical Center Utrecht, Utrecht, the Netherlands

O031 **David Szabolcs** - The influence of various diffusion MRI processing pipelines

Image Sciences Institute, University Medical Center Utrecht, Utrecht, the Netherlands

O032 **Tom Dela Haije** - Reconstruction of Convex Polynomial Diffusion MRI Models Using Semi-definite Programming

Mathematics and Computer Science, Eindhoven University of Technology, Eindhoven, the Netherlands

## **Index Posters**

Poster	First Author	Title			
p001 p002 p003	Schnerr Froeling Vandoorne	Angiography and pulsatility of small intracranial vessels at 7T Whole heart DTI using asymmetric bipolar diffusion gradients Noninvasive Three-dimensional Mapping of endothelial dysfunction in Cardiac Ischemia by Dynamic Contrast Enhanced Magnetic Resonance Imaging Using Albumin-based Contrast Agent			
p004	van Hoof	The effect of Ivabradine on plaque size, biomechanics, and microvasculature in atherosclerotic rabbits measured using MR and Ultrasound Imaging			
p005	Chen	A novel method to estimate labeling efficiency for pseudo- continuous arterial spin labeling imaging			
p006	Schmid	Hemodynamics of the cerebral border zone regions in healthy, young volunteers			
p007	Zhang	Arterial spin labeling spectroscopy for cerebral perfusion measurement			
p008	Simonis	Improving the Arterial Input Function in Dynamic Contrast Enhanced MRI by fitting the signal in the complex plane			
p009	Verbree	Influence of the cardiac cycle on pCASL: the effect of triggering the end-of-labeling on signal stability			
p010	Clement	Understanding brain perfusion modifiers in normal subjects			
p011	Hindel	Validation of Quantitative Blood Flow with 3D Gradient Echo (GRE) Dynamic Contrast-enhanced Magnetic Resonance Imaging (DCE-MRI) using Blood Pool Contrast Medium in Skeletal Muscle of Swine			
p012	Nelissen	Deformation-Induced Damage in Rat Skeletal Muscle: role of the vascular system			
p013	De Meulenaere	Multi-modality imaging in a pre-clinical model of developing rat brain metastases: initial results			
p014	Crombez	Development of a molecular approach for the monitoring and treatment of diabetic patients			
p015	Amiri	Multiparametric Magnetic Resonance to Investigate Aggression: A Study at 11.7T on the BALB/cJ Mouse Model			
p016	Praet	Magnetisation transfer contrast imaging reveals white matter pathology in the APP/PS1 mouse model of amyloidosis.			
p017	Siero	Basal metabolic state does not modulate cerebrovascular reactivity response to common hypercapnic stimuli			
p018	Hermans	Network analysis of EEG related functional MRI changes due to medication withdrawal in focal epilepsy			
p019	Bhogal	Investigating the effects of hypercapnia and hyperoxia on T2* and S0 calculated from multi-echo BOLD data at 7T			
p020	van Veenendaal	Relating cognitive adverse events of antiepileptic drugs to functional network efficiency			
p021 p022	Collier Oudeman	Theoretical study of the free water elimination model Robust diffusion-prepared neurography of the complete brachial plexus facilitated by an optimized shimming strategy.			

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p023	Qi	Two methods to study the small-worldness measures of human
p024	Billiet	brain structural network Age-related microstructural changes quantified using myelin
p025	Hendriks	water imaging and advanced diffusion MRI Potential gain of a 256 channel head coil at 7T: combined
p026	Deprez	measurements and g-factor calculations Investigating possible recovery of chemotherapy-induced structural changes in cerebral white matter and its relation with
p027	Fanfone	cognitive functioning in breast cancer patients Thyroid cancer imaging: peptidic targeting of galectin-1 as a diagnostic tool
p028	Jacobs	Multiparametric MRI analysis for the evaluation of MR-guided High Intensity Focused Ultrasound treatment
p029	Cao Pham	Qualification of a new method to measure lipid T1 relaxation, a marker of tumor oxygenation
p030	Maas	Discriminating low-grade from high-grade peripheral zone prostate cancer by multiparametric MRI: a multicenter study
p031	Krikken	Retrospective T1 calculation based on DCE-MRI series with inhomogeneous B1 at 7T in the breast
p032	Schreurs	Micro-vascular effects of photodynamic therapy in tumors evaluated with dynamic contrast-enhanced MRI
p033	Ion-Margineanu	Tumour relapse prediction using multi-parametric MR data recorded during follow-up of GBM patients
p034	van de Lindt	An MRI based mid-ventilation approach for radiotherapy of liver cancer on an MR-linac
p035	Maspero	mproved cortical bone segmentation using a spectral-spatial selective pulse to reduce water/fat in-phase echo time
p036	van Gorkum	Towards Real-Time Monitoring of Laser Induced Hyperthermia for Photodynamic Therapy with Magnetic Resonance
p037	Gurney-Champion	Thermometry at 7T Revisiting the potential of alternating repetition time balanced
p038	Sbrizzi	steady state free precession imaging in the abdomen at 3T Rapid online multiband RF peak power minimization for CAIPIRINHA and pTX-multi-slice shims by inter-slice phase relaxation
p039	Spijkerman	A fast method for T1 and T2 mapping of cerebrospinal fluid at 7T
p040	Boyacioglu	Echo based correction of multiband multi-echo EPI improves task fMRI at 7T
p041	van der Velden	Characterization of respiratory induced B0 fluctuations in the breasts at 7 tesla
p042	van Valenberg	Accelerating Bloch equation simulations by time-domain reduction of the RF pulse waveform
p043	Burakiewicz	Olefinic Fat Suppression in Skeletal Muscle DTI with Combined 6- and 2-Point Dixon
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p046	Mandija	MR guidance of TMS for a patient specific treatment plan: MR based TMS field measurements and electromagnetic			
p047	Schakel	simulations Fat suppression for DW-FSE sequences using an integrated multi-acquisition Dixon method			
p048	Liang	Comparison of different compressed sensing algorithms for low SNR 19F application imaging of transplanted pancreatic islets with PFCE labeled			
p049 p050	van Ormondt Sebastien	Improved line-shape estimation for in vivo MRS Bottom-up study of MRI positive contrast induced by superparamagnetic particles using the Off-Resonance Saturation sequence			
p051	Ramos-Llordén	Simultaneous group-wise rigid registration and T1 ML estimation for T1 mapping			
p052	Jansen	Comparison of mult-band multi-echo and multi-echo at 3T			
p053	Voogt	Combined 8-channel transceiver fractionated dipole antenna array with a 16-channel loop coil receive array for body imaging at 7 Tesla			
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p055	Brink	RF Safety Validation of High Permittivity Pads at 7 Tesla			
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p064	Lindeboom	Quantum coherence spectroscopy to measure 1D 1H-[13C]- lipid signals			
p065	Peereboom	Measuring the metabolic effects of photodynamic therapy using 31P MRSI			
p066	Das	2D-1H Localized PRESS-COSY and 2D-31P EXSY spectra of the mouse hindleg at 11.7T			
p067	Wiegers	Measuring brain lactate with 1H-MRS during hypoglycemia in humans; preliminary results			
p068	Tayari	Robust 3D 1H MRSI of the prostate without endorectal coil at 3T			

