WP1 – MR Guided HIFU and interventional imaging

MRGHIFU: Methodological developments for preclinical & clinical applications of MR guided HIFU

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WP2 – New sequence and new contrast

- **HRDTI: High Resolution DTI method**

Collaborative patch-based super-resolution for diffusion-weighted images.

Diffusion weighted image denoising using overcomplete local PCA.

Anatomically Constrained Weak Classier Fusion for Early Detection of Alzheimer’s Disease.

Optimized PatchMatch for Near Real Time and Accurate Label Fusion.

An Optimized PatchMatch for Multi-scale and Multi-feature Label Fusion.

Detection of Alzheimer’s Disease Signature in MR Images Seven Years Before Conversion to Dementia: Toward an Early Individual Prognosis.

MRI Noise Estimation and Denoising Using Non-local PCA.

NABS: Non-local Automatic Brain Hemisphere Segmentation.

Non-local means inpainting of MS lesions in longitudinal image processing.

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Automatic thalamus and hippocampus segmentation from MP2RAGE: comparison of publicly available methods and implications for DTI quantification.

Fasudil treatment in adult reverses behavioural changes and brain ventricular enlargement in Oligophrenin-1 mouse model of intellectual disability.

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MDMRI: Methodological Developments in High Spatial/Angular-resolution DTI for ex-vivo validation of tractography

High-resolution 3D diffusion tensor MRI of anesthetized rhesus macaque brain at 3T.

NEWFISP: Improving MRI resolution to correctly MRI-diagnose cardiac pathologies and metastases

Self-gated bSSFP sequences to detect iron-labeled cancer cells and/or metastases in vivo in mouse liver at 7 Tesla.

Time-resolved TOF MR angiography in mice using a prospective 3D radial double golden angle approach.

Fast and robust 3D T1 mapping using spiral encoding and steady RF excitation at 7T: application to cardiac manganese enhanced MRI (MEMRI) in mice.


In vivo MEMRI characterization of brain metastases using a 3D LookLocker T1-mapping sequence. Charles R. Castets, Néha Koonjoo, Andreea Hertanu, Pierre Voisin, Jean-Michel Franconi, Sylvain Miraux & Emeline J. Ribot, Nature Scientific Reports, Jan 2017

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Compressed-Sensing MP2RAGE sequence: Application to the detection of brain metastases in mice at 7T. A Trotier, S Rapacchi, T Faller, S Miraux, E Ribot, Magnetic Resonance in Medicine 2018
WP3 – Dynamic Nuclear Polarization

**ONCOFLUX: Metabolic flux MR imaging in tumors**

MR imaging, targeting and characterization of pulmonary fibrosis using intra-tracheal administration of gadolinium-based nanoparticles.

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WP4 – Tracers and contrast agents

**IMMELAPT: SPECT molecular imaging and optimized aptamers for tumor detection**

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*Data on atherosclerosis specific antibody conjugation to nanoemulsions.*

*Data on iron oxide core oil-in-water nanoemulsions for atherosclerosis imaging.*

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PIAF: PET Imaging of Angiogenesis by 18F-RGD

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General Last-Step Labeling of Biomolecule-Based Substrates by $^{[12}C$, $^{[13}C$, and $^{[11}C$ Carbon Monoxide.

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A phantom-based method to standardize dose-calibrators for new β+ emitters: $^{68}$Ga as demonstrative working example.

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## WP5 – Biological bioimaging markers

### BIOPSYPROSTAPROBE: Antibody-based fluorescence probe for biopsy guidance of prostate cancer

In vivo imaging of prostate cancer using an anti-PSMA scFv fragment as a probe.

Radiologic imaging of the renal parenchyma structure and function.

In Vivo Imaging of Local Gene Expression Induced by Magnetic Hyperthermia.
Olivier Sandre, Coralie Genevois, Eneko Garaio, Laurent Adumeau, Stéphane Mornet, and Franck Couillaud, Genes, Feb 2017

In vivo imaging of prostate cancer tumors and metastasis using non-specific fluorescent nanoparticles in mice.

### BRAIN–RESV: Neuroprotective effect of resveratrol in hypoxic ischemic rat pups: how supplementation of the pregnant female could impact brain lesion of the pups?

Consumption of Alcopops During Brain Maturation Period: Higher Impact of Fructose Than Ethanol on Brain Metabolism.

Insulin treatment partially prevents cognitive and hippocampal alterations as well as glucocorticoid dysregulation in early–onset insulin–deficient diabetic rats.

### GMCOG: Grey matters! Toward a better understanding of grey matter alteration and cognitive deficit associated with multiple sclerosis

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IBIONI: Imaging Biomarkers of experimental and clinical neuroinflammation

Neuroinflammatory imaging biomarkers: Relevance to Multiple Sclerosis and its therapy.

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Luc Pellerin, Current Biology, 2018, Vol 28, Issue 21, 1258–1260

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**SCICOG & REACTIV: Bio-imaging markers of tissue integrity, predictors of cognitive impairment in inflammatory demyelinating diseases**

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WP6 – Mathematical simulation and modeling

**ARM: Automatic assesment of Radiofrequency ablation Margins**

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WP7 - Cohort Imaging Methodology

**ACTE: Ambulatory cognitive training in elderly: Relation with intrinsic brain functional connectivity**

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Any publication issued from the TRAIL community must have the following sentence in the acknowledgments or in the financial support:

“This study was achieved within the context of the Laboratory of Excellence TRAIL ANR-10-LABX-57.”