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ParaVision® 360

● Application and Workplace Packages

Innovation with Integrity
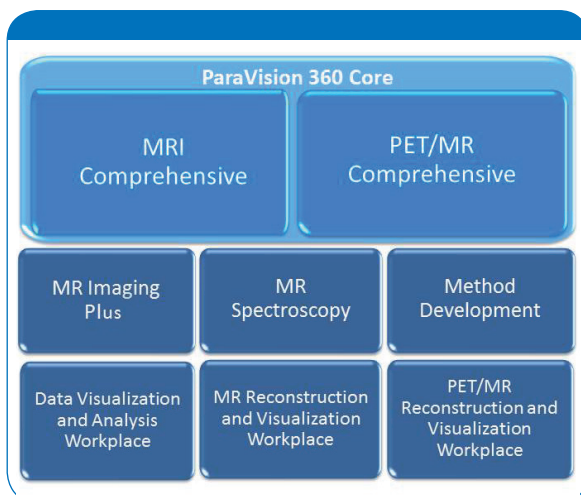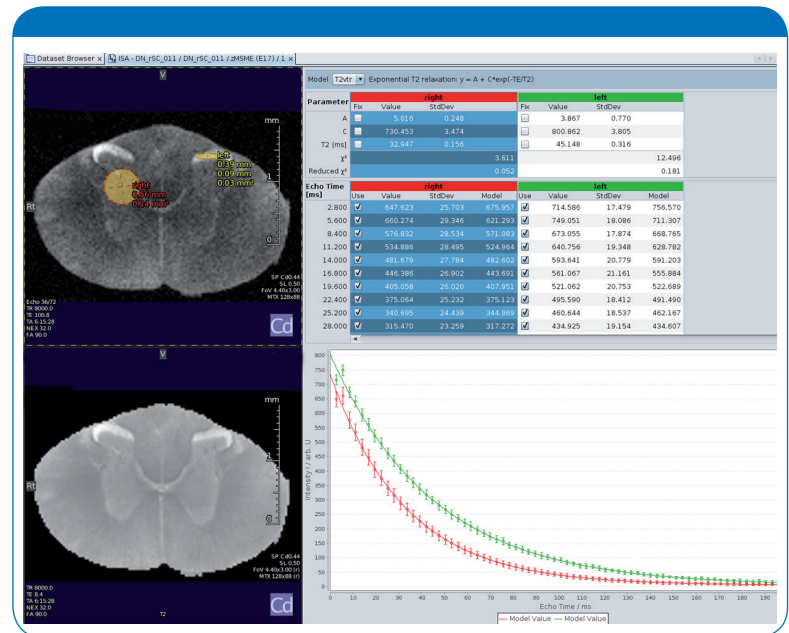
PCI

ParaVision 360 Packages

The Core package builds the heart of ParaVision and provides the infrastructure necessary for acquisition and reconstruction. MRI and PET/MR instruments also come with the MRI Comprehensive and PET/MR Comprehensive packages, respectively. These enable imaging of a broad range of common applications. The Method Development package provides a method programming environment for both MRI and PET. For MRI, the MR Imaging Plus for advanced MR imaging, such as fMRI, is available as well as the MR Spectroscopy package for metabolic investigations. Additional workplaces for data visualization and analysis as well as for reconstruction and visualization are also available.

ParaVision 360 Core Highlights

- Instrument configuration
- Multimodal project, study, and scan planning and registration
- Fused image display and image coregistration
- Image analysis
- Report generation
- Central PCI database with DICOM import and export and NifTI export
- **Interactive quantitative parameter mapping**

Quantitative parameter map tool with interactive ROI navigation with immediate update and export capabilities

Optional extension packages and workplaces enhance the Core and Comprehensive packages

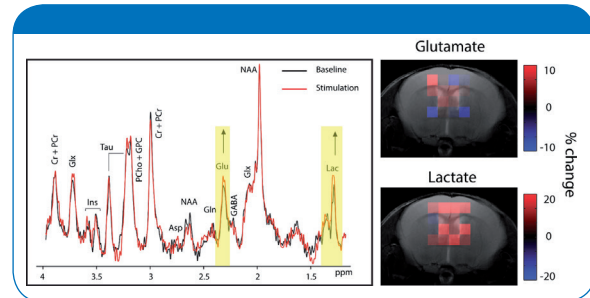# Extension Packages and Additional Workplaces

MR Spectroscopy

The MR Spectroscopy package contains all methods for single voxel spectroscopy and Chemical Shift Imaging and includes outer volume suppression, solvent suppression, heteronuclear decoupling, and nuclear Overhauser polarization.

- Localized spectroscopy methods: PRESS, STEAM, and ISIS
- Chemical Shift Imaging methods: CSI, EPSI*

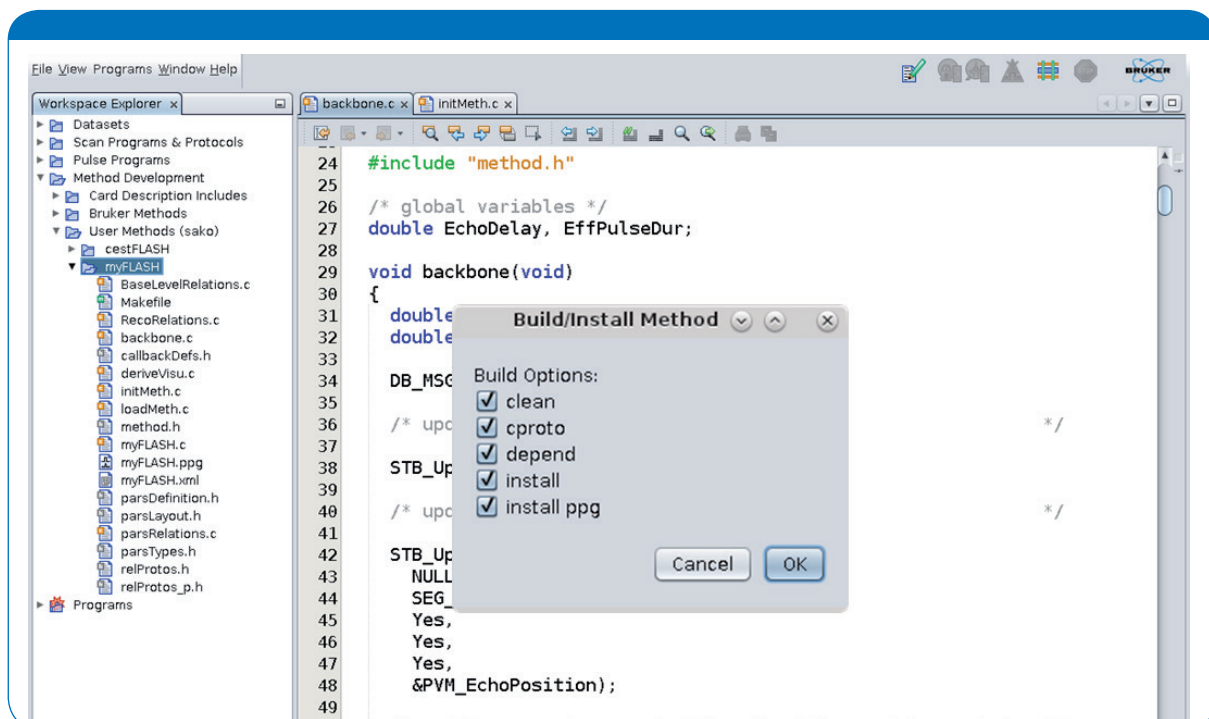* for EPSI, the MR Imaging Plus package is a prerequisite

Glutamate and lactate alteration imaging during electrical stimulation of mouse hindpaw visualized with CSI
Courtesy: A. Seuwen, M. Rudin, ETH Zurich, Zurich, Switzerland

Method Development

The Method Development package provides a fully integrated, user-friendly method programming environment. It includes PVM source code of methods, powerful toolboxes and a method development editor and compilation framework. It enables fast implementation of new acquisition methods and techniques and modification of existing methods with only basic programming knowledge. Compiled sequences can be directly pulled into the scan queue.

Workplaces

The Data Visualization and Analysis Workplace allows the visualization and analysis of reconstructed MRI, PET or uCT preclinical image data. Raw data reconstruction customizing of MRI and PET/MR data, respectively, can be performed on the MRI and PET/MR Reconstruction and Visualization Workplaces, which additionally allow offline reconstruction of raw data, and data visualization and analysis on a separate reconstruction server.
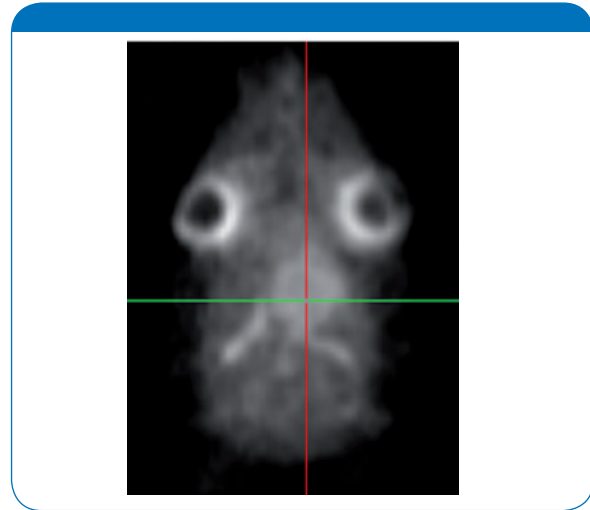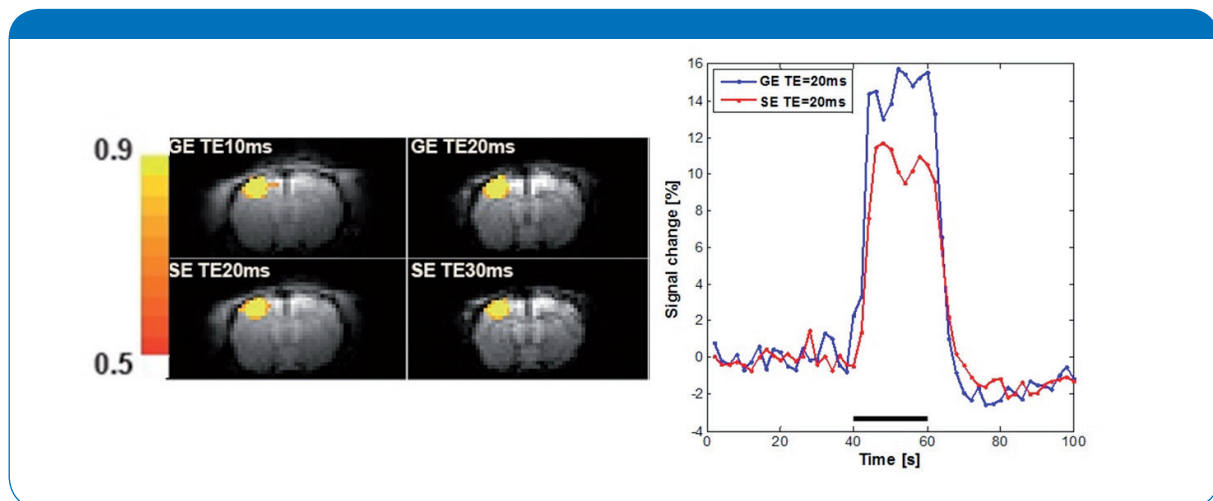

Method development framework

MR Imaging Plus

The MR Imaging Plus package is available for the most demanding imaging needs. It includes all standard, EPI, and short echo imaging methods for diffusion, perfusion, fMRI, flow imaging, relaxometry, and advanced cardiac imaging.
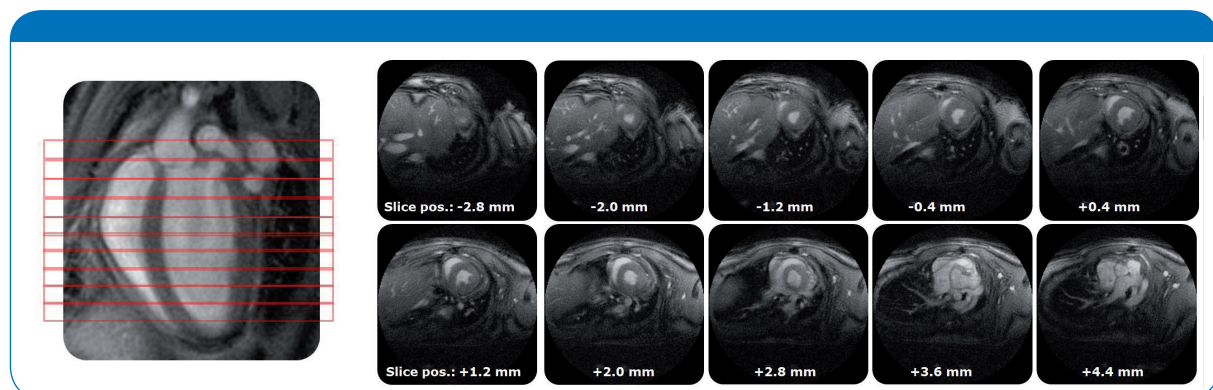
Highlights

- Retrospective cardiac and respiratory gating and reconstruction
- Spiral readout, radial readout
- Trigger out for external device synchronization
- Diffusion tensor evaluation

Sodium imaging of glioma therapy response with UTE 3D at 21.1 T
Courtesy: V. Schepkin, National High Magnetic Field Laboratory/Florida State University, Tallahassee, USA

Optimization of BOLD signal change during electrical stimulation of rat forepaw at 15.2 T
Courtesy: S. Han and S-G. Kim, the IBS Center for Neuroscience Imaging Research, Korea

IntraGateUTE enables full cardiac assessment with (130 × 130) µm² in plane resolution and 14 cine frames per heart beat in less than 15 minutes
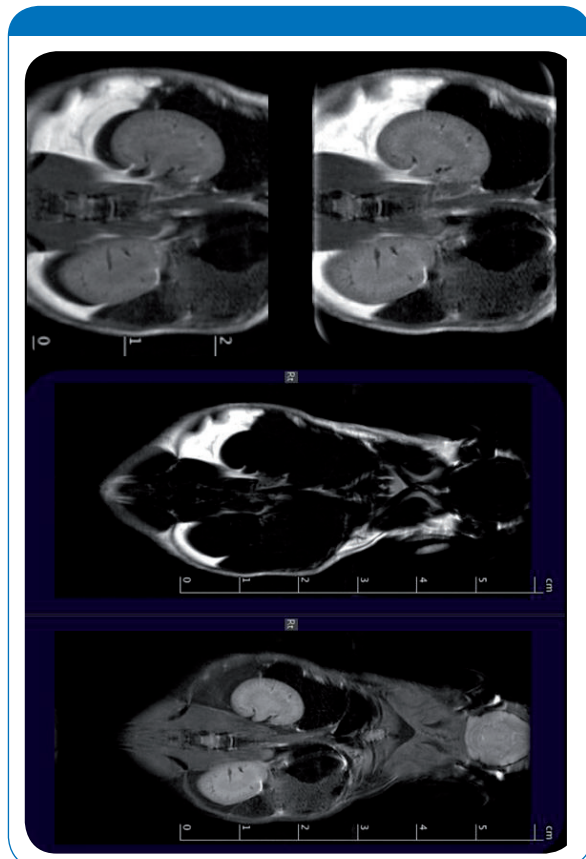
MR Comprehensive and PET/MR Comprehensive

MRI Comprehensive

The MRI Comprehensive package is included with the MRI instrument and enables a broad range of common MR imaging applications. It features queued scan program execution with ready to use MR application protocols for mice and rats. Additionally, on demand pre-scan gradient duty cycle simulation, automatic RF and gradient coil detection and configuration, as well as MAPSHIM, B1 calibration, dynamic shimming*, and image stitching are included. It contains all common spin-echo and gradient-echo imaging methods.

Highlights

- Parallel imaging
- Flow saturation and compensation
- SWI reconstruction
- Black blood, tagging modules
- Multiple contrast images
- Magnetization transfer, CEST
- Fat-water imaging

Fat-water imaging in mouse (middle and bottom) and fat chemical shift corrected image (top right) opposed to standard RARE (top left)
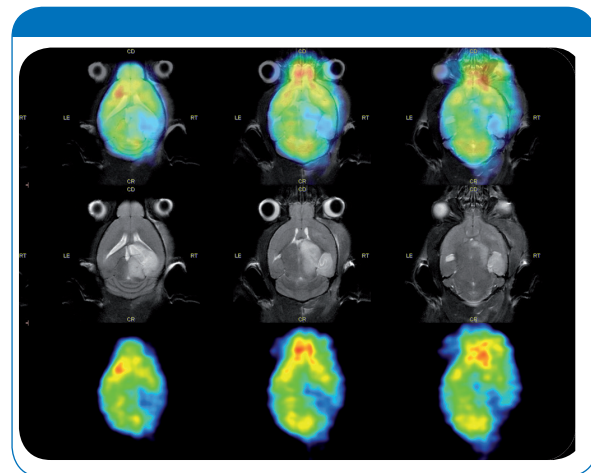
PET/MR Comprehensive

The PET/MR Comprehensive package is included with the PET/MR instrument and enables a broad range of common MR and PET imaging applications. It contains all features and functions of the MRI Comprehensive package. In addition, a register of PET compounds and isotopes and a tracer activity calibration log are included and Attenuation Correction maps can be automatically calculated based on MR data. It contains the PET Preclinical Imaging Method as well as all common MRI spin-echo and gradient-echo imaging methods.

Highlights

- Parallel imaging
- Flow saturation and compensation
- SWI reconstruction
- Black blood, tagging modules
- Multiple contrast images
- Magnetization transfer, CEST
- Fat-water imaging
- Static and dynamic PET image acquisition
- PET List Mode or RAW data acquisition
- PET kinetic time course image reconstruction and segmentation
- PET random-, scatter-, dead-time correction, isotope decay corrections, attenuation correction
- Simultaneous PET and MRI reconstruction

* Work In Progress

Simultaneous PET/MR stroke imaging in ischemic MCAO mouse with Turbo-RARE MR and ^{18}F-FDG PET imaging
Courtesy: U. Himmelreich, W. Gsell, C. Casteels, and C. Deroose Molecular Small Animal Imaging Center (MoSAIC), University Hospital of Leuven, Belgium

Pioneering Preclinical Imaging Solutions

Bruker is a leading provider of high-performance scientific instruments for preclinical and industrial analysis and research with more than five decades of experience in these fields. Bruker's preclinical imaging software, ParaVision, supports the most advanced global market leading preclinical MRI and PET/MR instruments.

Bruker BioSpin

info@bruker.com
www.bruker.com