

BioSpec 70/40 and BioSpec 47/40

- Large Bore MRI for Non-Human Primate Research

The Most Room for Research

Many MRI preclinical experiments require a large amount of space within the magnet. This can simply be due to the size of the animal under investigation, whether it be large rabbits, macaques or other large non-human primates, or other species. Or it can result from advanced experiments that require extensive peripherals. Whatever the reason, Bruker's large bore MRI instruments do not confine you to the boundaries of smaller bore instruments, but give you the freedom that you need.

Bruker's large bore magnets go beyond the traditional 30 cm. To meet the crucial need for non-human primate research, both the BioSpec 47/40, which offers a field strength similar to the clinic, facilitating translational studies and the 70/40, with the great advantage of increased sensitivity enabling higher resolutions are available.

Common Features

- Intuitive ParaVision software for multi-dimensional MRI/MRS data acquisition, reconstruction, analysis and visualization including IntraGate based methods, UTE, ZTE, EPI, DTI, parallel acceleration, multi-band excitation, and fast 3D mapping
- Open sequence architecture for full freedom of study design
- Gradient inserts for studies on smaller species available
- Significant signal-to-noise boost *in vivo* with the MRI CryoProbe™ for small rodents
- In-house development and production of all key components (software, magnet, gradient, spectrometer, RF-coils) ensures the best performance and short repair times

Key features BioSpec 47/40

- Upgradable with state-of-the-art PET Insert
- Large range of proton and x-nuclei coils for mouse and rat brain, body, and cardiac studies with up to 8 channels

Key features BioSpec 70/40

- Sensitivity and resolution of high-field 7T MRI
- Smooth workflows for animals with dedicated handling solutions
- Dedicated non-human primate neurology RF coils
- Easy animal handling of non-human primates with specially designed cart
- Premium labscape service and support maintenance agreement



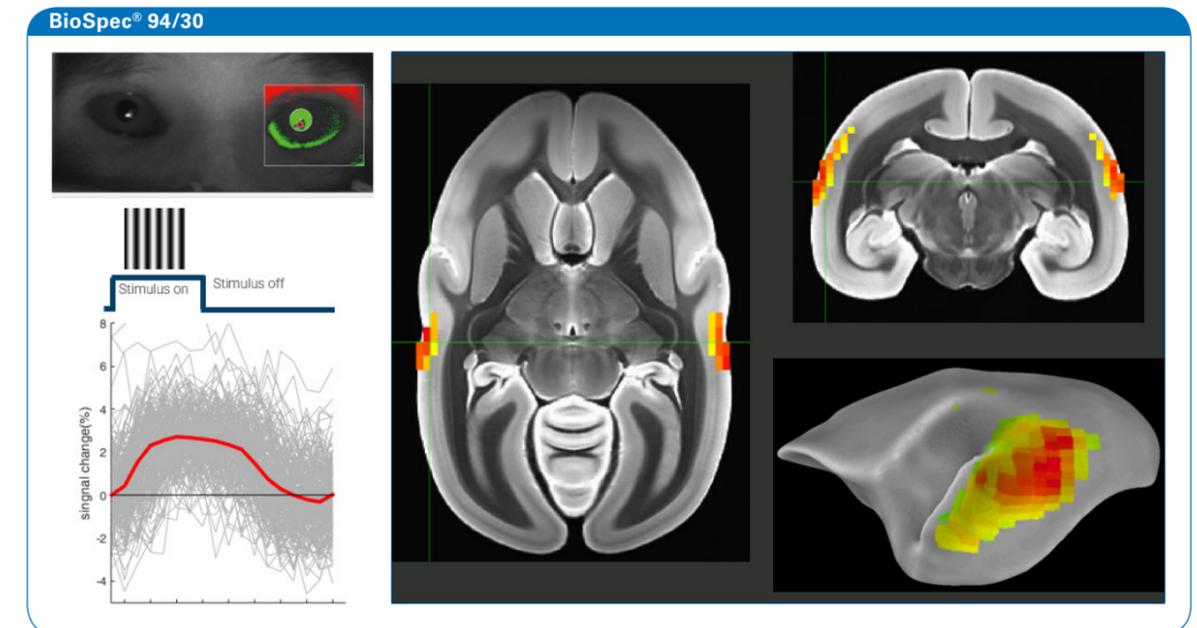
BioSpec 47/40



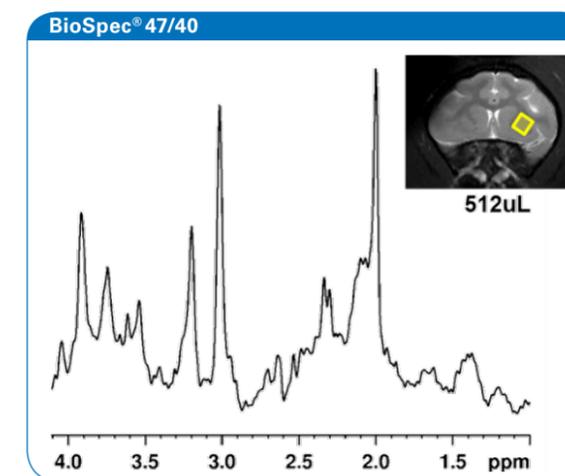
BioSpec 70/40 installed at QST Hospital, National Institutes for Quantum and Radiological Science and Technology, Chiba, Japan
Image courtesy: I. Aoki

Non-Human Primate Research

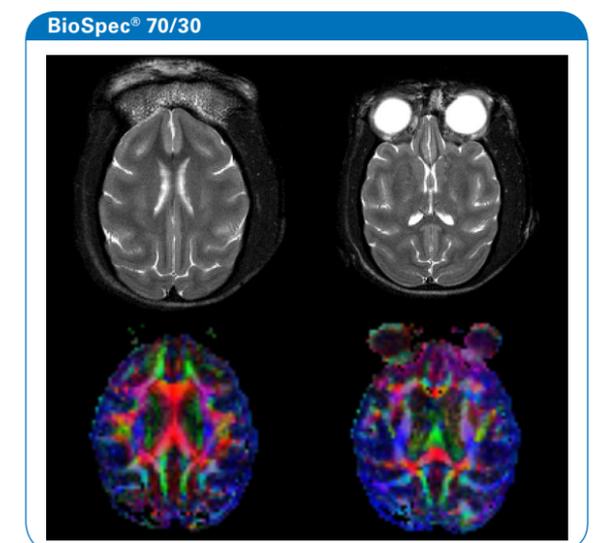
A vital extent of medical treatment research is preformed on non-human primates. From validation of therapeutic strategies, drug testing, disease development, and therapy monitoring, this research focuses on oncology, infectious diseases, metabolism, and cardiovascular diseases. It also covers a wide range of neurological disorders, such as basic brain function, psychiatric disorders, cognitive (dys-) function, e.g. Parkinson's, Alzheimer's Disease, and Multiple Sclerosis. The BioSpec 70/40 facilitates this research with features such as the specially designed dockable animal cart, and animal monitoring and handling provisions.



Neural areas of perception of visual motion in awake marmosets
Courtesy: T Kaneko, RIKEN BSI, Japan



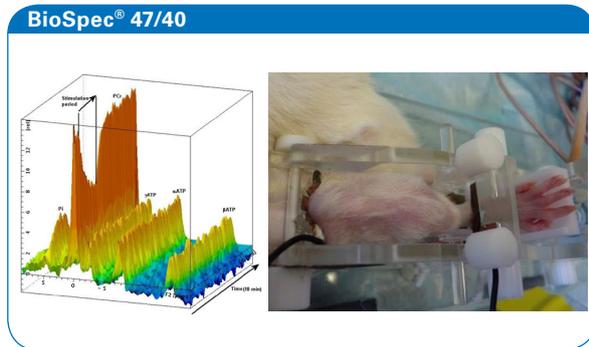
GABA in striatum of non-human primate via ¹H-PRESS
Courtesy: B. Künnecke, M. v. Kienlin et al., Hoffmann La Roche, Basel, Switzerland



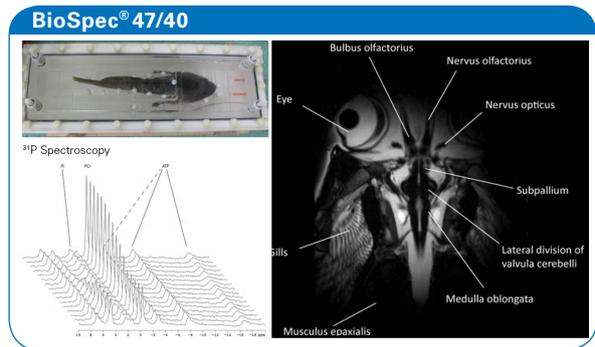
Fractional Anisotropy maps of crab-eating macaque
Courtesy: Wake Forest Baptist Medical Center, Winston-Salem, NC, USA

Intricate Set-ups

The flexibility of a large bore MRI is often necessary for intricate set-ups. The 40 cm bore BioSpecs provide the space that is decisive in the design of such studies.



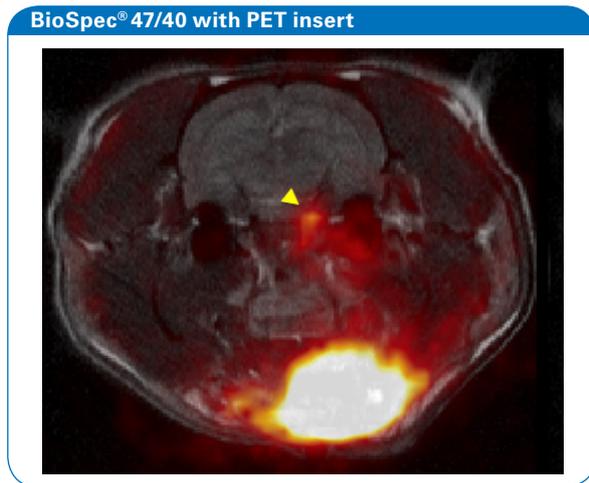
Intricate setup involving rat calf muscle enables dynamic ^{31}P spectroscopy of muscle energetic metabolism at exercise
 Courtesy: C. Gerard, P. R. Allegrini, et al., Novartis, Basel, Switzerland



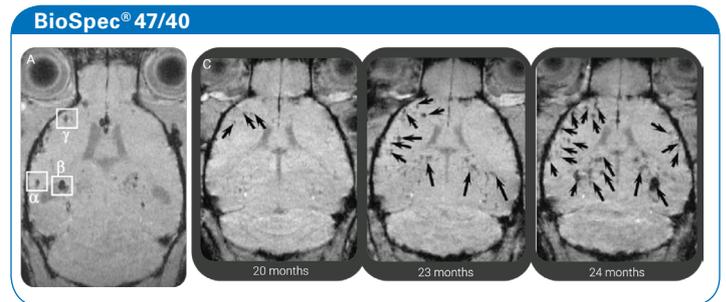
An expansive swim box allows high resolution anatomical and ^{31}P spectroscopic investigations of neurophysiological changes due to ocean acidification in the antarctic rock cod notothenia
 Courtesy: C. Bock, H.-O. Poertner et al., Alfred-Wegener-Institute for Polar and Marine Research, Bremerhaven, Germany

Superb Small Rodent Imaging

Gradient inserts allow these flexible instruments to cover the full range of common species used in preclinical studies. The up to 1000 mT/m gradient strength and slew rate of 9000 T/m/s provide optimal images even in species as small as mice.



Imaging of rat embolic stroke model using a novel fibrin targeted tracer shows high uptake at occlusive thrombus in the internal carotid artery (arrowhead)
 Courtesy: N. Rotile, I. Ay, C. Farrar, P. Caravan, Institute for Innovation in Imaging and Martinos Center at Massachusetts General Hospital, Boston, MA, USA



SPIO-labeled macro-phages in mouse Alzheimer disease shows age related progression of disease
 Courtesy: N. Beckmann et al., Novartis Pharma, Basel, Switzerland