

The 7 T Bruker Small Animal MRI and Spectroscopy System at the Citigroup Biomedical Imaging Center

516 East 72nd Street, Weill Cornell Medical College, Manhattan, New York City



Biospec 70/30 USR 7 Tesla pre-clinical MRI core facility

A multipurpose research system for high resolution MRI and MRS

- Located on 1st floor at CBIC
- Supported by NIH grant 1S10RR023020-01 (PI Ballon) and construction funds from the Department of Radiology
- In operation since fall 2009
- Fee: \$180/hr; discount for overnight scans

Contact

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Technical Specifications

- Actively-shielded superconducting wide-bore magnet B-C 70/30 USR
- Screening against external field perturbations
- Combined symmetrical RT-shim and gradient system B-GA 20S
- Gradient strength at 200 A: 450 mT/m, Slew rate: 4500 T/m/s

Additional Equipment

- Adjacent animal preparation lab with anesthesia system
- Monitoring of respiration, temperature, EKG
- Stimulus isolation unit for functional MRI
- Easy-to-use CBIC developed solution for the control of stimulus devices for functional MRI, e.g. laser for optical fMRI

Statistics (11/2009-10/2010)

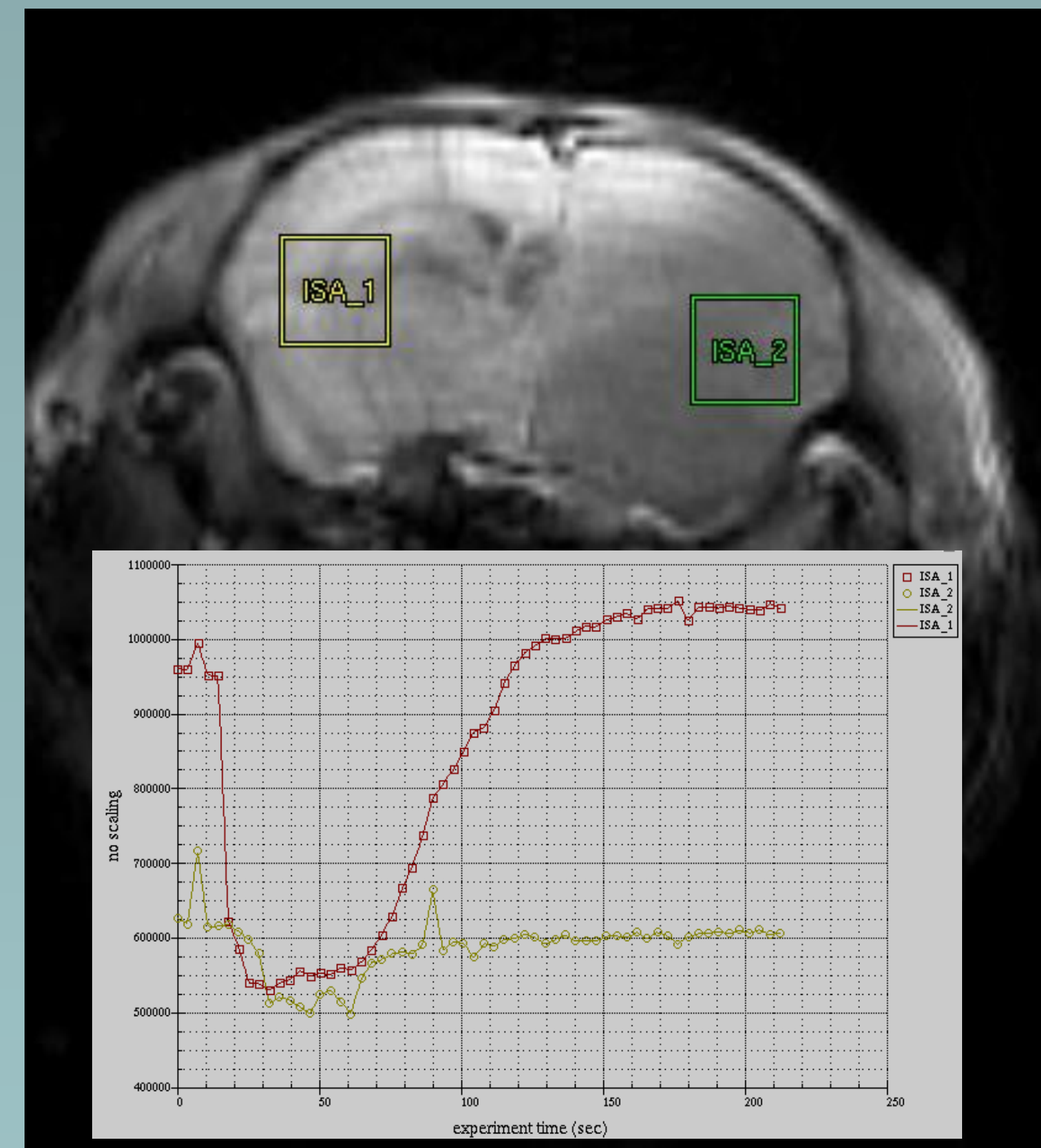
- about 22 ongoing projects
- about 570 hours of user projects scan time

Protocols

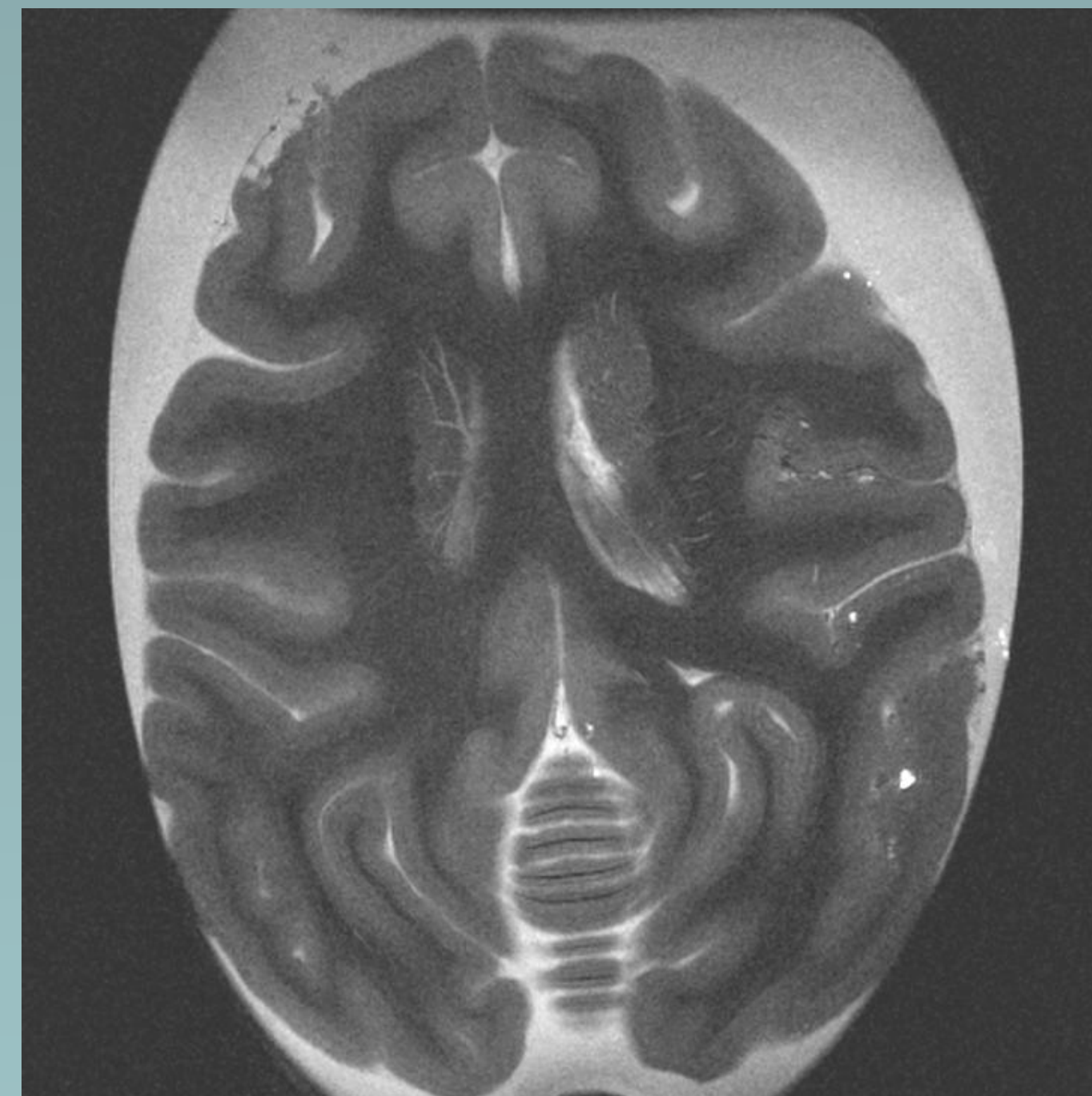
- Gradient Echo, Spin-Echo
- Turbo Spin Echo (RARE)
- Diffusion Weighted and Diffusion Tensor Imaging (DTI)
- MDEFT (T1-weighted high-resolution 3D MRI)
- FISP (ultra fast steady-state MRI, including TrueFISP option)
- Time-of-flight angiography
- Echo-planar Imaging with gradient-echo and spin-echo options
- Perfusion imaging using pulsed arterial spin labeling
- Inversion Recovery
- Relaxometry
- Movie and Cine
- Magnetization Transfer
- Functional MRI
- Localized single voxel spectroscopy (PRESS/STEAM)
- Spectroscopic imaging (CSI)



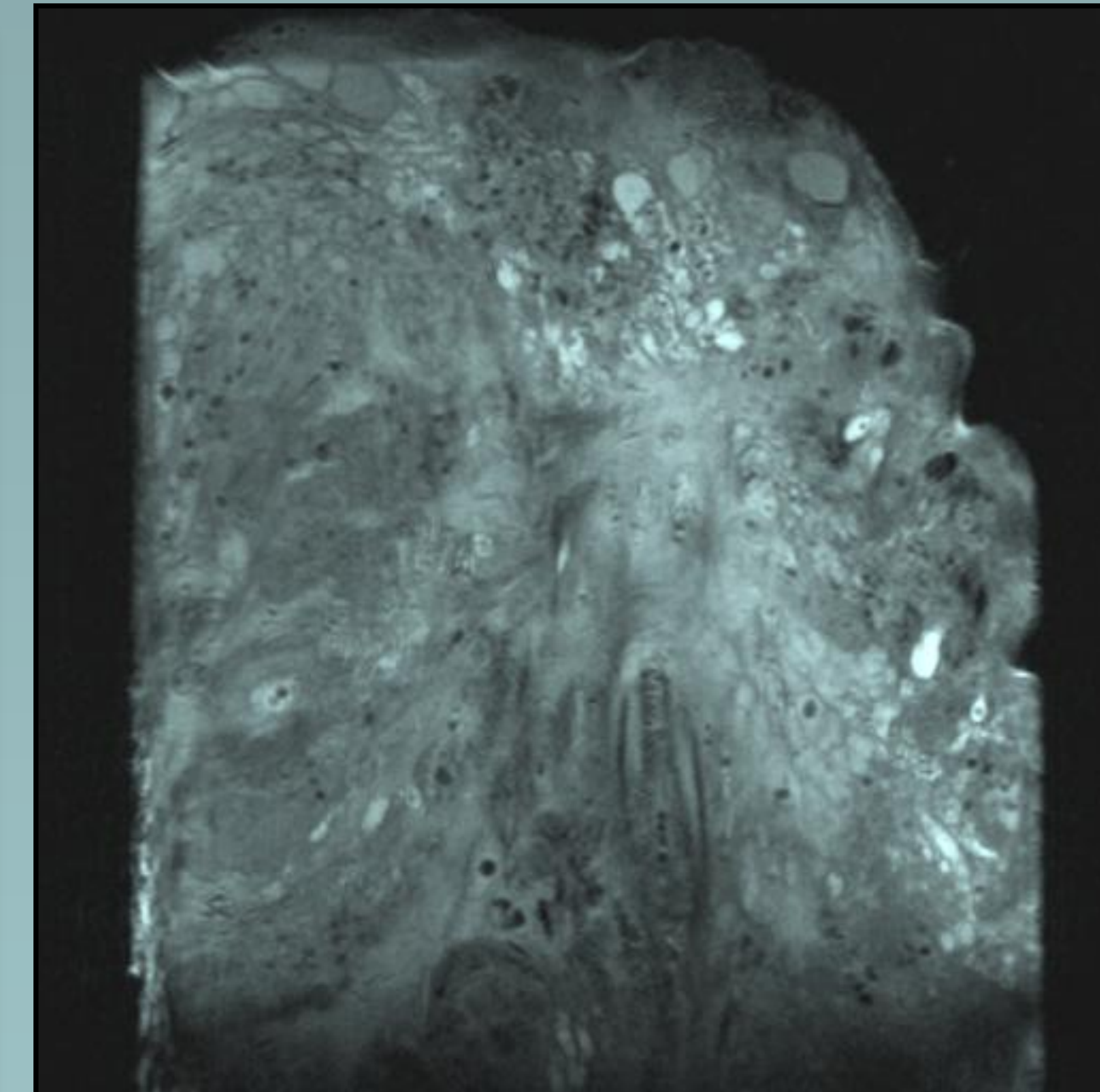
Delivery spring 2009



Dynamic contrast enhanced study of blood brain barrier pharmacology (mouse)



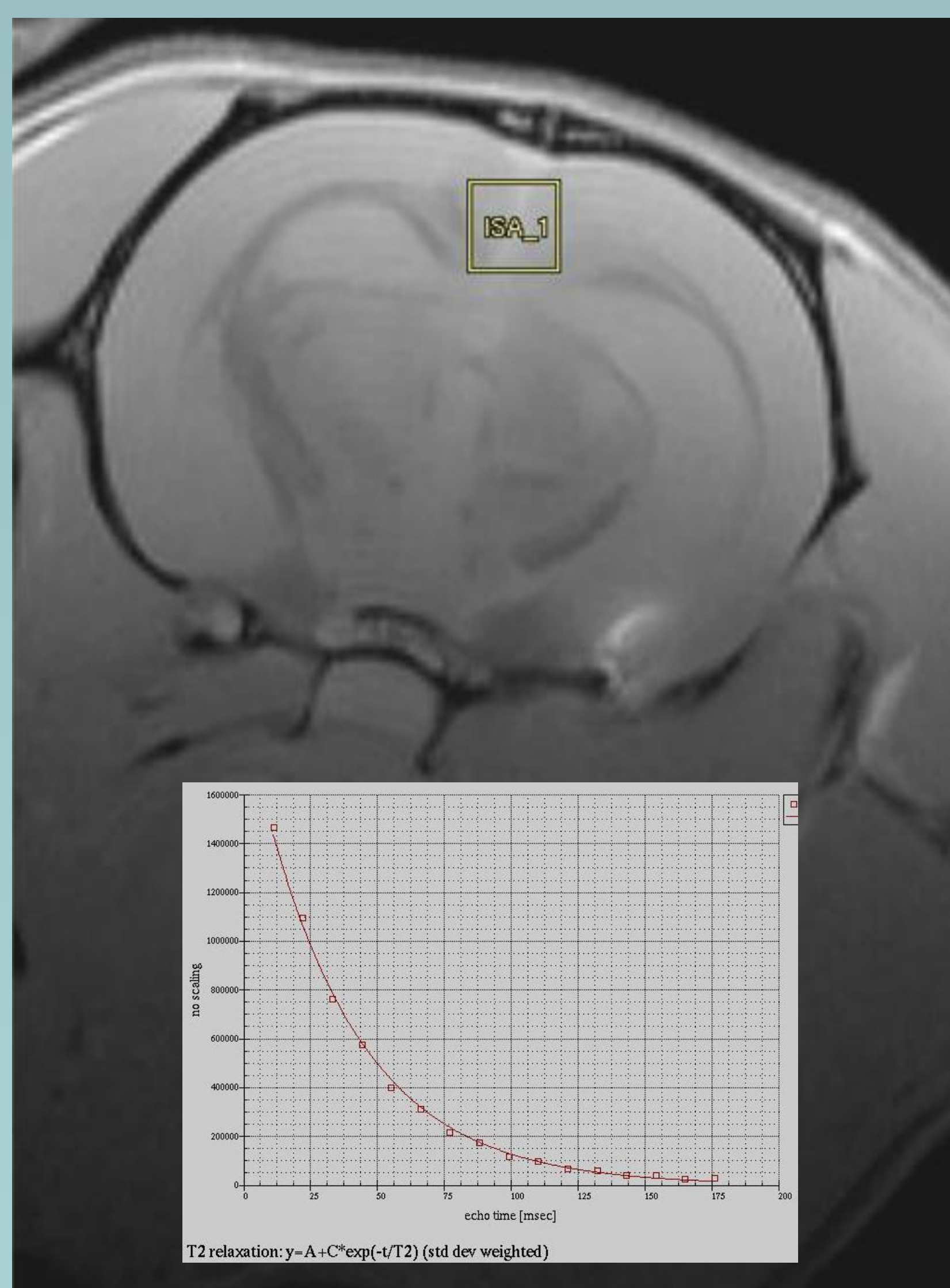
Excised macaque brain (RARE sequence)



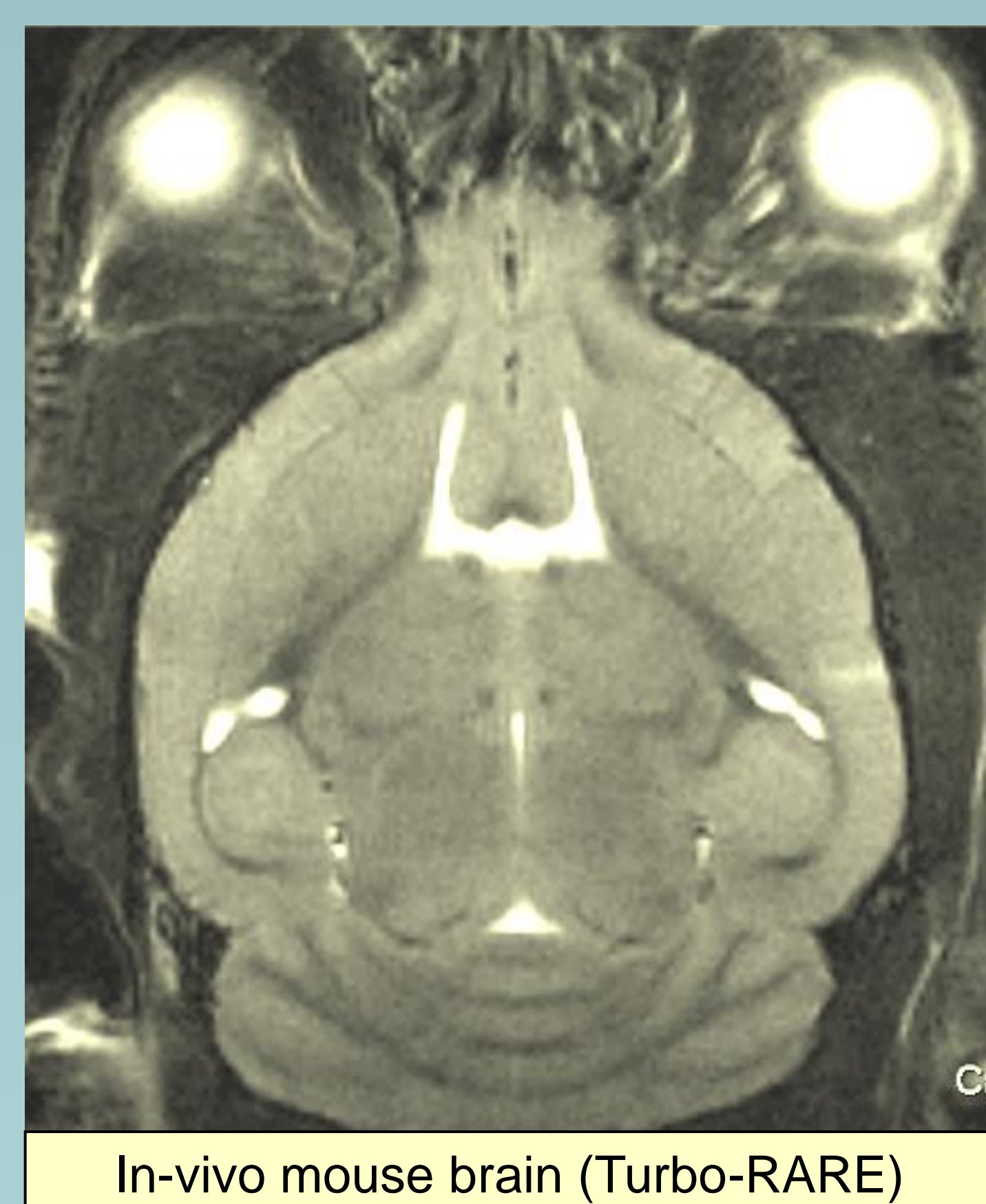
Excised human prostate with 87 87 500 μm^3 resolution (RARE sequence)



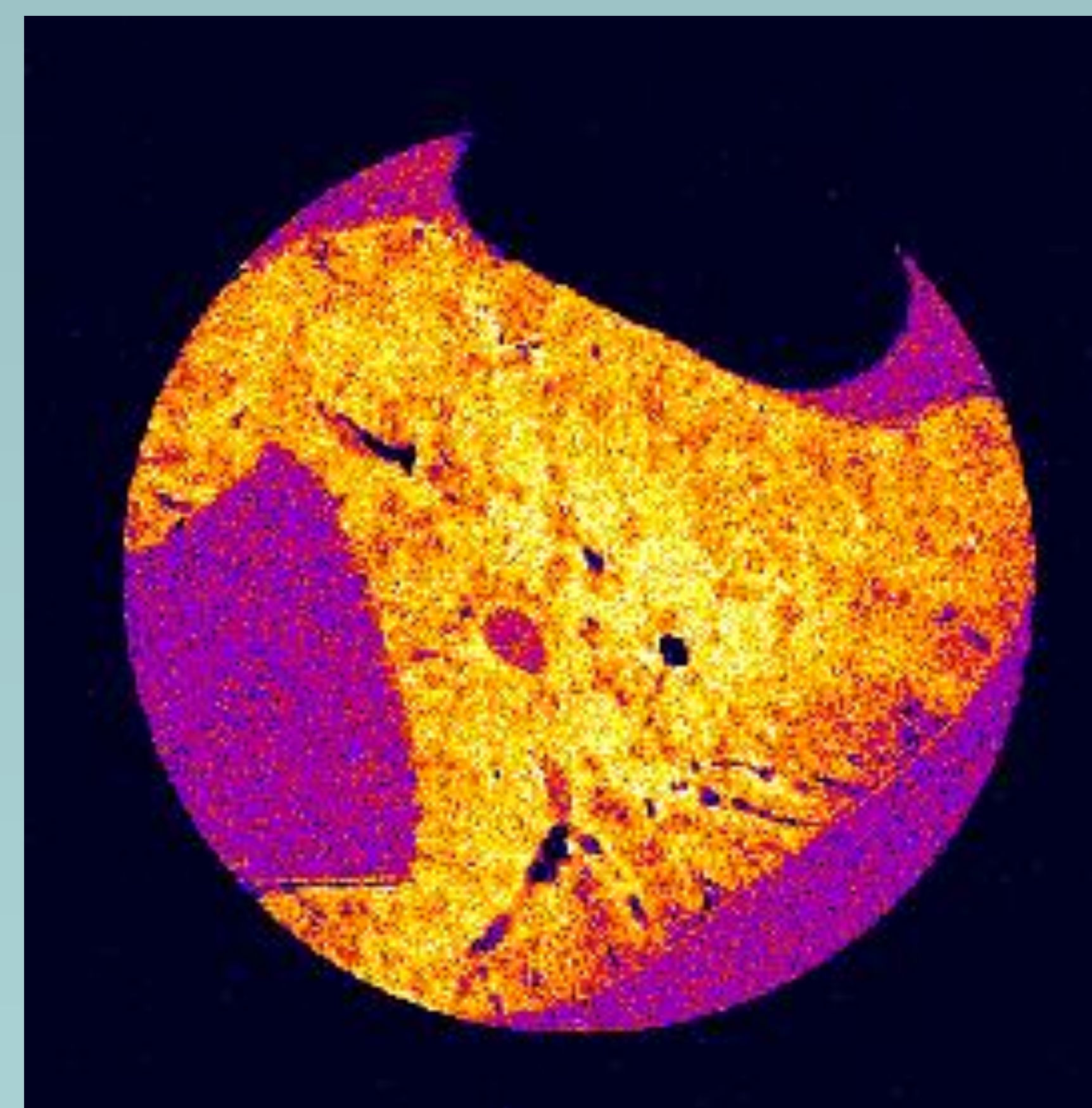
In-vivo rat knee, 140 140 1000 μm^3 (2D PD RARE sequence)



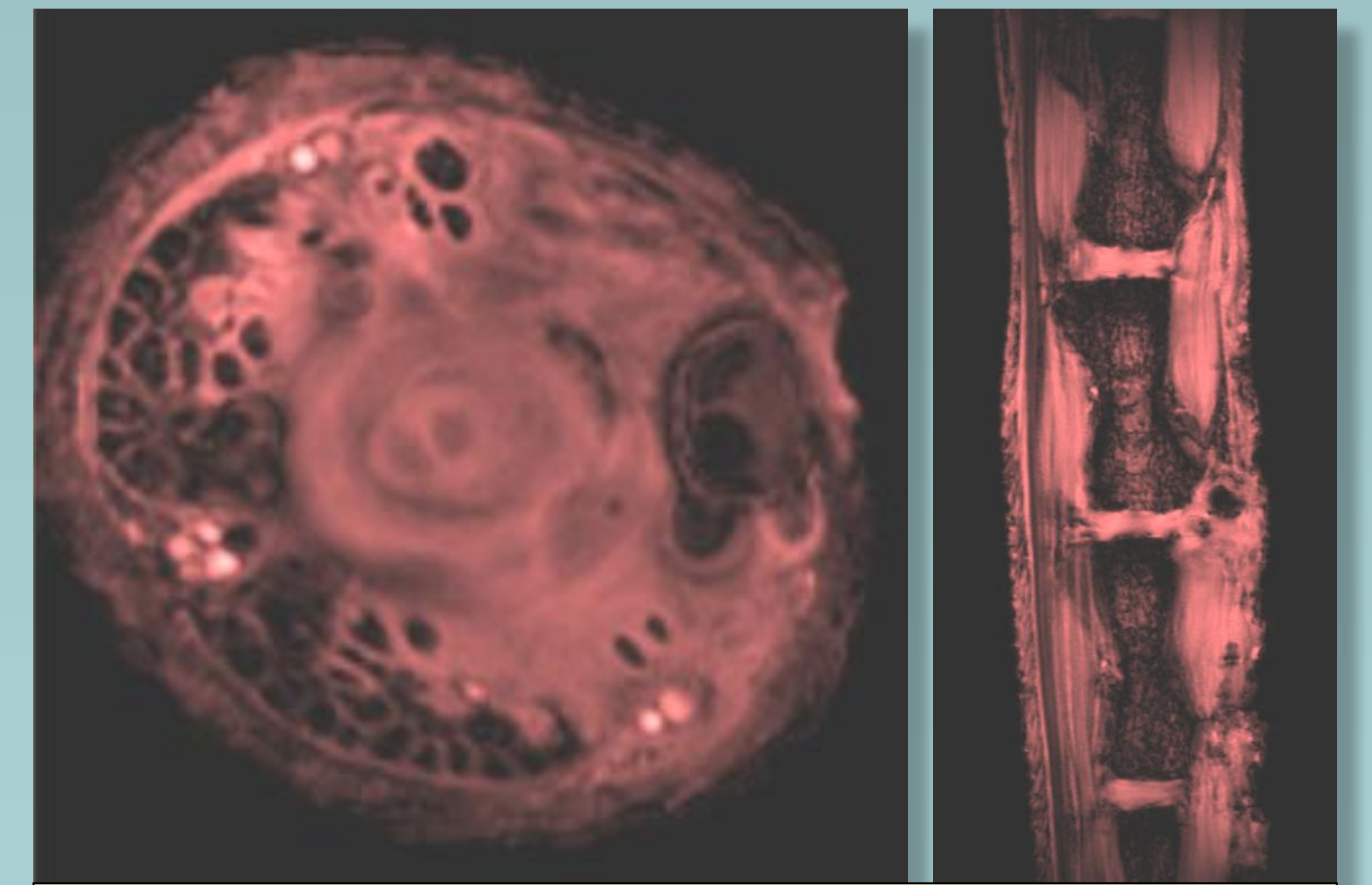
In-vivo T2-mapping in mouse



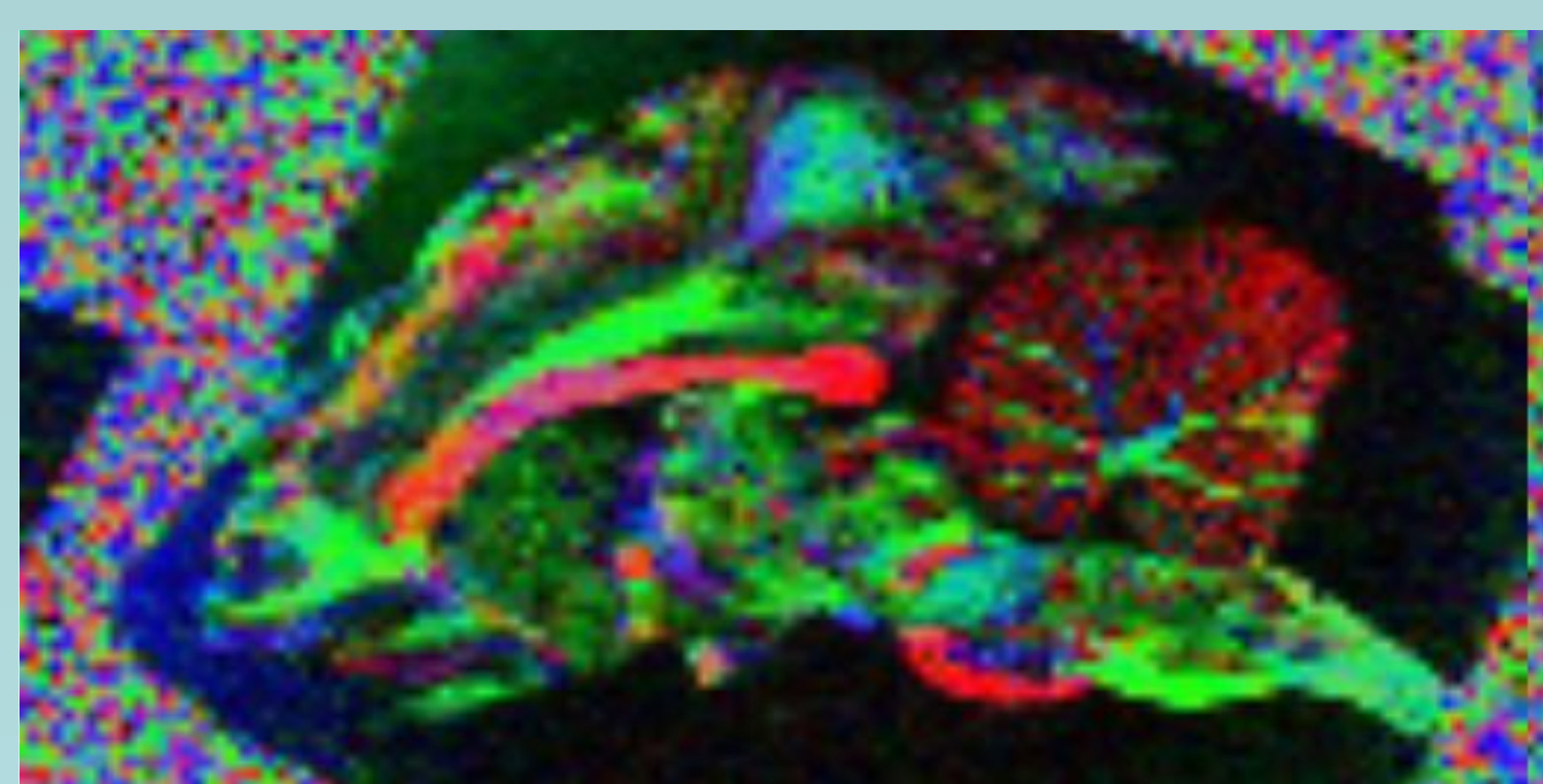
In-vivo mouse brain (Turbo-RARE)



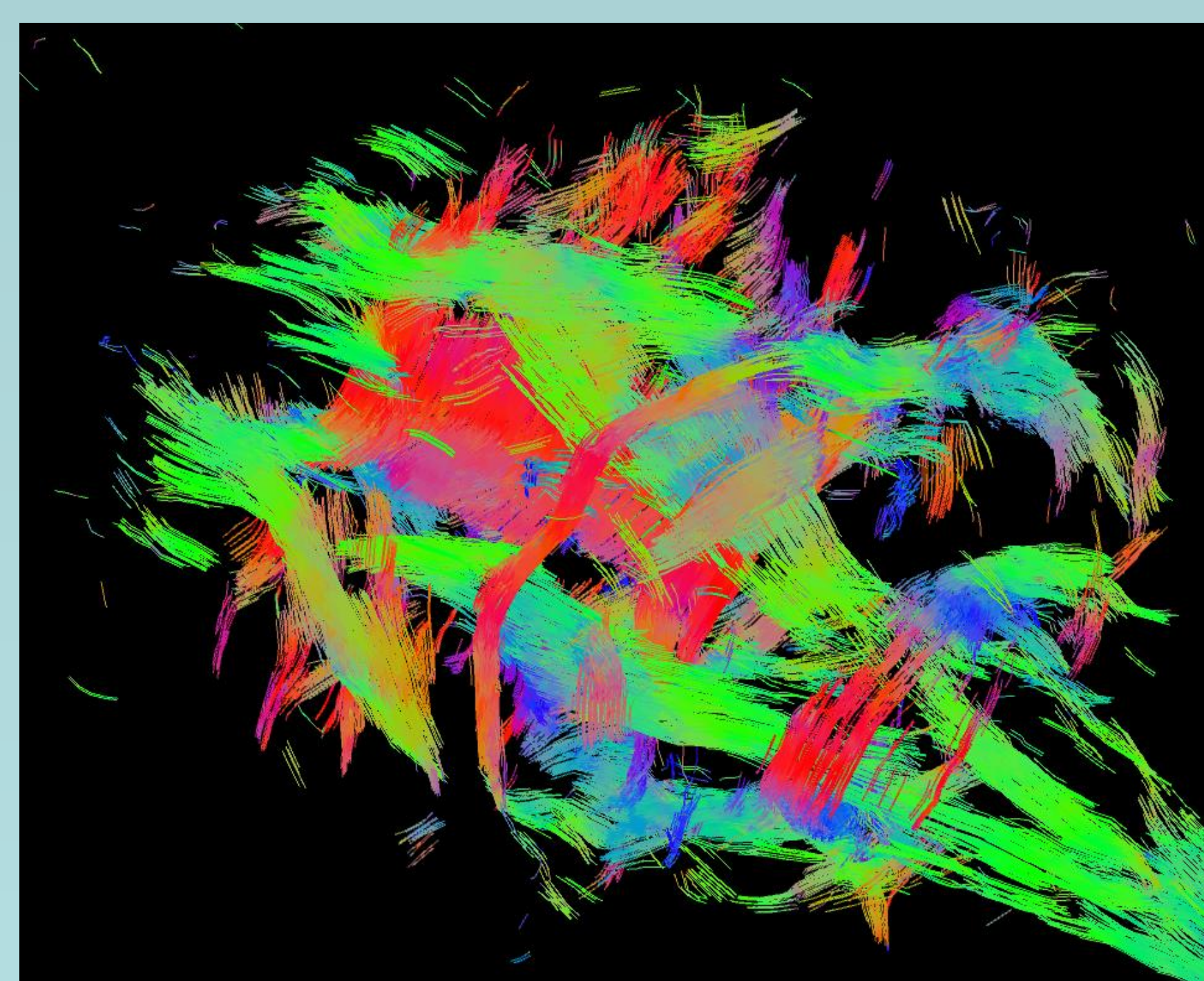
Excised rat liver with 29 29 91 μm^3 resolution (Snap sequence)



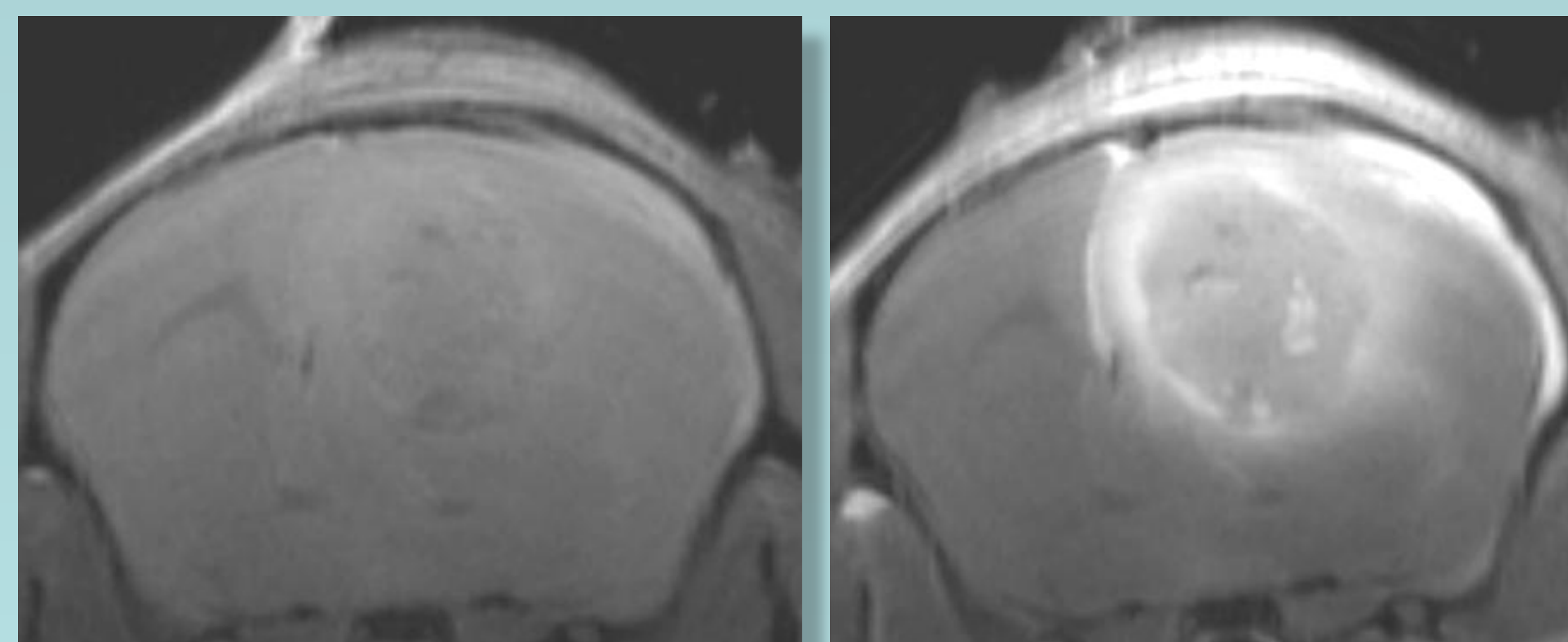
In-vivo MRI of implanted artificial disk in rat tail (FLASH sequence)



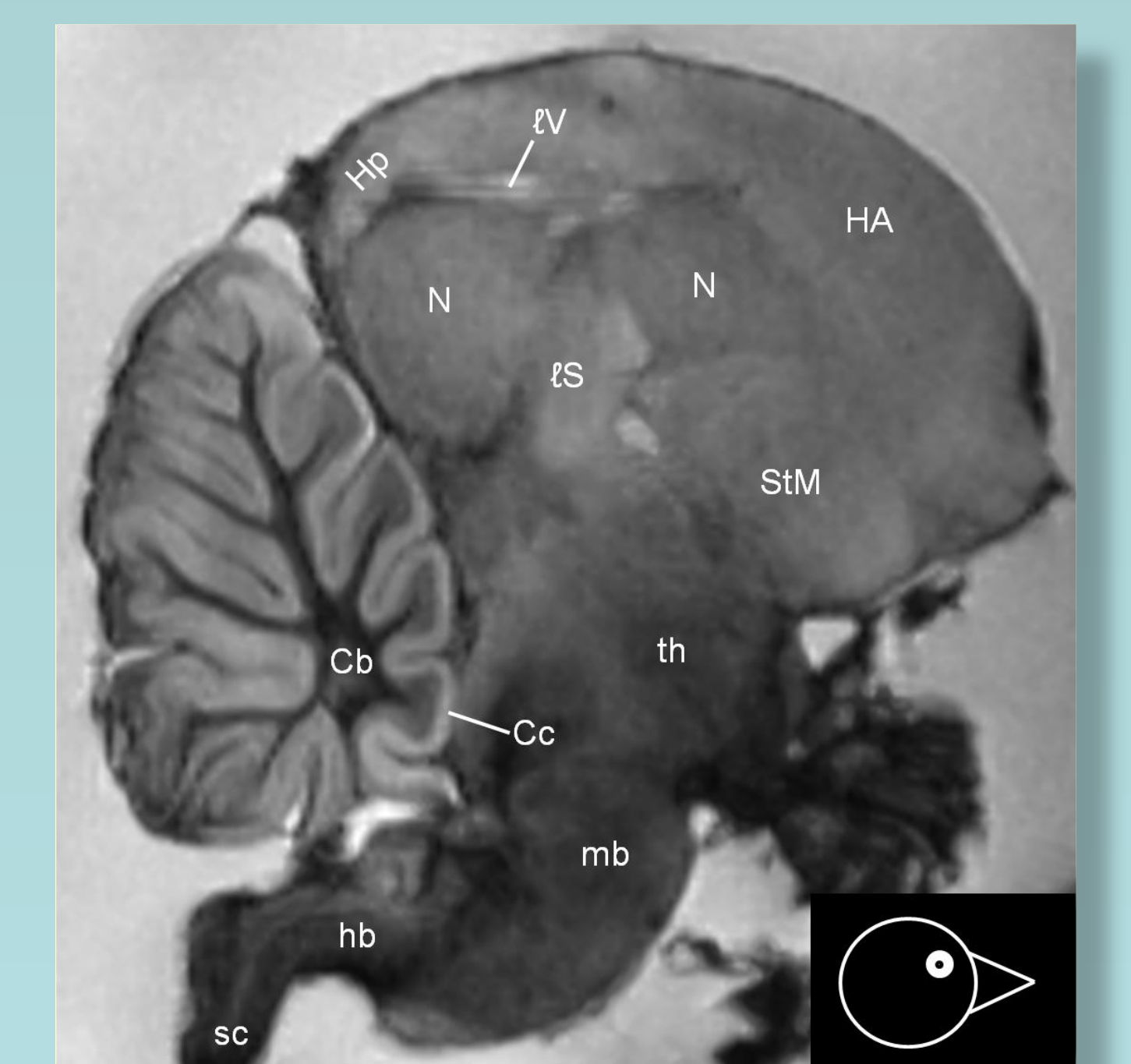
Fractional anisotropy of white matter in excised macaque monkey brain
(red: right-left fibers;
green: anterior-posterior fibers;
blue: superior-inferior fibers)



White matter fiber tracts in macaque monkey brain based on HARDI, with crossing fibers



Mouse with glioblastoma multiforme tumor pre- and post-contrast injection (RARE)



Zebra finch brain (acquired on CBIC 3T MRI; on 7T forthcoming)