

MGH NMR Center

Biomaterials Laboratory/Athinoula A. Martinos Center for Biomedical Imaging

System Specifications

14 T 89 mm Vertical Bore Bruker Bio-Spin Avance Analytical MR Spectrometer

Magnet by Magnex Scientific Ltd.

Magnet	14.09 T actively shielded 89 mm bore
Proton frequency	600 MHz
Operating frequencies	All nuclei
RF channels	Three: observe, decouple, lock Complete amplitude, frequency (0.001 Hz) and phase (0.05 degree) shaping at 1 kW maximum power on observe and decouple
Receiver	4 MHz bandwidth, model SE-451
Host computer	SGI O ₂ , to be replaced with a Linux PC at 4.7 T upgrade time
Software	Bruker XWIN-NMR for n-D spectroscopy Bruker Paravision for imaging

Probes

Liquids

Multinuclear broadband observe (BBO)	5 mm tubes, ¹⁵ N through ³¹ P { ¹ H decouple}
Multinuclear broadband observe (BBO)	10 mm tubes, ¹⁰⁹ Ag through ³¹ P { ¹ H decouple}
Inverse broadband observe (BBI)	5 mm tubes, { ¹⁰⁹ Ag through ³¹ P} ¹ H observe and z-gradient spectroscopy

Microimaging

Plug-in inserts (others may be purchased)	10 mm ¹ H birdcage 20 mm ¹ H birdcage 5 mm ¹ H solenoid 20 mm ¹³ C / ¹ H volume 20 mm ³¹ P / ¹ H volume
--	--

Solids

CP/MAS	4 mm (70 µl rotors), ¹⁵ N through ³¹ P { ¹ H}, 15 kHz spin rate
--------	--

High resolution MAS

Inverse probe { ¹³ C} ¹ H	4 mm (70 µl rotors), 40 G/cm magic angle gradient, 15 kHz spin rate, 1.5 Hz proton resolution
---	---

Variable temperature

Liquids	-100 to +200 °C, stability ± 0.1 °C
Solids	-100 to +150 °C
HR-MAS	range unknown
Microimaging	-20 to +60 °C

Automated sample changer

for up to 40 HR-MAS and MAS rotors