Development of MRI Bone Marrow Biomarkers for Assessment of Treatment Response Using a 7T Cryoprobe

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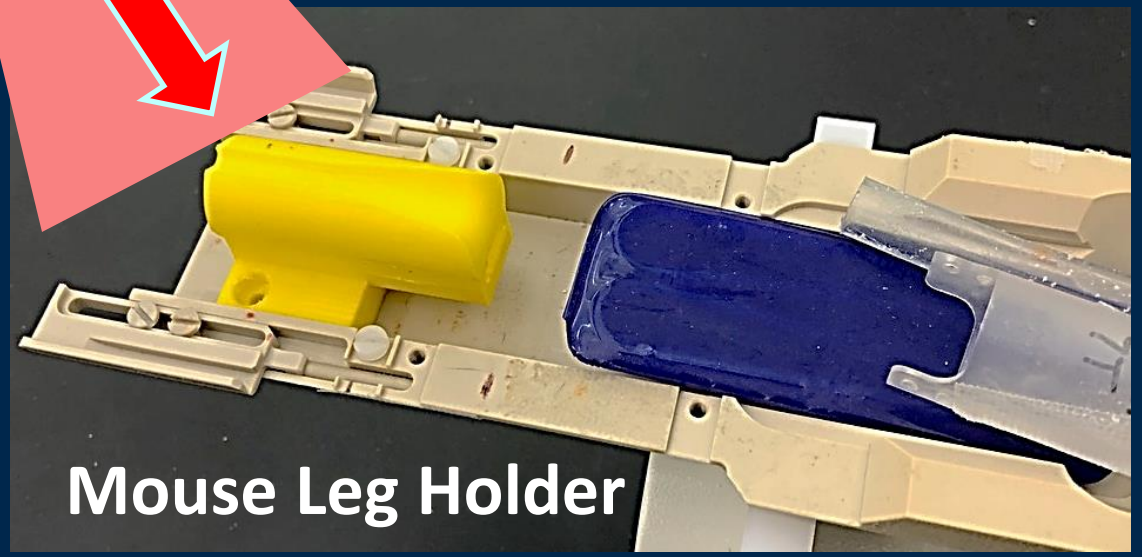
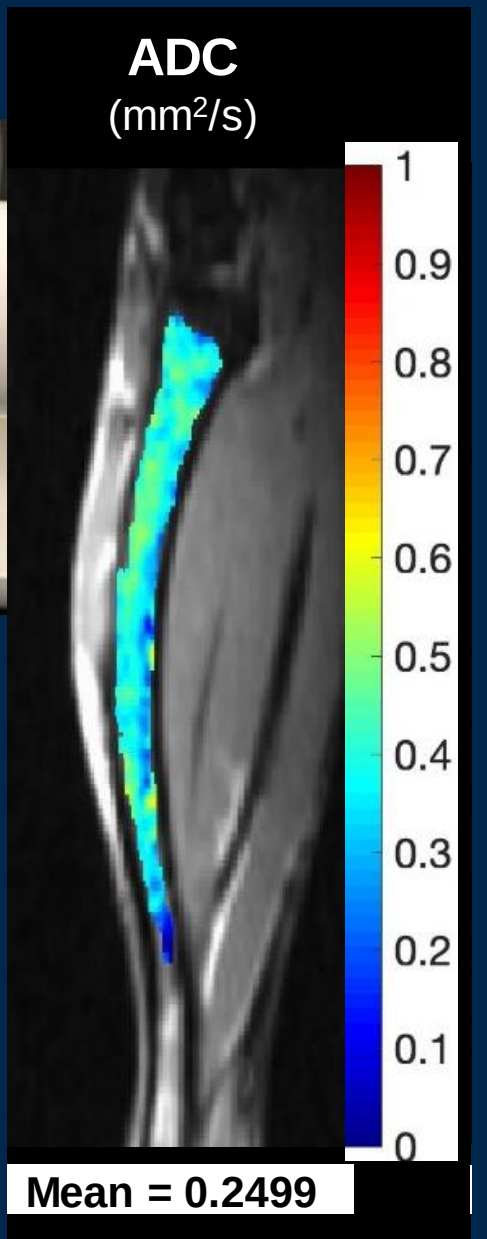
MRI Scanning of Mouse Tibia with Cryoprobe

Kevin Heist



DWI Scan



Reproducibility of Bone Marrow MRI Measurements

Test-Retest of ADC Metrics

NORMAL TEST-RETEST (WHOLE Tibia)	Test	Retest
MFL1C1M1	0.221	0.219
MFL1C2F1	0.234	0.269
MFL1C2F2	0.264	0.193
MFL1C3F1	0.256	0.276
MFL1C3F2	0.232	0.275
MFL2C1F1	0.201	0.324
MFL2C1F2	0.258	0.268
MFL2C1F3	0.28	0.316
MFL2C1F4	0.249	0.288
MFL2C2M1	0.167	0.123
Average (μm^2/msec)	0.2362	0.2551
SEM	0.008065	0.013920187

Ten mice underwent 7T DWI of the tibia 24 hours apart as part of a test-retest study.

Average ADC values from the distal region were 0.236+/-0.008 and 0.255+/-.0139 at the two time points.

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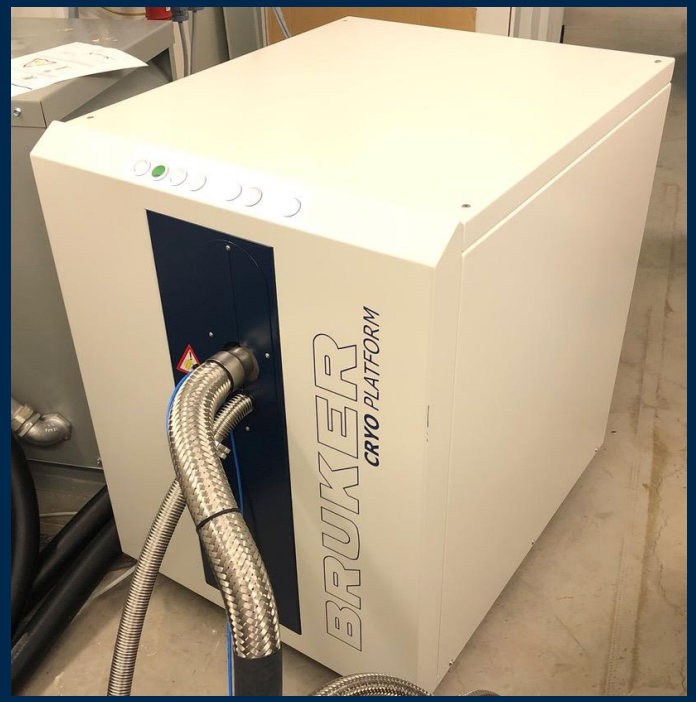
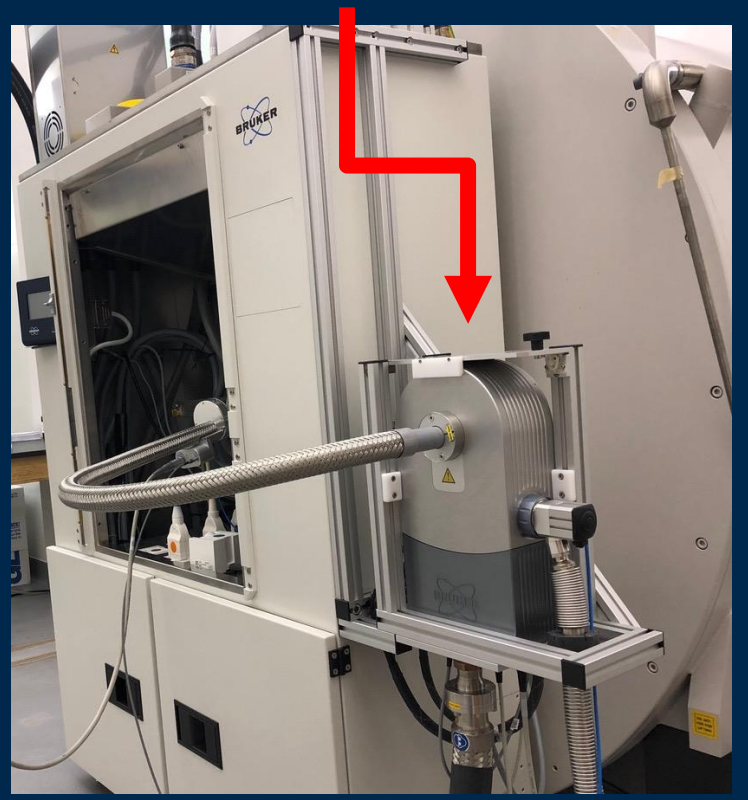
MRI Cryoprobe Bruker Hardware

Helium Compressor



Controller and Chiller

Cryo-cooled Preamp



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MRI Cryoprobe Summary

- A closed-cycle cryogenically cooled quadrature RF coil and preamplifier for mice
- MRI cryoprobe provides ~2.5 times SNR increase compared to standard room-temperature (RT) coils
- Allows for new applications (i.e. mouse bone marrow imaging of the tibia)
- Faster measurements

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