

UCSD MSK Imaging Research Lab

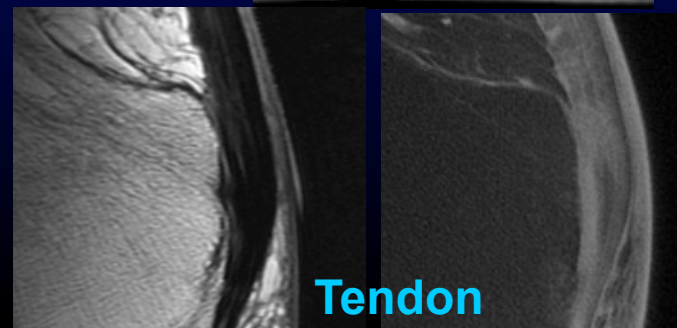
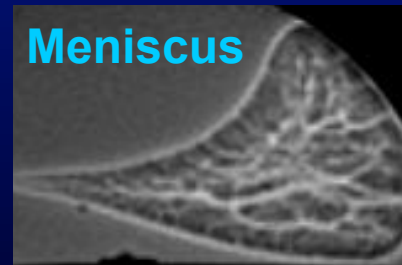
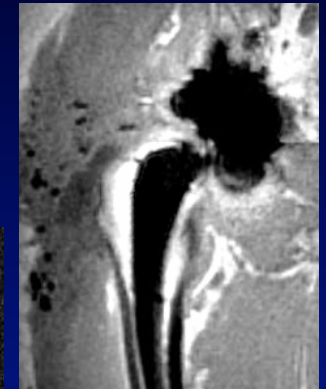
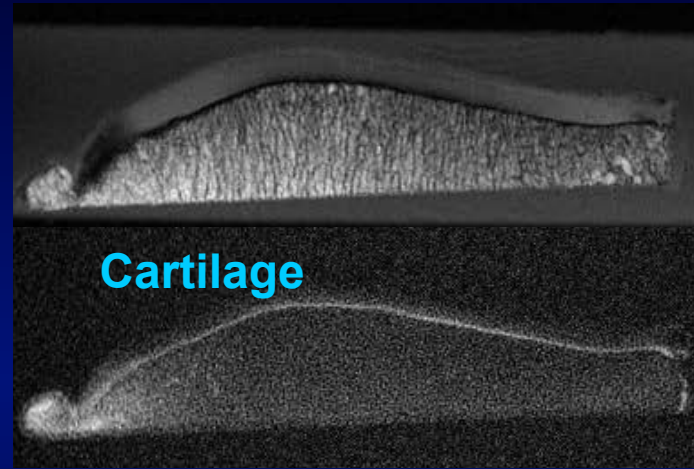
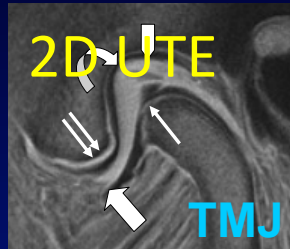
Christine Chung – Director / Won Bae – PI

- Translational research program that has focused on:
 - Implementation of MR pulse sequences (novel/ WIP/ clinically available):
 - To characterize structure of MSK tissues both morphologically and through quantitative MR biomarkers
 - To address clinical imaging and management challenges
 - Explore the potential for quantitative MR biomarkers to reflect tissue function (material property)

Overarching goal is to understand MSK disease processes to establish objective means for early diagnosis and to guide treatment

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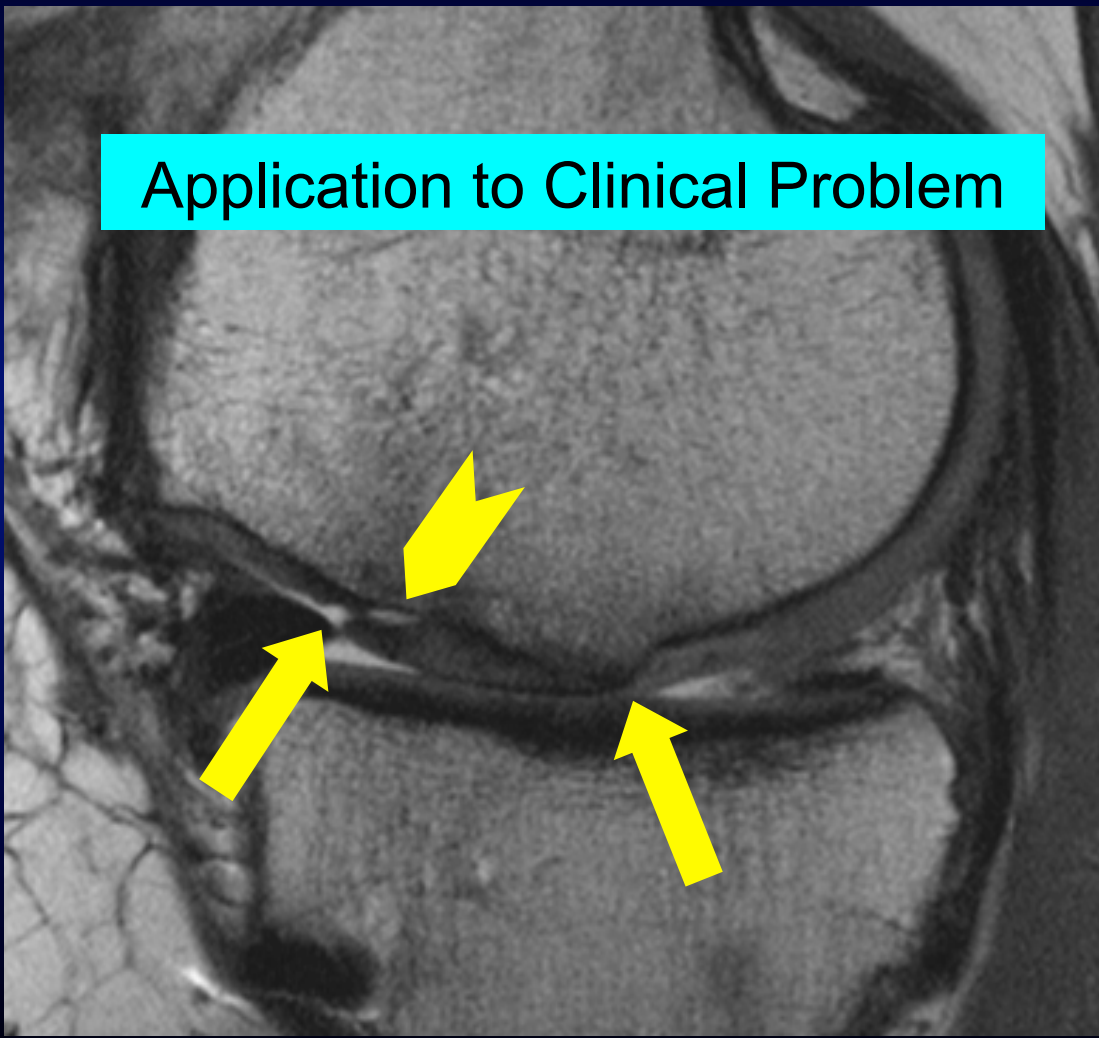
- TMJ
 - NIH R0-1 Chung PI
- Meniscal repair
 - NIH R0-1 Chung PI
- Articular cartilage
 - VA Merit Chung PI
 - NIH R0-1 Du PI, Chung Co-PI
 - NIH R0-1 Du PI, Chung Co-I
- Imaging around metal
 - VA Merit Chung PI
- Spine
 - NIH R0-1 Bae PI, Chung Co-I
- Tendon
 - VA Merit Chang, Chung Co-I



Translational Imaging Articular Cartilage

Clinical Application

Application to Clinical Problem

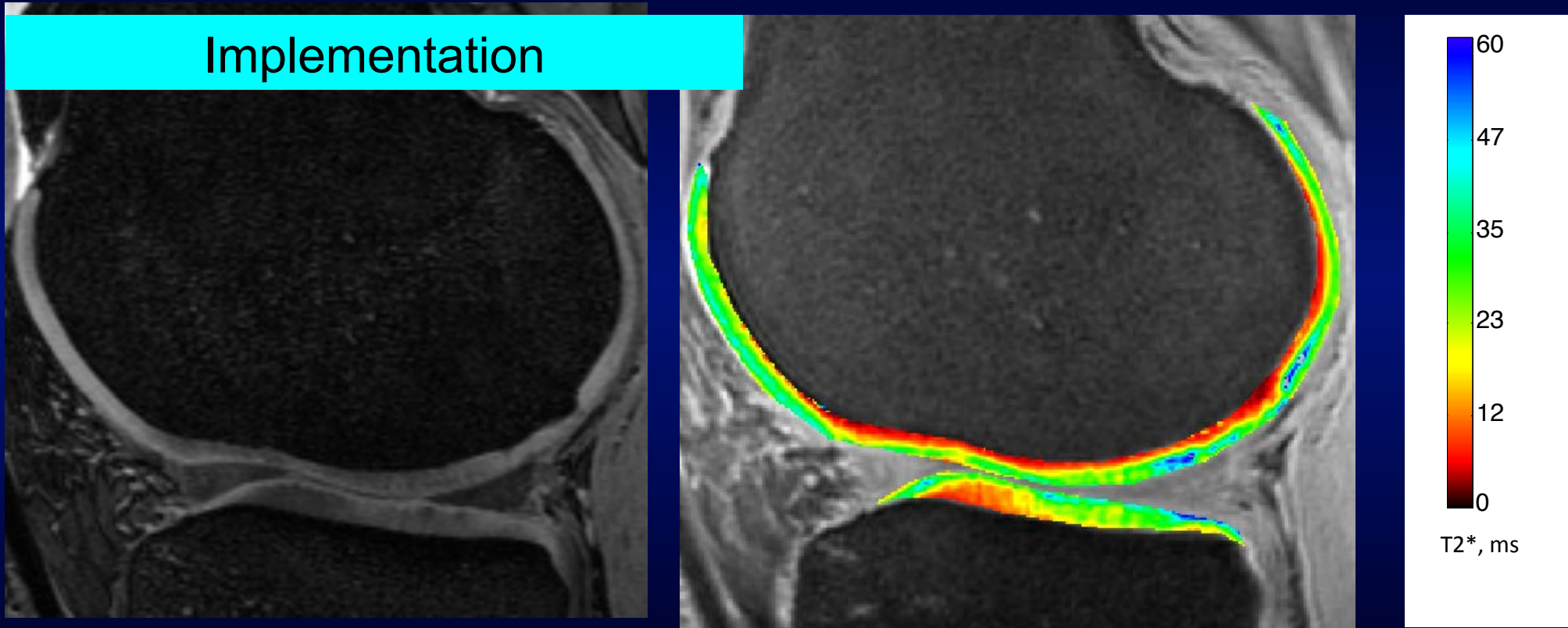


Clinical
Challenge:
Establish
Reconstitution
Of Calcified
Layer Cartilage
In Repair Tissue

Translational Imaging Articular Cartilage

Clinical Application – Cartilage Repair

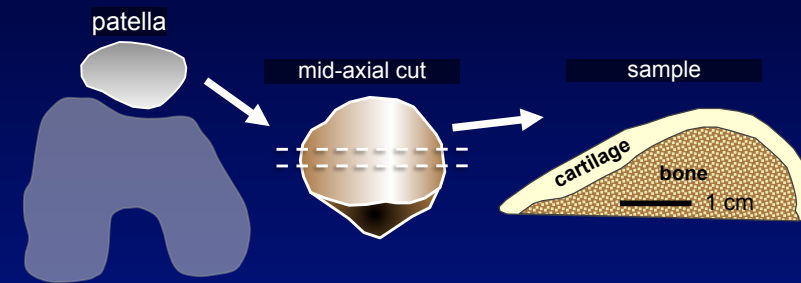
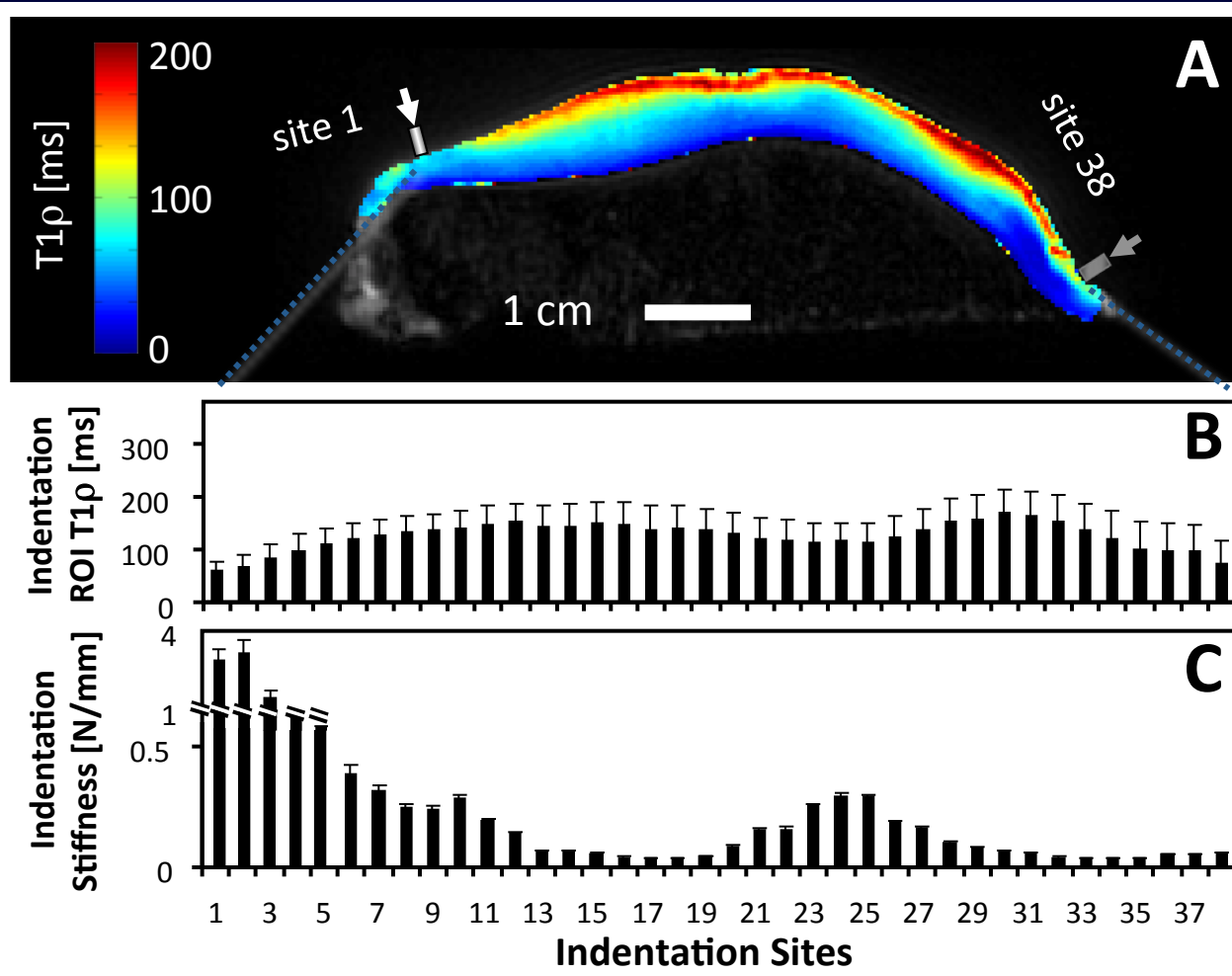
Implementation



- Focal chondral defect 3 years after injury. Note bone overgrowth of defect with overlying thin cartilage repair tissue on DESS. UTE T2* map shows elevated UTE T2* to intact appearing peri-lesional cartilage

Translational Imaging Articular Cartilage

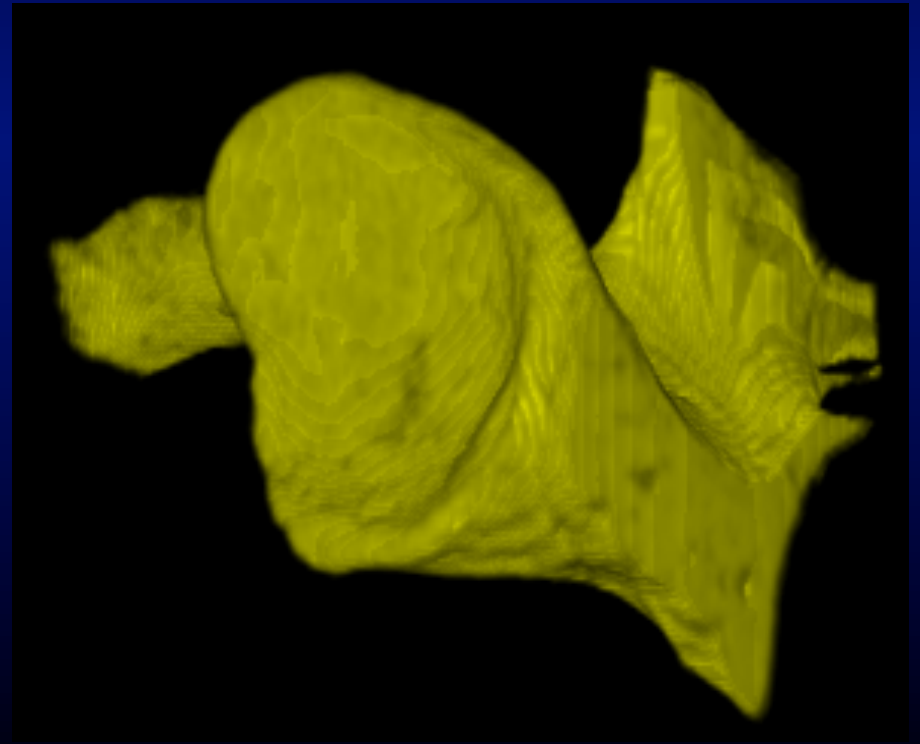
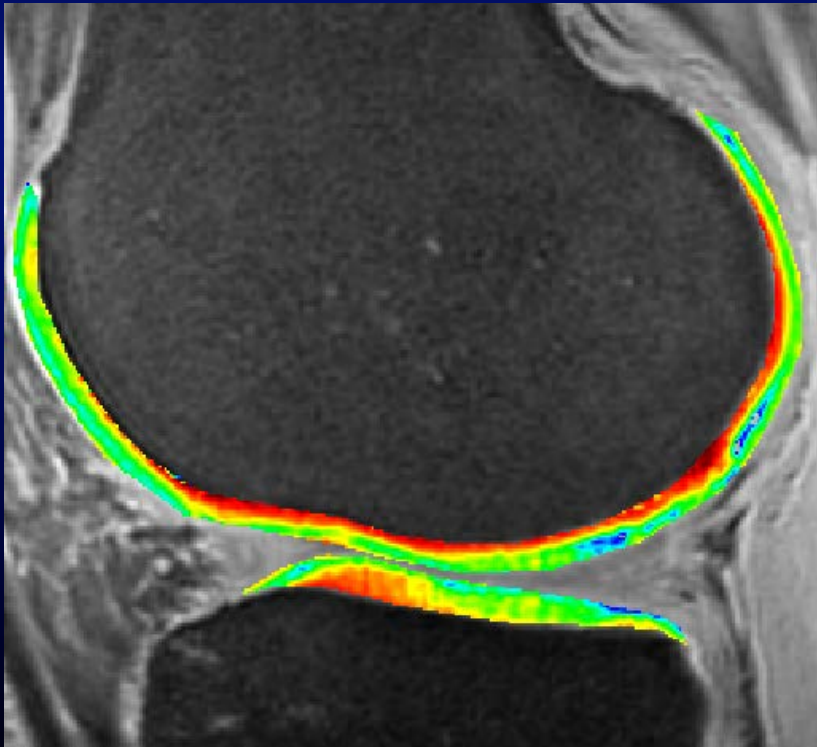
Material Property Quantitative MR (MP qMRI)



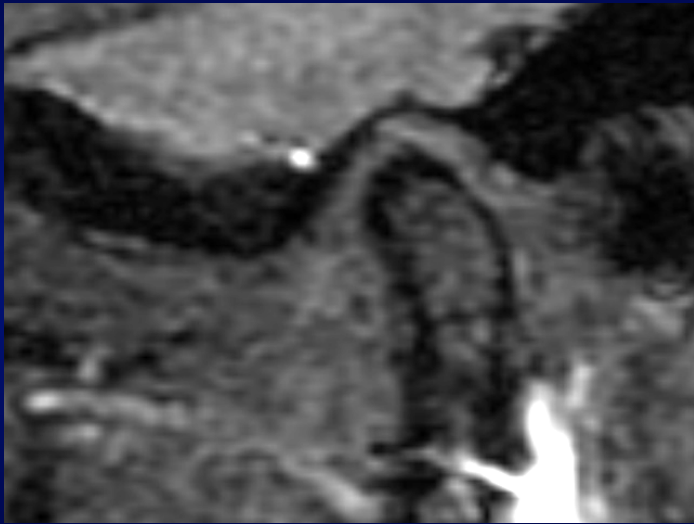
- high T1rho correlated with low indentation stiffness
- T1rho also correlated with biochemical content

Direction and Avenues for Collaboration

- Segmentation, Registration and Post-processing
 - Potential collaboration with NeuroCognetix



Direction and Avenues for Collaboration



Fast Imaging –
Collaboration with
HeartVista to adapt cardiac
package to kinematics in
MSK

RF Coil Development

- Interest and need for coil development and RF lab

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