



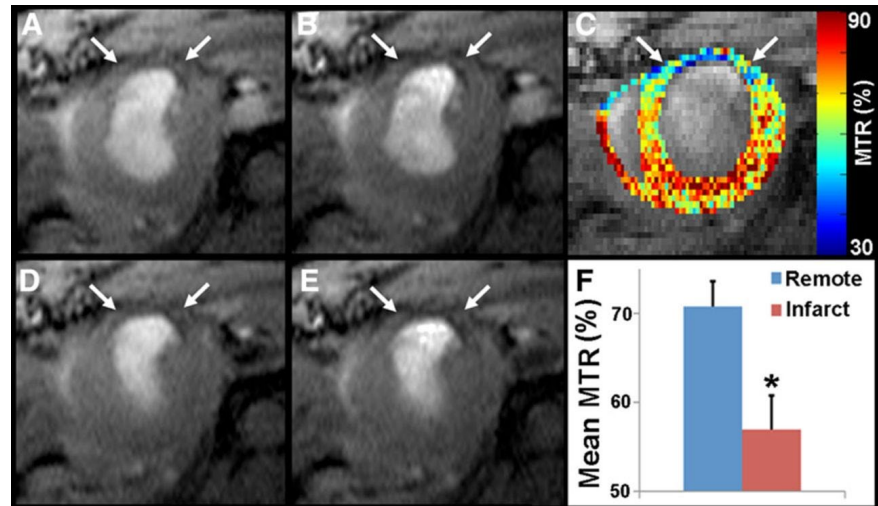
Magnetic Resonance Imaging (MRI) of Tissue Fibrosis Without Contrast Agent



MedTech &
Digital Health

Reference Number: **1665** \ Principal Investigator: **Prof. Michal Neeman** \ Patent Status: **US-2014-0303479-A1**

Cardiac fibrosis, a scarring process that impairs cardiac function and increases the risk of sudden death, remains difficult to detect at early stages with current imaging tools. This technology introduces a novel magnetization-transfer (MT) MRI method for high-sensitivity detection of myocardial fibrosis, enabling quantitative, contrast-free imaging of tissue scarring. The method generates three-dimensional fibrosis maps for diagnosis, disease monitoring, and surgical planning.



APPLICATIONS

- Early and non-invasive detection of myocardial fibrosis in hypertensive, diabetic, or post-infarction patients
- Assessment of anti-fibrotic therapy efficacy and disease progression
- Surgical planning (e.g., RF ablation, cardiac assist device placement) based on 3D fibrosis geometry
- Detection of fibrosis in other organs – liver, kidney, skeletal muscle, or fibrotic cancers
- Pre-clinical platform for studying fibrosis and developing targeted therapies

DEVELOPMENT STAGE

Validated in vivo in mouse models of myocardial infarction, demonstrating accurate detection and temporal monitoring of collagenous scar formation in close correlation with histology. Pulse sequence design and analysis algorithms are established and ready for adaptation to clinical MRI systems.

DIFFERENTIATION



Compatible with
existing MRI
systems



Enhanced sensitivity
versus current
gadolinium-based MRI



No contrast
agent required

REFERENCES

- [M Vandsburger et al, Circ. Cardiovasc. Imaging, 2015](#)

