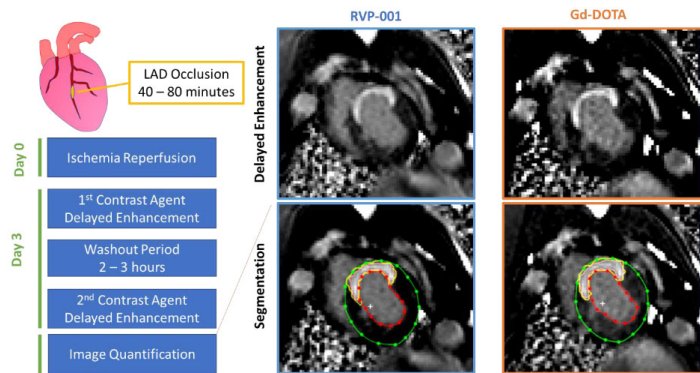


Contrast-enhanced cardiac MRI with a manganese-based alternative to gadolinium for tissue characterization of acute myocardial infarction

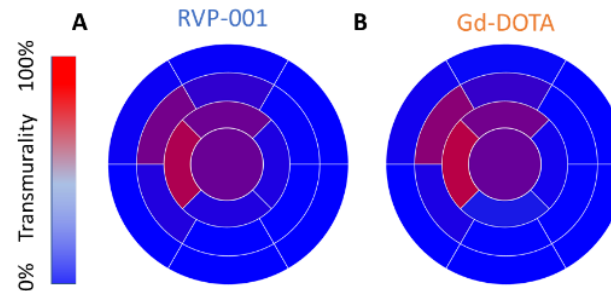
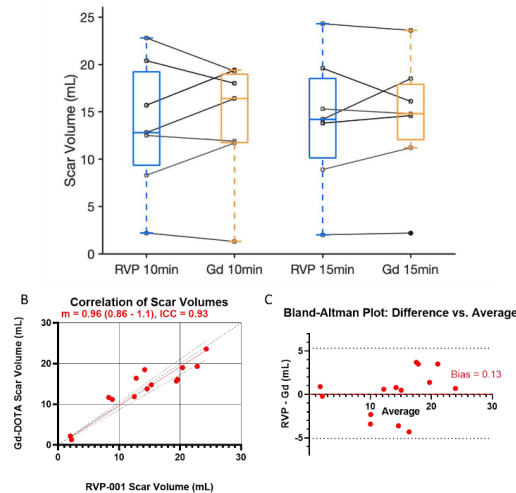
Benjamin Bonner, Salva Yurista, Jaume Coll-Front, Shi Chen, Robert Eder, Anna Foster, Khoi Nguyen, Peter Caravan, Eric Gale, Christopher Nguyen

Methodology

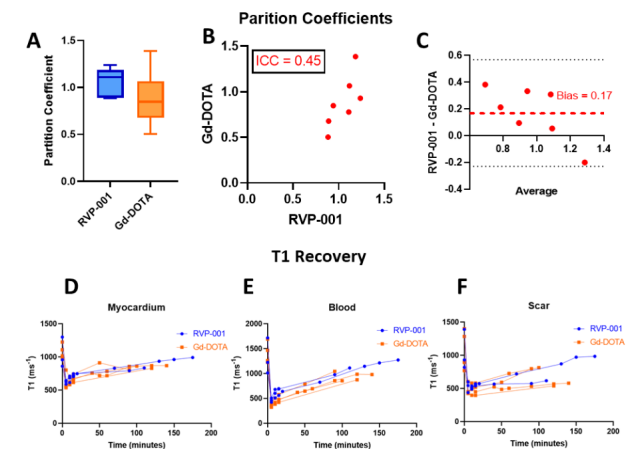


- Late gadolinium enhancement (LGE) is the gold standard in cardiac magnetic resonance (CMR) imaging to visualize and quantify myocardial infarction (MI) severity
- MI remains the major cause of heart failure with reduced ejection fraction, and the prevalence of MI-induced heart failure (HF) has increased steadily over the past five decades.
- The utility of contrast-enhanced CMR has recently been validated against existing standards of care such as invasive coronary artery catheterization in landmark trials such as the MR-INFORM study
- Gadolinium based contrast agents (GBCAs) are contraindicated in patients with a glomerular filtration rate below 30mL/min/1.73m
- [Mn(PyC3A)(H2O)]-, here referred to as RVP-001, has been proposed as a candidate alternative to GBCAs and has been demonstrated to exhibit similar pharmacokinetics and relaxivity to conventional gadolinium agents.

Quantification of Myocardial Injury



Contrast-tissue T1 modification



Conclusion

- This is the first study to validate the in-vivo performance of a manganese-based alternative (RVP-001) to GBCAs for contrast enhanced cardiac MRI of acute myocardial infarction.
- In a MI porcine model, robust performance of RVP-001 demonstrated comparable infarct volumes, transmurality, and post-contrast T1 relaxometry with minimal bias and no significant differences to conventional gadolinium-based measurements.
- Future studies will include chronic and diffuse cardiovascular insults as well as rigorous clinical validation in patients.