

Supplementary Information

Multipulse sodium magnetic resonance imaging for multicompartment quantification: Proof-of-concept

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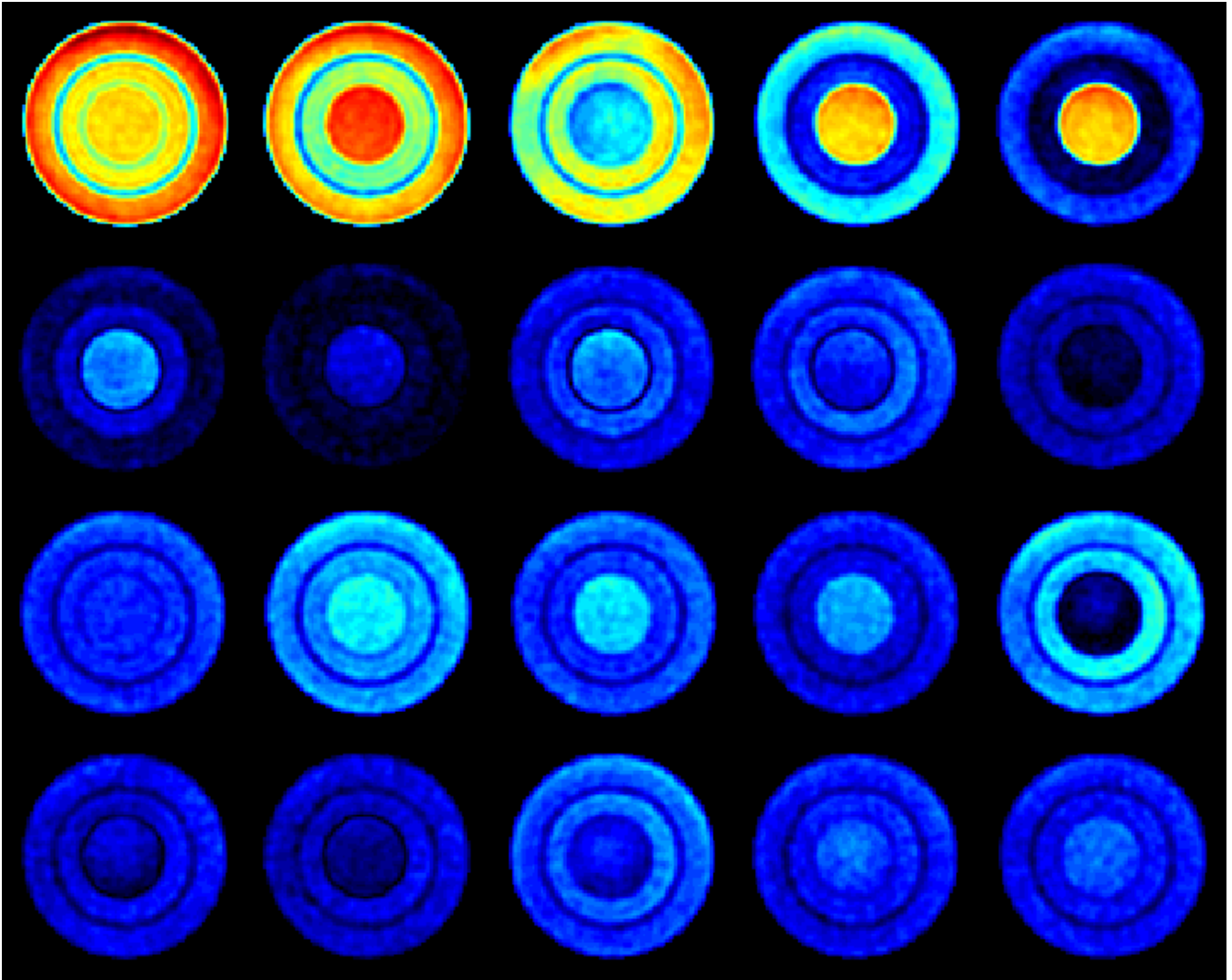


Figure S1. Acquisitions for relaxation times measurements in phantom. Sodium signal acquisitions of the three-compartment phantom over the 20-pulse FLORET sequence used for relaxation time measurements. The 20 RF pulses with flip angles were $\theta_i = 43^\circ, 25^\circ, 99^\circ, 114^\circ, 23^\circ, 122^\circ, 43^\circ, 72^\circ, 68^\circ, 24^\circ, 36^\circ, 56^\circ, 27^\circ, 16^\circ, 107^\circ, 26^\circ, 32^\circ, 79^\circ, 45^\circ, 36^\circ$, with phases $\phi_i = 113^\circ, 159^\circ, 153^\circ, 176^\circ, 72^\circ, 20^\circ, 167^\circ, 4^\circ, 4^\circ, 62^\circ, 44^\circ, 49^\circ, 28^\circ, 93^\circ, 94^\circ, 13^\circ, 57^\circ, 89^\circ, 139^\circ, 142^\circ$, and constant delays $\tau_i = 5$ ms between the pulses.

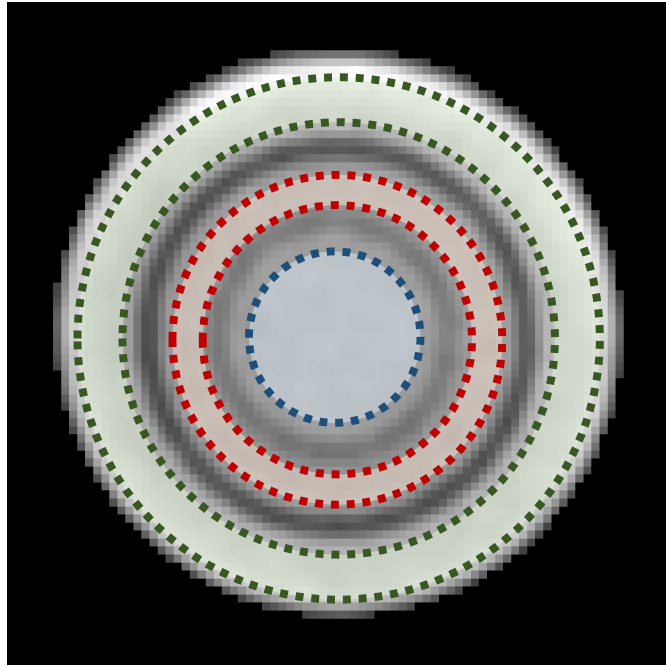


Figure S2. ROIs in phantom. Examples of the three ROIs (red: 8% agar gel, green: 4% agar gel, blue: 0% agar gel) in one central axial slice used to measure the absolute signal evolutions of the three different phantom compartments over a 20-pulse FLORET sequence.

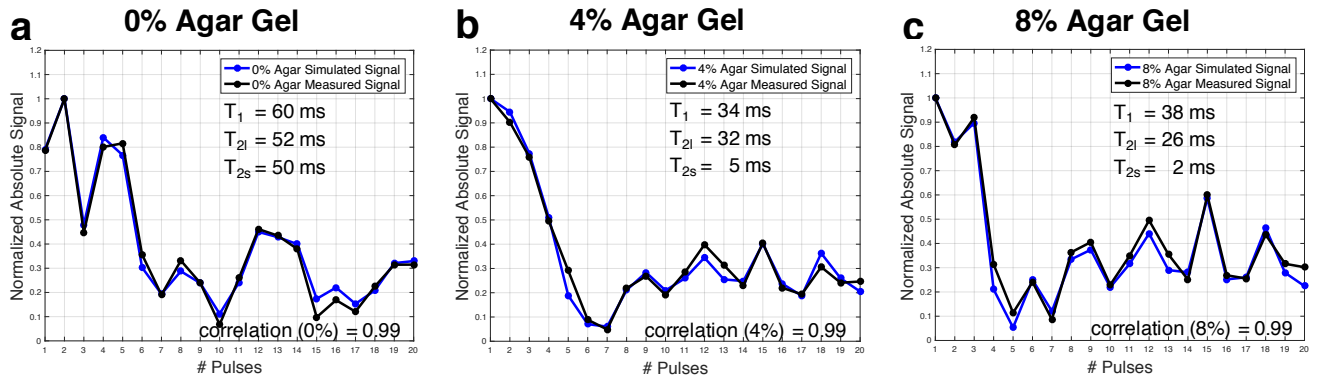


Figure S3. Measured signals for relaxation times matching. Measured normalized ROI ^{23}Na signal evolutions (black) over 20-pulse FLORET sequence for three different phantom compartments, a: 0% agar gel, b: 4% agar gel, c: 8% agar gel, and corresponding ^{23}Na normalized absolute signal simulations from relaxation time dictionary that show maximum correlation to the measured signals. The correlations between measured signal evolutions and matching relaxation time dictionary simulations are 0.99 for all three phantom compartments. The matching simulations provide relaxation times for the three phantom compartments: 0% agar gel: $T_1 = 60$ ms, $T_{2l}^* = 52$ ms, $T_{2s}^* = 50$ ms; 4% agar gel: $T_1 = 34$ ms, $T_{2l}^* = 32$ ms, $T_{2s}^* = 5$ ms; 8% agar gel: $T_1 = 38$ ms, $T_{2l}^* = 26$ ms, $T_{2s}^* = 2$ ms.