

SUPPLEMENT

Details of 3D MRF

For both experiments, three-dimensional MR fingerprinting (MRF) was performed with the same parameters: sinusoidal 320 flip angles, repetition time = 16 ms, echo time = 4 ms, resolution = $0.6 \times 0.6 \times 3 \text{ mm}^3$, field of view = $160 \times 160 \times 72 \text{ mm}^3$ and scan time = 3 minutes 48 seconds. The dictionary was generated based on the Bloch equation in MATLAB (MathWorks). The T1 range of the dictionary was 50–3000 ms with a 10 ms step size and 3050–4000 ms with a 50 ms step size. The T2 range of the dictionary was 5–250 ms with a 1 ms step size, 252–350 ms with a 2 ms step size, and 355–400 ms with a 5 ms step size. Dictionary matching using the inner-product method was performed to acquire quantitative MRF T1 and T2 maps.