Supplementary Material

Long Lived NMR Signal in Bone

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Supplementary Figures

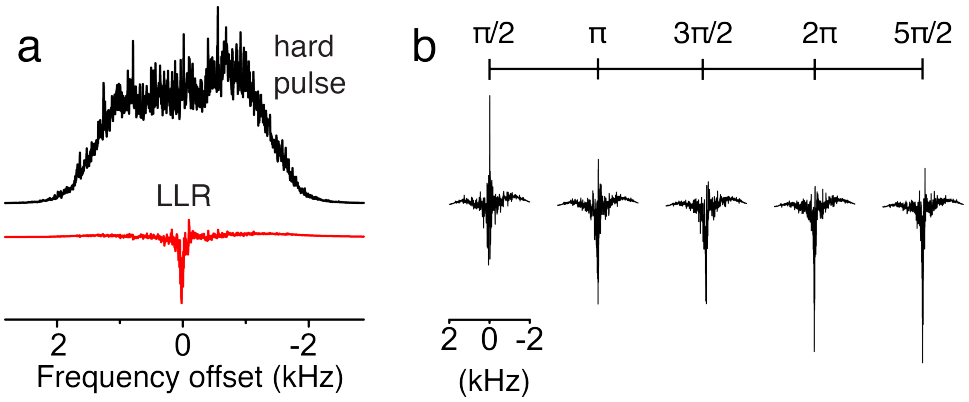

Fig. S1. Simulated spectra of long-lived signal excitation in 10 dipolar-coupled spins. (**a**) Comparison between a conventional spectrum with a π/2 excitation pulse of 25 kHz amplitude (black) and a LLR spectrum (red) using a nominal 2π pulse with 50 Hz power. (**b**) Simulated LLR spectra vs. the flip angle of the excitation pulse (at 50 Hz pulse power). For the simulation a system of 10 dipolar-coupled spins ½ with random dipolar couplings (in the range spanning -750 Hz ~ +900 Hz) and random chemical shifts (spanning -400 Hz ~ +460 Hz) was chosen to mimic a homogeneously broadened system with a continuous spectrum, while avoiding any accidental symmetries. After a rectangular pulse was applied to the thermal equilibrium state, a 2048-point free induction decay was numerically calculated, multiplied by a decaying exponential with decay constant 10 Hz, and Fourier transformed to produce the corresponding spectrum.

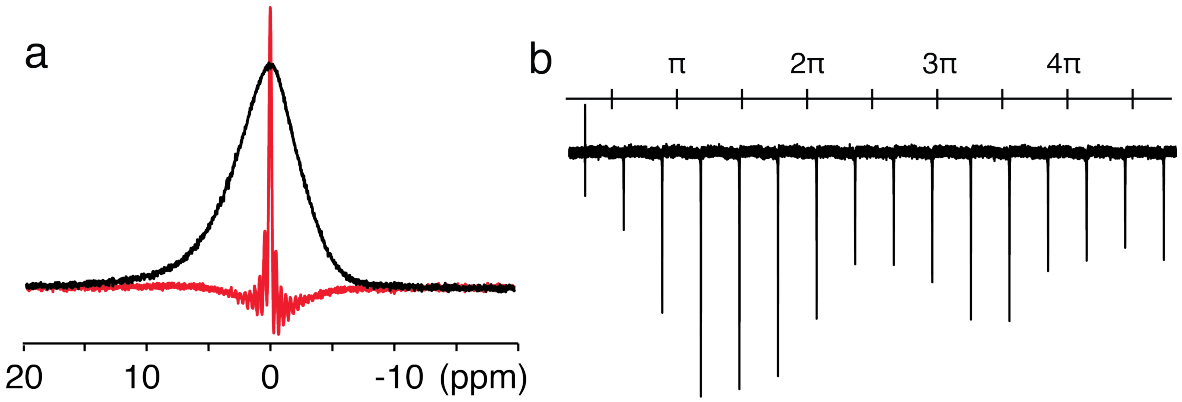

Fig. S2. Conventional and long-lived response ^{1}H spectra of a dry collagen sample. (**a**) Hard-pulse excitation (black) and LLRE spectra with a pulse power of 40 Hz (red). (**b**) LLR signals were excited with pulses with flip angles ranging from ~π/6 to 5π with a pulse power of 40 Hz.

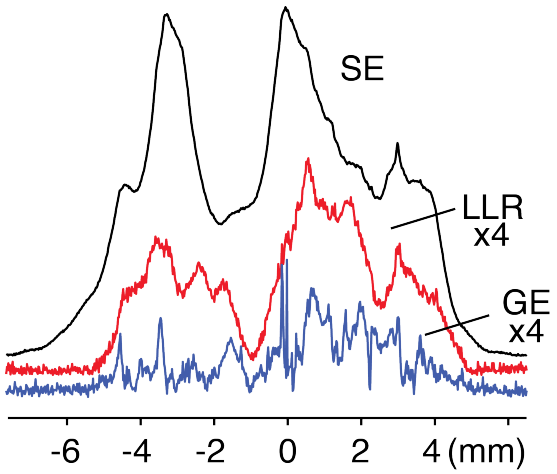

Fig. S3. One-dimensional images of a trabecular bone sample with conventional spin echo (SE) (black), LLR (red) and conventional gradient echo (GE) (blue).

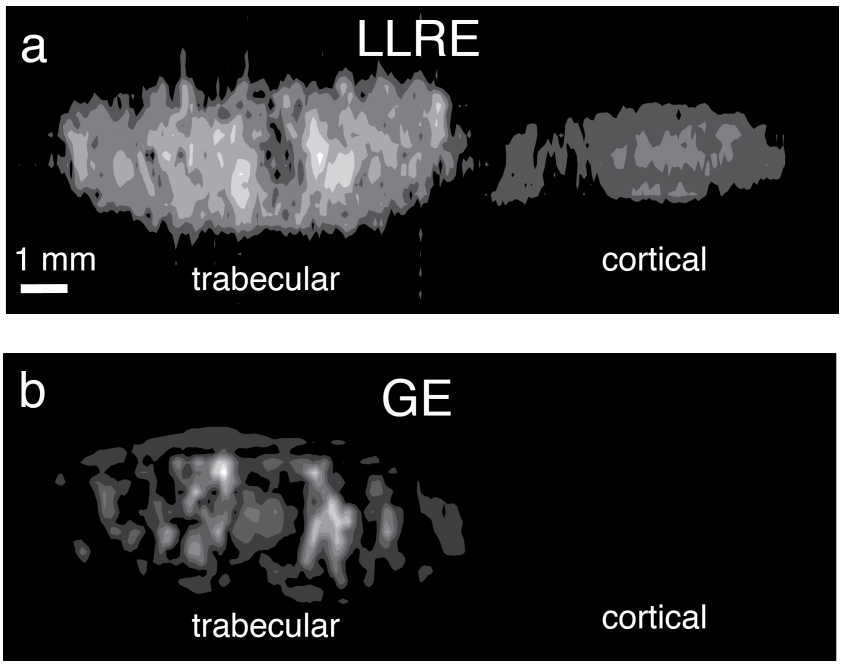

Fig. S4. Two-dimensional images of a sample containing a piece of cortical and trabecular bone. (**a**) LLRE and (**b**) conventional GE. Resolution: 77×226 μm^2.