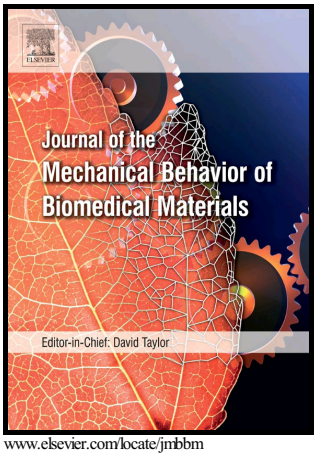

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Viscoelastic power law parameters of *in vivo* human brain estimated by MR elastography

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Abstract

The noninvasive imaging technique of magnetic resonance elastography (MRE) was used to estimate the power law behavior of the viscoelastic properties of the human brain *in vivo*. The mechanical properties for four volunteers are investigated using shear waves induced over a frequency range of 10 to 50 Hz to produce a displacement field measured by magnetic resonance motion-encoding gradients. The average storage modulus (μ_R) reconstructed with non-linear inversion (NLI) increased from approximately 0.95 to 2.58 kPa over the 10-50 Hz span; the average loss modulus (μ_I) also increased from 0.29 to 1.25 kPa over the range. These increases were modeled by independent power law (PL) relations for μ_R and μ_I returning whole brain, group mean exponent values of 0.88 and 1.07 respectively. Investigation of these exponents also showed distinctly different behavior in the region of the cerebral falx compared to other brain structures.

Keywords: elastography, viscoelastic, MRE, Power law

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