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Viscoelastic Characterization of Bovine Trabecular Bone Samples

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Abstract : Knowledge of bone mechanical properties is important for bone substitutes design and fabrication, and more efficient prostheses development. The aim of this study is to characterize the viscoelastic behavior of bone specimens, through stress relaxation and fatigue tests performed to trabecular bone samples from bovine femoral heads. Relaxation tests consisted on preloading the samples at five different magnitudes and evaluate them for 1020 seconds, adjusting the results to a KWW mathematical model. Fatigue tests consisted of 700 load cycles and analyze their status at the end of the tests. As a conclusion we have that between relaxation stress and each preload there is linear relation and for samples with initial Young´s modulus greater than 1.5 GPa showed no effects due fatigue test loading cycles.

Keywords : bone viscoelasticity, fatigue test, stress relaxation test, trabecular bone properties
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