EXPLORATIVE STUDY OF WISTAR RAT FEMORAL BONE BY RESONANT ULTRASOUND SPECTROSCOPY RELATED TO OSTEOPOROSIS PROCESS

P. A. I. Hernández-Becerra¹, D. Ramirez-Infante¹, M. Balleza-Ordaz¹, L. Sandoval-Solis², Diana Ramirez-Saenz³, M. R. Huerta-Franco⁴, M. Vargas-Luna¹ and I. Delgadillo-Holtfort¹.


Osteoporosis is a public disease which affects the skeletal system. It basically consists in the loss of mineral and organic components of bone, such as calcium hydroxyapatite and collagen respectively. These losses increase the bone porosity and lead to diminishing thickness of cortical bone, making them more susceptible to fractures or cracks and therefore influencing negatively the life quality of people with osteoporosis disease [1]. In this work we developed an explorative resonance study of ex-vivo samples of female rat femur at different ages in order to analyze the osteoporosis process. The samples are studied using the resonant ultrasound spectroscopy, RUS, technique, which allows the characterization of a sample by measuring its vibrational frequency spectrum [2]. The samples consist in a set of right femur bones of female Wistar rats at five different stages of life, the stages ranging from youth to old age. To perform the RUS measurements a pair of V150 Panametrics transducers are employed, and the pressure exerted between transducers and the sample is monitored using a Futek load cell for purposes of repeatability. A spline graphic analysis is performed on the measured spectra to study the effects induced on each resonant peak as function of the osteoporosis progress.

Keywords: Ultrasound, Osteoporosis, Mechanical Characterization

References:


Presenting author’s email: variaciones.sintacticas@hotmail.com