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Age-related elemental change in bones

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Abstract

To investigate age dependence of the bone element contents and structure, lumbar and femur from Sprague–Dawley (SD) rats were chosen for their more susceptibility to fracture. These rats were divided into to 5 age groups: 1, 4, 7, 11 and 25 month-age, corresponding human beings from the young to the old. The elements contents were detected by external Proton Induced X-ray emission (PIXE) technique. X-ray Absorption Fine Structure (XAFS) method was also applied to obtain information about calcium (Ca) and phosphor (P) structure. It was found that Ca content, Ca/P ratio, valance state of Ca and P and their coordinate structure remains unaltered with age variance, whereas the content of strontium (Sr) was significantly decreasing. Sr concentration may provide a new parameter for diagnosis of bone disorder.

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