

Natural Uranium Tissue Content of Three Caucasian Males

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Uranium content and concentrations were measured in the tissues of three Caucasian male whole body donors to the U.S. Transuranium and Uranium Registries with no known intake other than from natural environmental sources. Average total body uranium content in the three cases was $81.3 \pm 22.3 \mu\text{g}$, of which $37.2 \pm 2.1 \mu\text{g}$ (46%) was in the skeleton. The skeleton had a mean concentration of $3.79 \pm 0.45 \mu\text{g U kg}^{-1}$ wet weight and $11.72 \pm 1.49 \mu\text{g U kg}^{-1}$ ash. Distribution was in bone volume and not predominately on bone surfaces. Soft tissue concentrations ranged over about an order of magnitude, averaging about $0.5 \mu\text{g kg}^{-1}$ wet weight for all tissues except the thoracic lymph nodes, which averaged 32.3 times the mean for soft tissue of the three cases. Observed thyroid tissue concentrations were about an order of magnitude greater than the average soft tissue concentration in two of the three background cases, suggestive of a possible long-term depot in this organ. Kidney content of uranium averaged $0.38 \pm 0.21 \mu\text{g}$ for the three cases, an order of magnitude lower than the $7 \mu\text{g}$ recommended for Reference Man. The lower content and concentration in the kidney do not support a significant long-term depot for uranium in that organ. Assuming equilibrium between intake and excretion, the tissue data suggest a transfer coefficient from blood to skeleton of 0.14 with a residence half-life in the skeleton of 4,950 d (13.56 y), significantly greater than the 1,500 d (4.1 y) half-time proposed by ICRP.

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