

Distribution of Uranium in Two Whole Body Donors

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Most human biokinetic data for uranium have been obtained by studying individual tissues on autopsy rather than the tissues of an entire organ system or whole body. This study supplements existing data by examining uranium concentrations determined by kinetic phosphorescence analysis (KPA) in tissues of two whole body donors to the United States Transuranium and Uranium Registries (USTUR). Geometric mean skeletal concentrations were calculated to be 4.84 ± 2.79 ng g⁻¹ for Case 0213 and 5.75 ± 3.19 ng g⁻¹ for Case 0242. The skeletal uranium burdens were estimated to be 41,500 ng and 55,900 ng, respectively. Soft tissues had a much larger variability in uranium concentrations. The geometric mean of the soft tissue concentrations were calculated to be 0.699 ± 2.959 ng g⁻¹ for Case 0213 and 0.259 ± 6.390 ng g⁻¹ for Case 0242. The lung tissue concentration of Case 0242 at 1.3 ng g⁻¹ is about 5 times greater than the overall soft tissue geometric mean. Tracheobronchial lymph node concentrations at 22.8 ng g⁻¹ and 65.7 ng g⁻¹ are significantly above the data presented in ICRP 23. The concentration in the kidney for both individuals, at 0.94 ng g⁻¹ and 0.97 ng g⁻¹ was markedly less than the 22 ng g⁻¹ in ICRP 23. Soft tissue uranium burdens were approximately 28,000 ng (Case 0213) and 16,600 ng (Case 0242). Thus, the total uranium body burdens were estimated to be 69,500 ng and 72,500 ng, respectively. Using tissue weights for Reference Man rather than the donor tissue weights, total uranium body burdens in Case 0213 (-96,000 ng) and Case 0242 (-74,000 ng) agree with that of Reference Man at 90,000 ng.

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