

Beryllium in the Tissues of Weapons-site Workers

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Beginning in the 1960's with the mission of acquiring and providing precise information about the effects of plutonium and other transuranic elements in man, the USTUR has followed up to 'old age' almost 500 volunteer Registrants who worked at weapons sites and received measurable internal doses. As shown in the Table below, many of USTUR's tissue donors had also worked extensively with beryllium.

Table. USTUR tissue donors with reported exposure to beryllium.

Donation	Total Number	Primary Actinide Exposure	
		Pu/Am	U
Whole-body	10	9	1
Partial-body	52	47	5
Self-reported years of exposure			
1-10	11-30	31-50	Unknown
21	22	10	9

USTUR has analyzed the actinide contents of donated tissues and routinely preserved about half of each tissue sample for potential future study, e.g., of gene expression and proteomics. The National Human Radiobiology Tissue Repository (NHRTR) holds all tissues donated to USTUR, together with all acid solutions previously used for actinide determination. This is a unique resource for retrospective analysis of the beryllium content of human tissues for comparison with occupational exposure history and beryllium sensitization status. The results of exploratory measurements of the beryllium content of lung, thoracic lymph node and bone for selected USTUR cases will be presented. Two measurement techniques will be tested for this application: Inductively Coupled Plasma (ICP) Mass Spectrometry (MS) and ICP Optical Emission Spectrometry (OES). The technique of Laser Ablation (LA) ICP-MS will also be evaluated, in order to quantify the Be distribution in non-digested lung and lymph nodes.

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