

Micro Trace Minerals Laboratory

environmental & clinical laboratory

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MINERAL ANALYSIS			Hair		
			Lab Number	1H120002	
Doctor	Sample Doctor		Test Date	7/1/2013	
Patient Name	Sample Patient	Sex	w	Age	50
Clinical Information	Sample Report Radiation Elements			Page	1/2
	Acceptable Range	Test Value			
Potentially Toxic Elements (ppm = mg/kg = mcg/g)					
Uranium	< 0.10	0.42	↑		
Radiation Elements (CPS = Counts Per Second = Becquerel (Bq))					
Uranium 235		3,037.00			
Uranium 238		415,784.00			

n.n. = not detected

Accreditation: DIN EN ISO 17025; Quality control: Dipl. Ing. Friedle, Ing. J. Merz, Dr. Rauland; Validation: Dr. E.Blaurock-Busch PhD, Laboratory physician: Dr. med. A. Schönberger

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MINERAL ANALYSIS

Hair

Patient Name	Sample Patient	Lab Number	1H120002	Page	2/2
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Your Analysis Determined The Following Mineral Deficiencies And Excesses. Since it is difficult to distinguish treated samples from untreated ones, it is assumed that the spectroanalytical analysis was performed on chemically untreated hair as requested in our laboratory brochure. Chemically treated hair does not provide reliable results and TMI does not assume responsibility for data obtained from treated hair. The information contained in this elemental analysis report is designed as an interpretive adjunct to normally conducted diagnostic procedures. The findings are best viewed in the context of a medical examination and history.

Uranium (U)

We tested Uranium-238 (U-238), the most common isotope of uranium, 99.3 percent being present in natural uranium. Uranium's most stable isotope, uranium-238, has a half-life of about 4.5 billion years. It decays into thorium-234 through alpha decay or decays through spontaneous fission.

TOXICITY: In 2003, the WHO (World Health Organization) recommended a daily intake of soluble compounds of <math><0.5\mu\text{g}/\text{kg}</math> body weight and <math><5\mu\text{g}/\text{kg}</math> body weight for insoluble compounds. Uranium is not absorbed through the skin, but open wounds facilitate the uptake. When ingested, between 0.2 and 2% is absorbed, when inhaled about 5% is absorbed. The rest is excreted by the kidneys.

Uranium-238 emits alpha particles which are less penetrating than other forms of radiation, and weak gamma rays. As long as it remains outside the body, uranium poses little health hazard (mainly from the gamma-rays). If inhaled or ingested, however, its radioactivity poses increased risks of lung cancer and bone cancer. Uranium is also chemically toxic at high concentrations and can cause damage to internal organs, notably the kidneys. Animal studies suggest that uranium may affect reproduction, the developing fetus, and increase the risk of leukemia and soft tissue cancers. The most serious health hazard associated with uranium mining is lung cancer due to inhaling uranium decay products. Uranium mill tailings contain radioactive materials, notably radium-226, and heavy metals (e.g., manganese and molybdenum) which can leach into groundwater. Near tailings piles, water samples have shown levels of some contaminants at hundreds of times the government's acceptable level for drinking water.

DEPOSITS: U-238 is located in different amounts in soil, water, plants and animal tissues and is often found with other earth metals such as gold or vanadium. Natural uranium is found in Canada, USA, Brazil, South and Central Africa, Australia, France, Sweden and the former USSR. In the Federal Republic of Germany relatively insignificant uranium deposits exist in areas such as the Black Forest. Traces of uranium are contained in coal and are released during combustion.

LABORATORY DETECTION: Uranium can be detected in tissue and urine months after exposure. Hair concentrations reflect the level of exposure over time. Water can, depending on the geographical nature, contain high amounts of uranium.

n.n. = not detected

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