

# Micro Trace Minerals Laboratory

environmental & clinical laboratory

Röhrenstrasse 20, 91217 Hersbruck, Germany  
P.O.Box 4613; Boulder, CO 80306-4613, USA

Phone: +49 (0) 9151/4332  
Facsimile: +49 (0) 9151/2306  
http://www.microtrace.de  
service@microtrace.de



MINERAL ANALYSIS			Hair		
			Lab Number	1H120001	
Doctor	Sample Doctor		Test Date	5/5/2012	
Patient Name	Sample Patient	Sex	m	Age	20
Clinical Information	Sample Report			Page	1/5
	Acceptable Range	Test Value			
<b>Essential Trace Elements (ppm = mg/kg = mcg/g)</b>					
Chromium	0.02 --- 0.21	0.20			
Cobalt	0.01 --- 0.30	0.02			
Copper	10.00 --- 41.00	22.01			
Iodine	0.05 --- 5.00	1.15			
Iron	4.60 --- 17.70	11.57			
Manganese	0.03 --- 1.10	0.19			
Molybdenum	0.03 --- 1.10	0.10			
Selenium	0.40 --- 1.70	12.37	↑		
Vanadium	0.01 --- 0.20	0.07			
Zinc	150.00 --- 272.00	109.86	↓		
<b>Essential Macroelements (ppm = mg/kg = mcg/g)</b>					
Calcium	220.00 --- 1,600.00	585.97			
Magnesium	20.00 --- 130.00	44.19			
<b>Nonessential Trace Elements (ppm = mg/kg)</b>					
Boron	0.08 --- 1.30	1.08			
Germanium	< 1.65	0.03			
Lithium	< 0.30	0.01			
Strontium	0.65 --- 6.90	1.15			
Tungsten	< 0.01	0.01			
<b>Potentially Toxic Elements (ppm = mg/kg = mcg/g)</b>					
Aluminum	< 8.00	20.10	↑		
Antimony	< 0.30	0.27			

n.n. = not detected

These 95percentile Reference Ranges listed above are representative for a healthy population. All elements are tested quantitatively.

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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	Acceptable Range	Test Value			
<b>Potentially Toxic Elements (ppm = mg/kg = mcg/g)</b>					
Arsenic-total	< 0.20	0.10			
Barium	< 4.64	0.51			
Beryllium	< 0.10	0.00			
Bismuth	< 0.20	0.03			
Cadmium	< 0.20	0.14			
Cerium	< 0.10	0.01			
Cesium	< 0.01	0.00			
Dysprosium	< 0.01	0.00			
Erbium	< 0.01	0.00			
Europium	< 0.01	0.00			
Gadolinium	< 0.10	0.00			
Gallium	< 0.20	0.02			
Iridium	< 0.01	n.n.			
Lanthanum	< 0.03	0.01			
Lead	< 3.00	2.64			
Lutetium	< 0.01	0.00			
Mercury	< 0.60	0.29			
Nickel	< 1.00	0.15			
Palladium	< 0.03	0.02			
Platinum	< 0.01	0.00			
Praseodymium	< 0.01	0.00			
Rhenium	< 0.00	0.00			
Rhodium	< 0.01	n.n.			

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	Acceptable Range	Test Value			
<b>Potentially Toxic Elements (ppm = mg/kg = mcg/g)</b>					
Ruthenium	< 0.10	n.n.			
Samarium	< 0.01	0.00			
Silver	< 1.00	0.34			
Tantalum	< 0.01	0.00			
Tellurium	< 0.01	0.00			
Thallium	< 0.01	0.00			
Thorium	< 0.01	n.n.			
Thullium	< 0.00	0.00			
Tin	< 0.70	1.31			
Titanium	< 1.50	0.31			
Uranium	< 0.10	0.02			
Ytterbium	< 0.01	0.00			
Zirconium	< 0.50	0.23			

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## MINERAL ANALYSIS

## Hair

Patient Name	Sample Patient	Lab Number	1H120001	Page	4/5
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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.**

ALUMINIUM (Al) is commonly ingested with food, medicine and water.

COMMON SOURCES: soft drinks, medications, and certain treated waters. Al is also used in certain covering called Waraq which is another source of silver in India as well as Ayurvedic medicines. Aluminum cooking vessels may also be a cause of excessive Al- intake. For decades, aluminum was considered virtually non-absorbable and was thus freely used in a variety of food additives and over-the-counter drugs such as antacids. New research suggests that Al can cause neurological changes as seen in Alzheimer's and Parkinson's disease, and dialysis dementia. Al can bind to DNA, resulting in abnormal neurofibrillary tangles in the brain. Al inhibits the enzyme, hexokinase. It is absorbed in the intestine and excreted via the kidney. Al can be deposited in bones, particularly in the presence of calcium deficiency.

TOXICITY SYMPTOMS include muscular coordination problems, colic and gastric irritation.

THERAPEUTIC CONSIDERATION: Increased blood levels indicate increased exposure and uptake. To decrease uptake and increase elimination, support digestive and kidney function and check calcium balance. Check hair tissue levels to confirm or rule out longterm exposure. Chelation treatments support the binding and elimination of Aluminum. Comparing pre and post urine levels is a direct reflection on the chelating agents binding capacity and the body's ability to detoxify.

SELENIUM (Se) In humans, toxicity is rare, but excessive intake results in alkali disease, characterized by liver and neuromuscular disorders. Long-term exposure or excess supplementation can cause toxicity symptoms including hair loss, arthritis, brittle nails, prevailing garlic breath and body odor, digestive disorders, irritability, kidney impairment, metallic taste in mouth and yellowish skin. THERAPEUTIC CONSIDERATION: sulfates and sulfur-containing amino acids reduce selenium absorption and toxicity. The amino acid methionine detoxifies excess selenium.

TIN (Sn) is considered essential, because some studies suggest that tin deprivation depresses growth in rats. Tin is poorly absorbed and retained by humans and is excreted mainly in the feces. Once tin is absorbed, both the bile and urine are routes of excretion and the level of accumulation seems related to the intake. Large amounts of tin can accumulate in foods that are in contact with tin plate or are absorbed as tin fluoride from toothpaste. Tin has a low toxicity, but tin salts are gastric irritants causing nausea, vomiting, and diarrhea. High tin levels influence the metabolism of several minerals, including calcium, zinc and alkaline phosphates activities in liver and femur. Tin is a potent inducer of heme oxygenase and thus affects heme-dependent functions. TOXICITY SYMPTOMS: vomiting, diarrhea, abdominal cramps, loss of appetite, tightness of chest, metallic taste in mouth, dry throat. Excessive inhalation of tin oxide can cause Stannosis (pneumoconiosis). THERAPEUTIC CONSIDERATION: avoid toothpaste, containing stannous fluoride. Check calcium and zinc levels.

ZINC (Zn) is a cofactor for many metalloenzymes, incl. those involving RNA and DNA synthesis. It is necessary for growth, healthy cell division and insulin production. Pregnant women, cancer and burn patients are at high risk for zinc deficiency, causing fatigue, poor growth, menstrual problem and sexual maturity problems. Deficiency causes are malnutrition and malabsorption. Skin problems, diarrhea, anorexia, hair loss, growth retardation, extreme irritability and increased susceptibility to infection are known deficiency symptoms. The zinc absorption occurs mainly in the small intestine, and Vitamin B6 is needed for utilization. The minimum dialy requirement is 3-10 mg/day, depending on age and sex. In severe zinc deficiency states, a much higher intake is warranted with proper supervision. SOURCE: yeast, meat, fish, legumes, and eggs. The zinc in whole grains has a low bio-availability. Phytates block zinc absorption and a high intake of uncooked grains or unleavened bread can cause zinc deficiency. THERAPEUTIC CONSIDERATION: zinc supplementation plus increased vitamin B6 intake. High exposure to toxic metals reduces the zinc absorption and increases the need for zinc and Viit. B6 supplementation.

**The following nutritional program is aimed at providing optimum health. The program is suitable for patients 12 years and older. It is recommended for 3-4 months, after which a repeat analysis is recommended. A follow-up test would evaluate and determine your body's ability to digest and absorb nutrients. If any questions or problems arise, consult your medical doctor or health care provider.**

### Al

To reduce the aluminum uptake, support digestive function. Increase fiber intake and support intestinal function. Lactobazillus acidophilus improves the intestinal pH and flora, which in turn reduces the aluminum uptake.

n.n. = not detected

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## Hair

Patient Name	Sample Patient	Lab Number	1H120001	Page	5/5
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### Se

To reduce selenium levels, increase intake of vitamin B6 and support kidney function

### Sn

To reduce tin levels, avoid canned foods and fluoride toothpastes. Increase Riboflavin intake

### Zn

Increase zinc intake, 5-25mg daily depending on age and condition. Take after dinner plus Vitamin B6 to improve zinc absorption.

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