

## LABORATORY SERVICES

### **Micro Trace Minerals** Laboratory

Clinical & Environmental Laboratory  
for Doctors and Patients Worldwide



# LABORATORY SERVICES

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### CONTENT

2   3	CERTIFICATES AND RECOGNITION
4   5	ANALYSES AND TESTS – URINE
6   7	ANALYSES AND TESTS – STOOL
8   9	ANALYSES AND TESTS – SALIVA
10   11	PORPHYRINS
12   13	ANALYSES AND TESTS – BLOOD, SERUM, PLASMA
14   15	VITAMIN D
16   17	HAIR- OR NAIL TISSUE ANALYSIS
18   19	ANALYSES AND TESTS – WATER, RADIOACTIVE MATERIAL, SOIL, COSMETICS, PHARMACEUTICALS, NUTRITIONAL SUPPLEMENTS, ALGAE AND FOODS
20   21	DETOXIFICATION- AND ANTIOXIDATIVE ENZYMES
22   23	ORGANIC ENVIRONMENTAL TOXINS
24   25	FUR ANALYSIS
26   27	VETERINARY TESTS – BLOOD, SERUM, PLASMA
28   29	ELEMENTS AND ISOTOPES
30   31	BOOK LIST
32   33	REPORT EXPLANATION
34   35	REFERENCE RANGES
36   37	RESEARCH & SEMINARS



Micro Trace Minerals, Germany, was founded by Dr. E. Blaurock-Busch in 1975. In addition, she owned and operated Trace Minerals International Inc. in Boulder, Colorado from 1984 to 2000. Today, Micro Trace Minerals and Partners are operating in Germany and Colorado, USA, serving doctors worldwide.

- We regularly participate in laboratory round robins, and have achieved excellent results, which are open for you to see.
- All testing is performed with the highest quality control standards.
- Our turnaround time is between 3-7 days after sample receipt.
- We have researchers who constantly engage in the development of improving protocols
- We invest in research to improve diagnostic and therapeutic knowledge
- We are engaged in teaching laboratory diagnostics on a worldwide basis
- We regularly publish in international journals
- The food and pharmaceutical testing division under Dipl Ing Friedle & Dr. Rauland performs testing worldwide
- We utilize state-of-the art equipment such as ICP-MS with cell technique for metal testing, and use up-to-date equipment for all other laboratory tests, many of which are not listed here.
- Our personnel holds high academic standards and appreciates inquiries
- We provide reports in English, German, Italian, French, Spanish and Portuguese
- All Profiles & Prices are subject to change.
- We are not required to add sales tax for services provided to doctors and patients of non-European countries.

We are dedicated to serve you and your patients,

Ing. Albrecht Friedle, Laboratory Manager, Quality control

Dr. E. Blaurock-Busch PhD, Director of Research and Data Validation

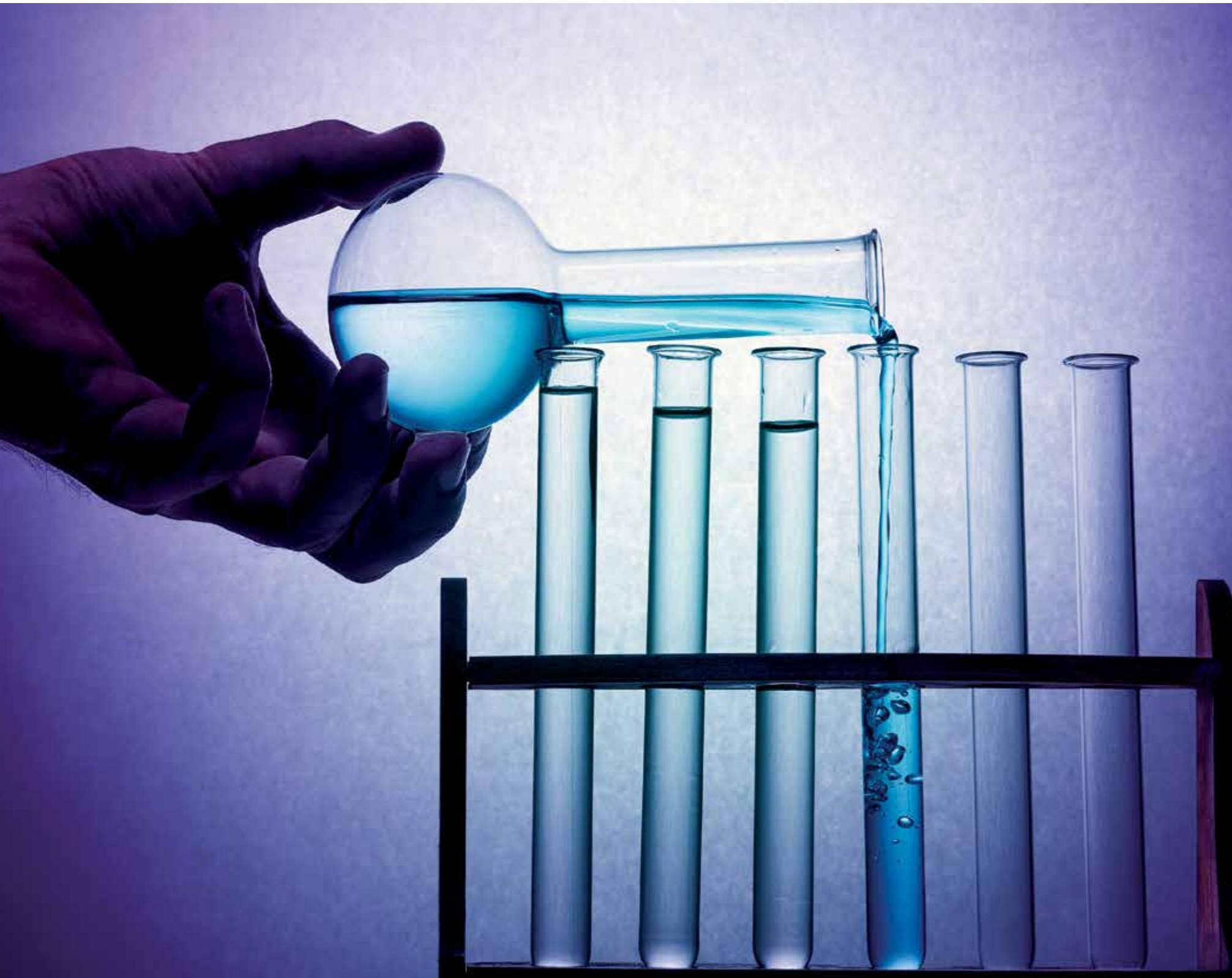
Yvette M Busch, BA, CEO

Micro Trace Minerals GmbH, Director, CEO Yvette Busch District Court Nuernberg Germany HRB 21937



# CERTIFICATES + RECOGNITION

## CERTIFICATES AND RECOGNITION



**Deutscher  
Akkreditierungs  
Rat**



Accreditation for clinical and environmental laboratory services



Accreditation for testing of food products



GMP Zertifikat



Accreditation for testing of pharmaceutical products



Quebec Multielement external Assessment Scheme (QMEQAS)

Accreditation/Recognition/Membership

AKS-PL-20918 Federal Accreditation Bureau Hannover

ISO/IEC 17025:2005

RECIPE Reference Laboratory 2011

RELANA Quality Circle

(Membership granted to laboratories with high level of performance)

QS-recognized laboratory for food testing

GMP Certification §14, 4 Nr 3, Testing of Pharmaceuticals

# ANALYSES AND TESTS

## URINE



## URINE

### BASELINE URINE

- Under normal conditions, a baseline urine test shows urine metal concentrations that are either within, or slightly outside the reference ranges. The test serves as a comparison, and may be legally required to compare urine baseline concentrations with urine challenge test values. A baseline urine test is best taken before the first treatment. We recommend that the patient stops eating fish for three days prior to collecting the urine, because fish may contain high amounts of arsenic or mercury. It is also recommended to stop smoking and to stop nutritional supplementation the day before urine collection takes place.
- Urine is not useful to diagnose a classical deficiency of essential elements such as zinc, copper or selenium. It only suggest an inadequate intake.
- If baseline urine zinc levels are low prior to a EDTA or DMPS provocation, supplementation is recommended. EDTA and DMPS have strong zinc binding capabilities.

### URINE CHALLENGE TESTS

- The urine metal concentration after a challenge test demonstrates the chelating substances metal binding ability.
- We provide reference ranges that apply to specific chelators.
- We reserve the right to limit metal testing, if needed. For instance, if a metal-bound chelator such as CaEDTA is used, we do not report calcium; if ZnDTPA is used, we do not report zinc, etc.
- High copper values in post chelation urines may mask mercury excretion i.e. provide false low results.

We provide single element testing on request. Please ask for pricing.

#### Standard Profile (P1)

Tested are:

Calcium, Magnesium, Chromium, Cobalt, Copper, Germanium, Iron, Manganese, Molybdenum, Lithium, Selenium, Strontium, Vanadium and Zinc, plus Aluminium, Arsenic, Barium, Beryllium, Cadmium, Lead, Nickel, Mercury, Silver, Tin, Antimony, Bismuth, Platinum, Thallium plus creatinine

**Material**  
5-7ml Urine

**Method**  
ICP-MS

#### Dental- and Environmental Profile (P40)

Tested are:

Aluminium, Arsenic, Barium, Beryllium, Boron, Cadmium, Cerium, Cesium, Chromium, Cobalt, Copper, Gallium, Gadolinium Iridium, Iodine, Lead, Manganese, Mercury, Molybdenum, Nickel, Palladium, Platinum, Rhodium, Selenium, Silver, Strontium, Tantalum, Thallium, Tin, Titanium, Uran, Vanadium, Zirconium, Zinc, plus creatinine

**Material**  
5-7ml Urine

**Method**  
ICP-MS

#### Nutrient- and Toxic Profile (P6)

Tested are:

If B12 is given, Cobalt value will be high  
Calcium, Magnesium, Chromium, Iron, Cobalt, Copper, Germanium, Lithium, Manganese, Molybdenum, Selenium, Strontium, Vanadium, Zinc plus Aluminium, Antimony, Arsenic, Barium, Beryllium, Bismuth, Cadmium, Cesium, Gallium, Lead, Mercury, Nickel, Palladium, Platinum, Silver, Thallium, Tin, Titanium, Tungsten, Uranium, Zirconium, plus creatinine

**Material**  
5-7ml Urine

**Method**  
ICP-MS

#### Gold

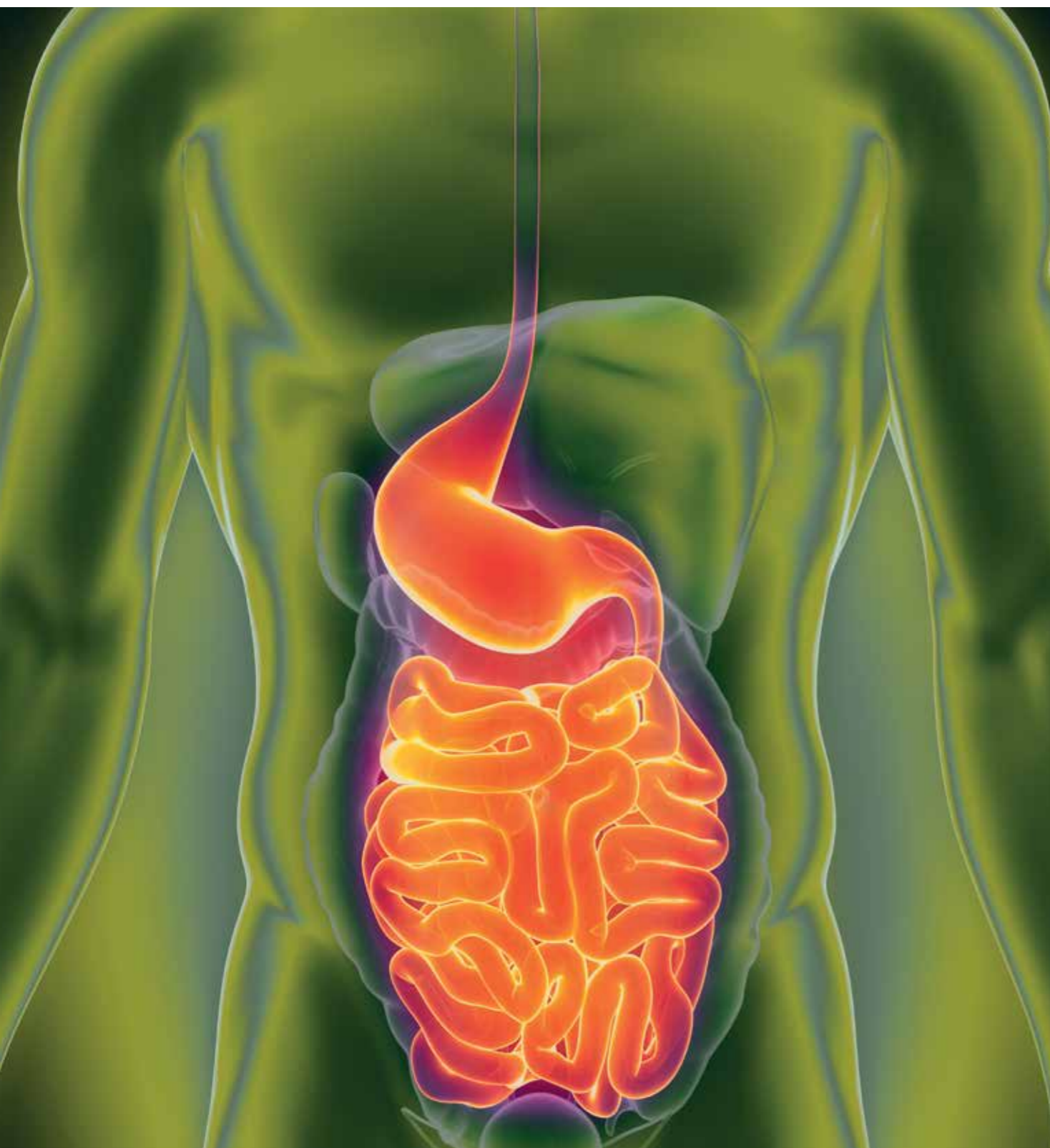
**Material**  
5-7ml Urine

**Method**  
ICP-MS



# ANALYSES AND TESTS

## STOOL METALS



STOOL

## STOOL METALS

When oral chelators are used, significant metal binding can happen within the digestive tract. The metal concentration of fecal matters before chelation is a reflection of the oral metal intake.

The metal concentration after oral chelation demonstrates the chelator's metal binding concentration.

### Standard Profile (P39)

Tested are:

Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Copper, Lead, Mercury, Nickel, Silver, Tin, Uranium

Gold

### Material

5gr Stool

5gr Stool

### Method

ICP-MS

ICP-MS

### Extended Profile (P38)

Tested Elements Parameter as profile 39 plus:

Aluminum, Barium, Cerium, Cesium, Chromium, Cobalt, Gallium, Iodine, Manganese, Molybdenum, Platinum, Selenium, Strontium, Tantalum, Thallium, Titanium, Tungsten, Vanadium, Zinc

### Material

5gr Stool

### Method

ICP-MS

# ANALYSES AND TESTS

## SALIVA METALS



## SALIVA

### SALIVA METALS

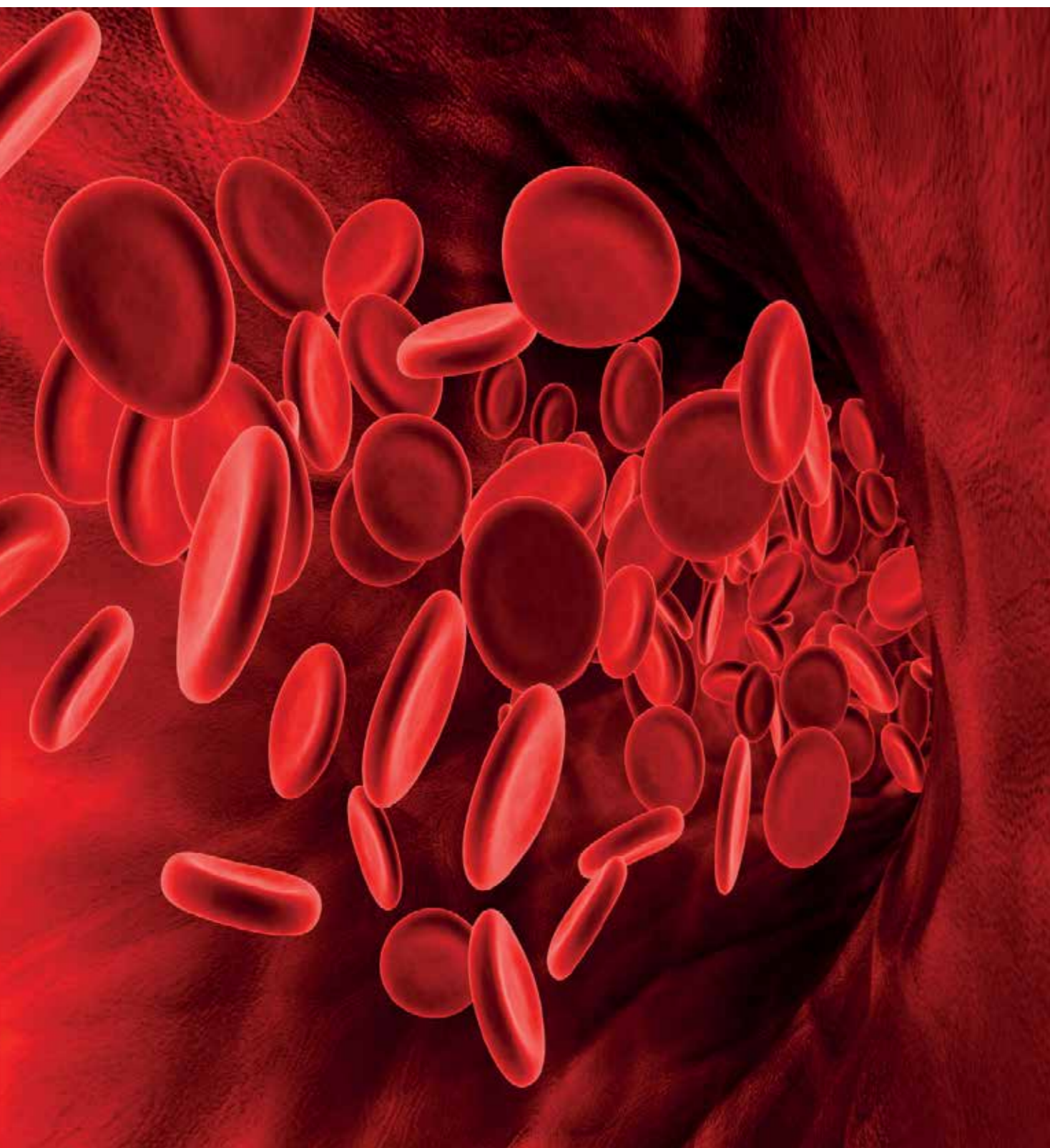
A high metal concentration of saliva is generally due to metal release from dental material. When we compare the metal concentration of saliva before and during a chewing gum test, we can see a marked increase in metal release, when amalgam fillings are old and porous.

<b>Dental Profile (P3)</b> Spectroscopic analysis of saliva / dental metal test / amalgam test: Tested Elements: Cadmium, Chromium, Cobalt, Copper, Gallium, Iridium, Mercury, Molybdenum, Nickel, Palladium, Platinum, Rhodium, Silver, Tin	<b>Material</b> 3ml Saliva	<b>Method</b> ICP-MS
<b>Dental Profile + Gold (P5)</b> Tested Elements Parameter as profile 3 plus: Gold	<b>Material</b> 3ml Saliva	<b>Method</b> ICP-MS
<b>Extended Dental Profile (P43)</b> Tested Elements Parameter as profile 3 plus: Aluminum, Beryllium, Boron, Cerium, Iron, Lanthanum, Manganese, Niobium, Rhenium, Ruthenium, Tantalum, Titanium, Tungsten, Vanadium, Zinc, Zirconium	<b>Material</b> 3ml Saliva	<b>Method</b> ICP-MS
<b>Extended Dental Profile + Gold (P45)</b> Tested Elements Parameter as profile 43 plus: Gold	<b>Material</b> 3ml Saliva	<b>Method</b> ICP-MS



# ANALYSES AND TESTS

## PORPHYRINE



## PORPHYRINE

### PORPHYRINS – URINE

Also known as: Uroporphyrin; Coproporphyrin; Protoporphyrin; Delta-aminolevulinic Acid; ALA; Porphobilinogen; PBG; Free Erythrocyte Protoporphyrin; FEP

Porphyryns are organic compounds, one of them being hemoglobin, the protein in the red blood cells which carries oxygen in the blood. Porphyryns can be best measured in the urine.

High levels of porphyryns found in urine can be tied to lead (Pb) intoxication, and to long-term mercury (Hg) exposure in adults and children, especially the autistic. Porphyryn changes in the urine analysis can also be used as a biomarker for adults who are exposed to elemental mercury (Hg) in the workplace.

Symptoms of porphyria can also be seen in other diseases, making this a difficult diagnosis.

There is the Neurologic (or acute) Porphyria, which primarily affects the nervous system & the Cutaneous Porphyria, which primarily affects the skin. Both of these may be triggered by drugs, alcohol, and other environmental factors such as diet, stress, and illness.

The first and easiest step is to monitor porphyryns in the urine. Measuring porphyryns in plasma or other fluids is not necessary to make a diagnosis.

Test material: Send a sample about 10ml Urine of the 24h urine collection, listing total volume, or about 10ml of a random sample. The urine sample must be protected from light during collection and shipping.

#### **Porphyryns, Total, Urine**

The Total Porphyryn Level is tested.

#### **Material**

10ml urine of the 24h urine collection.  
Provide total volume of 24h collection

#### **Method**

HPLC

#### **Porphyryns, Quantitative Differentiation**

Tested:

Uroporphyrin, Heptacarboxyporphyrin, Hexacarboxyporphyrine  
Pentacarboxyporphyrin, Coproporphyrin

#### **Material**

10ml urine of the 24h urine collection.  
Provide total volume of 24h collection

#### **Method**

HPLC



# ANALYSES AND TESTS

## BLOOD, SERUM, PLASMA



## BLOOD, SERUM, PLASMA

### METAL ANALYSIS BLOOD, SERUM, PLASMA

Blood is a transport system that provides body systems with nutrients and toxins. High blood metal levels are a direct reflection of immediate exposure, low values of nutrient elements such as zinc reflect a low intake that may result in deficiency symptoms.

As long as metals circulate in blood, organ systems including hair receive and store them. An inadequate excretion system results in increased metal storage.

#### **Nutrient and Toxic Profile** (P4)

Tested Elements:

Aluminum, Antimony, Arsenic-total, Beryllium, Bismuth, Cadmium, Chromium, Cobalt, Copper, Iodine, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Selenium, Silver, Thallium, Tin, Uranium, Vanadium, Zinc, Zirconium

#### **Material**

3-5ml EDTA Whole Blood  
in metal free tubes

#### **Toxic Profile** (P49)

Tested Elements:

Aluminum, Arsenic-total, Cadmium, Gadolinium, Lead, Mercury, Nickel, Palladium, Tin

#### **Material**

3-5ml EDTA Whole Blood  
in metal free tubes

#### **Extended Micronutrient Profile** (P35)

Tested Elements:

Calcium, Copper, Iron, Magnesium, Manganese, Selenium, Zinc

#### **Material**

3-5ml EDTA Whole Blood

#### **Micronutrient Profile** (P36)

Tested Elements:

Calcium, Copper, Iron, Magnesium, Selenium, Zinc

#### **Material**

3-5ml EDTA Whole Blood

#### **Serum or Plasma Metals** (P18)

Tested Elements:

Aluminum, Antimony, Beryllium, Bismuth, Cadmium, Calcium, Copper, Gallium, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Selenium, Silver, Thallium, Tin, Uranium, Zinc

#### **Material**

3-5ml EDTA Whole Blood



# ANALYSES AND TESTS

## VITAMIN D

## VITAMIN D

### VITAMIN D

Vitamin D is referred to as a fat-soluble vitamin when in fact it is a pre-hormone, necessary for many body functions. It is stored in fatty tissue for longer periods of time.

Vitamin D is often considered the “sunshine” vitamin since production is stimulated through exposing the skin (without sunscreen) in the sun. It is said that 10-15 minutes of sunshine three times weekly is enough to produce the body’s requirement of Vitamin D. People living in regions where days are predominantly cloudy, or have high pollution, or live in countries where full clothing is necessary often show Vitamin D deficiencies.

Most of the positive effects of solar radiation are linked to ultraviolet-B (UVB) rays which are responsible of Vitamin D production in skin.

Some foods contain high amounts of Vitamin D, such as fatty fish (salmon & mackerel), grain cereals, oysters, caviar, fortified daily products, as well as soy products, but it is almost impossible to receive sufficient vitamin D from the diet.

Vitamin D plays a vital role in the calcium & phosphorus absorption. A lack of Vitamin D in early age can cause bone and tissue malformation, rickets and osteoporosis later in life. Vitamin D also helps to keep the immune system strong and provides a protection from autoimmune diseases, hypertension, and infectious disease. Low vitamin D levels have been associated with an increased risk of developing cancer. Vitamin D deficiency has been linked to depression.

*Kjaergaard M, Waterloo K, Wang K etc al. Effects of Vitamin D supplement on depression scores in people with low levels of serum 25-hydroxyvitamin D: nested case-control study and randomised trial. Br J Psychiatry. 2012 Jul 12.*

A Vitamin D deficiency is a common occurrence, though often overlooked, which can result from:

- Lack of exposure to sunlight as outlined above and a lack of enough vitamin D in the diet
- Liver and kidney diseases
- Poor food absorption
- Use of certain medicines, including phenytoin, phenobarbital, and rifampin

Higher-than-normal levels of Vitamin D may be due to a condition called Hypervitaminosis D, also known as Vitamin D toxicity, a rare but potentially serious condition that occurs when too much vitamin D is supplemented.

Vitamin D is easily measured in Serum, and the 25-hydroxy vitamin D test is considered the most accurate.

#### **Vitamin D**

25-Hydroxy-Vitamin D (25-OH-D)

#### **Material**

3ml Serum

#### **Method**

CLIA

#### **1,25-Dihydroxy-Vitamin D ( Calcitriol)**

1,25-Dihydroxy-Vitamin D(1,25-(OH)2D3)  
Calcitriol

#### **Material**

3ml Serum  
frozen

#### **Method**

CLIA

# HAIR- OR NAIL TISSUE ANALYSIS



## HAIR- OR NAIL TISSUE ANALYSIS

### SAMPLING PROCEDURE

Hair provides a record of past and current trace element levels. Unlike blood, hair is an inert substance that consists of a fibrous protein and trace elements. As hair grows, nutrient and toxic elements are deposited from the blood stream into the hair follicle and hair shaft. Once a trace element has been incorporated into the hair, it remains fixed. To measure these values reliably and with good reproducibility, the following criteria must be met:

- Untreated head hair cut from the back of the head is the preferred sample.
- Do not mix different sample types (i.e. hair with nails).
- Hair that has been chemically treated ("permed", dyed, bleached, or otherwise treated) will not provide accurate results. If the hair has been treated, it should be allowed to grow for at least 2-3 months before new sampling.

#### Long Hair

- 1) Part the hair in the middle of the back of the head, and pull it out and up.
- 2) Cut 1.5 to 2 inches (4.5 to 5.5 cm.) strands of hair close to the head. DISCARD ends of long strands and KEEP less than 2 inches (less than 5.5 cm) closest to the scalp.
- 3) Repeat cutting on various regions on the back of the head until enough hair is obtained.
- 4) Place hair in sampling envelope, fill out the Submission Form with the appropriate information and send to laboratory.

#### Short hair

- 1) Trim .5 to 1 gram of hair from the back of the head. Use thinning scissors, if possible.
- 2) Place hair in sample envelope, fill out the Submission Form with the appropriate information and send to laboratory.

#### Nails

Needed material:  
0,2gr clean finger- or toenails.  
No nail polish, please

#### Standard Profile (P9)

Tested are  
Aluminum, Antimony, Arsenic-total, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Germanium, Iodine, Iron, Lead, Lithium, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Palladium, Platinum, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, Zinc, Zirconium

**Material**  
0,3 gr Hair or  
0,2gr Nail

**Method**  
ICP-MS

#### Extended Profile (P10)

This extended profile tests all metals as shown in the Basic Profile above, plus these additional metals which find use in industry, medicine or dentistry.  
Tested are  
Cerium, Cesium, Dysprosium, Erbium, Europium, Gadolinium, Gallium, Iridium, Lanthanum, Lutetium, Praseodymium, Rhenium, Rhodium, Ruthenium, Samarium, Tantalum, Tellurium, Thorium, Thulium, Ytterbium

**Material**  
0,3 gr Hair or  
0,2gr Nail

**Method**  
ICP-MS



# ANALYSES AND TESTS

WATER, SOIL, MISC.



WATER, SOIL, MISC.

## WATER ANALYSIS

<b>Standard Profile Water (Hardness Included) (P8)</b>	<b>Material</b>	<b>Method</b>
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Tested Elements:  
Aluminum, Antimony, Arsenic-total, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Selenium, Silver, Strontium, Thallium, Uranium, Zinc

5-7ml Water

ICP-MS

<b>Short Profile Water (Hardness Included) (P80)</b>	<b>Material</b>	<b>Method</b>
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Tested Elements:  
Cadmium, Calcium, Copper, Lead, Magnesium, Nickel, Uranium, Zinc

5-7ml Water

ICP-MS

<b>Uranium Profile Water (Uranium)</b>	<b>Material</b>	<b>Method</b>
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5-7ml Water

ICP-MS

## SOIL ANALYSIS

<b>Standard Profile Soil (P8)</b>	<b>Material</b>	<b>Method</b>
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Tested Elements:  
Aluminum, Antimony, Arsenic-total, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Selenium, Silver, Strontium, Thallium, Uranium, Zinc

20gr Soil

ICP-MS

## METAL ANALYSIS OF COSMETICS, PHARMACEUTICALS, NUTRITIONAL SUPPLEMENTS, ALGAE AND FOODS

<b>Toxic Profile</b>	<b>Material</b>	<b>Method</b>
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Tested are:  
Aluminum, Antimony, Arsenic-total, Barium, Beryllium, Bismuth, Cadmium, Calcium, Cesium, Chromium, Cobalt, Copper, Gallium, Germanium, Iron, Lead, Lithium, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Palladium, Platinum, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, Zinc, Zirconium

please ask

ICP-MS

Important Note: We request the right to limit the number of elements tested, if necessary due to sample limitations.

# DETOXIFICATION- AND ANTIOXIDATIVE

## GENETIC TESTING ENZYME SYSTEMS



## DETOXIFICATION- AND ANTIOXIDATIVE

## GENETIC ENZYME SYSTEMS

### Needed Material:

2 ml EDTA-Blood or 5 drops whole blood  
on filter paper or gum swab

### Genetic Testing of Detoxification- and Antioxidative Enzyme Systems:

		<b>Method</b>
Glutathione –S-Transferase M1	GSTM1	PCR
Glutathione –S-Transferase T1	GSTT1	PCR
Glutathione –S-Transferase P1	GSTP1	PCR
Glutathione –S-Transferase M3	GSTM3	PCR
Superoxide dismutase 1	CuZnSOD	PCR
Superoxide dismutase 2	MnSOD	PCR
Apo-E Gene-	E2, E3 & E4	PCR
Cytochrome P450 1A1	CYP1A1	PCR
Phase-I-Enzyme		
N-Acetyltransferase 2	NAT2	
Phase-II-Enzyme		

For detailed information:

<http://www.microtraceminerals.com/en/diagnostic-humans/detoxification-enzymes/>



# ORGANIC ENVIRONMENTAL TOXINS



## ORGANIC ENVIRONMENTAL TOXINS

**FORMALDEHYDE:** In view of its widespread use, toxicity and volatility, exposure to formaldehyde is a significant consideration for human health. It is found in textiles, furniture, resins, wood panels, permanent adhesives used for installing plywood or carpet, and is used as a disinfectant and biocide. It is released from cigarette smoke. Formaldehyde is highly toxic to humans, regardless of method of intake. It is an irritant, causes oxidative stress and is considered carcinogenic.

Xylol or Xylene are used as solvents in the rubber, printing and leather industry and are common components of paint, ink, adhesives and cleaning agents.

**SOLVENTS** (aromatic, chlorinated or nonchlorinated) are used in a variety of products such as paints, plastic products, etc. Benzol is known as a carcinogenic. Chlorinated solvents such as polychlorinated biphenyls (PCBs) are easily stored in fatty tissue and can be detected years after exposure.

**PCP - Pentachlorophenol** is used as a herbicide, pesticide, fungicide, algacide and disinfectant. PCP's have been used widely as a wood preservative. Contact with PCP (particularly in the form of vapor) can irritate the skin, eyes, and mouth. Long-term exposure to low levels such as those that occur in the workplace can cause damage to the liver, kidneys, blood, and nervous system. Exposure to PCP is also associated with renal and neurological effects. The US Environmental Protection Agency classifies PCP as a probable human carcinogen.

### Organic Environmental Toxins

	Material	Method
DDT (Dichlorodiphenyltrichloroethan) (tested is DDT and DDE)	Heparin Blood	GC
Formiat (Metabolit from Formaldehyde)	30ml Urine, pH3-4	enzym.
PCP (Pentachlorphenol) wood preservative	4ml Serum or 30ml Urine	GC-MS
Insecticide Pyrethroid Metabolite <ul style="list-style-type: none"> <li>• C12Ca, m-PBA, Br2Ca</li> </ul>	30ml Urine	
Hexachlorhexane (Lindan)	10ml Heparin Blood	GC-MS
Methyl-Hippuric-Acid from Xylol	30ml Urine	HPLC
Solvents - Aromatic Hydrocarbons <ul style="list-style-type: none"> <li>• Benzol</li> <li>• Ethylbenzol</li> <li>• Toluol</li> </ul>	5ml EDTA Blood	GC-MS
Solvents - Chlorinated Hydrocarbons <ul style="list-style-type: none"> <li>• Dichlormethane</li> <li>• Tetrachlorethylene</li> <li>• Tetrachlormethane</li> <li>• Trichlorethylene</li> <li>• Trichlorethane</li> </ul>	5ml EDTA Blood	GC
Nonchlorinated Hydrocarbons <ul style="list-style-type: none"> <li>• 1-Butanol, 2-Butanol, i-Butanol, Ethanol</li> <li>• Ethylacetat, Isobutylacetate, Methanol</li> <li>• Methylethylketone, Methylisobutylketone</li> <li>• 1-Propanol + 2-Propanol</li> </ul>	5ml EDTA Blood	GC



# VETERINARY TESTS

## METAL TESTING OF FUR



## VETERINARY TESTS

### METAL TESTING OF FUR

Essential elements can be toxic, if over-supplied. Horses are more sensitive to selenium overexposure. Loss of fur is the first sign. Horses may also be lame, lose weight easily and have a dull coat. The horse's hooves may also be affected by selenium levels that are too high and may begin to crack and become brittle. If the condition is left untreated the hoof may begin to slough off, leaving the horse with essentially no hoof at all until a new hoof can grow back.

Selenium toxicity is rare in cattle, but these animals are sensitive to selenium deficiency, which is widespread in countries such as Ireland. Molybdenum overexposure can disturb the copper metabolism, causing copper deficiency symptoms in farm animals. Generally, water and soil conditions are significant influences on farm animals' nutritional status.

#### SAMPLING PROCEDURE

Fur or nail and hoof testing provides a record of chronic metal exposure. Unlike blood, these tissues are an inert substance that consists of a fibrous protein and trace elements. As fur, nail or hoof grow, nutrient and toxic elements are deposited from the blood stream into these tissues. Once a trace element has been incorporated, it remains fixed. To measure values reliably and with good reproducibility, the following criteria must be met:

- Samples should not have been exposed to chemical treatment. Chemically treated samples will not provide reliable results.
- Do not mix different sample types (i.e. fur with nails).

#### Metal Testing of Fur (Cat, Dog, Bovine, Equine)

##### Standard Profile (P9)

Tested are:

Aluminum, Antimony, Arsenic-total, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Germanium, Iodine, Iron, Lead, Lithium, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Palladium, Platinum, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, Zinc, Zirconium

##### Material

0,5gr Fur or  
0,3gr Nails or Hooves.  
No manes.

##### Method

ICP-MS

##### Extended Profile (P10)

This extended profile tests all metals as shown in the Basic Profile above, plus these additional metals.

Cerium, Cesium, Dysprosium, Erbium, Europium, Gadolinium, Gallium, Iridium, Lanthanum, Lutetium, Praseodymium, Rhenium, Rhodium, Ruthenium, Samarium, Tantalum, Tellurium, Thorium, Thulium, Ytterbium

##### Material

0,5gr Fur or  
0,3gr Nails or Hooves.  
No manes.

##### Method

ICP-MS



# VETERINARY TESTS

WHOLE BLOOD / SERUM / PLASMA



## VETERINARY TESTS

WHOLE BLOOD / SERUM / PLASMA

Blood mineral analysis (whole blood, serum or plasma) is used to detect metal overexposure. The metal concentration found in blood is a direct reflection of the animal's metal exposure. Water, feed, medication even cosmetics can be the cause.

Zinc toxicosis has been reported in dogs. It is characterized by an intravascular hemolytic anemia, gastrointestinal upset from direct irritation, and, potentially, multi-organ failure. Common sources of zinc contamination include galvanized coating on iron and steel (cages and nails, metal nuts from transport cages, and fencing; automotive parts, batteries, fungicides, and topical medications. There have been reports of dogs that have ingested large amount of zinc oxide ointment, used to combat skin irritation. Other sources include calamine lotion, paints, and shampoos.

Arsenic poisoning has been reported in dogs and cats. Toxicity occurs over a long term, such as when animals are exposed by eating grass that is regularly treated with herbicides. Symptoms of arsenic poisoning are vomiting, diarrhea, abdominal pain, lethargy, bloody feces, staggering and cold extremities.

Hair/fur and blood metal analysis are used to diagnose chronic exposure.

### **Whole Blood-Metal Analysis (P4)**

Tested are:

Aluminum, Antimony, Arsenic-total, Beryllium, Bismuth, Cadmium, Cobalt, Copper, Chromium, Iodine, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Selenium, Silver, Thallium, Tin, Uranium, Vanadium, Zinc, Zirconium

### **Material**

5ml EDTA Blood  
in metal-free tubes

### **Method**

ICP-MS

### **Serum- or Plasma-Analysis (P18)**

Tested are:

Aluminum, Antimony, Beryllium, Bismuth, Cadmium, Calcium, Copper, Gallium, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Selenium, Silver, Thallium, Tin, Uranium, Zinc

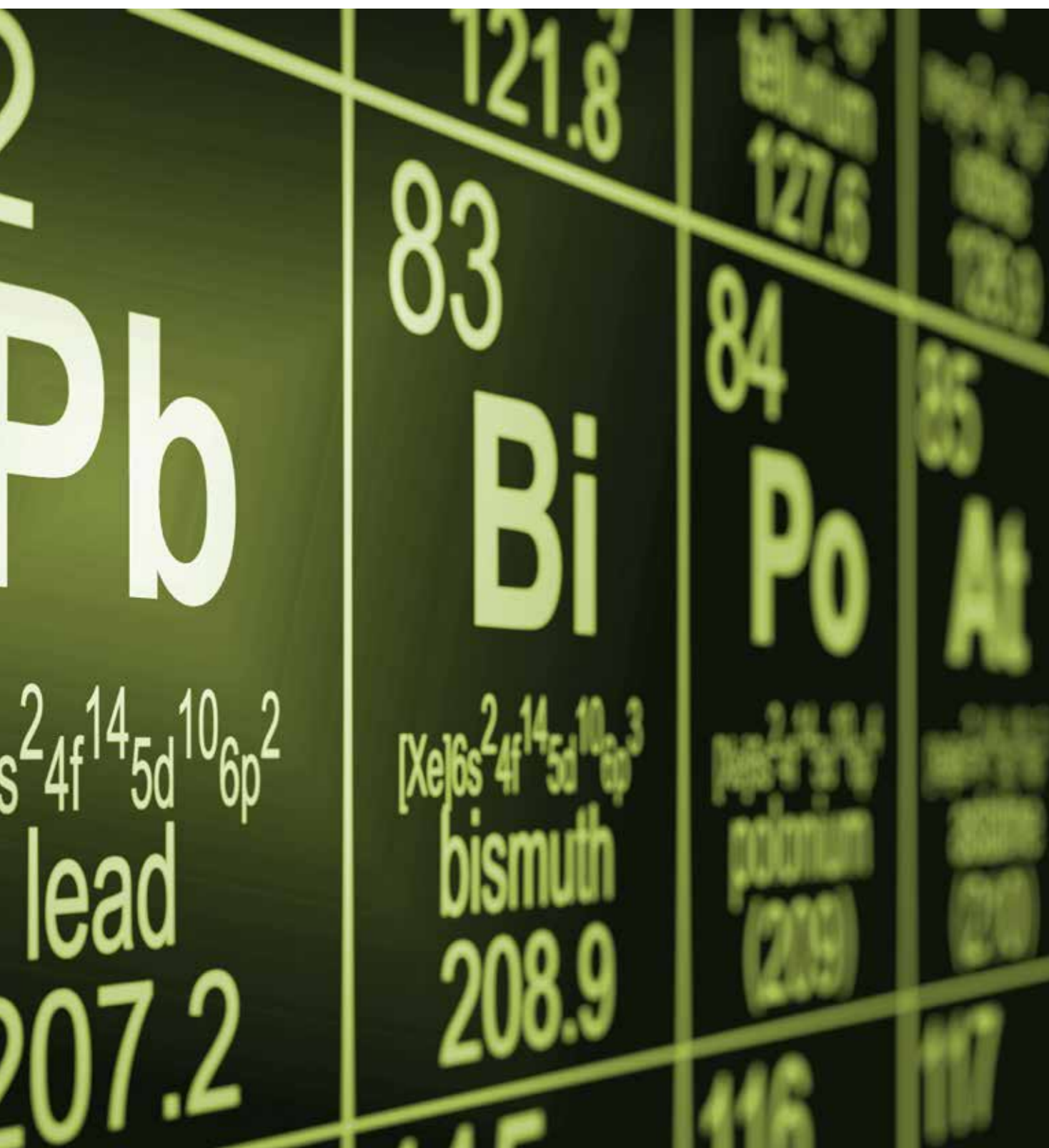
### **Material**

5ml EDTA Blood  
in metal-free tubes

### **Method**

ICP-MS

# ELEMENTS



## ELEMENTS

### ELEMENTS AND THEIR ISOTOPES

We also perform single element testing in human and animal samples, tissues and various environmental materials. Please ask about sample and shipping requirements, prices etc.

ELEMENT	SYMBOL	ISOTOP	
1	Lithium	Li	7
2	Beryllium	Be	9
3	Boron	B	10
4	Sodium	Na	23
5	Magnesium	Mg	24
6	Aluminum	Al	27
7	Potassium	K	39
8	Calcium	Ca	44
12	Titanium	Ti	49
13	Vanadium	V	51
14	Chromium	Cr	52
15	Manganese	Mn	55
16	Iron	Fe	56
17	Cobalt	Co	59
18	Nickel	Ni	60
19	Copper	Cu	63
20	Zinc	Zn	66
21	Gallium	Ga	69
22	Germanium	Ge	74
23	Arsenic	As	75
24	Selenium	Se	78
25	Rubidium	Rb	85
26	Strontium	Sr	88
30	Zirconium	Zr	90
31	Niobium	Nb	93
32	Molybdenum	Mo	98
33	Rhodium	Rh	103
34	Palladium	Pd	105
35	Silver	Ag	107
36	Cadmium	Cd	111

ELEMENT	SYMBOL	ISOTOP	
37	Tin	Sn	118
38	Antimony	Sb	123
39	Iodine	I	127
40	Tellurium	Te	128
41	Cesium	Cs	133
42	Barium	Ba	138
43	Lanthanum	La	139
44	Cerium	Ce	140
45	Praseodymium	Pr	141
46	Neodymium	Nd	146
47	Samarium	Sm	147
48	Europium	Eu	153
49	Gadolinium	Gd	157
50	Dysprosium	Dy	163
54	Erbium	Er	166
55	Thulium	Tm	169
56	Ytterbium	Yb	172
57	Lutetium	Lu	175
58	Hafnium	Hf	178
59	Tantalum	Ta	181
60	Tungsten	W	182
61	Rhenium	Re	185
62	Iridium	Ir	193
63	Platinum	Pt	195
64	Mercury	Hg	202
65	Thallium	Tl	205
66	Lead	Pb	208
67	Bismuth	Bi	209
68	Thorium	Th	232
69	Uranium	U	238



# BOOK LIST

## E. BLAUROCK-BUSCH

### AUTISM & THE GENETIC CONNECTION

PRINTED EDITION OR E-BOOK \$0.99 - BOOKLET 1:  
BEAT AUTISM NOW - LOGICALLY, EFFECTIVELY AND INEXPENSIVELY

This first in a series by E.Blaurock-Busch, presents basic information and statistics about autism, explaining the detoxification pathway and how the toxic metal uptake and release is regulated genetically. About 50% of the Western population is missing at least one important detoxification enzyme, meaning the body's natural detoxification systems is not functioning properly, which leads to environmentally-caused ailments and the need to support detoxification mechanisms.

### NEUROTOXIC METALS AFFECTING AUTISM / ASPERGER / ADHD

PRINTED EDITION OR E-BOOK \$0.99 - BOOKLET 2:  
TREAT AUTISM LOGICALLY, EFFECTIVELY AND INEXPENSIVELY

This booklet tells parents and doctors which laboratory tests are most useful in diagnosing metal intoxication. With proper information, the best and most successful treatment approach can be selected.



## BOOK LIST - E.BLAUROCK-BUSCH

### TOXIC METALS AND ANTIDOTES. THE CHELATION THERAPY HANDBOOK



65 EURO PLUS SHIPPING.

This book is designed to help physicians determine the chelator of choice. It is a diagnostic guide that helps differentiate between acute and chronic metal exposures, and provides easy to locate information regarding metal related diseases. An update on the efficacy of chelation substances and combination treatments is included along with protocols for various chelating agents.

Publ. MTM 2016, 2nd edition. A4, 246 pages. Also available as e-book.

### ALLERGIES AND FOOD ADDICTIONS - NO MORE

PRINTED EDITION OR E-BOOK



This Self-Help Book is for Allergy Sufferers, and all those who want to feel better, physically and psychologically. According to a study released in 2013 by the Centers for Disease Control and Prevention, food allergies among children increased approximately 50% between 1997 and 2011.

This book provides answers, explains why food allergies are on the rise and how this trend can be stopped. The author explains the connection between nutrition and allergies. Case histories show how health problems such as dermatitis, asthma, rheumatoid arthritis, migraines etc. were reversed through simple changes in diet. Best of all, the reader learns how to select a fun diet that is appropriate for him or her. Recipes are included.

### GENTLE DETOX - THE NATURAL DETOXIFICATION PROGRAM

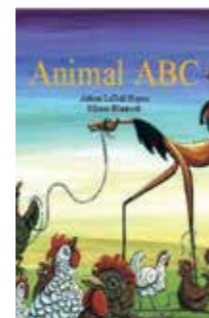
PRINTED EDITION OR E-BOOK



In the last decades, toxic metal syndromes have been described. Chronic overexposure to lead, mercury and other potentially toxic metals can affect body and brain, causing a wide variety of diseases, including skin and heart problems, contributing to Alzheimer, cancer and depression. International research has accumulated a large body of evidence linking chronic disease to environmental problems and some of it is listed. Nature has provided us with nutrients that are capable of 'chelating' metals and this book explains not only the toxicity of metals, which symptoms they may cause or which organ systems they affect, nature also provides nutritional alternatives to synthetic chelation. We explain how natural detoxifying agents work, and provide nutritional self-treatment protocols.

### OUR BOOK FOR YOUR WAITING ROOM - ABC ANIMALS

18.35 EURO INCLUDING SHIPPING.  
ART: ARLENE LADELL HAYES TEXT: E.BLAUROCK-BUSCH



For each letter of the alphabet Arlene created a colorful animal page, and E.Blaurock-Busch wrote a fun sentence where each word starts with the same letter. This book of art appeals to all Defcreative texts Softcover, 57 pages, glossy Color, \$21.00 including shipping to and within the USA For other countries, ask us for shipping costs.

# SAMPLE REPORT



## EXPLANATION OF DATA AND GRAPHIC

**Micro Trace Minerals Laboratory**  
 environmental & clinical laboratory  
 Röhrenstrasse 20, 91217 Hersbruck, Germany  
 P.O.Box 4613; Boulder, CO 80306-4613, USA

**MINERAL ANALYSIS**

**DMSA Urine**

Doctor: Physician  
 Patient Name: Patient Name  
 Clinical Information: DMSA oral 500mg  
 Creatinine (g/l) \* 0.490

Lab Number: 1UA167000  
 Sex: f  
 Test Date: 5/5/2016  
 Age: 36  
 Page: 1/1

Essential Trace Elements (mcg/g Creatinine)	Baseline URINE Norm	Chelator-specific orientation range	Test Value	Graphic
Chromium	0.550 --- 4.830		0.500	↓
Iodine	< 719.000		75.961	
Manganese	< 4.500		18.930	↑
Essential Macro- & Trace Elements (mg/g Creatinine)				
Zinc	0.060 --- 0.780		0.435	
Trace Elements (mcg/g Creatinine)				
Boron	< 3,766.000		982.155	
Strontium	< 200.000		62.051	
Potentially Toxic Elements (mcg/g Creatinine)				
Aluminum	< 40.000		97.279	↑
Barium	< 5.700		4.016	
Cadmium	< 0.800		0.717	
Cesium	< 11.000		5.820	
Gadolinium	< 0.230	10.000	15.489	↑
Lead	< 5.000	2.800	23.116	↑
Mercury	< 1.000	5.000	11.587	↑
Nickel	< 3.000		< DL	
Palladium	< 1.400		< DL	
Silver	< 1.400		0.457	
Thallium	< 0.600		0.615	
Tin	< 2.000			

n.n. = not detected, < DL = below Detection Limit  
 Accreditation: DIN EN ISO 17025; Quality control: Dipl. Ing. Friedle, Ing. J. Merz, Dr. Rauland; Validation: Dr. E. Blaurock-Busch



**High Values**  
 Identifies values above the reference range



**Low Values**  
 Identifies values below the reference range

Low Norm High

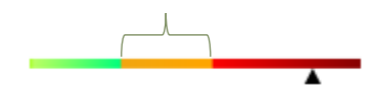


Identifies patient test value



**Identifies test values below the limit of quantitation**

If the report shows n.n. as a test value, this indicates that the element could not be detected.  
 If the reports shows as a test value of <DL, this indicates that the value detected was lower than the detection limit.



Color ID  
 Green = result within Reference Range for baseline urine  
 Orange = result between Reference Range and Orientation Range  
 Red = result above high limit.

For more information about Reference and Orientation Range see next page.



# REFERENCE RANGES



### DEFINITION OF REFERENCE RANGES

The 95th percentile is generally the basis of reference ranges in human biomonitoring. In metal toxicology, it is a value or score representing 95% of a population, meaning 95 percent of that population fall within that range.

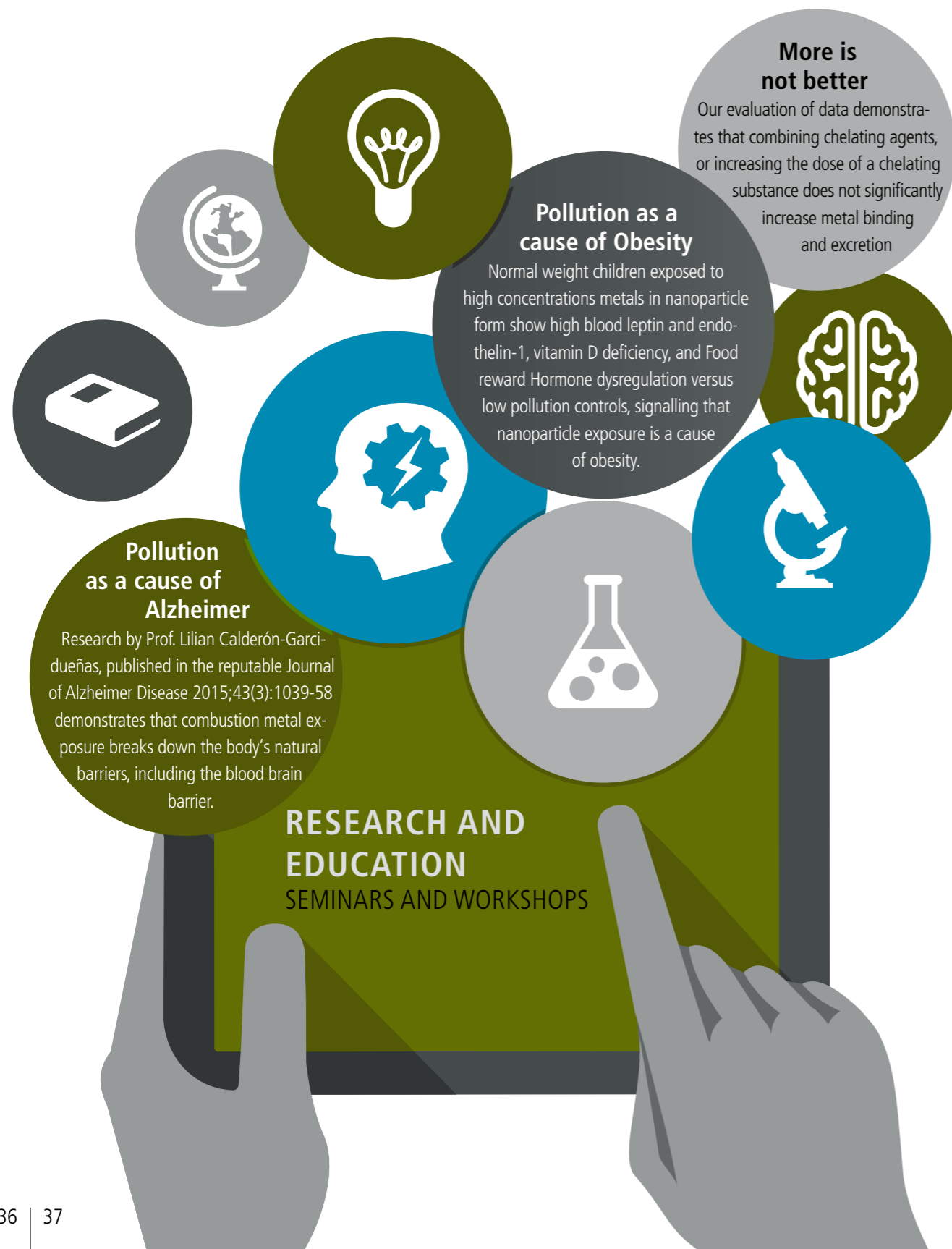
In laboratory diagnostics, the 95th percentile is generally used as the upper range; it is approximately 2 standard deviations from the mean. In clinical metal toxicology and biomonitoring, a test value exceeding this range is considered high, reflecting exposure in need of treatment.



Table 8. The Gaussian Curve

More information reference ranges is shown on our website under <http://www.microtraceminerals.com/en/diagnostic-humans/human-biomonitoring/> and <http://www.microtraceminerals.com/en/diagnostic-humans/urine/reference-ranges/> For any questions, please contact us.

# RESEARCH AND EDUCATION



### PARTIAL LIST OF RESEARCH AND OTHER PUBLICATIONS

- Toxic Metals and Autism. Townsend Letter. April 2008
- Chelating Iron in Conditions of Iron Overload (Hemochromatosis). Townsend Letter. May 2009
- Urine Metal Analysis to Define Chronic Metal Exposure. The Internist Sept 2009
- Saliva and Fecal Metal Testing: Evaluation of an unusual diagnostic approach. Townsend Letter. Jan 2010
- Hair Mineral Analysis to Define Past or Low Level Chronic Exposure. The Original Internist. March 2010
- Metal Exposure in the Children of Punjab, India. Clinical Med Insight: Therapeutics 2010:2
- Metal Exposure in the physically and mentally challenged children of Punjab, India. Maedica Vol.5(2), 2010
- Chelation Article Misleading. Townsend Letter. Oct 2011
- DMSA- die sanfte und effektive orale Entgiftung. OM & Ernährung 2011. Nr. 134
- Schwermetallbelastungen als Ursache der Alopecia areata. OM & Ernährung 2011. Nr. 135
- Kontrastmittel Gadolinium und die Nephrogene Systemische Fibrose. AZN 1/11
- Toxic Metals and Essential Elements in Hair and Severity of Symptoms among Children with Autism. 2012
- Hair Mineral Analysis to define past and/or chronic exposures- A research update. The Original Internist. June 2012: 43-46
- Efficacy of DMSA Therapy in a Sample of Arab Children with Autistic Spectrum Disorder. Maedica, Vol 7(3), 2012
- Untersuchungen zur Mono-DMPS Mobilisationstherapie im Vergleich zur DMPS + ZnDTPA Umwelt-Medizin 25, 4/2012
- Water Metal Analysis: An environmental test useful to locate the source of metal exposure. Townsend Letter Jan 2013
- Labornachweis umweltbedingter Metallbelastungen. Umwelt-Medizin 27, 1/2014
- Comparing the Metal Concentration in the Hair of Cancer Patients and Healthy People of Punjab, India. Oncology. 2014:8
- Comparison of Chelating Agents DMPS, DMSA and EDTA. British J of Med & Med Research 4(9): 1821-1835, 2014
- The Effects of Magnesium-EDTA Chelation Therapy on Arterial Stiffness. Health 2014,6.
- Comparing the Metal Concentration in the Nails of Healthy and Cancer Patients Living in Malwa Region of Punjab, India with a Random European Group- A follow up study. Brit. J of Med & Med Research 5(4):2015
- Air pollution and children: neural and tight junction antibodies and combustion metals, the role of barrier breakdown and brain immunity in neurodegeneration. J Alzheimers Dis. 2015; 43(3):1039-58
- Mexico City normal weight children exposed to high concentrations of ambient PM2.5 show high blood leptin and endothelin-1, vitamin D deficiency, and food reward hormone dysregulation versus low pollution controls. Relevance for obesity and Alzheimer disease. Environmental Research 05/2015; 140:579-592
- Efrain Olszewer and Orthomolecular Medicine in South America. Townsend Newsletter f Doctors. Oct 2015

### SEMINARS AND WORKSHOPS

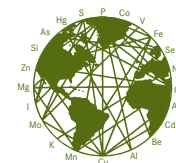
We provide seminars regularly. Past workshops received accreditation from the German medical board and the UK Royal Academy.

Our certified programs include

- Evaluation of laboratory diagnostics
- Chelation workshops for beginners and advanced chelation therapists
- Teaching of various chelation protocols and orthomolecular therapy as it applies to chelation therapy

check our website for articles





[www.microtrace.eu](http://www.microtrace.eu)  
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