Micro Trace Minerals Laboratory
40+ years of clinical & environmental laboratory diagnostics

Roehrenstr. 20
91217 Hersbruck, Germany

Phone +49.9151.4332
Fax +49.9151.2306

info@microtraceminerals.com
https://microtraceminerals.com

MTM Newsletter **N° 22 - September 2017**

Laboratory News

Our Corporate Philosophy

1. To provide best analytical quality as basis of diagnosis and therapy.
2. Involvement in international research as basis for increased recognition in environmental medicine and metal toxicology. With solid research, we aim to be leaders in the field.
3. Providing support in clinicians, especially regarding questions involving chelation therapy, including the proper application of the various chelating substances and there biochemical and medical function. We provide facts, evaluate available data and various protocols, und uses of chelating agents, but are recognizing that clinicians may choose alternative applications tapered to your patient's individual need or situation. It is not our aim to reduce your medical freedom.
4. We aim to provide you and your co-workers with reliable information as presently available. This includes laboratory diagnostic and the chemical/pharmaceutical knowledge of chelation and orthomolecular therapy.
5. We are happy to consult with you about your patient data, but are not able to directly consult with patients.

To 1.) Round Robins and Quality Control

At present, we know of no American or European institution that provides inter laboratory comparison tests (proficiency tests or round robin tests) for hair mineral analysis. Therefore, we cooperate with the Canadian Institute for Toxicology in Quebec (Institut national de santé publique, Centre de toxicologie or QMEQAS, and have achieved best results. The institute recognizes differences in analytical methods, and to double check with the German proficiency tests results we engage in, we also utilize QMEQAS for urine and water proficiency tests, again with excellent results.

To 2.) Pending Research projects

In cooperation with the Egyptian Research Center in Cairo and Dr. E. Schnakenberg from the Institut for Pharmacogenetic und Genetic Disposition (IPGD), we have tested about 100 autistic children. We are now in the process of statistically evaluating and comparing the children's metal exposure with the individual genetic detoxification ability. This study is financed by Micro Trace Minerals (MTM) and The Institute for Pharmacogenetic und Genetic Disposition (IPGD). There are no charges for the chronically underfinanced Egyptian Health and Environmental Research Center.

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We also support a project for the University of Benim in Nigeria, which evaluates autistic children. We are testing hair and blood metals free of charge. Here, too, toxic exposure is expected to be a cause of the disease pattern.

We will inform you as soon as results will be published.

To 3.) Gadolinium

Our previously published articles on Gadolinium received unusual attention. We mentioned the link between gadolinium exposure through contrasting agents and the apparent development of Nephrogenic Systemic Fibroses. We also provided urine analysis results, indicating high gadolinium concentration in urine after the receipt of Gd-containing contrasting agents. The published data had been the result of provocation urines. Extreme values had been noted, but we had no information when the Gd-contrasting agent had been received, prior to the chelation therapy.

The question on how long gadolinium remains in the system remains unanswered.

What we could clear is:

- Gadolinium is easily detected in human specimen. Detection limits are low.
- Gadolinium remains in the system far longer than anticipated.
- The renal excretion continues after weeks and months of exposure.
- Gd-Extreme values can be detected in urine and blood long after Gd-contrasting agents have been administered.
- Gadolinium can be found in hair, indicating tissue accumulation and past exposure. See below.

Test material	Number of Tests	Unit	95th percentile*	DL**	highest test value
Blood	1502	µg/l	**0.40**	0.125	**38.25**
Urine	10099	µg/g Crea	**0.80**	0.05	**57569**
Hair	13685	µg/g	**0.007**	0.001	**11.45**

*95th percentile equals the Human Biomonitoring Norm
**DL = Detection Limit

The following table demonstrates that gadolinium is more often detected in provocation urines as previously thought.

Gadolinium concentration in urine following Provocation

Number of Tests	µg/g Creatinine
10250	< 1
1288	> 1 - 10
308	> 10 - 100
51	> 101 - 1000
5	> 1001 - 4100
3	> 4101 - 12000
3	> 12001 - 707229

From the above data, we cannot safely deduct that chelation agents are the cause of the gadolinium excretion shown. At this point, we do not know how chelation agents affect gadolinium excretion.

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We compared the gadolinium concentration of individual patients before and after chelation. Few such samples had been submitted by various clinics, indicating that baseline urines are rarely used for comparison. We have no information how long ago or how often Gd-contrasting agents were administered prior to the provocation.

The following table clearly demonstrates that to objectively evaluate and rate the gadolinium concentration of a provocation urine, the post provocation test value MUST be compared to the baseline urine concentration or else the clinician risks misinterpretation of diagnostic results.

Gadolinium in Urine before and after Provocation

Patient #	Urine concentration no provocation in mcg/g Creatinine	Urine concentration after provocation in mcg/g Creatinine	Chelating agent used
1	3096	2040	DMPS iv, 1 amp.
2	13499	4296	ditto
3	902	941	ditto
4	563	536	ditto
5	525	507	ditto
6	2584	3777	DMPS + CaEDTA, each 1 amp. iv
7	1424	1285	ditto
8	512	860	ditto
9	830	554	ditto
10	908	1515	ditto
11	696	512	DMPS + ZnDTPA, each 1 amp. iv
12	696	550	DMSA oral
13	735	552	ditto
14	768	610	ditto

This and more updated information regarding Gadolinium and other metals is listed in our new book (German only) **‚Chronische Metallbelastungen, Toxikologie, Diagnose und Therapie‘**.

The book is available shortly through MTM. About 290 pages, soft cover. € 50.00.

To 4.) Detoxification processes

The human body is exposed to a wide array of xenobiotics in one's lifetime, and complex enzymatic mechanisms are genetically available to detoxify these substances. A variety of mechanisms support, or impair the body's natural ability to detoxify and scientific literature suggests an association between impaired detoxification and certain diseases.

Missing or nonfunctioning enzyme systems impair biotransformation systems, consequently increasing the need for lifestyle changes, including the avoidance of certain toxins. It avoid or reduce the effects of a toxic metal overload, the body's natural detoxification mechanisms can be supported, and chelation therapy is one option.

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Phase I detoxification enzymes
A reduced Phase I Metabolism reduces the detoxification ability of a variety of xenotoxins including the potentially toxic metals.

Enzymes involved in the Phase I metabolism are Cytochrome P450, and the SOD Enzymes.

While much is known about the role of Phase I enzymes in the metabolism of pharmaceuticals as well as their activation by environmental toxins, the role of Phase I detoxification in clinical practice has received less consideration than the Phase II enzyme systems.

Phase II detoxification enzymes
Testing for genetic polymorphisms is recommended when toxic exposure is high, especially to carcinogenic substances.

Phase II reactions follow Phase I reactions. Also known as conjugation reactions (e.g. with glutathione or amino acids or sulfonates), the Phase II system is an important defense mechanism against intake of toxins. The Glutathione Transferases and N-Acetyltransferase 2 (NAT2) belong to the group of Phase II Enzymes.

A reduced phase II detoxification leads to the accumulation of toxins. Gene variants in the glutathione S-transferases (GST) may lead to poor management of the extremely radical intermediates from the Phase 1 responses and thereby transmit a predisposition for diseases associated with oxidative stress.

Conclusion:
A deficiency of trace elements such as copper, manganese or zinc disrupts the Phase I detoxification pathway. If, in addition, Phase II detoxification enzymes such as GSTM1 are nonfunctioning or not present (and in about 50% of the population, this enzyme is missing), the detoxification ability is significantly impaired. In reality, these patients must be forced to detoxify, and this must be regularly done, using chemical or orthomolecular treatments.

Knowing a patient's detoxification ability is an important part of a successful treatment strategy.

Test material:
1ml EDTA Blood or 5-10 drops whole blood on filter paper. For pricing, please contact us.

- **To 5.) Questions**

Per e-mail are quickly answered. For phone consultations, please provide report number, phone number and time of day you are available.

Answers for common questions:
Do you accept samples on weekends?
Yes, we do. We also accept deliveries on holidays. Should sample delivery be delayed, the metal testing accuracy is generally not affected.

Why should we have a saliva test done before and during the chewing test?
For the chewing test, various chewing gums are used – and they do contain various metals in different concentrations. When we compare the metal concentration of saliva before and after the chewing test, we are able to properly evaluate test results.

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Which urine profile should be used for which provocation test i.e. do we need a special profile for the EDTA or DMPS test?
Each of our profiles can be used. The standard profile is cost-efficient. Tested are 14 nutrient and 14 toxic metals. The most important elements are included, but if you use CaEDTA or CaDTPA, for instance, calcium cannot be reported.

The **Dental or Environmental Profile** provides 34 potentially toxic elements incl. chromium, copper, manganese, selenium and zinc and the most commonly used dental metals. This is the profile we recommend for provocation tests, especially DMPS. The reason: DMPS binds most elements.
Note: If the chelating agent ZnDTPA is used, zinc is not reported.

The **Nutrient and Toxic Profile** tests 14 nutrient elements plus 21 potentially toxic elements, including iron and cadmium. EDTA shows a good binding ability for both of these metals. If CaEDTA, CaDTPA or ZnDTPA is used, calcium or zinc is not reported.

Please note that reserve the right to reject testing of a specific metal, if the sample does not suit quality control requirements.

When I am asking for a comparison report, do I become the regular metal report also?
Unless you request both reports, you will receive the comparison report only.

- **Orientation Ranges (OR)**

Within the next months, we are updating Orientation Ranges. If you have questions, please contact me personally at ebb@microtraceminerals.com. If you want urine reports without ORs, please let us know.

Medical Workshops and Conferences

- **International Conferences & Workshops 2017/2018**

10/11/2017	**MTM Chelation Seminar Stuttgart** **Effect of chemical chelation agents. Diagnostics, therapy, side effects, legal situation and report explanation.** **And much more...** Stuttgart, Germany (German)
01/31/2018	**MTM Chelation Seminar Nuremberg** **Effect of chemical chelation agents. Diagnostics, therapy, side effects, legal situation and report explanation.** **And much more...** Nuremberg, Germany (German)
02/21/2018	**MTM Chelation Seminar Berlin** **Effect of chemical chelation agents. Diagnostics, therapy, side effects, legal situation and report explanation.** **And much more...** Berlin, Germany (German)

For future workshops and updates, please visit:
https://microtraceminerals.com/en/workshops

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- **Webinars**

10/04/2017	**Effect of chemical chelation agents. Diagnostics, therapy, side effects, legal situation and report explanation.** (German)
11/08/2017	**Effect of chemical chelation agents. Diagnostics, therapy, side effects, legal situation and report explanation.** (German)
01/24/2018	**Effect of chemical chelation agents. Diagnostics, therapy, side effects, legal situation and report explanation.** (German)

At present, we are offering German Webinar presentation on chelation and diagnostics at various dates throughout the year.

If you are interested in English Webinar presentation, please let us know time and day of your liking.

The following Webinar presentations are available. A minimum of 10 attendees is requested, thus early registration is required:

- The Neurotoxicity of Metals
- Proper Use of Chelating Agents
- Diagnosing Metal Toxicity

For registration and further information, please visit:
https://www.edudip.com/academy/e.blaurock-busch

We wish you a wonderful time.

All the best

Your

E. Blaurock-Busch and Team