

**„Metal-free
Jaw Cavitations &
Root-canal treatment of teeth“**

as a basic component of holistic dentistry in chronic diseases

Dr. Josef Vizkelety

WELCOME



All roads lead to chronic systemic diseases...

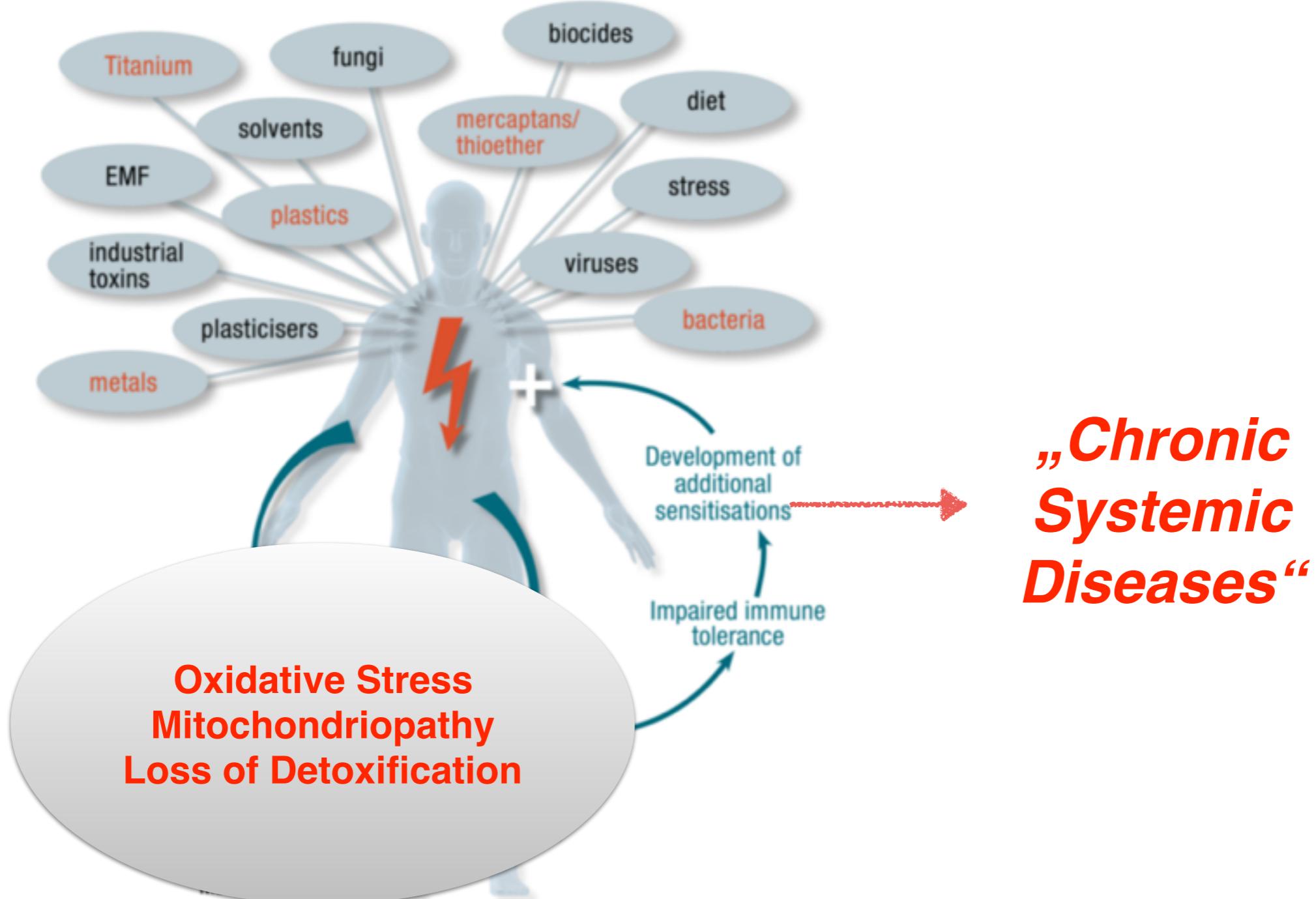
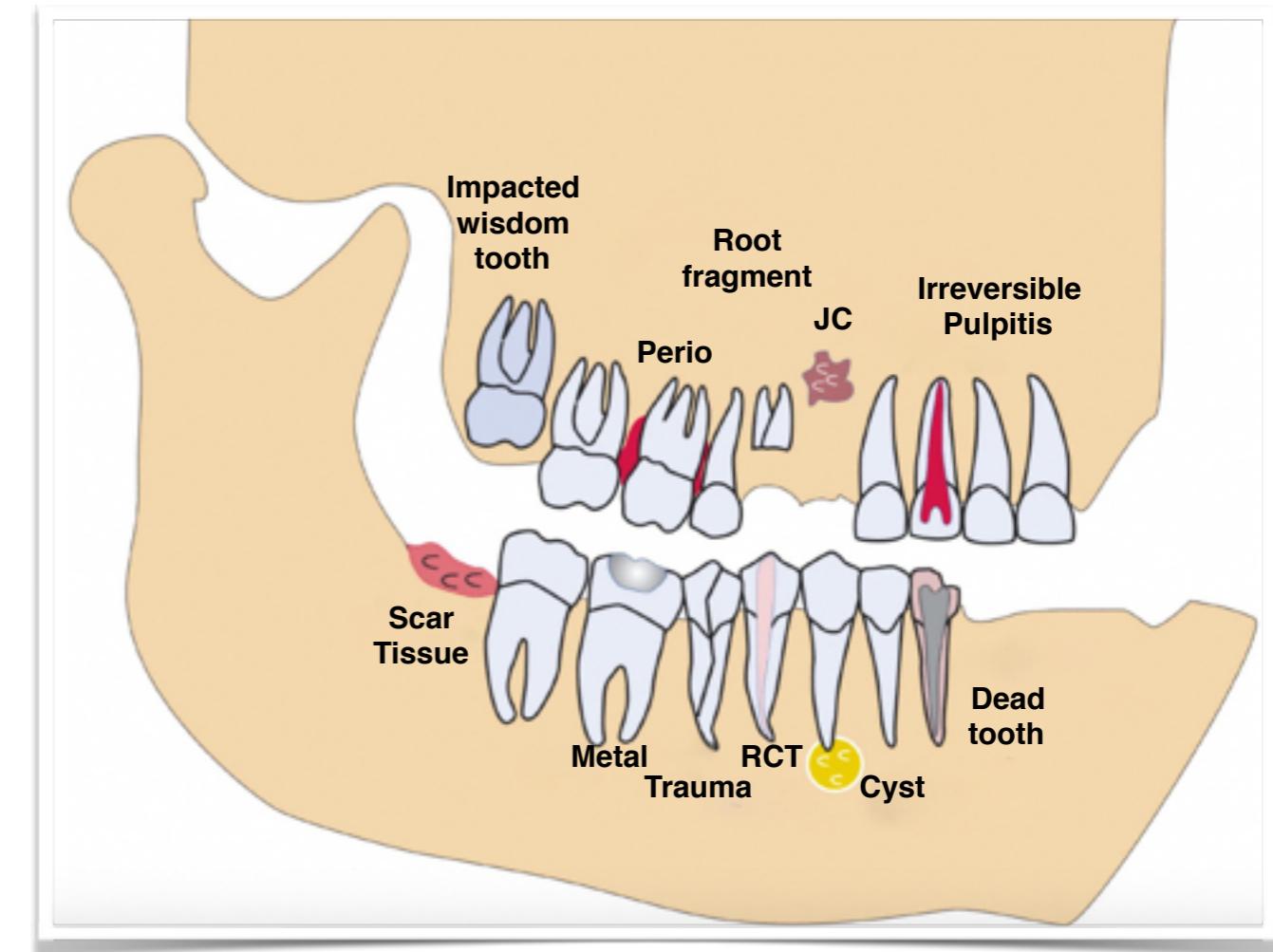


Fig 1.: Modified from Dr Pall (PhD), Department of Biochemistry Chair at the Washington State University ML.: Explaining ‘Unexplained Illnesses’.© imd Berlin, Volker Von Baehr

Tooth / Organ Relationship Chart																	
		RIGHT BREAST			Posterior pituitary			Intermediate lobe of pituitary		Pineal		Posterior pituitary		LEFT BREAST			
Glands	Anterior pituitary	Pariathyroid	Thyroid	Thymus									Thymus	Thyroid	Pariathyroid	Anterior pituitary	
Organs	Heart												Heart				
Teeth																	
Upper Jaw	3 rd molar (wisdom)	2 nd molar	1 st Molar	2 nd bicuspид (pre-molar)	1 st bicuspид (pre-molar)	canine (cuspied)	lateral incisor	central incisor	central incisor	lateral incisor	canine (cuspied)	1 st bicuspids (pre-molars)	2 nd bicuspids (pre-molars)	1 st Molar	2 nd molar	3 rd molar (wisdom)	
Lower Jaw	3 rd molar (wisdom)	2 nd molar	1 st Molar	2 nd bicuspids (pre-molars)	1 st bicuspids (pre-molars)	canine (cuspied)	lateral incisor	central incisor	central incisor	lateral incisor	canine (cuspied)	1 st bicuspids (pre-molars)	2 nd bicuspids (pre-molars)	1 st Molar	2 nd molar	3 rd molar (wisdom)	
Teeth																	
Organs	Heart													Heart			
Glands				Ovaries	testicles		Adrenals	Adrenals		Ovaries	testicles						
Element	Fire	Earth	Metal	Wood	Water	Water	Wood	Water	Wood	Metal	Earth	Fire					

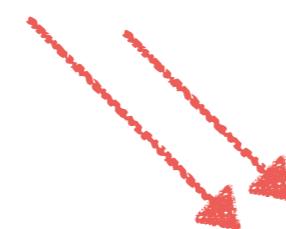
Dental foci/ „Field of disturbances“



- Mercury, Gold, Platinum, Palladium, Silver, Copper, Nickel, Chrome, Cobalt, Molybdenum, Iron, Manganese, Zinc (used for root canal filling material) and Titanium



- Physical attributes of dental metals lead to galvanic corrosion, oxidation and ion release (1,2,3)



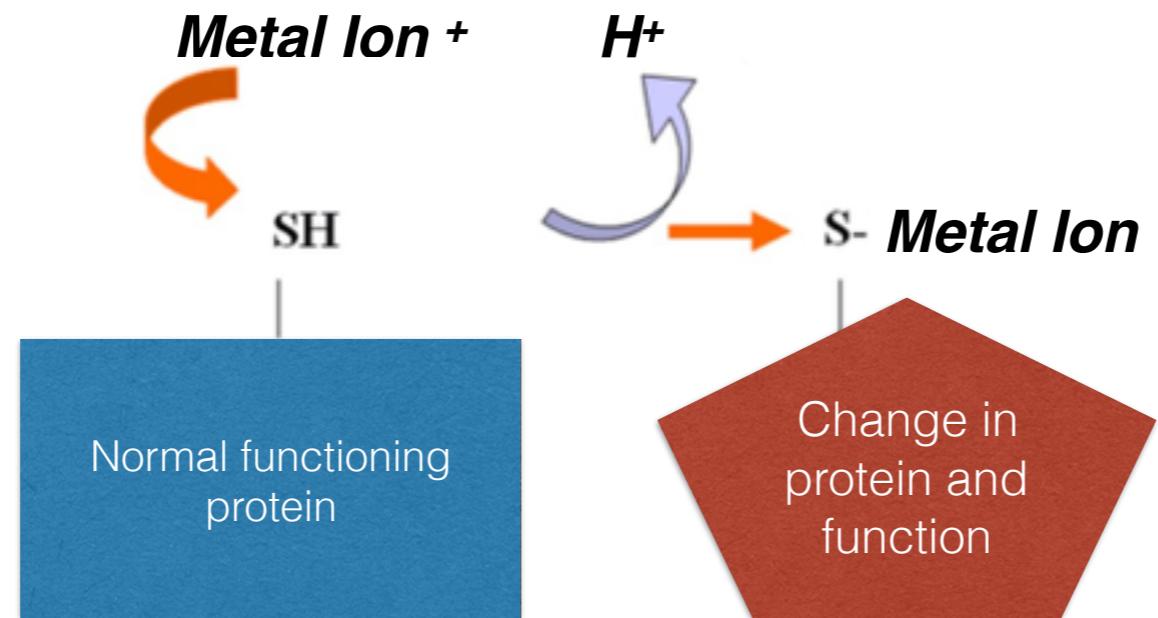
Priority List of Hazardous Substances				
The ATSDR 2013 Substance Priority List				
2013 RANK	SUBSTANCE NAME	TOTAL POINTS	2011 RANK	CAS RN
1	ARSENIC	1670.4	1	007440-38-2
2	LEAD	1529.2	2	007439-92-1
3	MERCURY	1458.6	3	007439-97-6
51	COBALT	1011.7	52	007440-48-4
57	NICKEL	996.2	57	007440-02-0
75	ZINC	915.5	75	007440-66-6
78	CHROMIUM	896.4	78	007440-47-3
118	COPPER	806.9	125	007440-50-8
139	MANGANESE	798.8	140	007439-96-5
171	PALLADIUM	705.3	171	007440-05-3
219	SILVER	605.4	217	007440-22-4

- A) **Toxicity of dental metals**
- B) **Immunological response to dental metals**
- C) **Antenna effect/Electrosensitivity**

Reference: 1) Research based results of Prof. Reppel, Oehmichen, Klötzter und Geis - Gerstorfer. 2) **Muris et al.**, Micro analysis of metals in dental restorations as part of a diagnostic approach in metal allergies, Neuro Endocrinol Lett 2006; 27(Suppl 1): 49-52, 3) **Stejskal et al.**, Increased frequency of delayed type hypersensitivity to metals in patients with connective tissue disease, Journal of Trace Elements in Medicine and Biology, 2015 Jan

A) Toxicity of dental metals

positively charged metal ions bind **sulphydryl (SH) groups** (but also -OH, NH₂ groups) located in proteins, enzymes, co-enzymes and cell membranes (4)



RBC (very rich in SH groups) —> systemic circulation —> Blockage of cellular processes in neuronal cells/mitochondria, membrane changes, permeability disregulations (free passage of BBB), and increase in antigenicity of autologous structures (5,6,7)

Reference: 4) Stejskal et al., The role of metals in autoimmunity, Neuroendocrinology Letters 1999; 20:351-364, 5) Queen H. et al., Chronic mercury toxicity. Colorado Springs, Colorado: Queen and Company Health Communications; 1988., 6) Goldman M et al., Druet P, Gleichmann E. TH2 cells in systemic autoimmunity: insights from allogenic diseases and chemically-induced autoimmunity. Immunol Today 1991; 12:223-7. 7) Weinberg et al., Mitochondrial bioenergetics during the initiation of mercuric chloride induced renal injury. J Biol Chem 1982; 257:68-74.

B) Immunological response to dental metals

Immune reaction towards metal or metallic carriers/proteins

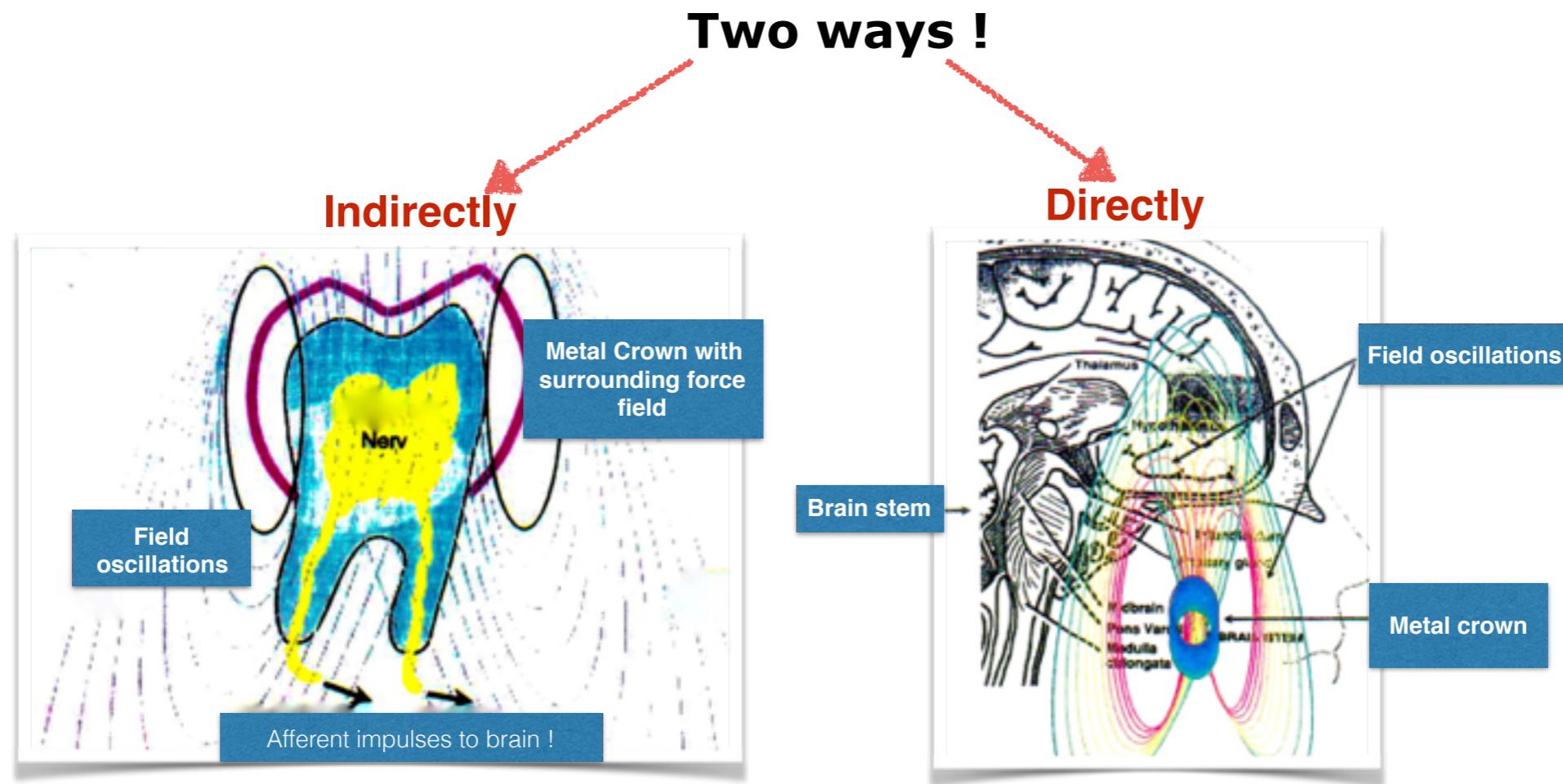
Non-specific → **immunomodulation** either being immunosuppressant (cytostatic) or immunoadjuvant (activation of the immune system), through cytokine modulation (8,9,10)

Antigen Specific → **Allergic reaction** in genetically susceptible individuals. Most of these are of type 4 (delayed-type) hypersensitivity reactions, rarely immediate-type reactions (11,12,13). (CAVE ! Titanium !)

Question of autoimmunity ? → Metals bind to SH and other groups leading to **modification of self-proteins** (self cell becomes „non self“) eliciting MHC changes and activation T and B cell response (14,15)

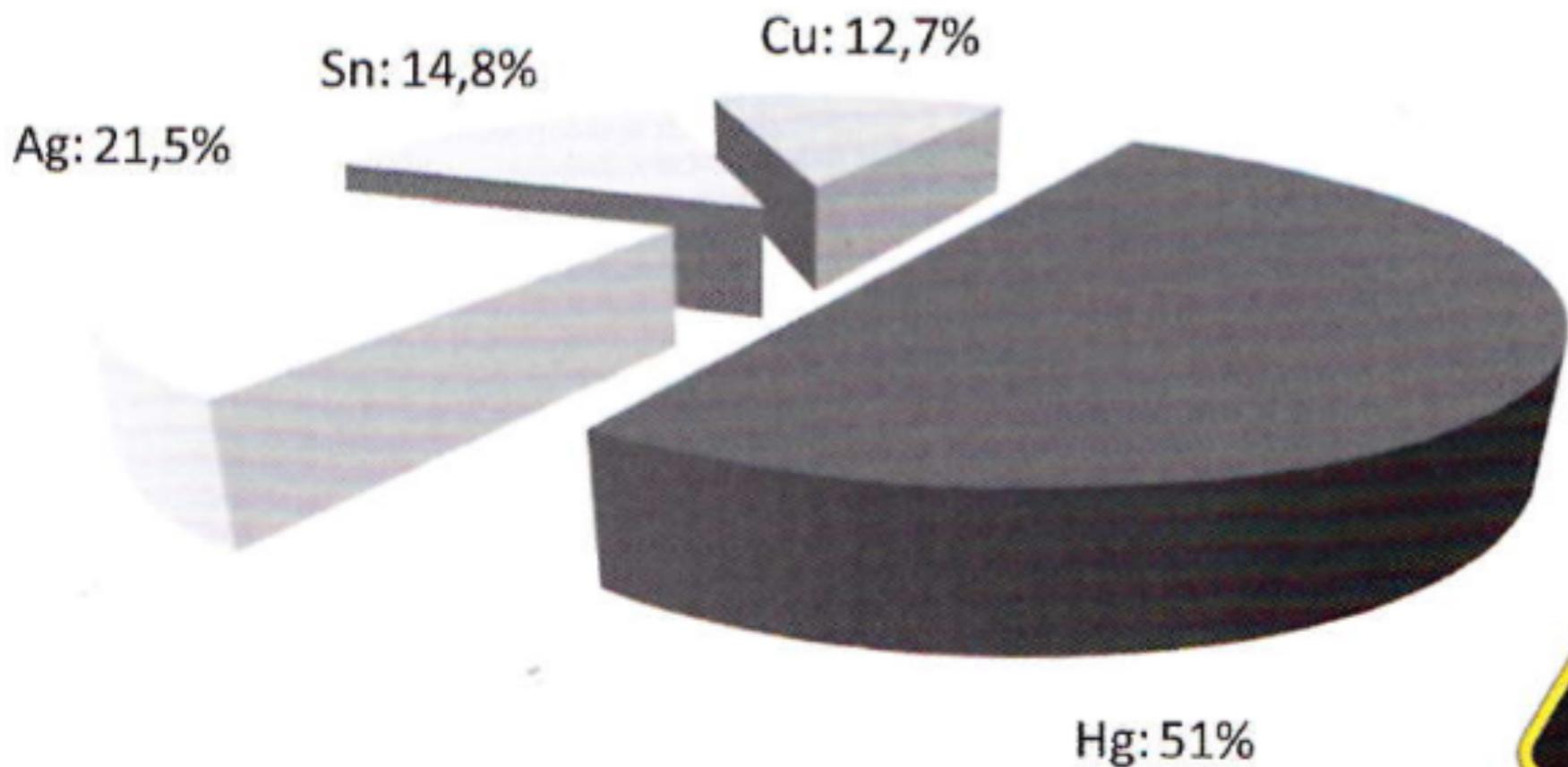
Reference: 8) Heo Y et al., Lead differentially modifies cytokine production in vitro and in vivo, Toxicol Appl Pharmacol 1996; 138:149–57. 9) Nakagawa T et al., Effect of gold salts on the IgE immune response in mice. Ann Allergy 1978; 40:272–5. 10) Rachmawati D et al., Toxicol In Vitro. 2015 Oct 9. pii: S0887-2333(15)00254-4. doi: 10.1016/j.tiv.2015.10.003. 11) Biagini RE et al., The diversity of reaginic immune responses to platinum and palladium metallic salts. J Allergy Clin Immunol 1985; 76:794–802. 12) Bergman A et al., Contact urticaria with anaphylactic reactions caused by occupational exposure to iridium salt. Contact Dermatitis 1995; 35:14–7. 13) Möller DR et al., Delayed anaphylactoid reaction in a worker exposed to chromium. J Allergy Clin Immunol 1986; 77:451–6. 14) Casciola-Rosen L et al., Scleroderma autoantigens are uniquely fragmented by metal-catalyzed oxidation reactions: implications for pathogenesis. J Exp Med 1997; 185:71–9. 15) Hultman P et al., Adverse immunological effects and autoimmunity induced by dental amalgam and alloy in mice. FASEB J 1994; 8:1183–90.

C)Antenna effect/Electrosensitivity



- 1.Increased **corrosion,oxidization** and **ionic discharge** from dental metals (16,17)
- 2.**Irritation/disregulation** of **neurovegetative systems** (18,19,20,21)

Reference: 16) **Saghiri et al.**, Effect of mobile phone use on metal ion release from fixed orthodontic appliances. Am J Orthod Dentofacial Orthop. 2015 Jun;147(6):719-24. 17)**Mortazavi et al.**, High-field MRI and mercury release from dental amalgam fillings. Int J Occup Environ Med. 2014 Apr;5(2):101-5. 18) **Mortazavi et al.**, Occupational exposure of dentists to electromagnetic fields produced by magnetostrictive cavitrons alters the serum cortisol level. J Nat Sci Biol Med. 2012 Jan;3(1):60-4. 19) **Korraah et al.**, Induction of apoptosis and up-regulation of cellular proliferation in oral leukoplakia cell lines inside electric field. Oral Surg Oral Med Oral Pathol Oral Radiol. 2012 May;113(5):644-54. 20) **Santemann et al.**, Electromagnetic fields and the pregnancies, Tidsskr Nor Laegeforen. 2012 May 15;132(9):1060-1. 21)**Frick et al.**, Comparison perception of singular transcranial magnetic stimuli by subjectively electrosensitive subjects and general population controls, Bioelectromagnetics . (2005) 26:287-298



Amalgam

Ag, Sn, Cu → health effects due to metals

Hg (Mercury) → health effects due to mercury

3 elemental forms of mercury compounds

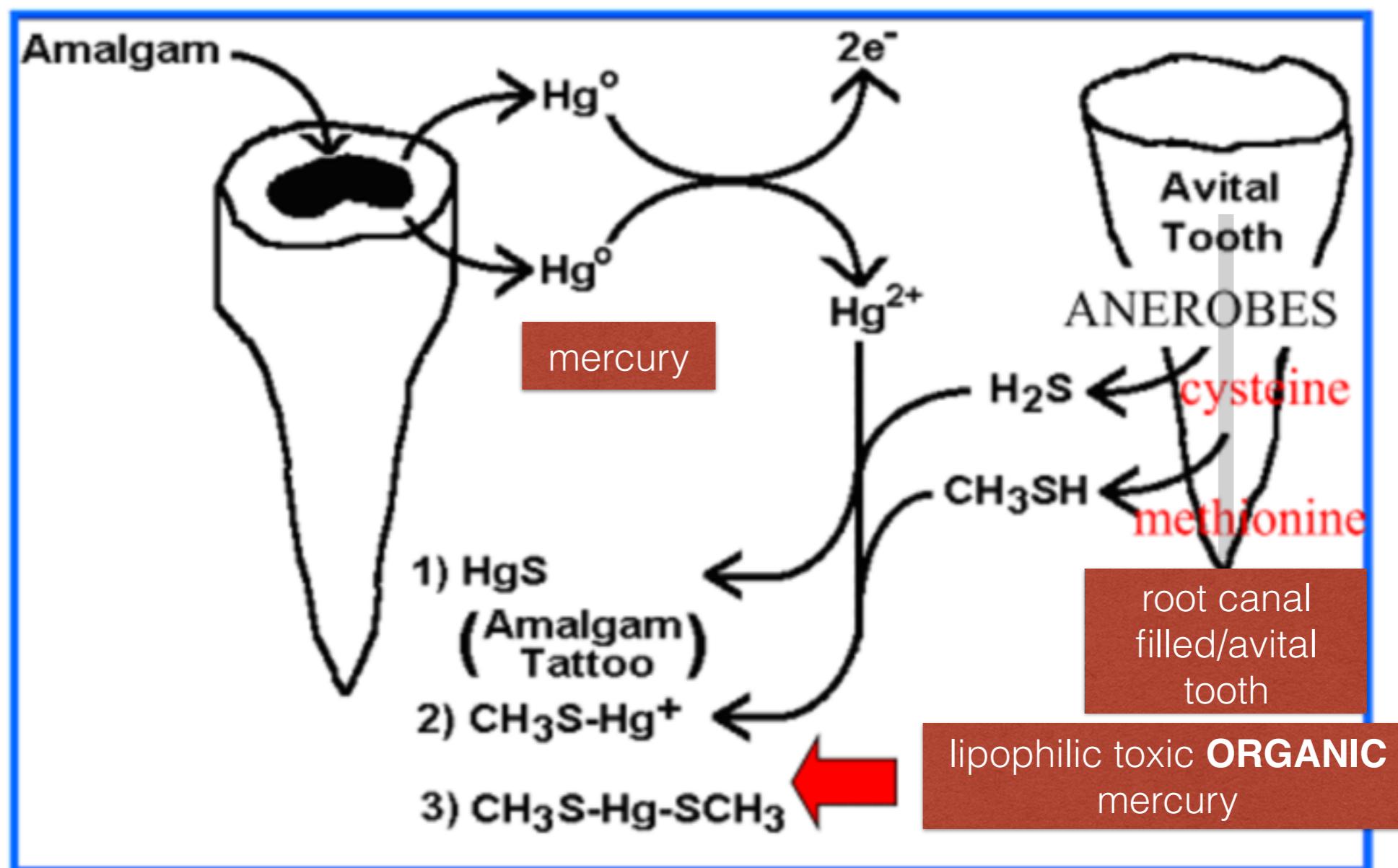
elementary **Hg0 (liquid)**
air contact —>oxidization,
vapours !!!

Respiratory tracts —> systematic circulation and release into every cell (RBC, BBB, Placenta)

organic Hg compounds
microorganism + inorganic mercury
—> toxic methyl/ethylmercury
highly lipophilic !!! —> systemic circulation and excretion
(Membranes, BBB, Placenta, Neuronal cells, RBC, excretion mainly liver)

inorganic **Hg+, Hg2+**
weak gastrointestinal tract absorption—> but if transformation into resorbable Methylmercury!!!
—> high permeability, systematic circulation and excretion (Kidney)

Amalgam Mercury Can Combine With Bacterial Toxins To Produce Even More Toxic Species



oxidative stress and
cancer formation,
antibiotic
resistance(A,B)

Lung & Bone
diseases(C)

Skin diseases (D)

Kidney diseases (F)

Health Effects

Heart diseases (E)

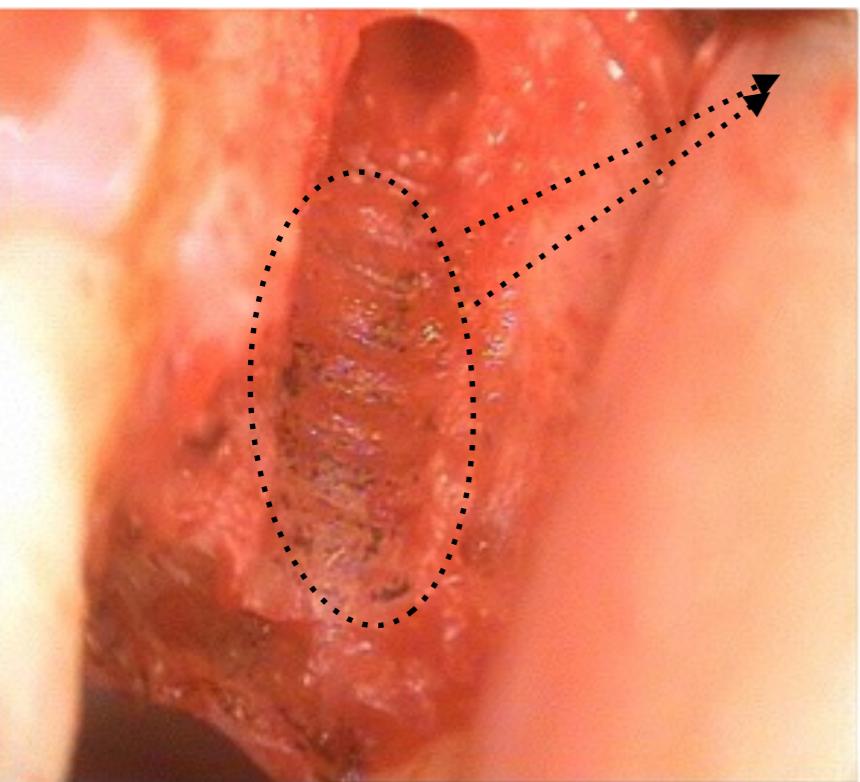
Genetic prevalence &
polymorphism (I)

Infertility(H)

Neurological diseases,
ALS, MS, Parkinson's
disease, Alzheimer (G)

Reference: A) **Di Pietro A et al.**, Biomonitoring of DNA damage in peripheral blood lymphocytes of subjects with dental restorative fillings. *Mutat Res* 2008, 650:115-122. B) **Lorscheider FL et al.**, The dental amalgam mercury controversy—inorganic mercury and the CNS; genetic linkage of mercury and antibiotic resistances in intestinal bacteria. *Toxicology* 1995, 97:19-22. C) **Hahn LJ et al.**, Whole-body imaging of the distribution of mercury released from dental fillings into monkey tissues. *FASEB Journal* 1990, 4:3256-3260. D) **Weidinger S et al.**, Body burden of mercury is associated with acute atopic eczema and total IgE in children from southern Germany. *J Allergy Clin Immunol* 2004, 114:457-459. E) **Houston MC**: The role of mercury and cadmium heavy metals in vascular disease, hypertension, coronary heart disease, and myocardial infarction. *Altern Ther Health Med* 2007, 13:128-133. F) **Mortada WI et al.**, Mercury in dental restoration: is there a risk of nephrotoxicity? *J Nephrol* 2002, 15:171-176. G) **Carpenter DO**: Effects of metals on the nervous system of humans and animals. *Int J Occup Med Environ Health* 2001, 14:209-218. H) **Gerhard I et al.**, Heavy metals and fertility. *J Toxicol Environ Health*. 1998, 54:593-611. I) **Wojcik DP et al.**, Mercury toxicity presenting as chronic fatigue, memory impairment and depression: diagnosis, treatment, susceptibility, and outcomes in a New Zealand general practice setting (1994-2006). *Neuro Endocrinol Lett* 2006, 27:415-423.

Is there a difference between Dental Metals and Titanium ?



Titanium → high affinity to oxygen → quick oxidation –> Titaniumoxide particels → Hyperreactivity of Macrophages → Secretion of TNF alpha and IL-1 (22,23)

vs.

Ion release from other dental metals → Ion attachment to body proteins → Allergen → Hyperreactivity of T-lymphocytes → Type IV Hypersensitivity (24)

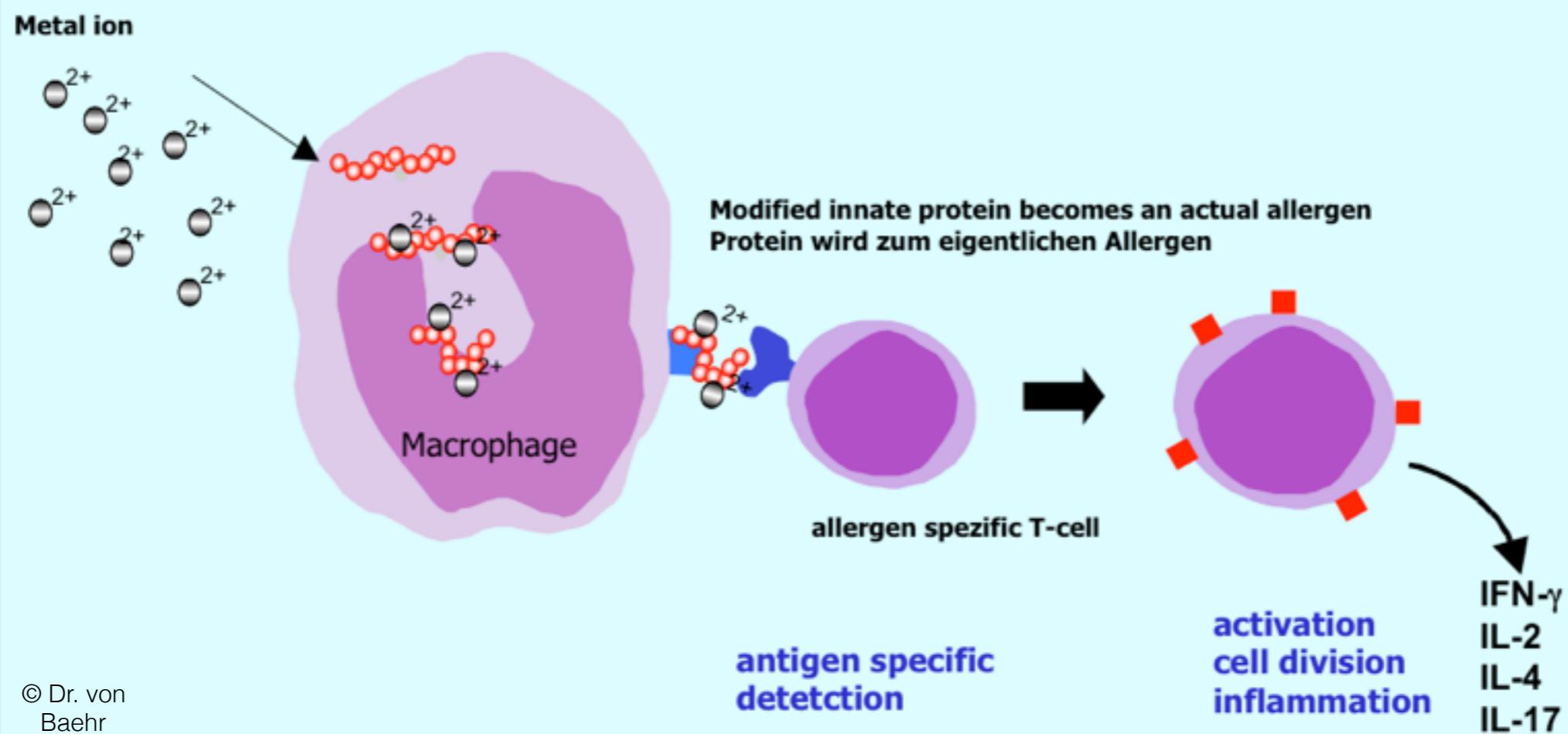
Diagnostic modalities

- Blood: **LTT/MELISA or TST** (25,26)
- Urine: **DMPS heavy metal mobilization test (MEA)** (27)
- Hair: **Hair mineral analysis (HMA)** (28)

Reference: 22) Sterner T, et al., Effects of clinically relevant alumina ceramic, zirconia ceramic and titanium particles of different sizes and concentrations on TNF-alpha release in a human macrophage cell line. Biomed Tech. 2004;49(12):340-344. 23) Dörner T et al., Implant-related inflammatory arthritis. Nat Clin Pract Rheumatol. 2006;2(1):53-56. 24) Stejskal et al., Increased frequency of delayed type hypersensitivity to metals in patients with connective tissue disease, Journal of Trace Elements in Medicine and Biology, 2015 Jan. 25) Valentine-Thon E et al., LTT-MELISA is clinically relevant for detecting and monitoring metal sensitivity. Neuro Endocrinol Lett 2006; 27(Suppl 1): 17-24. 26) Jansson H et al., Clinical consequences of IL-1 genotype on early implant failures in patients under periodontal maintenance. Clin Implant Dent Relat Res. 2005;7(1):51–59. 27) Vearrier D et al., Care of patients who are worried about mercury poisoning from dental fillings. J Am Board Fam Med. 2010 Nov-Dec;23(6):797-8. 28) Pan Y et al., Trace elements in scalp hair from potentially exposed individuals in the vicinity of the Bayan Obo mine in Baotou, China. Environ Toxicol Pharmacol. 2015 Sep 2;40(3):678-685.

Compared to other metals, Titanium does not induces allergic reactions as it oxidizes immediately and can not be found in an ionic form.

Predisposition for an allergic reactions is binding of metalic ions to proteins and their consequent modifications.
Titanium isn't capable of the latter.

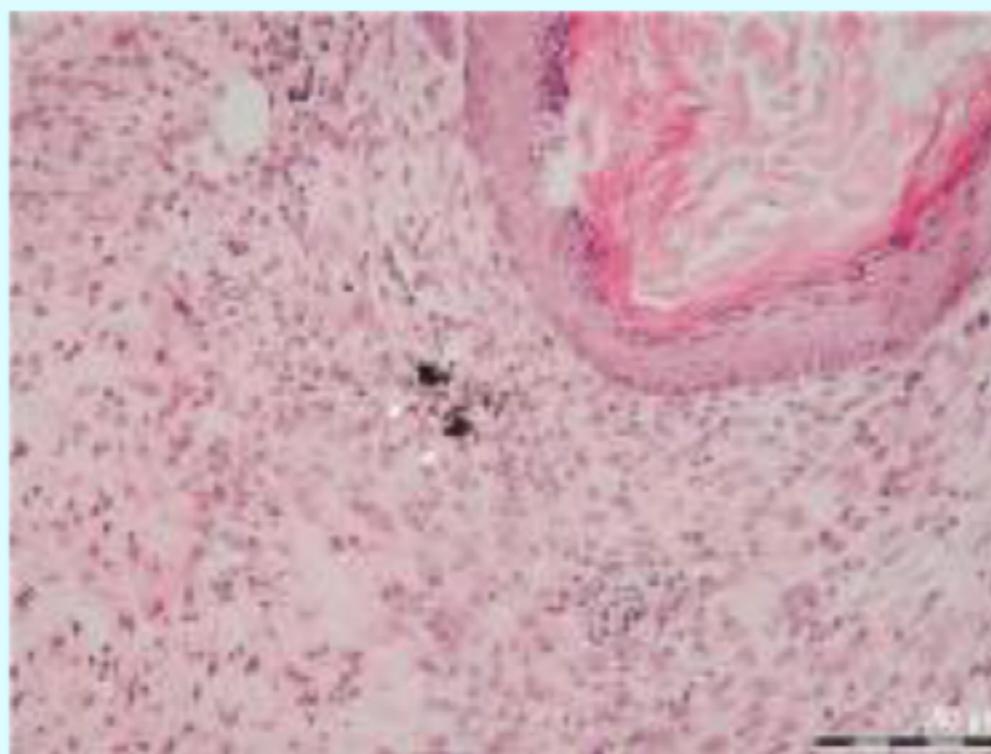


What is the actual antigen for an immune response towards titanium implants ?

In-vivo-analysis for systemic distribution of titanium wear debris

Systemic Spread of Wear Debris - An In-Vivo Study

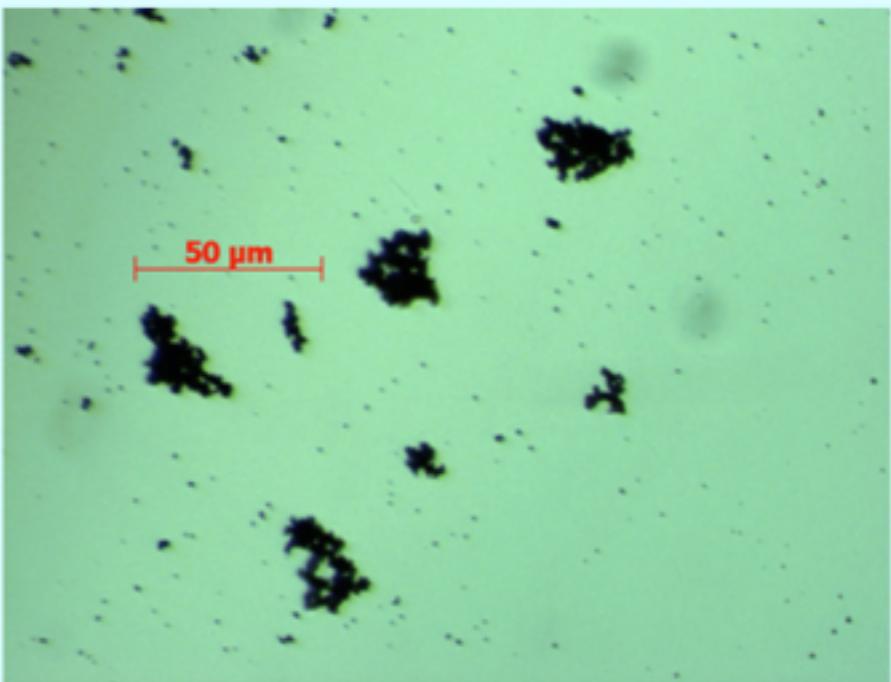
B. Burian¹, M. A. Wimmer², J. Kunze³, C. M. Sprecher⁴, P. H. Pennekamp¹, L. V. von Engelhardt¹, O. Diedrich¹,
Z Orthop Ihre Grenzgeb. 2006;144:539-44



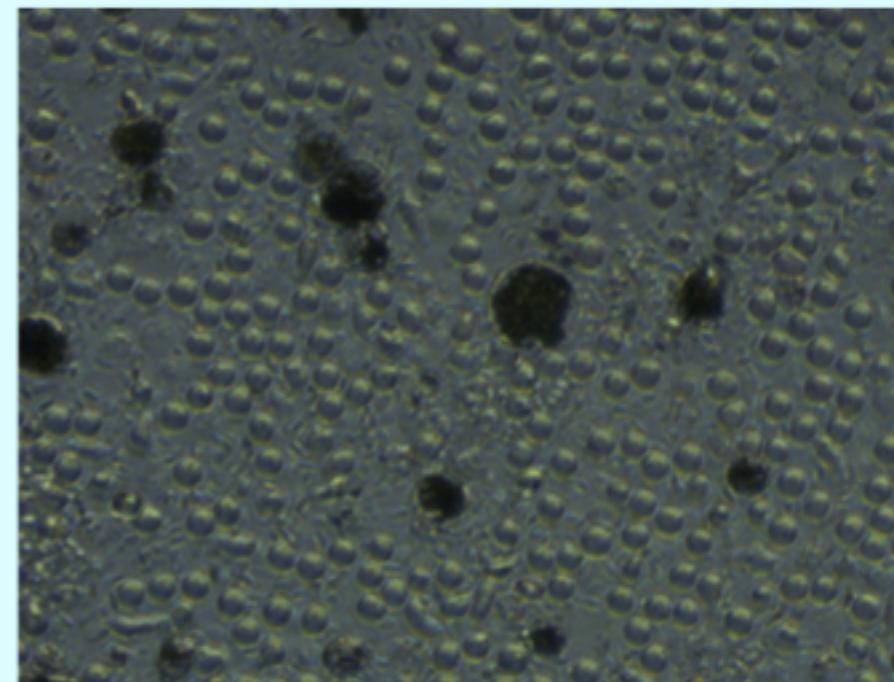
In close proximity wear particles of titanium can be found, size
0,5 bis 10 µm

© Dr. von
Baehr

Tissue macrophages digest „titanium“ particles



Titaniumoxide particles under 40x microscopic magnification



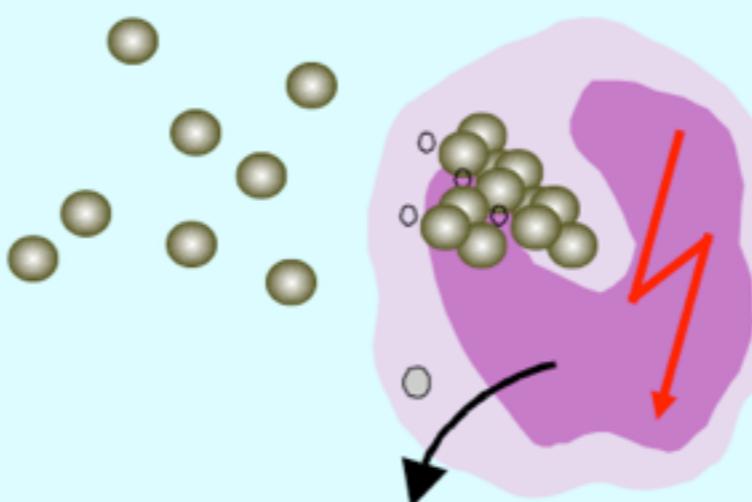
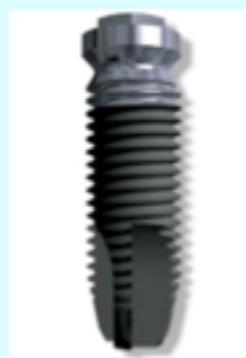
Titaniumoxide particles are digested after 60 minutes by macrophages

Problem: Macrophages secret inflammatory markers/mediators (TNF- α , IL1 β)

© Dr. von
Baehr

Titaniumoxide particles innitiate inflammatory reactions

Further support
of oxide particle
release



activation of tissue
macrophages

Local immune response

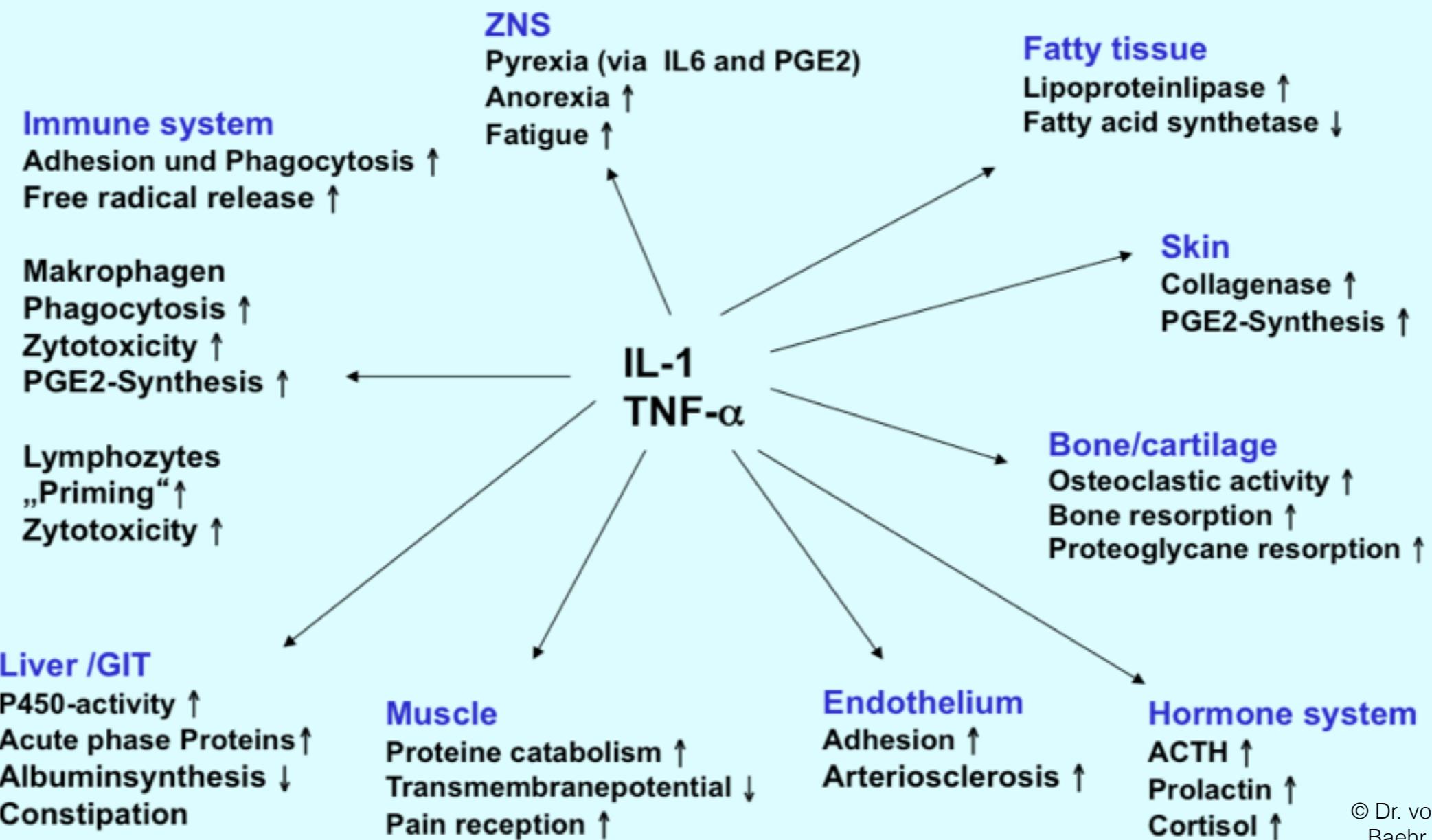
- Activation of osteoclasts
(loss of osseointegration)
- local inflammation and infiltration

$\xleftarrow{\text{TNF}\alpha + \text{IL-1}\beta\text{-secretion}}$

Systemic immune response

Due to cytokine effect on peripheral tissues

Local and systemic symptoms linked to immune mechanisms



© Dr. von Baehr

Diseases associated with metal overload.....

Fibromyalgia (29)
Lymes disease/ Borrreliosis (30)
Breast cancer (31)
Autoimmune disorders (32)
Infertility (33)
Muscle pain (34)
CFS (35)

Reference: 29) **Stejskal et al.**, Metal-induced inflammation triggers fibromyalgia in metal-allergic patients. Neuroendocrinol Lett 2013; 34(6):559–565. 30) **Valentine-Thorn E et al.**, A novel lymphocyte transformation test (LTT-MELISA) for Lyme borreliosis Diagn Microbiol Infect Dis. 2006 Jul 27. 31) **Stejskal et al.**, Increased levels of transition metals in breast cancer tissue. Neuro Endocrinol Lett 2006; 27(Suppl 1): 36-39. 32) **Sterzl I et al.**, Removal of dental amalgam decreases anti-TPO and anti-Tg autoantibodies in patients with autoimmune thyroiditis. Neuro Endocrinol Lett 2006; 27(Suppl 1): 25-30. 33) **Podzimek S et al.**, Sensitization to inorganic mercury could be a risk factor for infertility. Neuroendocrinology Letters, 2005;26(4):277-282
34+35) **Regland B et al.**, Nickel allergy is found in a majority of women with chronic fatigue syndrome and muscle pain – and may be triggered by cigarette smoke and dietary nickel intake. Journal of Chronic Fatigue Syndrome, Vol. 8(1) 2001

Where to test for metals in Northern America ?



United States of America

Pharmasan Labs

373 280th Street Osceola, WI
54020

Tel +1 715 294 2144

Fax +1 715 294 3921

Web www.neurorelief.com

Email

marie.loughlin@neurorelief.com

*Please note that testing must be
ordered by an authorized
healthcare provider*



Canada

CML HealthCare Inc.

60 Courtneypark Dr. West, Unit 1
Mississauga, ON L5W 0B3

Tel 1-800-263-0801

Web www.melisacanada.com

www.rmalab.com

Email melisa@rmalab.com

<http://www.melisa.org/contact-us/melisa-laboratories>

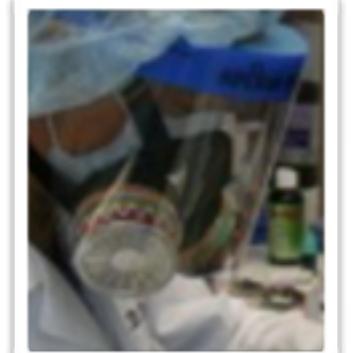
Protective measures for metal removal & detoxification ! Interdisciplinary work between dentist and doctor !



Rubberdam & clean up suctioner



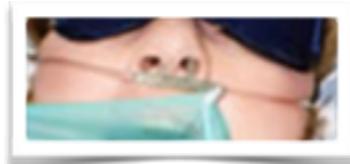
Pear shaped rough diamond, water, low rpm (15-20)



Protective gear



Suctioning device



Oxygen



„Metall Free“ - Ceramics



Na - Selenite



Solidago



Na - Thiosulfate



Cilantro



Dr. Rau´s Paracelsus Detox and/or Build Up Infusions with Vitamins, Minerals and antioxidants, chelating agents for any dental intervention



Chlorella



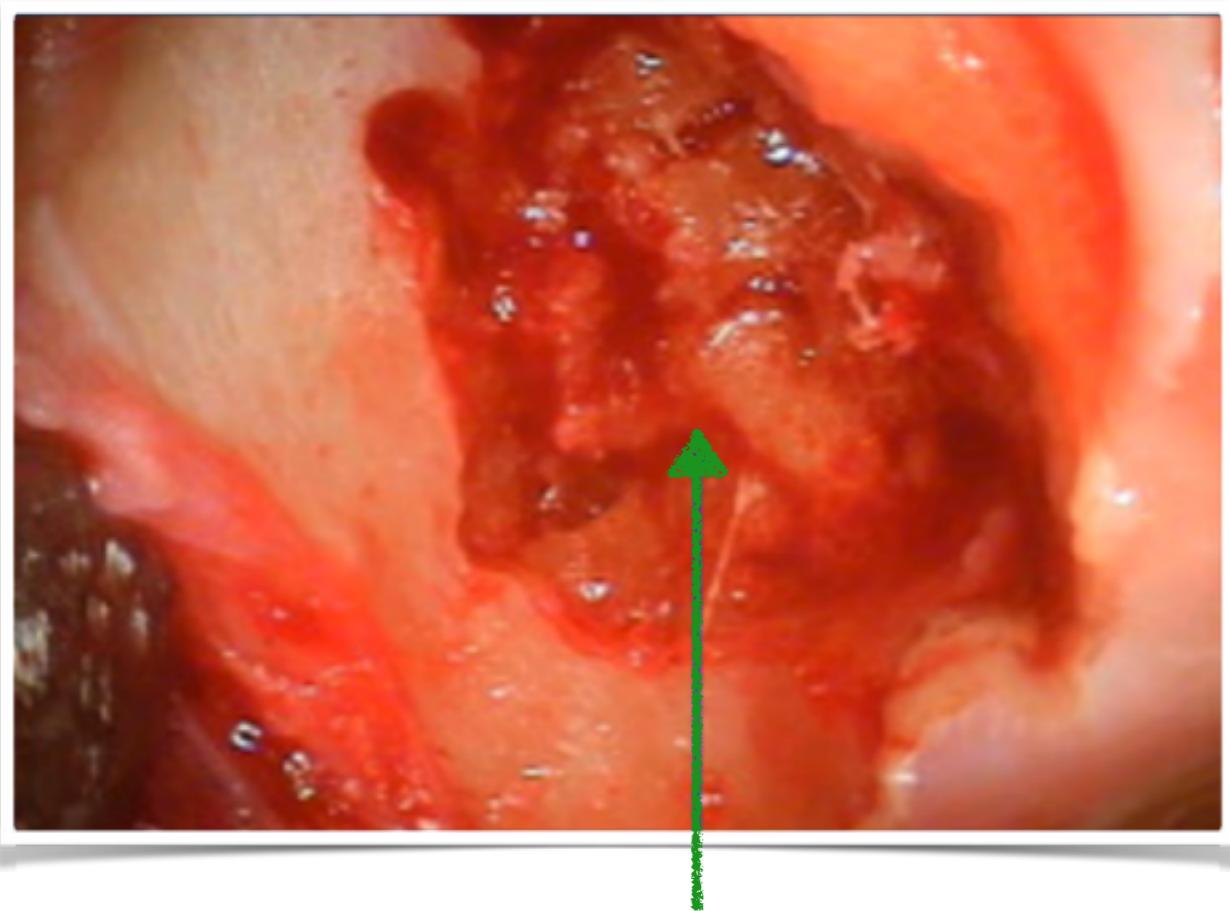
DMPS - Chelation Therapy

Jaw Cavitations (JC)
Chronic Ischaemic Bone Disease (CIBD)
Neuralgia inducing Cavitational Osteonecrosis (NICO)



appears like brownish discoloration, soft, small cavities, air filled spaces
→ Fatty degenerative osteonecrotic changes

How does it effect us ?



„fatty degenerative osteonecrosis“
anaerobic bacteria
—> Toxins !

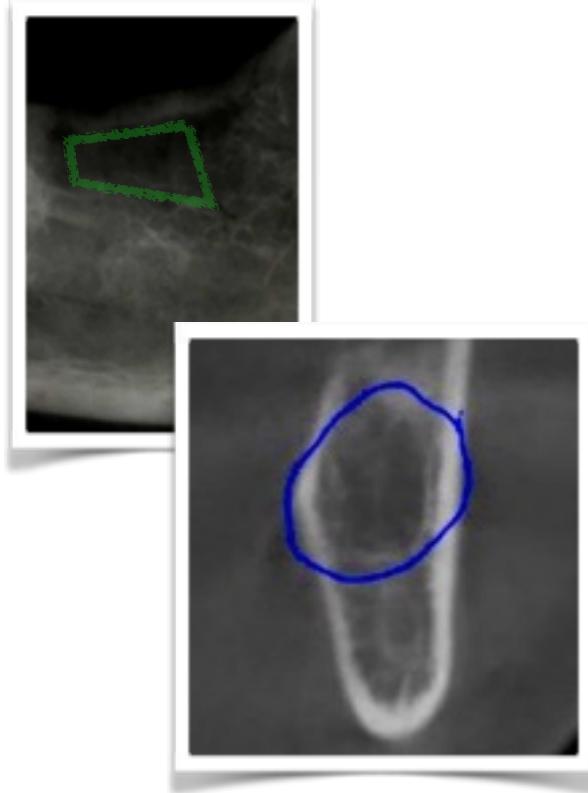
Locally: No signs of acute inflammation
—> **painless** (36)
—> **toxine —> facial neuralgia/pain** (37,38)
—> **no swelling**
—> **no pus formation**
—> **ischaemic nonresorbing necrotic bone flakes** with **cavity** formation(39)
—> **microscopic features:**
dense marrow fibrosis,
absence inflammatory cells
smudged tissue (40)

Systemically: Action at distance on other
organs/ organ systems

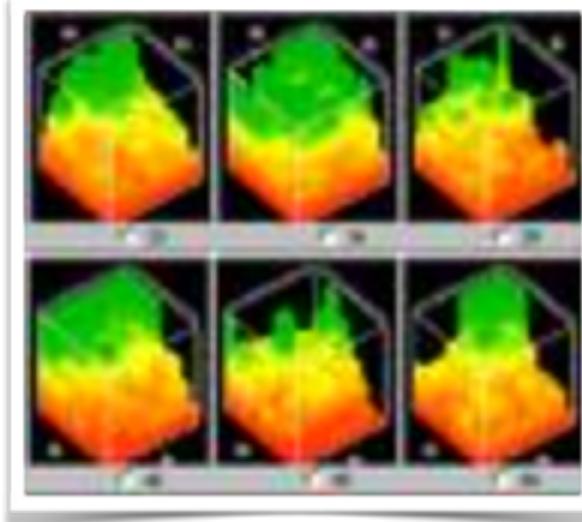
Reference: 36) Bouquot JE et al., Ischemia and infarction of the jaws--the "phantom" pain of NICO. Crano. 1994 Jul;12(3):138-9. + 37) Long-term effects of jawbone curettage on the pain of facial neuralgia. J Oral Maxillofac Surg. 1995 Apr;53(4):387-97; discussion 397-9 + 38)Neuropathic pain in maxillofacial osteonecrosis. J Oral Maxillofac Surg. 2000 Sep;58(9):1003-20.+ 39/40) Neuralgia-inducing cavitational osteonecrosis (NICO).Osteomyelitis in 224 jawbone samples from patients with facial neuralgia. Oral Surg Oral Med Oral Pathol. 1992 Mar;73(3):307-20

Diagnostics

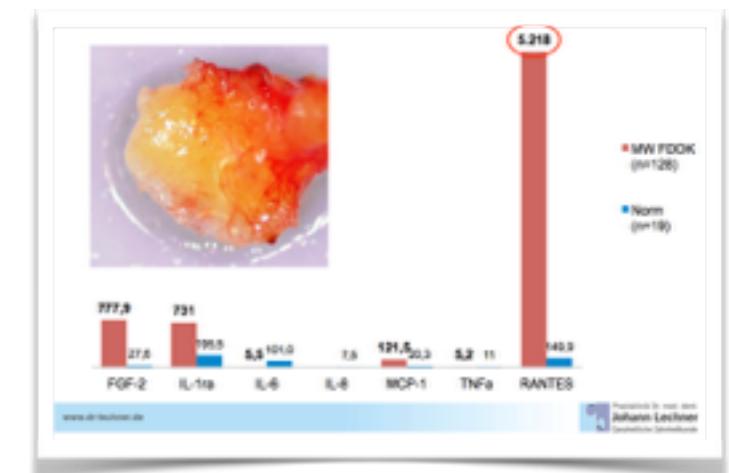
- **OPG**,
but better
DVT (3D
scan) (41)



- **CAVITAT** scan (computer based ultrasonic device, evidence based, FDA approved) (42)
 - > **ischaemic changes**
 - > **osteonecrotic areas**
 - > **cavities**

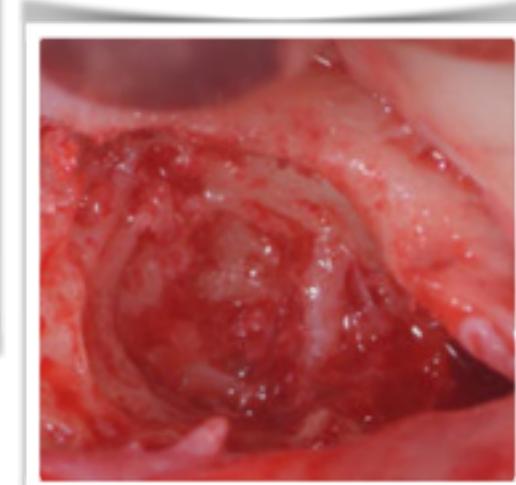
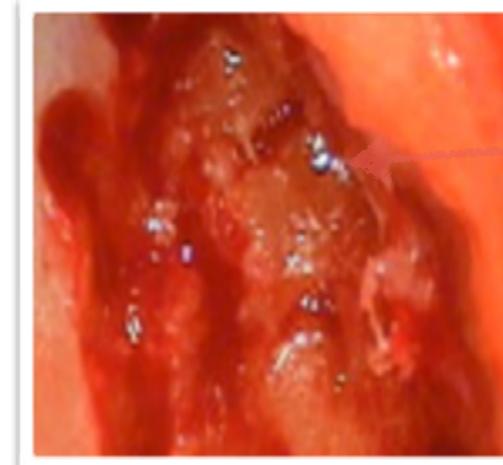
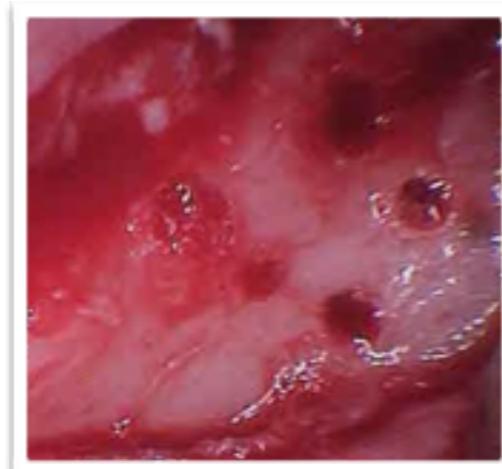
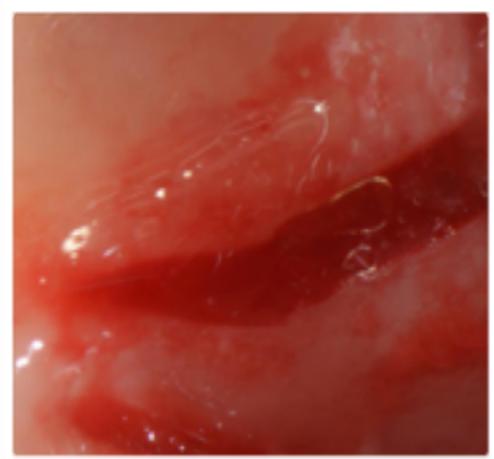


- **Blood**
(Cytokines):
Increase in
RANTES/CCL 5, FGF -2, IL-1RA
(43,44)
—> **Breast Cancer, MM, RA, MS ?** (45)



Reference: 41) Lechner J et al., Validation of dental X-ray by cytokine RANTES - comparison of X-ray findings with cytokine overexpression in jawbone. Clin Cosmet Investig Dent. 2014 Aug 21;6:71-9.. + 42) Shankland WE et al., Focal osteoporotic marrow defect: report of 100 new cases with ultrasonography scans. Crano. 2004 Oct;22(4):314-9. 43) Lechner J et al., Chemokine RANTES/CCL5 as an unknown link between wound healing in the jawbone and systemic disease: is prediction and tailored treatments in the horizon? EPMA J. 2015 May 6;6(1):10. + 44) Peripheral Neuropathic Facial/Trigeminal Pain and RANTES/CCL5 in Jawbone Cavitation. Evid Based Complement Alternat Med. 2015;2015:582520. + 45) Hyperactivated Signaling Pathways of Chemokine RANTES/CCL5 in Osteopathies of Jawbone in Breast Cancer Patients-Case Report and Research. Breast Cancer (Auckl). 2014 May 21;8:89-96.

Treatment by Incision & Curretage /Pieoztherapy (46)



Characteristic findings:

„Fatty vacuoles

&

soft smudged necrotic tissue“

**Chronic
Ostitis**

What next ?

- > **Ozonotherapy (47)**
- > **PRGF Therapy (48)**
- > **PNSA Therapy (49)**

Reference: 46) Bouquot JE et al., Long-term effects of jawbone curettage on the pain of facial neuralgia. J Oral Maxillofac Surg. 1995 Apr;53(4):387-97; discussion 397-9, 47) Nogales CG et al., Ozone therapy in medicine and dentistry. J Contemp Dent Pract. 2008 May 1;9(4):75-84. 48) Mozzati M et al., Failure risk estimates after dental implants placement associated with plasma rich in growth factor-Endoret in osteoporotic women under bisphosphonate therapy. J Craniofac Surg. 2015 May;26(3):749-55. 49) Egli S et al., Long-term results of therapeutic local anesthesia (neural therapy) in 280 referred refractory chronic pain patients. BMC Complement Altern Med. 2015 Jun 27;15:200.

Root Canal Treatment: A hidden risk to develop systemic diseases and even **CANCER** ?

What does evidence based international literature state ?



Oral microorganism/pathogens cause disseminated systemic diseases (50-52)



Increase in failure rate of endodontic treatments (CAP up to 60%) even with better technical equipment (53-55)



Past History: All improvements and innovations in the field of endodontics **have not lead to an improvement** in the success rates (56)

Presence : **No changes** in the situation, **stagnation** (57)

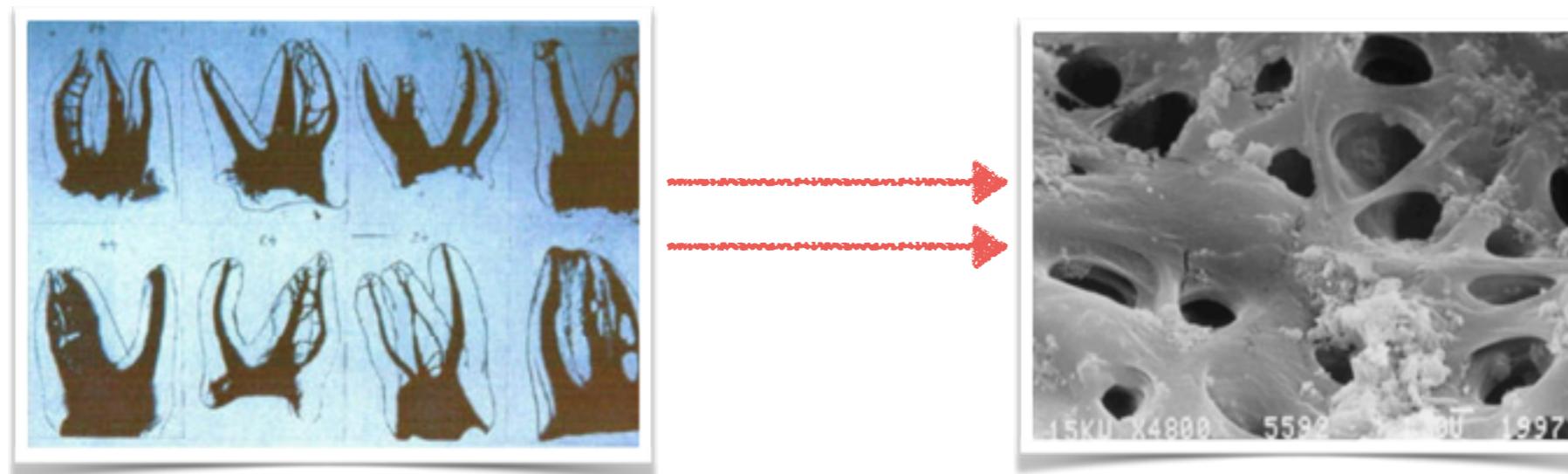
Reference: 50) **Debelian et al.**, Systemic diseases caused by oral microorganisms. 1994 Endod. Dent. Traumatol. 10:57-65. 51) **Xiaojing Li et al.**, Systemic Diseases Caused by Oral Infection Department of Oral Biology1 and Department of Endodontics,2 Faculty of Dentistry, University of Oslo, Oslo, Norway. 52) **Debelian et al.**, Anaerobic bacteremia and fungemia in patients undergoing endodontic therapy: an overview. 1998 Ann. Periodontol. 3:281-287. 53) **Eckerbom, M. et al.**: A 20-year follow-up study of endodontic variables and apical status in a Swedish population. Int Endod J 40,940(2007). 54) **Koch M et al.**, On implementation of an endodontic program. Swed Dent J Suppl 230, 9 (2013). 55) **Weiger R et al.**, Periapical status, quality of root canal fillings and ... Endodont Dent Traumatol 13:69 (1997). 56) **Kirkevåg L et al.**, Frequency and distribution of endodontically treated teeth and apical periodontitis ... Int Endodont J 34:198(2001). 57) **Van der Sluis L et al.**, Past and future of endodontics. ENDO (Lond Engl) 6 (2012).

How come ?

Pathogenesis (58)

Even when the highest standards and the most careful procedures are followed, failures still occur. This is because there are root canal regions that cannot be cleaned and obturated with existing equipments, materials, and techniques, and thus, infection can persist. In very rare cases, there are also factors located within the inflamed periapical tissue that can interfere with post-treatment healing of the lesion. The data on the biological causes

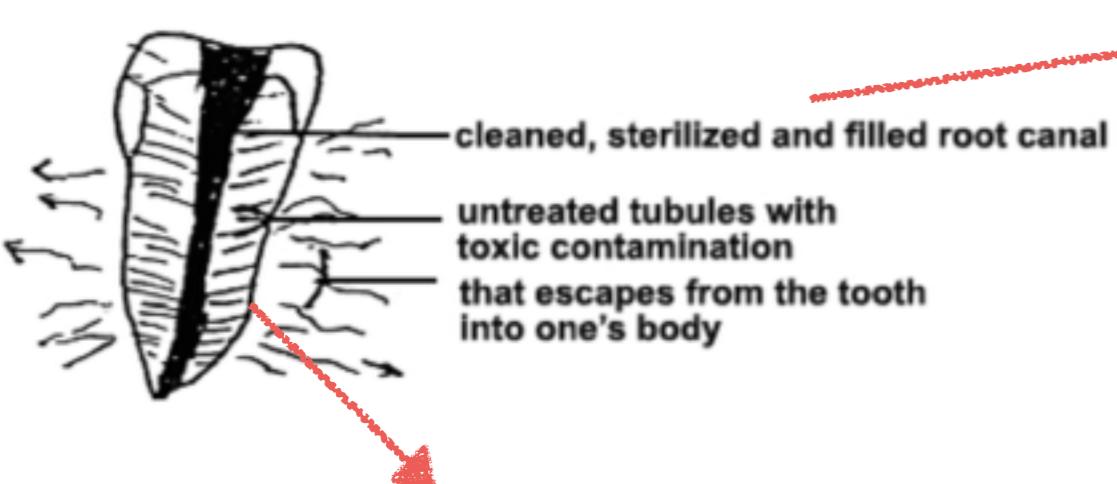
Root canal or canal system ?



Leading
to..... ?

Reference: 58) Nair PN et al., Pathogenesis of apical periodontitis and the causes of endodontic failures. Crit Rev Oral Biol Med. 2004 Nov 1;15(6):348-81.

Limitations



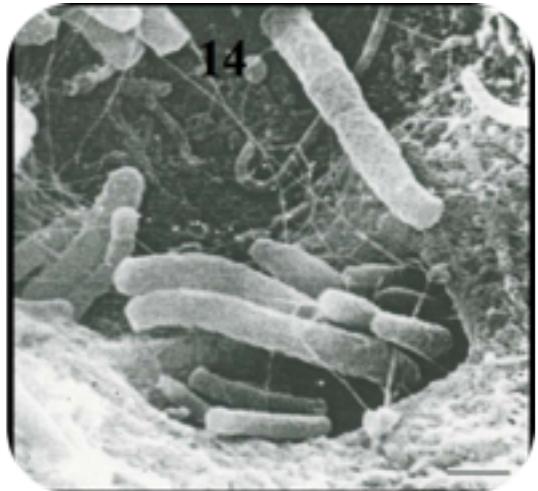
..... anatomical, immunological and mechanical **limitations** (59)

no blood supply, no lymphatics, no nerve tissue
 - no immune system (loss of odontoblast function —> unprotected tubuli) (60,61)

.....

great habitat for anaerobic bacteria (62,63)
 producing **Toxins**

Reference: 59) Barone C et. al., Treatment outcome in endodontics: the Toronto study--phases 3, 4, and 5: apical surgery. J Endod. 2010 Jan;36(1):28-35. 60) Gomes, M. et al., Can Apical Periodontitis Modify Systemic Levels of Inflammatory Markers? A Systematic Review and Meta-analysis. J Endod 39, 1205 (2013). 61) Wu, M. et al., Consequences of and strategies to deal with residual post-treatment root canal infection. International Endodontic Journal (2006). 62) Richardson N et al., Microflora in teeth associated with apical periodontitis: a methodological observational study comparing two protocols and three microscopy techniques. International Endodontic Journal 2009 October; Vol. 42(10): 908-21 63) J.F. Siqueira, et. al., Bacteria in the apical root canal of teeth with primary apical periodontitis. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics May 2009; Vol. 107 (5): 721-726



Toxins

Bacterias produce toxic metabolites —> carcinogenic hydrogen sulfur compounds (**Thioether/Mercaptane**) (64)

Toxins cause local and systemic diseases by triggering an **immune response** (65)

Immune Response

Local: adjacent to teeth structures causing **cystic lesions, absesses** and **jaw cavitations** —> unspecific immune response (66-68)

Systemic: Increase in inflammatory markers/cytokines (TNF alpha, Interleukine 1 β , 10, RANTES/CCL 5) circulate through the blood system —> **chronic inflammation** (low pH reduced oxygen saturation/oxidative stress), **cell proliferation** (69-74)

Reference 64) Persson S et al., The Formation of hydrogen sulfide and methyl mercaptan by oral bacteria. Oral Microbiology and Immunology 1990 August; Vol. 5 (4): 195-201
65) Lechner J et al., Mehrdimensionale Systemdiagnose des wurzelgefüllten Zahnes. ZWR-Das Deutsche Zahnärzteblatt 2012; Vol. 121(12): 640-644 66) Sousa EL et. al., Macrophage Cell Activation with Acute Apical Abscess Contents Determined by Interleukin-1 Beta and Tumor Necrosis Factor Alpha Production. J Endod. 2014 Sep 6. pii: S0099-2399(14)00576-7. 67) Martinho FC et. al., Signaling pathways activation by primary endodontic infectious contents and production of inflammatory mediators. J Endod. 2014 Apr;40(4):484-9. 68) Marciel KF et. al., Cytokine expression in response to root canal infection in gnotobiotic mice. Int Endod J. 2012 Apr;45(4):354-62. 69) Hernadi K et. al., Elevated tumor necrosis factor-alpha expression in periapical lesions infected by Epstein-Barr virus. J Endod. 2013 Apr;39(4):456-60. 70) Marton IJ et. al., Differential in situ distribution of interleukin-8, monocyte chemoattractant protein-1 and Rantes in human chronic periapical granuloma. Oral Microbiol Immunol. 2000 Feb;15(1):63-5. 71) Martinho FC et. al., Antigenic activity of bacterial endodontic contents from primary root canal infection with periapical lesions against macrophage in the release of interleukin-1beta and tumor necrosis factor alpha. J Endod. 2010 Sep;36(9):1467-74. 72) De Brito LC et.al., Immunological profile of periapical endodontic infections from HIV- and HIV+ patients. Int Endod J. 2014 Jul 29. 73) Lechner J et. al., RANTES and fibroblast growth factor 2 in jawbone cavitations: triggers for systemic disease Int J Gen Med. 2013 Apr 22;6:277-90. 74) Tripi TR et. al., Proliferative activity in periapical lesions. Aust Endod J. 2003 Apr;29(1):31-3.

Cell Proliferation

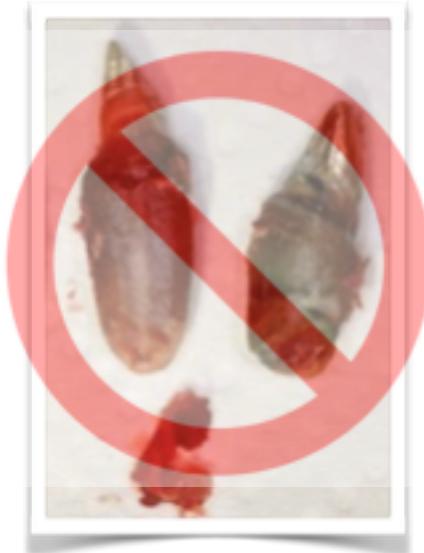
inflammatory markers/cytokines (e.g. TNF alpha, IL 1 β ,10, RANTES/CCL 5)
uncontrolled cell proliferation —> **Cancer formation ?**

Breast, Bladder, Prostate, Cervix (75-81)

! CAVE !

Vital teeth are much more resistant to bacterial invasion than nonvital/ root canal treated teeth (82).

The vital pulp plays an important role in the prevention of bacterial invasion and therefore protection !



If any doubt: Extraction (GBR/GTR), Ozon, PRGF, PNSA !

Reference: 75) Lechner J et. al., Hyperactivated Signaling Pathways of Chemokine RANTES/CCL5 in Osteopathies of Jawbone in Breast Cancer Patients-Case Report and Research. Breast Cancer (Auckl). 2014 May 21;8:89-96. 76) Karakaxas D et. al., Genetic polymorphisms of inflammatory response gene TNF- α and its influence on sporadic pancreatic neuroendocrine tumors predisposition risk. Med Oncol. 2014 Oct;31(10):241. 77) Thompson DB et. al., Immunological basis in the pathogenesis and treatment of bladder cancer. Expert Rev Clin Immunol. 2014 Nov 13:1-15. 78) Bigatto V et. al., TNF- α promotes invasive growth through the MET signaling pathway. Mol Oncol. 2014 Sep 26. pii: S1574-7891(14)00215-4. 79) FU XT et. al., Macrophage-secreted IL-8 induces epithelial-mesenchymal transition in hepatocellular carcinoma cells by activating the JAK2/STAT3/Snail pathway. Int J Oncol. 2014 Nov 18. 80) Singhal P et. al., Association of IL-10 GTC haplotype with serum level and HPV infection in the development of cervical carcinoma. Tumour Biol. 2014 Nov 21. 81) Lei YM et. al., Interleukin-1 β -mediated suppression of microRNA-101 and upregulation of enhancer of zeste homolog 2 is involved in particle-induced lung cancer. Med Oncol. 2015 Jan;32(1):387. 82) Nagaoka S et al., Bacterial invasion into dentinal tubules of human vital and nonvital teeth. J Endod. 1995 Feb;21(2):70-3.

Responsibilities

Holistic approach of the stomatognathic system

Diagnostic and therapy of:

- > dental foci and field of disturbances
- > dental material load (incl. detox)
- > cranio-mandibular dysfunctions (CMD)