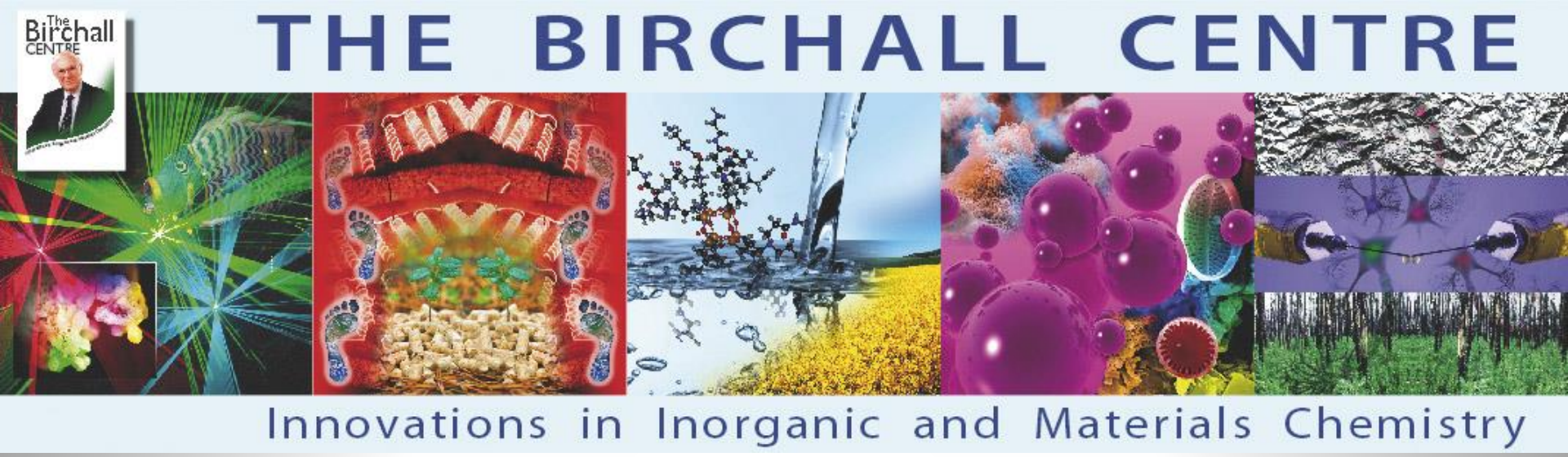

Living Safely (and Healthily) in the Aluminium Age

Christopher Exley PhD FRSB

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Aluminium and Silicon Research Group

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Keele University, Staffordshire, ST5 5BG, UK

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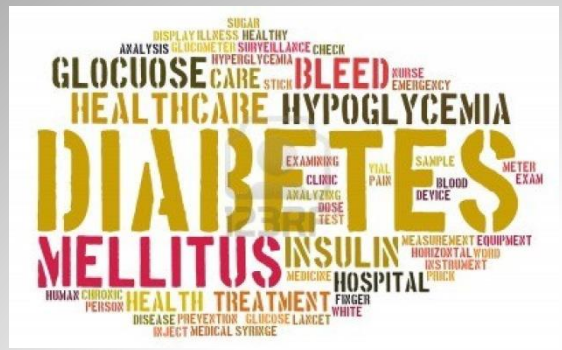
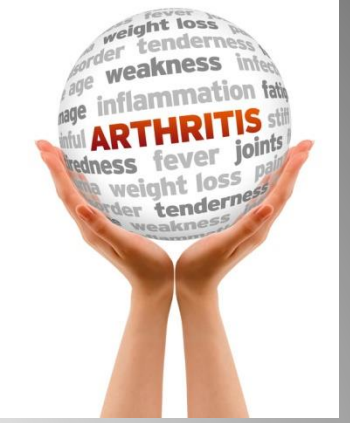
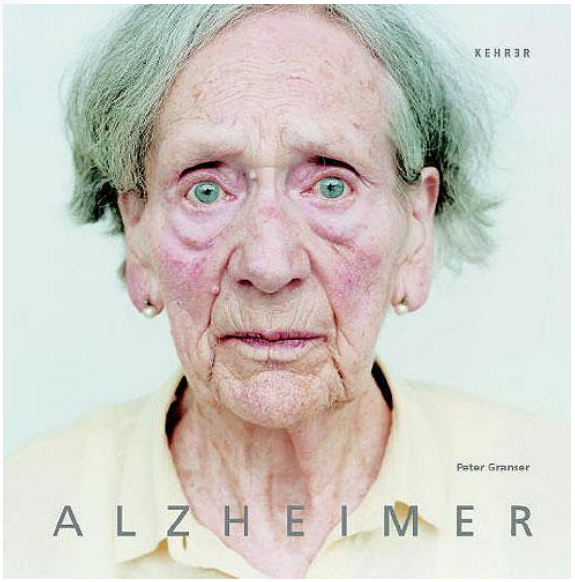
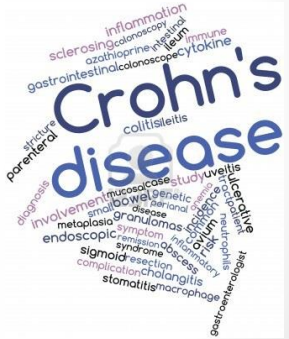
http://www.keele.ac.uk/aluminium/

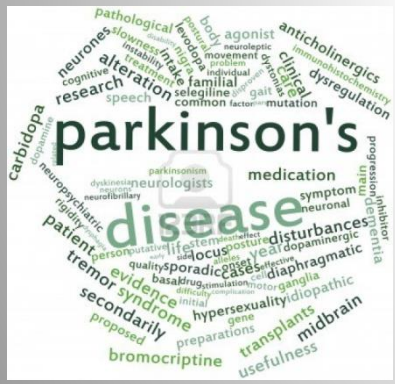
Honorary Professor, University of the Highlands and Islands, Scotland, UK





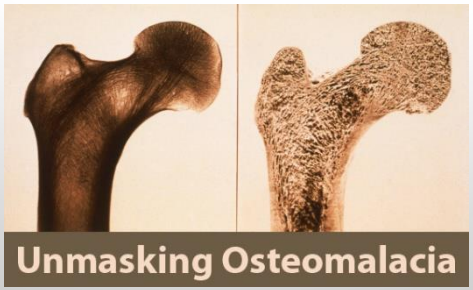






THE **ALUMINIUM** AGE?

https://www.hippocraticpost.com/mens-health/the-aluminium-age/

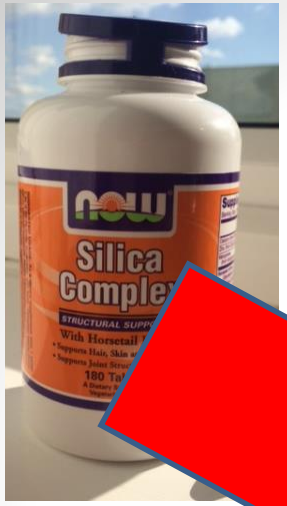



What seems to be the problem here
AI MAN

Human Exposure to Aluminium

Why Silicon-Rich Mineral Waters (and not so-called silicon/silica supplements) Will Protect You!

SILICON/SILICA SUPPLEMENTS



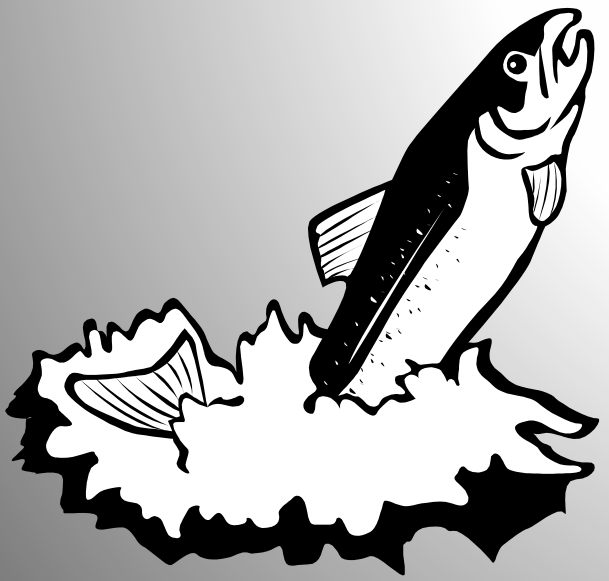
A Bioinorganic Solution to Aluminium-Related Disease?

1989

Acute toxicity of aluminium to fish eliminated in silicon-rich acid waters

J. D. BIRCHALL, C. EXLEY,
J.S. CHAPPELL & M. J. PHILLIPS

***Nature* 338, 146 - 148 (09 March 1989); doi:10.1038/338146a0**



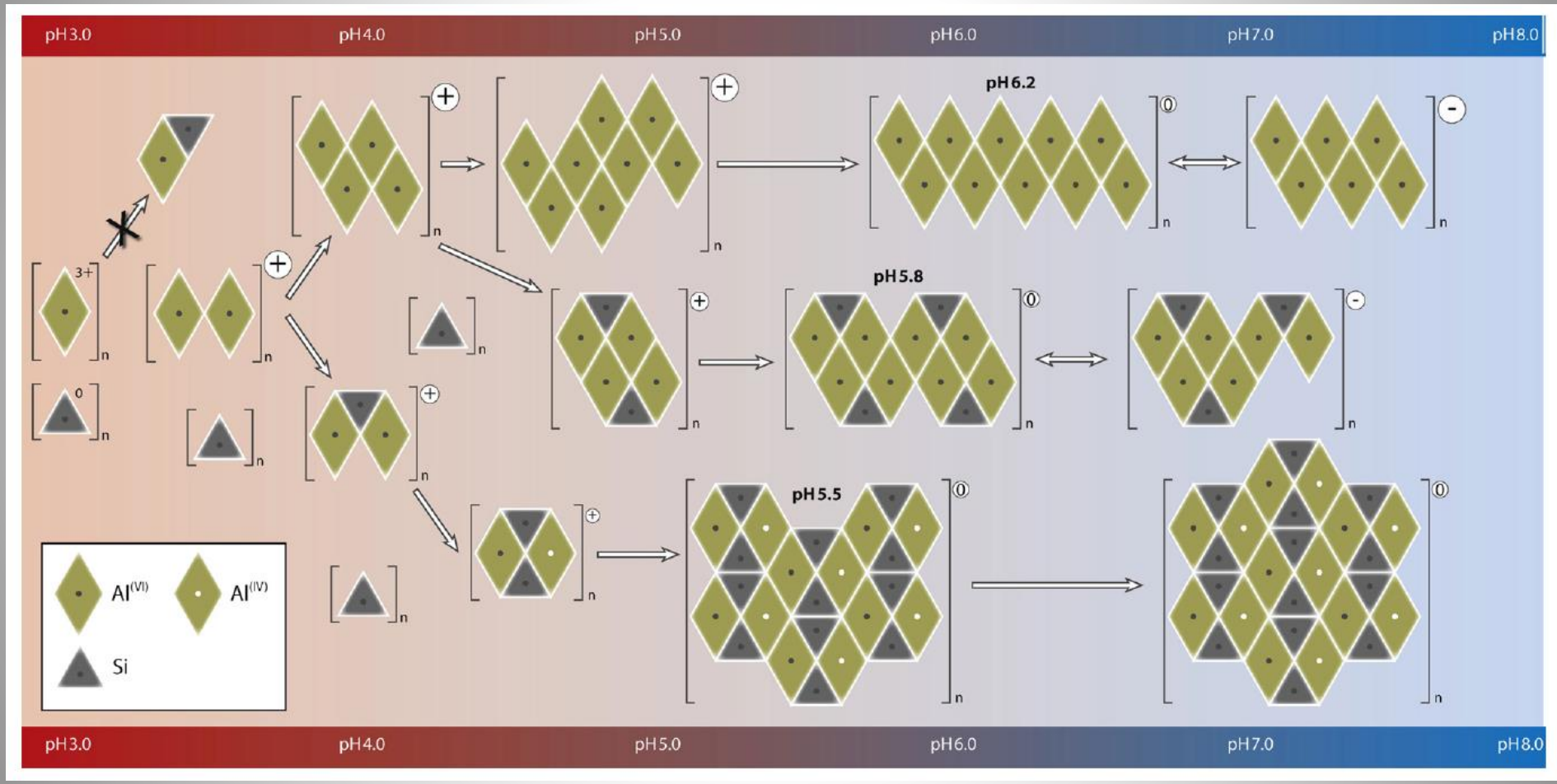
2006

Non-invasive therapy to reduce the body burden of aluminium in Alzheimer's disease

Christopher Exley, Olga Korchazhkina, Deborah Job, Stanislav Strekopytov, Anthony Polwart and Peter Crome

Journal of Alzheimer's Disease 10 (2006) 17–24

The Unique Inorganic Chemistry of the Reaction of Aluminium with Silicic acid



Coordination Chemistry Reviews 256 (2012) 82–88

Silicic acid reacts with aluminium to form HAS

SCIENTIFIC REPORTS

OPEN

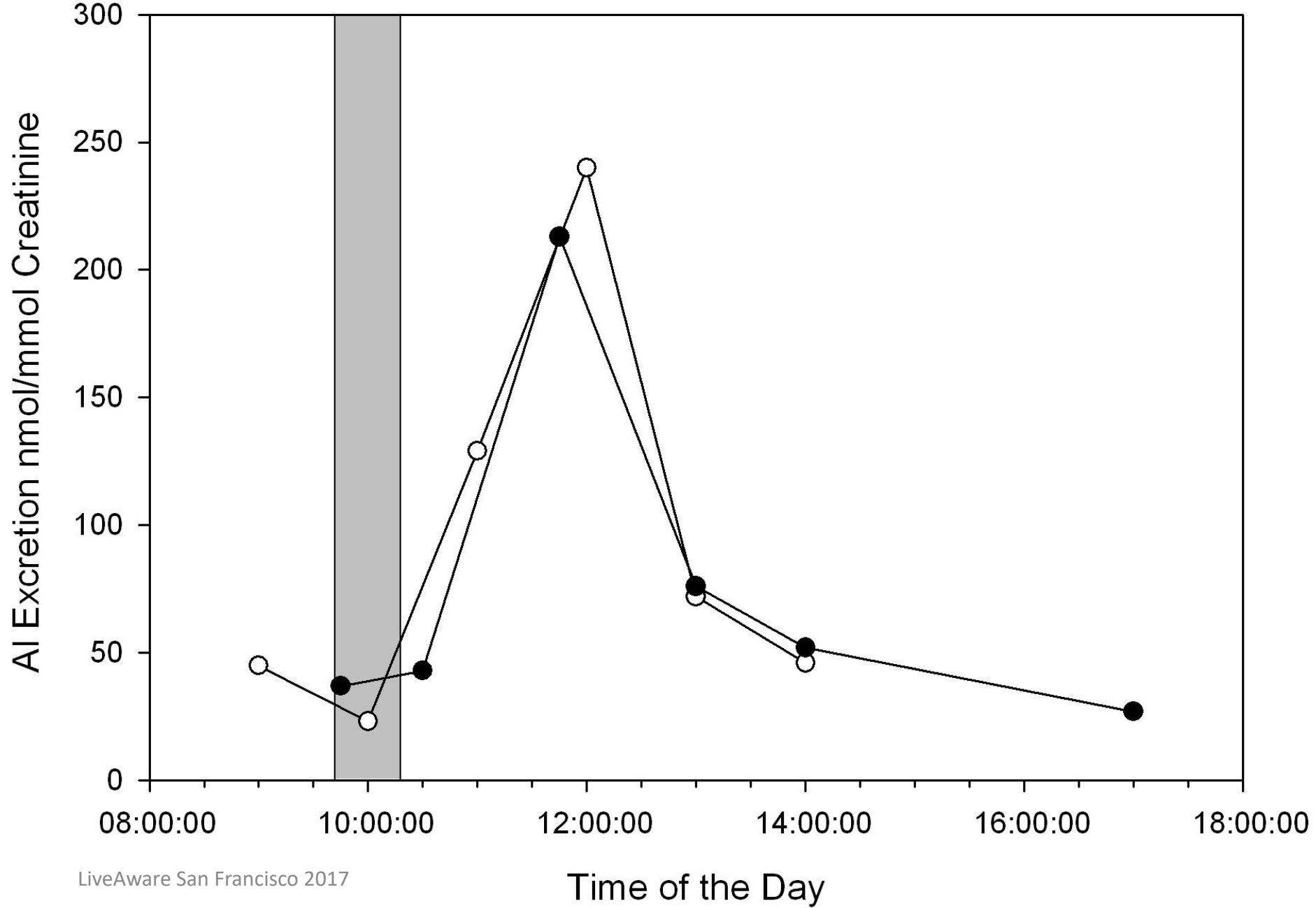
What is the mechanism of formation of hydroxyaluminosilicates?

Received: 26 May 2016
Accepted: 08 July 2016
Published: 01 Aug 2016

James Beardmore[1], Xabier Lopez[2], Jon I. Mujika[2] & Christopher Exley[1]

The formation of hydroxyaluminosilicates is integral to the biogeochemical cycles of aluminium and silicon. The unique inorganic chemistry which underlies their formation explains the non-essentiality in biota of both of these elements. However, the first steps in the formation of hydroxyaluminosilicates were hitherto only theoretical and plausibly only accessible *in silico*. Herein we have used computational chemistry to identify and define for the first time these unique and ultimately critically important reaction steps. We have used density-functional theory combined with solvent continuum models to confirm first, the nature of the reactants, an aluminium hydroxide dimer and silicic acid, second, the reaction products, two distinct hydroxyaluminosilicates A and B and finally, how these are the precursors to highly insoluble hydroxyaluminosilicates the role of which has been and continues to be to keep inimical aluminium out of biota.

http://www.nature.com/articles/srep30913


300
250
200
150
100
50
0
AI Excretion nmol/mmol Creatinine
08:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
Time of the Day

Journal of Alzheimer's Disease 10 (2006) 17–24
IOS Press

Non-invasive therapy to reduce the body burden of aluminium in Alzheimer's disease

Christopher Exley[a,*], Olga Korchazhkina[b], Deborah Job[c], Stanislav Strekopytov[a], Anthony Polwart[d] and Peter Crome[c,e]

[a]*Birchall Centre for Inorganic Chemistry and Materials Science, Keele University, Staffordshire, UK*
[b]*Institute for Science and Technology in Medicine, Keele University, Staffordshire, UK*
[c]*Department of Gerontology, University Hospital of North Staffordshire, Staffordshire, UK*
[d]*Life Sciences, Keele University, Staffordshire, UK*
[e]*School of Medicine, Keele University, Staffordshire, UK*

The first 'test' (over only 5 days) of an 'aluminium hypothesis of Alzheimer's disease with a silicon-rich mineral water showed that silicon-rich mineral waters could be an effective and non-invasive method to lower the body burden of aluminium.

Journal of Alzheimer's Disease 33 (2013) 423–430
DOI 10.3233/JAD-2012-121231
IOS Press

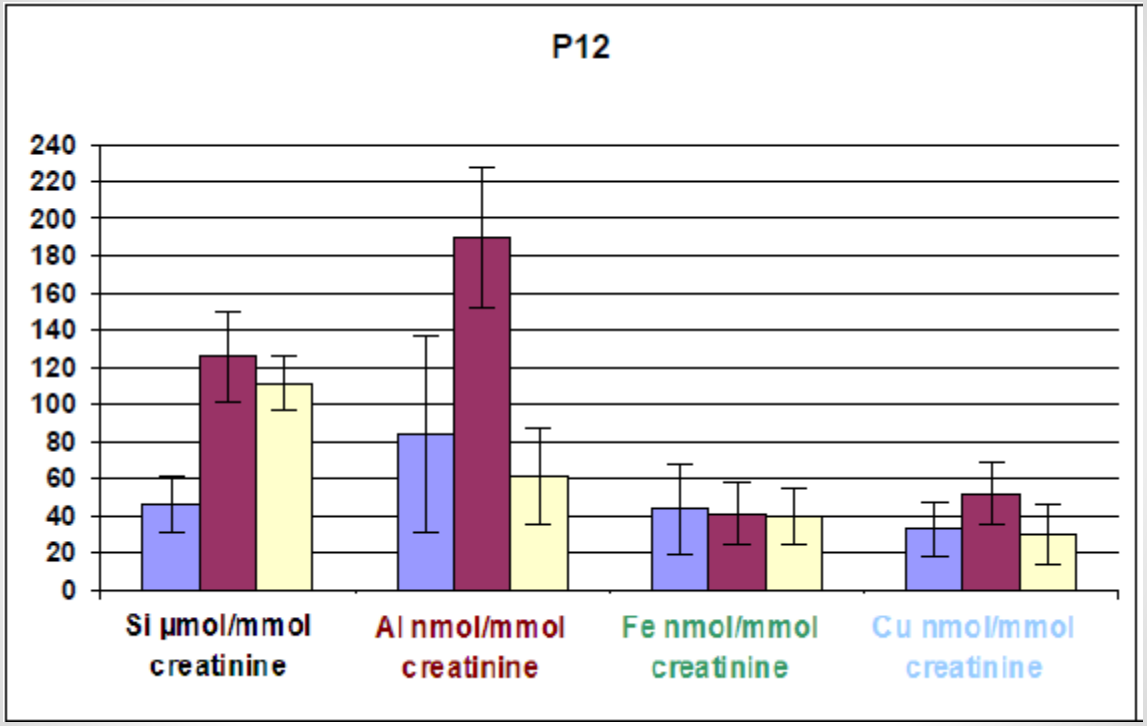
The Second Test!

Silicon-Rich Mineral Water as a Non-Invasive Test of the 'Aluminum Hypothesis' in Alzheimer's Disease

Samantha Davenward[a], Peter Bentham[b], Jan Wright[b], Peter Crome[c], Deborah Job[c], Anthony Polwart[d] and Christopher Exley[a,*]
[a]*The Birchall Centre, Lennard-Jones Laboratories, Keele University, Stoke-on-Trent, Staffordshire, UK*
[b]*Birmingham and Solihull Mental Health NHS Foundation Trust, The Barberry Centre, Birmingham, UK*
[c]*North Staffordshire Combined Healthcare NHS Trust, Harplands Hospital, Stoke-on-Trent, UK*
[d]*Life Sciences, Keele University, Stoke-on-Trent, Staffordshire, UK*

We have provided preliminary evidence that over 12 weeks of silicon-rich mineral water therapy the body burden of aluminium fell significantly in individuals with Alzheimer's disease and, concomitantly, cognitive performance showed clinically relevant improvements in at least 3 out of 15 individuals.

Alzheimer's Disease



Healthy Volunteers

*Table 3.1.4.1: **Mean**, SD and range of Si (µmoles/24h), Al, Fe and Cu (nmoles/24h) excreted in a 24-hour urine sample for the control and treatment data sets (n = 23).*

Urinary excretions in a 24-hour urine sample						
	Silicon (µmoles/24h)			**Aluminium (nmoles/24h)**		
	Mean	SD	Range	Mean	SD	Range
Control	550	249	179 – 1216	1069	494	276 - 2356
Treatment	947	428	303 – 1852	1808	843	402 - 3597
	Iron (nmoles/24h)			**Copper (nmoles/24h)**		
	Mean	SD	Range	Mean	SD	Range
Control	376	282	128 – 1123	216	107	85 - 519
Treatment	332	122	135 – 804	207	89	83 - 407

Healthy Volunteers

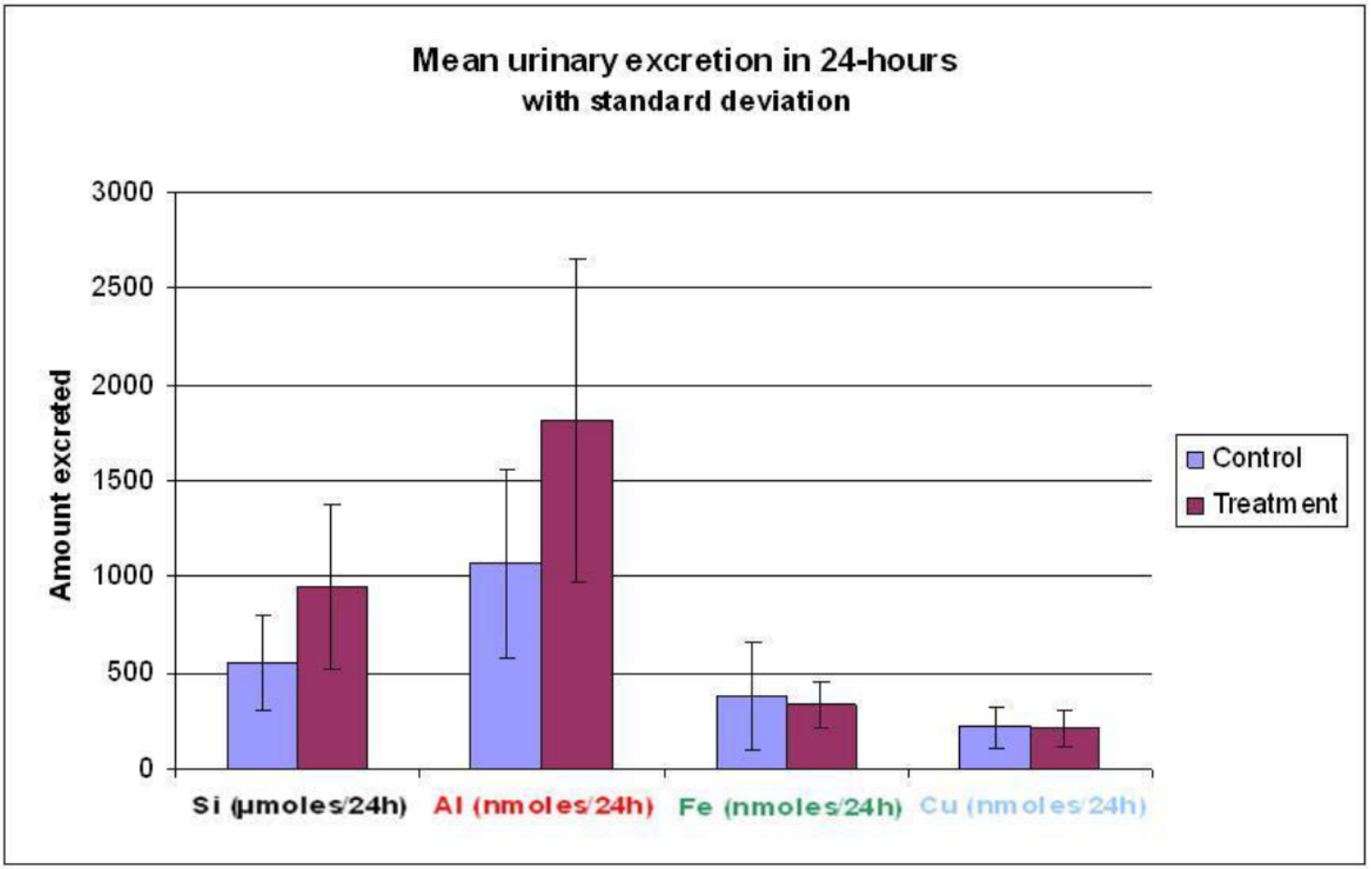


*Figure 3.1.4.2: **Mean** amounts and standard deviation bars of excreted Si (µmoles/24h), Al, Fe and Cu (nmoles/24h) in the control and treatment samples.*

ARTICLE *Multiple Sclerosis* 2006; **12**: 533–540

Elevated urinary excretion of aluminium and iron in multiple sclerosis

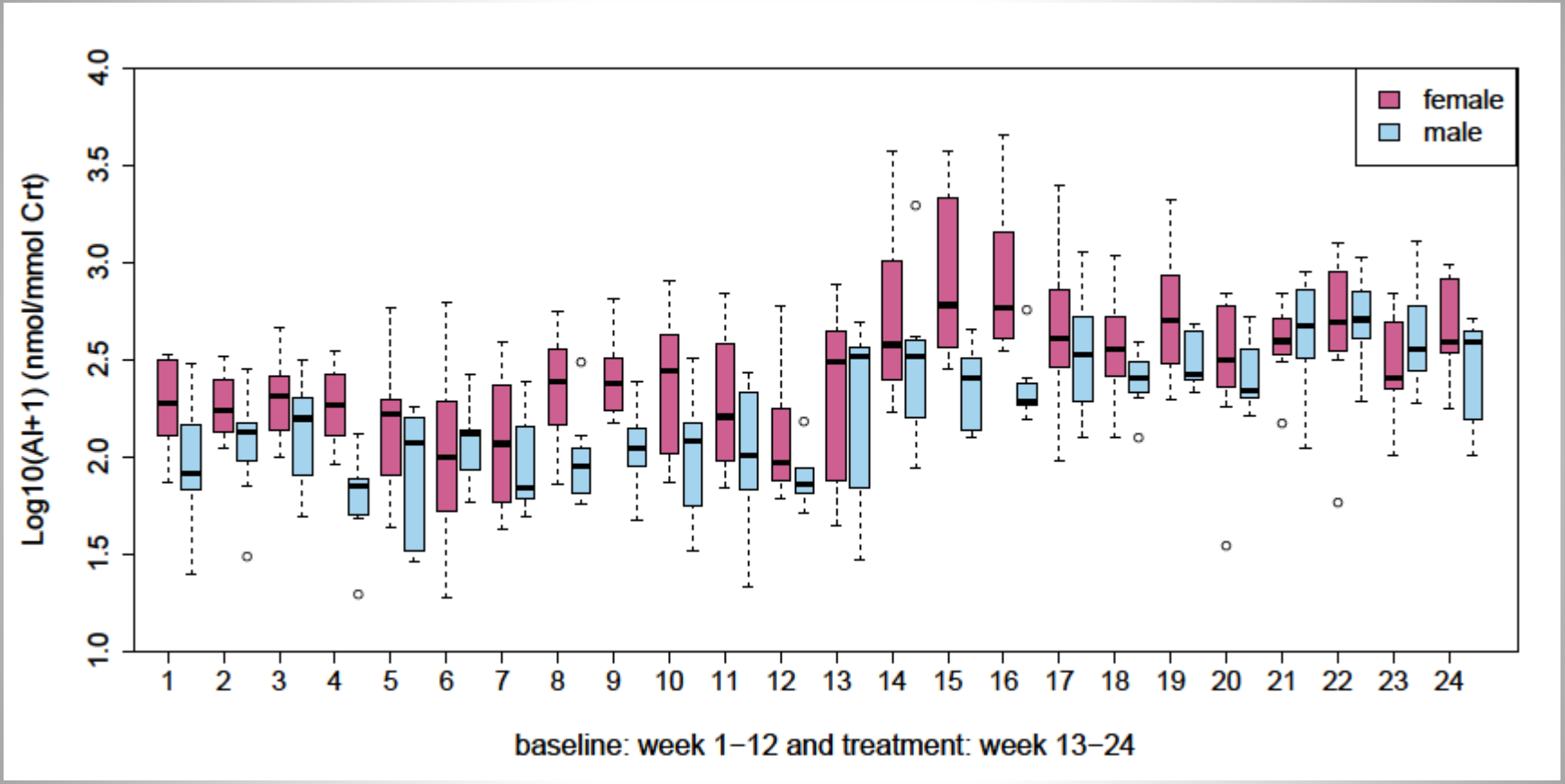
Christopher Exley[1], Godwin Mamutse[2], Olga Korchazhkina[3], Eleanor Pye[2], Stanislav Strekopytov[1], Anthony Polwart[4] and Clive Hawkins[2]

Levels of urinary aluminium excretion similar to those seen in aluminium intoxication suggested that aluminium may be a hitherto unrecognised environmental factor associated with the aetiology of MS. If aluminium is involved in MS then an increased dietary intake of its natural antagonist silicon, might be a therapeutic option.

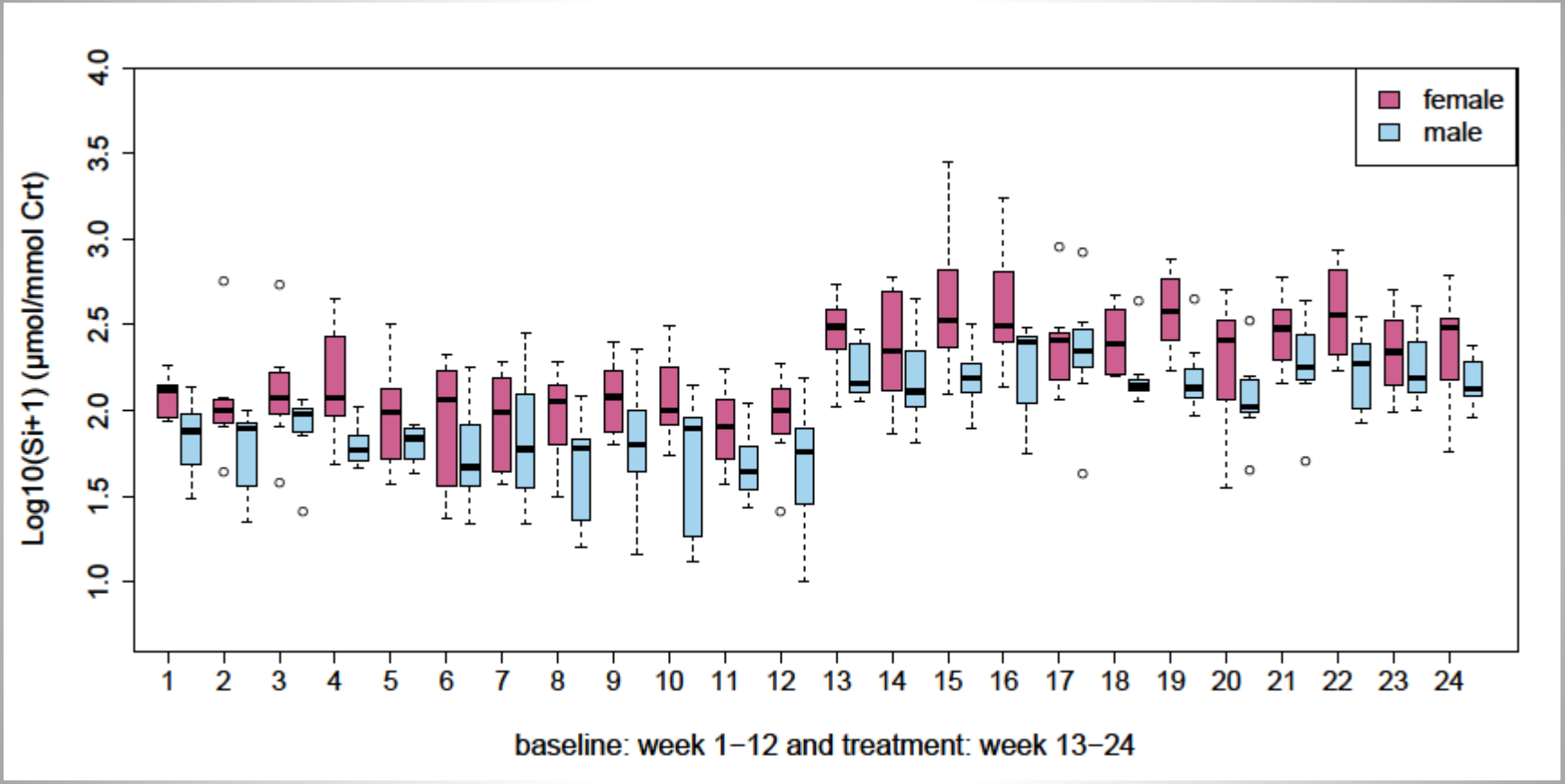
Urinary excretion of aluminium and silicon in secondary progressive multiple sclerosis (SPMS)

Urinary excretion of aluminium and silicon, measured using transversely-heated graphite furnace atomic absorption spectrometry, was determined in 15 individuals diagnosed with SPMS over 24 weeks, a 12 week baseline period (control) followed by a 12 week treatment period, during which individuals consumed up to 1.5L of a silicon-rich mineral water every day.

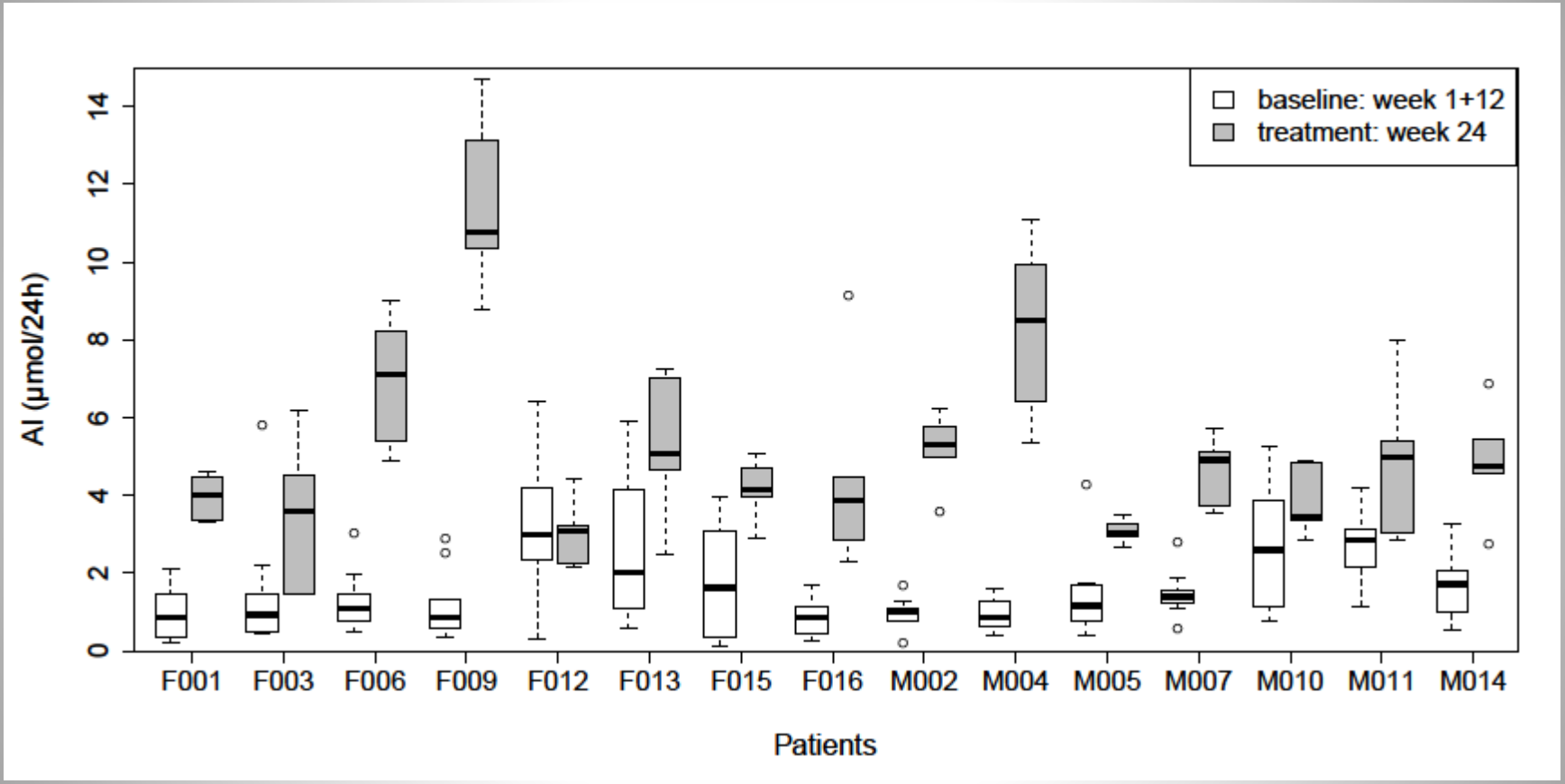
Multiple Sclerosis



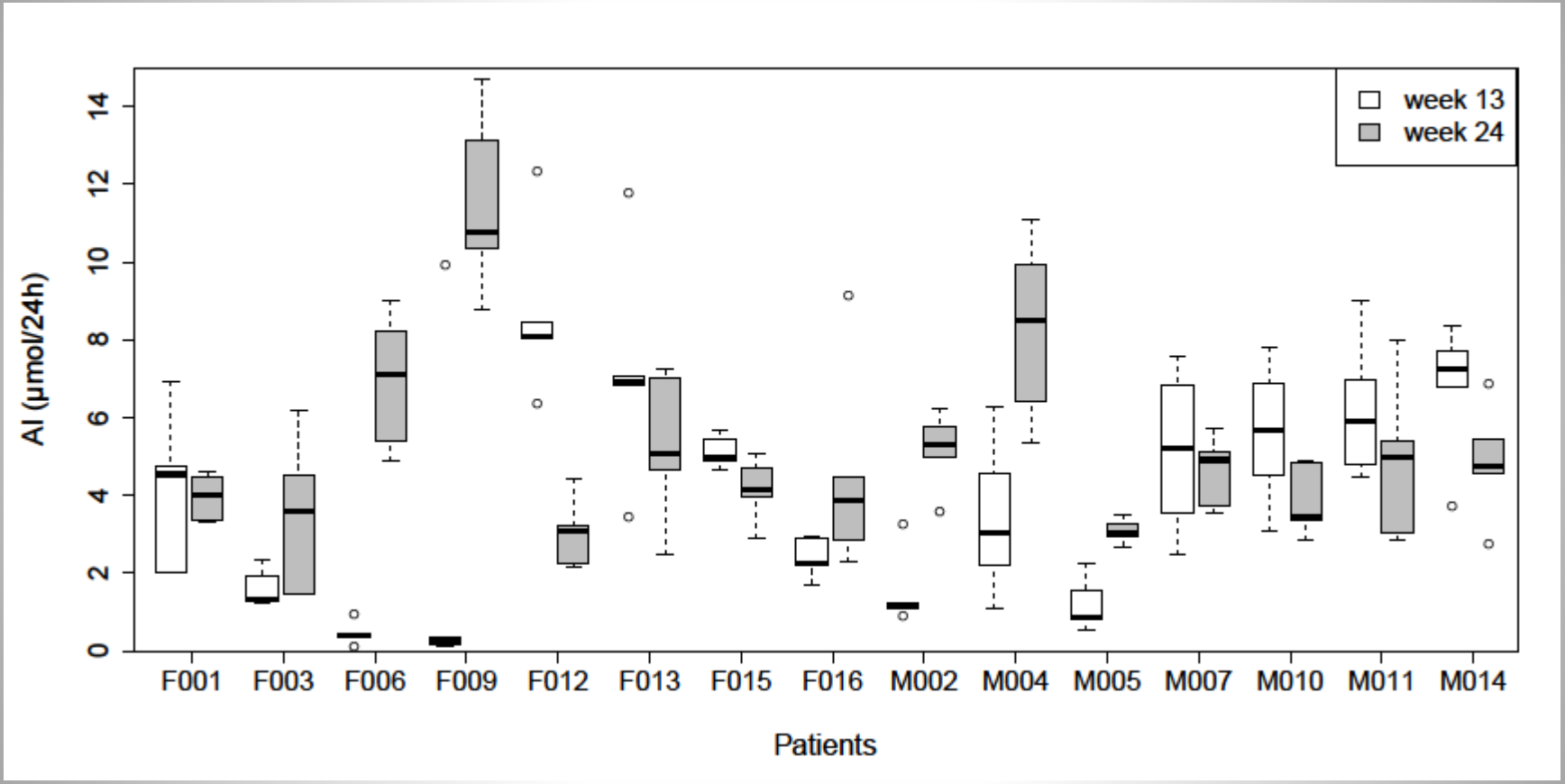
Multiple Sclerosis



Multiple Sclerosis



Multiple Sclerosis



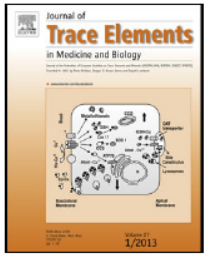
Silicon-rich mineral waters may be an effective and non-invasive therapy for the removal of aluminium from the body of individuals with SPMS.

Journal of Trace Elements in Medicine and Biology 28 (2014) 87–88

Contents lists available at ScienceDirect

Journal of Trace Elements in Medicine and Biology

journal homepage: www.elsevier.de/jtemb



Short communication

Aluminium in human sweat

Clare Minshall[a], Jodie Nadal[a], Christopher Exley[b,*]

[a] *Life Sciences, The Huxley Building, Keele University, Staffordshire, United Kingdom*
[b] *The Birchall Centre, Lennard-Jones Laboratories, Keele University, Staffordshire, United Kingdom*

Perspiration may be as important, if not more important, as a means of removal of aluminium from the body!

How might this be influenced by regular drinking of a silicon-rich mineral water?

Healthy Volunteers

Excretion of Si in sweat		
ID	[Si] Sweat control (µg/L)	[Si] Sweat treatment (µg/L)
F1	812 (170)	1466 (172)
F2	647 (8)	1609 (23)
F3	601 (9)	1332 (72)
F4	626 (27)	1683 (113)
F5	576 (5)	1476 (22)
F6	668 (37)	1612 (56)
F7	616 (12)	1110 (17)
F8	732 (87)	1634 (323)
F9	787 (57)	1778 (18)
F10	691 (9)	1938 (17)
M1	944 (31)	1661 (18)
M2	1050 (10)	2167 (28)
M3	874 (22)	1281 (35)
M4	743 (34)	1870 (80)
M5	810 (25)	1348 (52)
M6	783 (20)	2327 (73)
M7	994 (15)	1941 (5)
M8	578 (31)	1588 (28)
M9	674 (17)	1726 (41)
Mean (SD)	**748 (140)**	**1660 (303)**

Healthy Volunteers

Excretion of Al in sweat		
ID	[Al] Sweat control (µg/L)	[Al] Sweat treatment (µg/L)
F1	467 (96)	1184 (169)
F2	217 (11)	381 (33)
F3	270 (10)	1081 (55)
F4	255 (17)	986 (20)
F5	187 (9)	619 (13)
F6	300 (16)	424 (42)
F7	266 (57	427 (29)
F8	520 (120)	1035 (131)
F9	585 (8)	994 (51)
F10	461 (9)	1215 (85)
M1	444 (88)	772 (15)
M2	71 (4)	1030 (42)
M3	526 (6)	1589 (113)
M4	574 (26)	1677 (28)
M5	464 (12)	1666 (33)
M6	183 (36)	1276 (87)
M7	152 (57)	1536 (88)
M8	400 (31)	690 (18)
M9	255 (34)	639 (25)
Mean (SD)	**347 (156)**	**1012 (419)**


I think I have the solution…
Have a good day!
SPRITZER
Al MAN