

The Eleventh Keele Meeting on Aluminium

The Natural History of Aluminium Past, Present and Future

Scientific programme

Saturday 28th February 2015

17.00 Registration and Poster Assembly

19.30 Welcome to Meeting / Welcome Buffet

Sunday 1st March 2015

The Conference is Open!

Session 1

Environmental, Biological and Medicinal Chemistry

*Denotes presentation by a student.

Chair: *Tamas Kiss* (Szeged University, Szeged, Hungary)

08.55 Introduction by the Chair

9.00 Platform 1

Aluminium in the open ocean: simulation and observation.

Marco van Hulst (LSCE, France)

9.20 Discussion

9.30 Platform 2

Density-functional insights into the structure and formation of hydroxyaluminosilicates.

James Beardmore (Keele University, United Kingdom)

9.50 Discussion

10.00 Platform 3

Aluminium in biological environments: a computational approach.

Xabier Lopez (University of San Sebastian, Spain)

10.20 Discussion

10.30 **Coffee**

10.50 Platform 4

Identifying aluminium binding sites in amyloid β peptide by means of computational chemistry.

Jon Mujika (University of San Sebastian, Spain)

11.10 Discussion

11.20 Oral Poster 1

Effect of Al(III) on coenzyme NADH in solution.

Elena Formoso (University of San Sebastian, Spain)

11.25 Discussion

11.30 Platform 5

Irreversible denaturation of proteins through aluminium-induced formation of backbone ring structures.

Bo Song (Shanghai Institute of Applied Physics, China)

11.50 Discussion

12.00 Oral Poster 2*

A potentiometric, spectrophotometric and NMR study of protonation and formation equilibria of two new aluminium chelators.

Guadalupe Jaraquemada-Pelaez (University of Cagliari, Italy)

12.05 Discussion

12.10 Oral Poster 3*

A new series of kojic acid derivatives as ligands for aluminium.

Delara Mansoori (University of Cagliari, Italy)

12.15 Discussion

12.20 Platform 6*

The relationships between the physicochemical properties of aluminium-based adjuvants and their relative cytotoxicities in a THP-1 cell line.

Emma Shardlow (Keele University, United Kingdom)

12.40 Discussion

Chair's Summary

13.00 **Lunch**

Session 2 **Bacteria, Fungi and Plants**

*Denotes presentation by a student.

Chair: *Leon Kochian* (USDA-ARS, Cornell University, New York, USA)

14.15 Introduction by the Chair

14.20 Platform 7

Fungal heterotrophic leaching of red mud: biogenic organic acid contribution to aluminium mobility in the environment.

Martin Urík (Comenius University in Bratislava, Slovakia)

14.40 Discussion

14.50 Platform 8*

Characterisation of aluminium toxicity in pollutant degrading bacteria.

Sean Booth (University of Pennsylvania, USA)

15.10 Discussion

15.20 Platform 9

Migration and transformation of inorganic and organic complexes of aluminium from soil to leaf through root, stem and twig of *Betula pendula*.

Marcin Frankowski (Adam Mickiewicz University in Poznań, Poland)

15.40 Discussion

15.50 Platform 10

Aluminium rhizotoxicity in solution culture: The past and the present.

Peter Kopittke (The University of Queensland, Australia)

16.10 Discussion

16.20 **Tea**

16.40 Platform 11*

Aluminium accumulation in three *Symplocos* species from Central Sulawesi.

Marco Schmitt (Ulm University, Germany)

17.00 Discussion

17.10 Oral Poster 4*

Comparative analysis of aluminium accumulation in leaves of several woody aluminium accumulators.

Eriko Maejima (Hokkaido University, Japan)

17.15 Discussion

17.20 Oral Poster 5

Differences and similarities in the characteristics of aluminium accumulation in various aluminium accumulators.

Toshihiro Watanabe (Hokkaido University, Japan)

17.25 Discussion

17.30 Platform 12

Signalling aluminium response in two contrasting rice cultivars.

Charlotte Poschenrieder (The Autonomous University of Barcelona, Spain)

17.50 Discussion

18.00 Platform 13

Sustainable crop growth and yields on acid soils.

Jiping Liu (Cornell University, USA)

18.20 Discussion

Chair's Summary

18.30 **End of the first day**

20.15 **Dinner**

21.15 **Poster session and BEER TASTING**

Monday 2nd March 2015

Session 3

Animal Models

*Denotes presentation by a student.

Chair: *David Chettle* (McMaster University, Hamilton, Canada)

08.55 Introduction by the Chair

09.00 Platform 14

Aluminium toxicity in *Caenorhabditis elegans* experimental model of Alzheimer's disease.

Rosilene Kaiser (Federal Institute for Education, Science and Technology of Rio Grande do Sul, Brasil)

09.20 Discussion

09.30 Oral Poster 6*

Investigation of the toxicity of dairy industry effluents on the nervous system of *Caenorhabditis elegans*.

Vanessa Oliveira (Federal Institute for Education, Science and Technology of Rio Grande do Sul, Brasil)

09.35 Discussion

09.40 Oral Poster 7

Experimental intoxication with aluminium chloride induces behavioural and mitochondrial alterations in mice and decreased viability, proliferation and morphological changes in neurospheres.

Jessié Gutierrez (Federal University of Santa Maria, Brasil)

09.45 Discussion

09.50 Platform 15*

Aluminium as an environmental risk factor in visceral hypersensitivity.

Nicolas Esquerre (University of Lille, France)

10.10 Discussion

10.20 **Coffee**

10.40 Platform 16

The RAS/P13K pathway is involved in damage to long-term potentiation induced by acute aluminium treatment.

Qiao Niu (Shanxi Medical University, China)

11.00 Discussion

11.10 Oral Poster 8*

Non-apoptotic role of caspase 3 on long-term depression in area CA1 of the rat hippocampus following aluminium exposure in vivo.

Huifang Zhang (Shanxi Medical University, China)

11.15 Discussion

11.20 Platform 17

Aluminium can cross and damage the intestinal epithelial barrier *in vitro*.

Mathilde Body-Malapel (University of Lille, France)

10.40 Discussion

11.50 Platform 18*

Effects of aluminium adjuvants on social behaviour in mice.

Sneha Sheth (University of British Columbia, Canada)

12.10 Discussion

12.20 Oral Poster 9

Gene-toxin synergy in the brain of an autistic mouse model.

Dan (Alice) Li (University of British Columbia, Canada)

12.25 Discussion

12.30 Platform 19

Assessment of the neurotoxic effects of aluminium vaccine adjuvant injected into mice.

Guillemette Crépeaux (Paris Est University, France)

12.50 Discussion

13.00 Oral Poster 10

Fluorescent nanodiamonds as a relevant tag for the assessment of alum adjuvant particle biodisposition.

Housam Eidi (Paris Est University, France)

13.05 Discussion

Chair's Summary

13.10 **Lunch**

Free afternoon,

3.00-5.00 **Exclusive guided walking tour of the old Lille**

20.00 **Dinner in the heart of Lille in the estaminet* Barbue d'Anvers**

*an estaminet is a typical northern French inn

Tuesday 3rd March 2015

Session 4 **Human Exposure**

*Denotes presentation by a student.

Chair: *Philippa Darbre* (University of Reading, United Kingdom)

8.25 Introduction by the Chair

8.30 Platform 20

Elucidating upon the cellular uptake of aluminium based adjuvants and the amyloidogenic $A\beta_{42}$ peptide 'antigen' in a monocytic THP-1 cell line.

Matthew Mold (Keele University, United Kingdom)

08.50 Discussion

09.00 Platform 21

Aluminium treatment of THP-1 monocytic cell line induces alterations in inflammatory and proteolytic pathways.

Ferdinando Mannello (University 'Carlo Bo' of Urbino, Italy)

09.20 Discussion

09.30 Oral Poster 11*

Effect of aluminium on migration of oestrogen unresponsive MDA-MB-231 human breast cancer cells in culture.

Ayşe Bakir (University of Reading, United Kingdom)

09.35 Discussion

09.40 Platform 22*

Antiperspirants, aluminium salts and breast cancer: Preliminary data from a clinical trial.

Caroline Linhart (Medical University of Innsbruck, Austria)

10.00 Discussion

10.10 **Coffee**

10.30 Platform 23*

A pilot study measuring aluminium in bone in Alzheimer's and reference subjects: Work in progress.

Hedi Mohseni (McMaster University, Hamilton, Canada)

10.50 Discussion

11.00 Platform 24

Aluminium and bone: New clinical circumstances where aluminium deposition occurs in the calcified matrix of bones.

Daniel Chappard (University of Angers, France)

11.20 Discussion

11.30 Oral Poster 12

Study of aluminium in cancellous and compacted bone in humans.

Anetta Ziola-Frankowska (Adam Mickiewicz University in Poznań, Poland)

11.35 Discussion

11.40 Platform 25*

Impact of aluminium on human fertility.

Jean-Philippe Klein (University of Lyon, France)

12.00 Discussion

12.10 Oral Poster 13*

Aluminium and silicon in human sweat.

Krista Jones (Keele University, United Kingdom)

12.15 Discussion

12.20 Platform 26

Sea vegetables and aluminium.

Shunsuke Meshitsuka (Tottori University, Japan)

12.40 Discussion

12.50 Demonstration

DEVEXI Health Analytics Research Database: Applications in human exposure to aluminium.

Claire Dwoskin (Childrens Medical Safety Research Institute, USA)

13.05 Discussion

Chair's Summary

13.10 **Lunch**

Session 5 Human Health

All Platform Presentations in Session 5 are 15 minutes plus 5 minutes for Discussion

*Denotes presentation by a student.

Chair: *Cecile Vignal* (University of Lille, France)

14.25 Introduction by the Chair

14.30 Platform 27

Aluminium and health: A century of controversy, research and regulation.

Florence Hachez-Leroy (University of Lille, Nord de France, France)

14.45 Discussion

14.50 Platform 28

Aluminium-induced NF- κ B -mediated pro-inflammatory signalling and amyloidogenesis in human brain microglial cells and tissues.

Walter Lukiw (Louisiana State University Health Sciences Center, USA)

15.05 Discussion

15.10 Platform 29

Colocalisation of aluminium and iron in neurodegenerative diseases.

Sakae Yumoto (Yumoto Institute of Neurology, Tokyo, Japan)

15.25 Discussion

15.30 Platform 30

Aluminium intoxication and treatment with chelation therapy.

Maria Elena Ferrero (University of Milan, Italy)

15.45 Discussion

15.50 Platform 31

Can 5-hydroxy-2-(hydroxymethyl)pyridine-4(1H)-one tautomer cure diseases of aluminium overload?

Joanna Lachowicz (University of Cagliari, Italy)

16.05 Discussion

16.10 Platform 32

Clinical features and functional brain imaging in patients with persisting aluminium hydroxide-induced macrophagic myofasciitis (MMF).

François-Jérôme Authier (Paris Est University, France)

16.25 Discussion

16.30 Platform 33

Aluminium-induced entropy in biological systems.

Robert Davidson (PhyNet Inc., USA)

16.45 Discussion

16.50 Platform 34

Predictors of costs of care in aluminium-related dementia: A stress simulation hypothesis.

Paolo Prolo (Swiss Disability Insurance, Bellinzona, Switzerland)

17.05 Discussion

Chair's Summary

17.10 **Tea**

Final Session

Chair: *Chris Exley* (Keele University, UK)

17.30 Introduction by the chair to the JD Birchall Memorial Lecture

17.35 The JD Birchall Memorial Lecture

Plants do some surprising things to deal with toxic aluminium in soil!

Leon Kochian (Cornell University, USA)

18.35 Discussion

18.45 **CONCLUSION OF MEETING**

20.00 Conference Dinner

List of Additional Posters

*Denotes presentation by a student.

Session 1

Poster 1*

Application of ion selective electrodes and optical sensors for the detection of aluminium(III) ions in clinical samples.

Lukasz Mendecki (Keele University, United Kingdom)

Session 2

Session 3

Poster 1*

Experimental reproduction of ovine ASIA syndrome: From symptoms to genomics.

Javier Asín (University of Zaragoza, Spain)

Poster 2*

Effects of aluminium on miR29 and beta amyloid (1-42) in rat brain.

Linping Wang (Shanxi Medical University, China)

Session 4

Poster 1*

Effect of aluminium on DNA damage and DNA repair in MCF10A immortalised non-transformed human breast epithelial cells.

Abdullah Farasani (University of Reading, United Kingdom)

Poster 2

Microcrystalline tyrosine (MCT): Its use a depot adjuvant in allergy immunotherapy, future perspectives and applications.

Matthew Heath (Allergy Therapeutics, United Kingdom)

Poster 3*

The fate of L-tyrosine in immunotherapy: What happens at the injection site?

Iulia Neagu (Keele University, United Kingdom)

Poster 4*

The use of antiperspirants containing aluminium salts and its relation to breast cancer: Methods and implementation of biospecimen sampling.

Dominik Panosch (Medical University of Innsbruck, Austria)

Poster 5*

Aluminium in human brain tissue: Measurement and imaging.

Ambreen Mirza (Keele University, United Kingdom)

Poster 6

Aluminium is deposited in the calcified matrix of bone exostoses.

Daniel Chappard (University of Angers, France)

Poster 7

Al exposure from food contact materials made of aluminium

Veronika Fekete (Scientific Institute of Public Health, Brussels, Belgium)

Poster 8

Accumulation of aluminium in human eye tissue: a role in age-related macular degeneration?

Alex Langford-Smith (Wellcome Trust Centre for Cell-Matrix Research, Faculty of Life Sciences, University of Manchester, Manchester, UK)

Session 5

Poster 1

Small sensory fiber neuropathy in patients with aluminium hydroxide-induced macrophagic myofasciitis (MMF)

François-Jérôme Authier (Paris Est University, France)

Poster 2

Do we need a holistic understanding about the effects and working mechanism of aluminium?

Esko Meloni (Enopop T:mi, Finland)

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