

11<sup>th</sup> International Symposium on Metal Ions in Biology and Medicine

MONDAY 20<sup>TH</sup> JUNE (AUDITORIUM AND BOULIND SUITE)

9.00 Registrations  
11.30 Lunch (Fellows dining room)

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**AUDITORIUM**

13.00 **Opening Lecture**  
Welcome by the organising committee

13.10 **Prof Dame Athene Donald (UK) – Plenary Keynote Lecture: 'No Need to Dry - the power of Environmental Scanning Electron Microscopy for Biology'**

14.00 **INORGANIC ANALYTICAL METHODOLOGY: Part I**  
*Chairs: Jules Griffin (UK) and Nuno Faria (UK)*

14.05 **Ryszard Lobinski (France) – Keynote Lecture: State-of-the-art analytical methods for metals and their species in biological systems** 001

14.35 Fiona Larner (UK) - A new separation procedure for Cu prior to stable isotope measurement by MC-ICPMS

15.00 Fadi Abou-Shakra (UK) – Analysis of clinical samples using ICP-MS with novel ion optics

15.30 Coffee Break (Foyer: 1<sup>st</sup> floor)

16.00 **INORGANIC ANALYTICAL METHODOLOGY: Part II**

16.05 Rob Hutchinson (UK) - The potential for metallomic imaging by LA-ICP-MS in biomedical analysis 002

16.35 Peter Winship (UK) - Analytical Pitfalls in the measurement of Whole Blood Cobalt and Chromium by DRC-ICP-MS 004

17.00 John W Ejniak (USA)- Gold analysis in biological samples by ICP-AES 005

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**BOULIND SUITE**

14.00 **METAL-BASED TOXICOLOGY: Part I**  
*Chairs: Paul Tchounwou (USA) and Shelton Swanier (USA)*

14.10 **Michael Aschner (USA) – Keynote Lecture: The role smf transporters and dopamine in manganese-induced neurodegeneration in *C. elegans*** 007

14.40 John Viles (UK) - Copper and its neurotoxic effect in Alzheimer's disease

15.05 Stanley Fan (UK) - Do oral aluminium based phosphate binders in dialysis patients cause accumulation of aluminium to toxic levels? 055

15.30 Coffee Break (Foyer: 1<sup>st</sup> floor)

16.00 **METAL-BASED TOXICOLOGY: Part II**

16.05 **Moussa Youdim (Israel) – Keynote Lecture: Why multi target iron chelators as neuroprotective-neurorestorative drugs for neurodegenerative disorders?** 008

16.35 Gabi Drochioiu (Romania) - Metal- and pH-induced conformational changes of amyloid peptides: a structural-phenomenological approach 010

17.00 Manuela Murariu (Romania) - Physiological significance of silver-induced conformational changes of histidine-containing peptides 057

17.30 Closing

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**21.30 Punting tour**

## **TUESDAY 21<sup>ST</sup> JUNE (AUDITORIUM)**

**8.30** Morning Coffee (Foyer: 1<sup>st</sup> floor)

**9.00 ORTHOPAEDICS & BIOMINERALISATION: Part I**

*Chairs: Serena Best (UK) and Peter Winship (UK)*

**9.05 *Alistair Hart (UK)* – Keynote Lecture: An inter-disciplinary approach to understanding exaggerated inflammation induced by implant-derived metal debris and ions** **O13**

**9.35 *Fred Mosselmans (UK)* - Using Synchrotron X-rays to probe the causes of MoM hip prosthetics failure.** O14

**9.55 *Patrick Case (UK)* - DNA damage at a distance** O15

**10.15 *Ashley Newton (UK)*- Distribution of Cobalt, Chromium and Nickel between whole blood, plasma and urine in 202 patients after metal on metal hip arthroplasty** O16

**10.30** Coffee Break (Foyer: 1<sup>st</sup> floor)

**11.00 ORTHOPAEDICS & BIOMINERALISATION: Part II**

**11.05 *Matt Royle (UK)*- Silver-containing surface engineered hip bearings as a potential to reduce post-operative infection** O17

**11.25 *Priya Kalia (UK)*- Direct inhibition of osteoclast formation and activity by the vitamin E isomer gamma-tocotrienol** O18

**11.45 *Karan Shah (UK)* - Effect of Metal Ion Combinations on Osteoblasts in vitro.** O19

**12.05 *Kristina Ulrich Sørensen (Denmark)* - Long Term Dietary Phosphorus Supply during Growth Affects Bone Mineralization and Development in Pigs.** O20

**12.30** Lunch break (Fellows dining room)

**14.00 NANOMINERALS: Part I**

*Chairs: Roger Brooks (UK) and Laetitia Pele (UK)*

**14.05 *Matthias Epple (Germany)* – Keynote Lecture: Calcium phosphate nanoparticles in biology and medicine.** **O21**

**14.35 *Svitlana Chernousova (Germany)* - Calcium phosphate nanoparticles functionalized with DNA that encodes the formation of antimicrobial peptide for cell transfection** O26

**14.55 *Andrew Brown (UK)* - Characterisation of ferrihydrite, a nanomineral phase** O24

**15.30** Coffee Break (Foyer: 1<sup>st</sup> floor)

**16.00 NANOMINERALS: Part II**

**16.05 *Marco Monopoli (Ireland)* - Protein corona associated with nanoparticles** O58

**16.25 *Sebastian Riedle (New Zealand)* - Dietary Exposure to Titanium Dioxide Does Not Affect Growth and Immune Cell Composition of Peyer's Patches and Mesenteric Lymph Nodes in Healthy Mice** O25

**16.45 *Zofia Gagnon (USA)* - Silver Nanoparticle Exposure: A Hematological Analysis of the Immunological Response in an Avian Model** O27

**17.05 *Abdelfattah Badawi (Egypt)* - Synergistic Antibacterial Effect of ZnO/Ampicillin Nanocomposite and the Role of Gamma-irradiation.** O22

**17.30** Closing

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## 18.00 Plenary Lecture (Auditorium)

**Jonathan Powell (UK) – Beer: Silicon and moderate alcohol consumption in connective tissue health**

## 19.00 POSTER and BEER RECEPTION (Fellows dining room)

### INORGANIC ANALYTICAL METHODOLOGY

Kazuya Takahashi (Japan) - New method for comprehensive detection of chemical warfare agents using an electron-cyclotron-resonance ion-source mass spectrometer P01

Tatsuya Urabe (Japan) - ESI-MS: a new metal speciation technique and its implication in toxicity of aluminum P02

Sylvaine Bruggraber (UK) - Direct identification of iron(III) complexes with maltol in solution by Electrospray Ionisation Mass Spectrometry P03

Sylvaine Bruggraber (UK) - Does ferric-maltol speciation model defined by data from electrospray ionisation mass spectrometry fit the spectrophotometry/potentiometry data? P04

Brij Tewari (Guyana) - Studies on biologically important nickel(II), lead(II) and mercury(II) binary complexes with homoserine in solution P05

### BIOMINERALISATION and ORTHOPAEDICS

Monika Martiniaková (Slovakia) - Microscopic structure of femoral bone tissue in adult male rats after subchronic cadmium administration P06

Radoslav Omelka (Slovakia) - Structural changes in femoral bone tissue of rats after subchronic peroral administration to selenium P07

Matt Royle (UK) - Surface engineered hip replacement bearings to reduce metal ion release P08

### INORGANICS IN CANCER, IMAGING and THERAPEUTICS

Gérard Bastian (France) - In vitro antitumor activity potentiation of a new diselenate Rhenium complex associated with Gallium salicylate. P09

Jose Ruiz (Spain) - Synthesis and Antiproliferative Activity of C,N-Cycloplatinated(II) Complex with a Potentially Intercalative Anthraquinone Pendant P10

Muhammad Hanif (Austria) - Synthesis, Cytotoxicity and Cell Uptake Studies of Ru(II)-Arene Complexes Linked with Carbohydrate Based Ligands P11

Venancio Rodríguez (Spain) - Novel Ruthenium(II), Rhodium(III) and Iridium(III) Antitumor Complexes with a Levonorgestrel Pendant P12

Concepción de Haro (Spain) - Synthesis and cytotoxicity of new acridine C,N-quelates of Ru(II), Rh(III) and Ir(III) P13

Clement Yedjou (USA) - In vitro Assessment of Lead-Induced Apoptosis to Human Liver Carcinoma (HepG2) Cells O38

### ENVIRONMENTAL EXPOSURE TO METALS

Tarek Elnimr (Egypt) - Evaluation of some heavy metals in Pangasius Hypothalmus and Tilapia Nilotica and the role of acetic acid in lowering their levels P15

John W Ejniik (USA) - Utilizing Vacuum Tumblers to Reduce Methyl Mercury Levels in Fish Fillets P16

Anatoly Skalny (Russia) - Moderate metal exposure in humans and multielement profiles of biosamples: age related changes are more significant than occupational contacts P18

### METAL-BASED TOXICOLOGY

Wayne Briner (USA) - Artemia Salina as a Model for Evaluating Depleted Uranium and Antioxidant Exposure P19

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- Wayne Briner (USA) - The Effect of Antioxidants on Behavioral and Biochemical Measures of Depleted Uranium Toxicity in Mice – A Preliminary Report P20  
Wayne Briner (USA) - The Behavioral Toxicology of Gallium Nitrate P21

## **NANOMINERALS**

- Abdelfattah Badawi (Egypt) - Novel Ampicillin ZnO Nanocomposite-Remarkable Breakthrough in Potential Cytotoxicity Against Myeloma Cell Lines. P26  
Laura Sáez (Spain) - Fluorimetric determination of Cu (II) in biological samples by using capped cysteine Cd-Te quantum dots P27  
Milica Todea (Romania) - Synthesis and characterization of titanium silicate microspheres P28  
Lyliya Khassanova (Russia) - Further understanding of the mode of the silver nanoparticles action against *Saccharomyces cerevisiae* cells P29  
Carolyn Haas (UK) - Characterization of in vitro synthesized amorphous calcium phosphate particles and their immunomodulatory effects on blood-derived macrophages P30

## **NUTRITIONAL IMMUNOLOGY**

- Ana Aguilar Cardenas (Mexico) - Zinc supplementation and its effects on the histology and cellularity of the thymus in mice at different developmental stages. P31  
Rachel Hewitt (UK) - Enhanced cytotoxic responses to inorganic dietary microparticle antigen carriers P32

## **NUTRITION**

- Julietta Binaghi (Argentina) - Traditional dishes from Northern Argentina: mineral content and "in vitro" availability P33  
Nadia Munquía (Mexico) - The content of zinc in hair of mice with zinc excessive intake P34  
Laura Sáez (Spain) - Status of iron and copper in high-performance athlete P35  
Daniela Florea (Spain) - Assessment of Nutritional Status of Selenium in a healthy adult population of Granada, Spain. P36  
Virginia Melo (Mexico) - The Chiton *Chiton articulatus* source of minerals for human health P37  
Virginia Melo (Mexico) - Mineral composition of avocado *Persea americana M.*, Mexican native fruit P38  
Zoe Tolkien (UK) - Dietary iron and quality of life in inflammatory bowel disease P39

## **MINERAL BIOCHEMISTRY**

- Antonio Donaire (Spain) - Structural rearrangements upon assembly of CuA centers P41  
Ekaterina Ilyechova (Russia) - In vivo model for studying the role of copper in the development of the skeletal system of mammals P42  
Yulia Vasilenko (Russia) - Involvement of adrenal glands in copper homeostasis in rats P43  
Josiane Arnaud (France) - Biological variability of selenium effect on cutaneous cell lines P44  
Massimiliano Peana (Italy) - Is PARK9 protein a manganese transporter protein? O50

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**WEDNESDAY 22<sup>ND</sup> JUNE (AUDITORIUM)**

- 8.30** Morning Coffee (Foyer: 1<sup>st</sup> floor)
- 9.00** **INORGANICS IN CANCER, IMAGING OR THERAPEUTICS: PART I**  
*Chairs: Philippe Collery (France) and Gerard Bastian (France)*
- 9.05** **Kevin Brindle (UK) – Keynote Lecture: Detecting tumour responses to treatment using hyperpolarized <sup>13</sup>C magnetic resonance spectroscopic imaging** **O28**
- 9.35** Theophile Theophanides (Greece) - Demineralization of bones due to breast cancer metastasis: an infrared study. **O29**
- 10.00** Maria Torre (Uruguay) - Antioxidant, pro-oxidant properties and antiproliferative activity of homoleptic and heteroleptic copper complexes. Potential antitumoral species **O31**
- 10.30** Coffee Break (Foyer: 1<sup>st</sup> floor)
- 11.00** **INORGANICS IN CANCER, IMAGING OR THERAPEUTICS: PART II**
- 11.05** Gérard Bastian (France) - In vitro antitumor activity of a new diselenate rhenium complex. **O30**
- 11.30** Helen Reid (UK)- Sub-cellular distribution and speciation of platinum in human cells after in vitro and in vivo treatments with platinum-based combination therapies **O32**
- 11.55** Fazlul Hug (Australia)- Platinums in combination with phytochemicals applied to the human ovarian tumour models **O34**
- 12.30** Lunch break (Fellows dining room)
- 14.00** **INORGANICS IN CANCER, IMAGING OR THERAPEUTICS: PART III**  
*Chairs: Philippe Collery (France) and Maria Torre (Uruguay)*
- 14.05** Paul Tchounwou (USA) – Trisenox-based chemotherapy of acute promyelocytic leukemia: molecular mechanisms of action **O36**
- 14.30** Alice Walker (USA) - Analysis of Stress and Apoptotic Protein Expressions in Arsenic Trioxide -Treated Lung Cancer Cells **O35**
- 14.55** Raven Byrd (USA)- Ascorbic Acid and Arsenic Trioxide Show In Vitro Promise as a Treatment Option for Drug Resistant Lymphoma **O33**
- 15.30** Coffee Break (Foyer: 1<sup>st</sup> floor)
- 16.00** **INORGANICS IN CANCER, IMAGING OR THERAPEUTICS: PART IV**
- 16.05** Jacqueline Stevens (USA) - Arsenic Trioxide Induces DNA Damage and Apoptosis in Human Colon HT-29 Cancer Cells through Oxidative Stress **O37**
- 16.30** Erika Brown (USA) Arsenic-Induced Genotoxicity and Apoptosis in Hepatocellular Carcinoma (HepG2) Cells: Influence of Oxidative Stress **O48**
- 17.00** Closing
- 19.00** **FORMAL DINNER (Great Hall)**
- 21.00** Closure

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## THURSDAY 23<sup>RD</sup> JUNE (AUDITORIUM)

- 8.30** Morning Coffee (Foyer: 1<sup>st</sup> floor)
- 9.00** **RAPID COMMUNICATIONS: Part I**  
*Chairs: Dora Pereira (UK) and Catherine Geissler (UK)*
- 9.05** Anatoly Skalny (Russia) - Metal ions as bioelements 047
- 9.25** Alexey Skvortsov (Russia) - CTR1 as a crossover of copper and platinum transport 046
- 9.45** Daniela Florea (Spain) - Zinc deficiency in critically ill patient 045
- 10.05** Elteka Farkas (Hungary) - Possible Biological Relevance of Complexes between Manganese(II)/(III) and Hydroxamates 056
- 10.30** Coffee Break (Foyer: 1<sup>st</sup> floor)
- 11.00** **RAPID COMMUNICATIONS: Part II**
- 11.05** Tarek Elnimr (Egypt)- Protective role of selenium and vitamin E against mercury, lead and cadmium occupational exposure in a fluorescent lamp factory 053
- 11.30** Udas Ambuja (India) - Comparative study of trace elements levels (Fe, Zn, Cu, and Se) in maternal serum, cord blood and colostrums 054
- 11.55** Victor Deflon (Brazil) - Thiosemicarbazone Complexes of Group 10 Metals. Preparation, Structural Analysis and Anti-Mycobacterium tuberculosis Activity 051
- 12.30** Lunch break (Boulind suite)
- 14.00** **ISSUES AND CONTROVERSIES IN MINERAL SUPPLEMENTATION AND FORTIFICATION: IRON**  
*Chair: Jonathan Powell (UK)*
- 14.05** **Michael Zimmermann (Switzerland)- Keynote Lecture: New developments in supplementation and fortification with iron** 039
- 14.30** Florentine Hilty (Switzerland) - Nanostructured iron and zinc containing compounds for nutritional applications 043
- 14.50** Bianca Mergler (UK) - Intestinal absorption of nano iron: cellular uptake mechanism(s) in Caco-2 cells 044
- 15.10** Monica Rodriguez (Spain) - Solving the issues of oral iron supplementation with ST-10-021: Semi-physiological modeling of its kinetics in humans 042
- 15.30** Coffee Break (Foyer: 1<sup>st</sup> floor)
- 16.00** **ISSUES AND CONTROVERSIES IN MINERAL SUPPLEMENTATION AND FORTIFICATION: IODINE, SELENIUM AND CALCIUM**
- 16.05** Michael Zimmermann (Switzerland) - Assessment and control of iodine deficiency in industrialized countries
- 16.30** Margaret Rayman (UK) - Selenium and Human Health: Optimising Exposure 041
- 17.00** **Ann Prentice (UK) - Keynote Lecture: Micronutrient fortification and supplementation: the calcium controversy** 040
- 17.30** Closing
- 18.00** **ELSIE WIDDOWSON LECTURE and RECEPTION**  
**Prof Sir Richard Thompson (UK) - Zinc deficiency and homeostasis**