



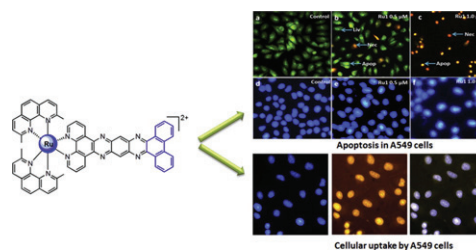
## Contents

**Shang-Hai Lai, Guang-Bin Jiang, Jun-Hua Yao, Wei Li, Bing-Jie Han, Cheng Zhang, Chuan-Chuan Zeng, Yun-Jun Liu**

*Journal of Inorganic Biochemistry* 152 (2015) 1–9

Cytotoxic activity, DNA damage, cellular uptake, apoptosis and western blot analysis of ruthenium(II) polypyridyl complex against human lung decarcinoma A549 cell

A new Ru(II) complex  $[\text{Ru}(\text{dmp})_2(\text{pddppn})](\text{ClO}_4)_2$  **Ru1** was synthesized and characterized. The cytotoxicity, apoptosis, cellular uptake, comet assay, cell cycle arrest, ROS, mitochondrial membrane potential, western blot analysis were investigated.

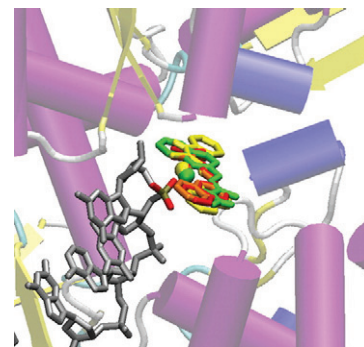


**Franco Bisceglie, Anastasia Musiari, Silvana Pinelli, Rossella Alinovi, Ilaria Menozzi, Eugenia Polverini, Pieralberto Tarasconi, Matteo Tavone, Giorgio Pelosi**

*Journal of Inorganic Biochemistry* 152 (2015) 10–19

Quinoline-2-carboxaldehyde thiosemicarbazones and their Cu(II) and Ni(II) complexes as topoisomerase IIa inhibitors

Quinoline-2-carboxaldehyde thiosemicarbazone derivatives and their copper(II) and nickel(II) complexes were tested for their antiproliferative properties on cell line U937. Copper(II) derivatives inhibit proliferation and topoisomerase IIa in vitro. Computational methods suggest that the positive charge formed by dissociation of the copper complexes may play a key role in their activity.

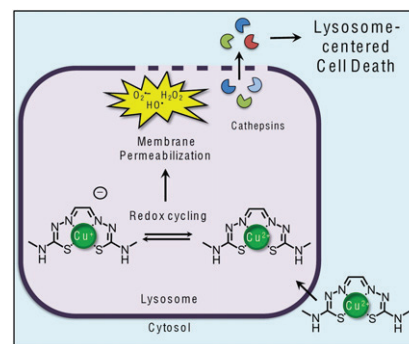


**Christian Stefani, Zaynab Al-Eisawi, Patric J. Jansson, Danuta S. Kalinowski, Des R. Richardson**

*Journal of Inorganic Biochemistry* 152 (2015) 20–37

Identification of differential anti-neoplastic activity of copper bis(thiosemicarbazones) that is mediated by intracellular reactive oxygen species generation and lysosomal membrane permeabilization

Bis(thiosemicarbazones) and their copper complexes possess unique anti-neoplastic properties. However, their mechanism of action remains unclear. We examined twelve bis(thiosemicarbazones) to elucidate mechanisms behind their anti-cancer efficacy. For the first time, this investigation highlights the role of reactive oxygen species and lysosomal membrane permeabilization in the anti-cancer activity of bis(thiosemicarbazones).

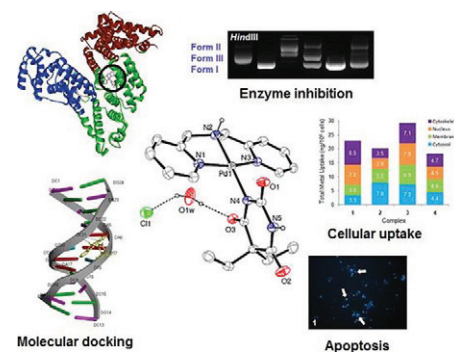


**Ceyda Icel, Veysel T. Yilmaz, Yunus Kaya, Selvi Durmus, Mehmet Sarimahmut, Orhan Buyukgungor, Engin Ulukaya**

*Journal of Inorganic Biochemistry* 152 (2015) 38–52

Cationic Pd(II)/Pt(II) 5,5-diethylbarbiturate complexes with bis(2-pyridylmethyl)amine and terpyridine display high binding affinity towards DNA/BSA as explored by various physical and biochemical methods. In addition, the Pd(II) complexes show selectivity against HT-29 (colon) and MCF-7 (breast) cell lines.

New Pd(II)/Pt(II) 5,5-diethylbarbiturate complexes with bis(2-pyridylmethyl)amine and terpyridine display high binding affinity towards DNA/BSA as explored by various physical and biochemical methods. In addition, the Pd(II) complexes show selectivity against HT-29 (colon) and MCF-7 (breast) cell lines.

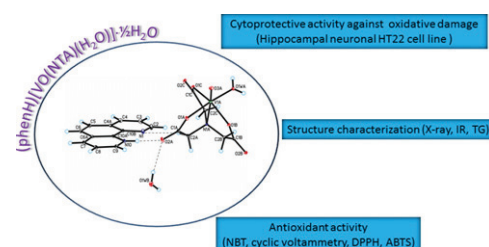


**A. Tesmar, I. Inkielewicz-Stępnia, A. Sikorski, D. Wyrzykowski, D. Jacewicz, P. Zięba, J. Pranczk, T. Ossowski, L. Chmurzyński**

*Journal of Inorganic Biochemistry* 152 (2015) 53–61

Structure, physicochemical and biological properties of new complex salt of aqua(nitrilotriacetato-N,O,O',O'')-oxidovanadium(IV) anion with 1,10-phenanthroline cation

A new nitrilotriacetato-oxidovanadium(IV) complex – structure and antioxidant activity.

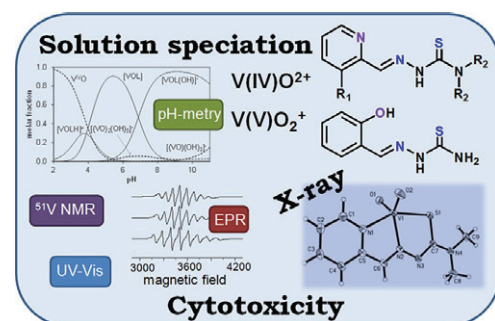


**Christian R. Kowol, Nóra V. Nagy, Tamás Jakusch, Alexander Roller, Petra Heffeter, Bernhard K. Keppler, Éva A. Enyedy**

*Journal of Inorganic Biochemistry* 152 (2015) 62–73

Vanadium(IV/V) complexes of Triapine and related thiosemicarbazones: Synthesis, solution equilibrium and bioactivity

Solution stability of vanadium(IV/V) complexes of Triapine and its terminally dimethylated derivatives were determined. The most stable complexes were synthesized in solid phase and tested against cancer cell lines. Complexes of salicylaldehyde thiosemicarbazone were also studied in comparison and displayed higher stability.

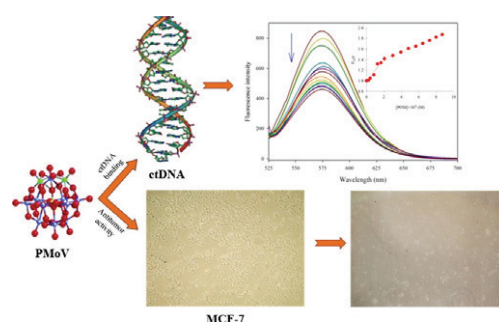


**Somayeh Dianat, Abdol-Khalegh Bordbar, Shahram Tangestaninejad, Bahram Yadollahi, Razieh Amiri, Sayyed-Hamid Zarkesh-Esfahani, Parvin Habibi**

*Journal of Inorganic Biochemistry* 152 (2015) 74–81

*In vitro* antitumor activity of free and nano-encapsulated  $\text{Na}_5[\text{PMo}_{10}\text{V}_2\text{O}_{40}] \cdot n\text{H}_2\text{O}$  and its binding properties with ctDNA by using combined spectroscopic methods

The free and nano-encapsulated forms of PMoV in starch and lipid nanocarriers showed a remarkable inhibitory effect on two types of cancer cells. The interaction mechanism of PMoV to ctDNA ruled out the presence of any direct coordinate covalent bond formation and proposed the groove or outside stacking binding mode.

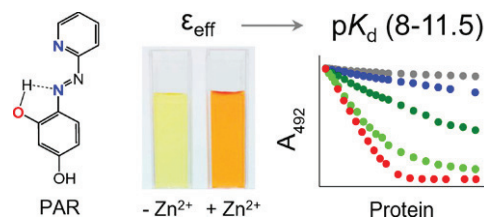


**Anna Kocyla, Adam Pomorski,  
Artur Krężel**

*Journal of Inorganic Biochemistry* 152 (2015) 82–92

Molar absorption coefficients and stability constants of metal complexes of 4-(2-pyridylazo)resorcinol (PAR): Revisiting common chelating probe for the study of metalloproteins

Re-determined values of effective molar absorption coefficients ( $\epsilon_{\text{eff}}$ ) of 4-(2-pyridylazo)resorcinol (PAR) complex with  $\text{Zn}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Hg}^{2+}$ ,  $\text{Co}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Mn}^{2+}$  and  $\text{Pb}^{2+}$  and effective dissociation constants ( $K_{\text{d}}^{\text{eff}}$ ) with  $\text{Zn}^{2+}$  allow for precise calculation of metal ion concentrations and affinities of metalloproteins.

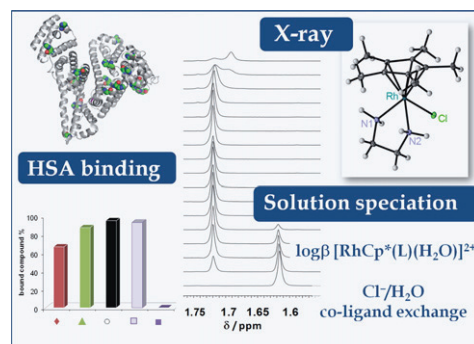


**Éva A. Enyedy, János P. Mészáros,  
Orsolya Dömötör, Carmen M. Hackl,  
Alexander Roller, Bernhard K. Keppler,  
Wolfgang Kandioller**

*Journal of Inorganic Biochemistry* 152 (2015) 93–103

Comparative solution equilibrium studies on pentamethylcyclopentadienyl rhodium complexes of 2,2'-bipyridine and ethylenediamine and their interaction with human serum albumin

Stoichiometry and stability of  $\text{RhCp}^*$  ( $\text{Cp}^*$ , pentamethylcyclopentadienyl) complexes of 2,2'-bipyridine and ethylenediamine were characterized in aqueous solution and compared with (O,O) donor deferiprone complexes. Interaction of these organorhodium compounds with human serum albumin was characterized by <sup>1</sup>H NMR, ultrafiltration and fluorometry involving site markers and amino acid side chain models.

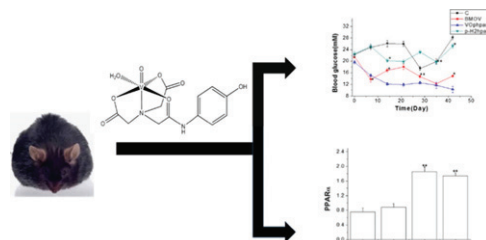


**Na Wang, Ziwei Wang, Xia Niu,  
Xiaoda Yang**

*Journal of Inorganic Biochemistry* 152 (2015) 104–113

Synthesis, characterization and anti-diabetic therapeutic potential of novel aminophenol-derivatized nitrilotriacetic acid vanadyl complexes

A novel low toxic vanadyl complex (VOphpada) was synthesized by incorporating antioxidant 4-aminophenol in ligand. VOphpada exhibited potent hypoglycemic effects via stimulating insulin enhancement signaling, i.e. increase of PPAR $\alpha$  and  $\gamma$ , activation of Akt while inactivation of JNK in muscle and adipose tissues.

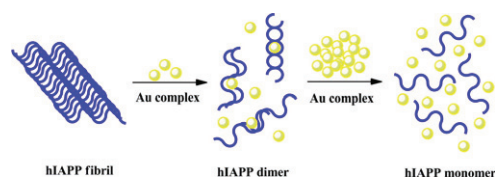


**Lei He, Dengsen Zhu, Cong Zhao, Xian Jia,  
Xuesong Wang, Weihong Du**

*Journal of Inorganic Biochemistry* 152 (2015) 114–122

Effects of gold complexes on the assembly behavior of human islet amyloid polypeptide

Gold complexes inhibit the fibril formation of human islet amyloid polypeptide through dimerization.

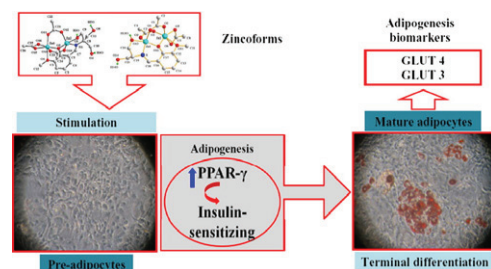


**O. Tsave, E. Halevas, M.P. Yavropoulou, A. Kosmidis Papadimitriou, J.G. Yovos, A. Hatzidimitriou, C. Gabriel, V. Psycharis, A. Salifoglou**

*Journal of Inorganic Biochemistry* 152 (2015) 123–137

Structure-specific adipogenic capacity of novel, well-defined ternary Zn(II)-Schiff base materials. Biomolecular correlations in zinc-induced differentiation of 3T3-L1 pre-adipocytes to adipocytes

Appropriately configured and well-defined ternary zinc-organic (Schiff-base) ligand materials induce 3T3-L1 pre-adipocyte differentiation to mature adipocytes. Structure specificity of the newly synthesized “zincforms” a) correlates with specific insulin-like bioactivity validated by targeted adipogenic biomarkers, and b) sets the stage for the development of effective “zincodrugs” in Diabetes Mellitus II.



## Special Issue from the Eleventh Keele Meeting on Aluminium

**Christopher Exley**

*Journal of Inorganic Biochemistry* 152 (2015) 138

### Guest Editorial

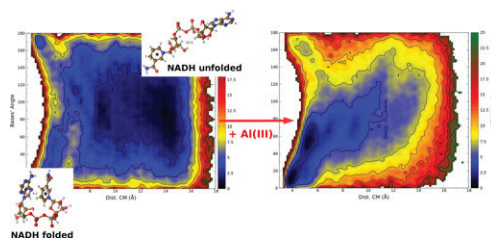
Guest editorial for the Special Issue from the Eleventh Keele Meeting on Aluminium

**Elena Formoso, Jon I. Mujika, Slawomir J. Grabowski, Xabier Lopez**

*Journal of Inorganic Biochemistry* 152 (2015) 139–146

Aluminum and its effect in the equilibrium between folded/unfolded conformation of NADH

The conformational change of NADH in the presence of aluminum(III) has been studied applying state-of-the-art computational methods. The study indicates that aluminum(III) alters the equilibrium between closed/open conformations of NADH. The ionic nature of aluminum-ligand bonds and the presence of strong hydrogen bonds in the complex are revealed.

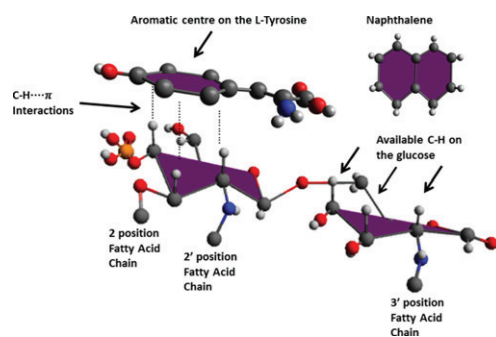


**A.J. Bell, M.D. Heath, S.J. Hewings, M.A. Skinner**

*Journal of Inorganic Biochemistry* 152 (2015) 147–153

The adsorption of allergoids and 3-O-desacyl-4'-monophosphoryl lipid A (MPL®) to microcrystalline tyrosine (MCT) in formulations for use in allergy immunotherapy

The measured adsorption of MPL® to L-tyrosine in MATA-MPL allergy immunotherapy formulations, which has been shown to be disrupted by the addition of naphthalene a stronger aromatic centre, could depend significantly on C-H...π interactions between upward facing C-H's on the 2-deoxy-2-aminoglucose of MPL® and the aromatic ring on L-tyrosine.

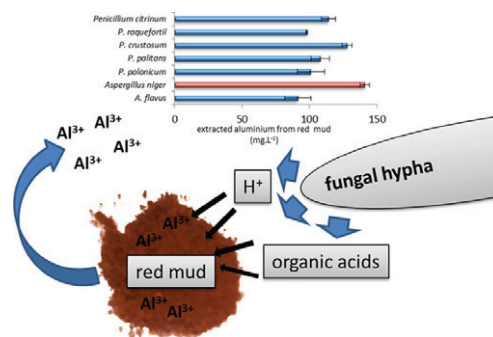


**Martin Urík, Marek Bujdoš,  
Barbora Milová-Žiaková, Petra Mikušová,  
Marek Slovák, Peter Matuš**

*Journal of Inorganic Biochemistry* 152 (2015)  
154–159

Aluminium leaching from red mud by filamentous fungi

Filamentous fungi produce organic acids and decrease culture media pH in static 7-day cultivation to induce efficient leaching of aluminium from red mud. This may help to recover aluminium and other valuable metals from this waste material, or decrease their content to non-hazardous concentrations.

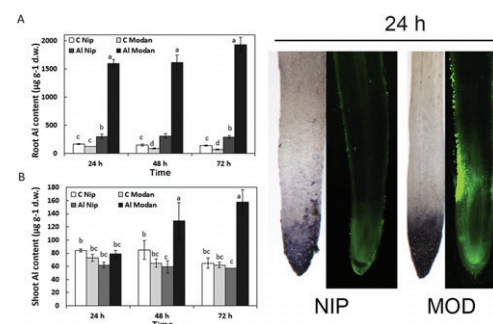


**Maite Roselló, Charlotte Poschenrieder,  
Benet Gunsé, Juan Barceló, Mercè Llugany**

*Journal of Inorganic Biochemistry* 152 (2015)  
160–166

Differential activation of genes related to aluminium tolerance in two contrasting rice cultivars

The Al-exclusion strategy of rice variety Nipponbare, at least in part mediated by STAR1 and probably regulated by ABA and JA, provided better protection against Al toxicity than the accumulation and internal detoxification strategy of variety Modan mediated by Nr1t1, ALS1 and ARS1.

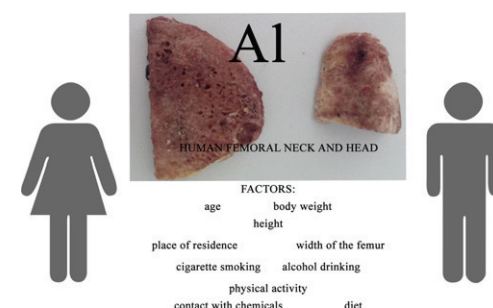


**Anetta Ziola-Frankowska,  
Mikołaj Dąbrowski, Łukasz Kubaszewski,  
Piotr Rogala, Marcin Frankowski**

*Journal of Inorganic Biochemistry* 152 (2015)  
167–173

Factors affecting the aluminium content of human femoral head and neck

The research showed that the aluminium content in bones can be affected by the type of medications taken, contact with chemicals at work, differences in body anatomy or sex. The results of the study confirm that aluminium accumulates in bones throughout our lives.

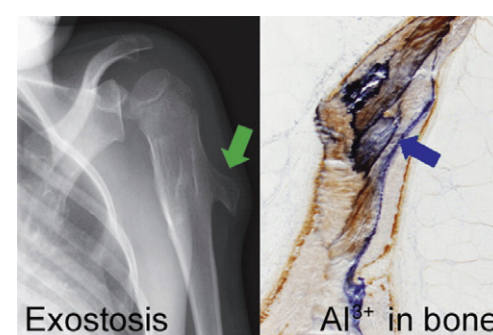


**Daniel Chappard, Guillaume Mabileau,  
Didier Moukoko, Nicolas Henric,  
Vincent Steiger, Patrick Le Nay,  
Jean-Marie Frin, Charlotte De Bodman**

*Journal of Inorganic Biochemistry* 152 (2015)  
174–179

Aluminum and iron can be deposited in the calcified matrix of bone exostoses

Exostosis is the most frequent benign bone tumor in children and adults. Aluminum (and also iron) can accumulate in the hydroxyapatite crystals of the bone matrix.

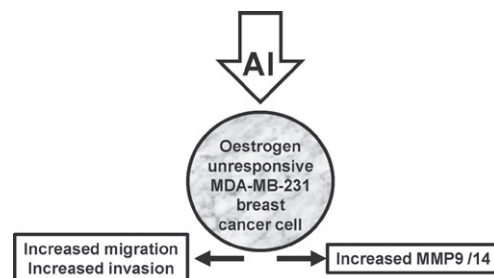


**Ayse Bakir, Philippa D. Darbre**

*Journal of Inorganic Biochemistry* 152 (2015) 180–185

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

Long-term exposure to aluminium increases migration, invasion and matrix metalloproteinases 9/14 in oestrogen unresponsive MDA-MB-231 human breast cancer cells.

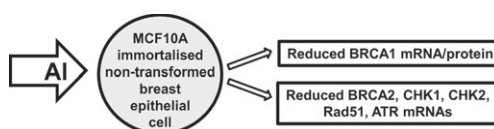


**A. Farasani, P.D. Darbre**

*Journal of Inorganic Biochemistry* 152 (2015) 186–189

Effects of aluminium chloride and aluminium chlorohydrate on DNA repair in MCF10A immortalised non-transformed human breast epithelial cells

Long-term exposure to aluminium salts results in reduced BRCA1 mRNA/protein and reduced mRNAs for BRCA2, CHK1, CHK2, Rad51, and ATR in MCF10A immortalised non-transformed human breast epithelial cells.

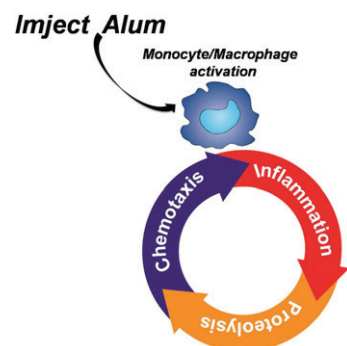


**D. Ligi, M. Santi, L. Croce, F. Mannello**

*Journal of Inorganic Biochemistry* 152 (2015) 190–198

Aluminum induces inflammatory and proteolytic alterations in human monocytic cell line

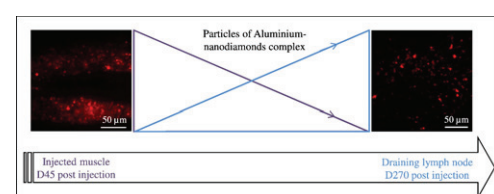
We investigated the ability of aluminum compounds to trigger inflammatory and proteolytic pathways in U-937 human monocytic cell line. The cell treatment with Imject Alum induced increased levels of several cytokines and proteinases, suggesting these monocyte mediators as possible biomarkers for aluminum-linked diseases.



**Guillemette Crépeaux, Housam Eidi, Marie-Odile David, Eleni Tzavara, Bruno Giros, Christopher Exley, Patrick A. Curmi, Christopher A. Shaw, Romain K. Gherardi, Josette Cadusseau**

*Journal of Inorganic Biochemistry* 152 (2015) 199–205

Highly delayed systemic translocation of aluminum-based adjuvant in CD1 mice following intramuscular injections

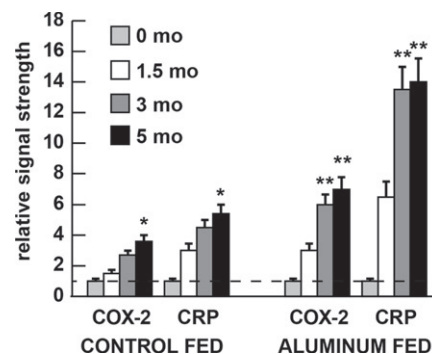


**Al Pogue, P Dua, JM Hill, WJ Lukiw**

*Journal of Inorganic Biochemistry* 152 (2015) 206–209

Progressive inflammatory pathology in the retina of aluminum-fed 5xFAD transgenic mice

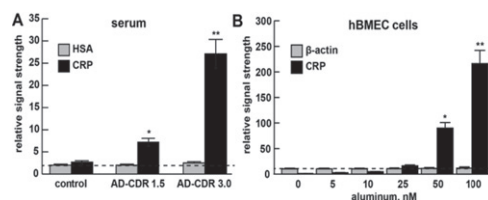
The 5xFAD transgenic Alzheimer's disease (AD) mouse-model exhibits progressive amyloidogenesis; aluminum-fed 5xFAD mice display accelerated amyloid deposition. 5xFAD animals also display up-regulation of the inflammatory-biomarkers COX-2 and CRP; for the first time we demonstrate the propagation of AD-type change into the retina; this may have relevance for 'pathological spreading' mechanisms.


**Peter N. Alexandrov, Theodore P.A. Kruck, Walter J. Lukiw**

*Journal of Inorganic Biochemistry* 152 (2015) 210–213

Nanomolar aluminum induces expression of the inflammatory systemic biomarker C-reactive protein (CRP) in human brain microvessel endothelial cells (hBMECs)

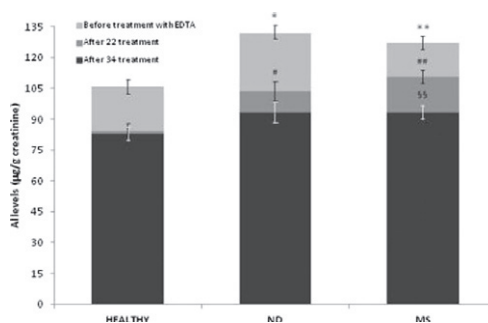
C-reactive protein (CRP) in human blood serum is a marker for systemic inflammation; CRP was found to be significantly up-regulated in blood sera obtained from Alzheimer's disease (AD) patients. Aluminum sulfate was found to strongly induce CRP in human brain micro-vessel endothelial cells (hBMECs), a highly specialized cell type that line the vasculature of the human brain.


**Alessandro Fulgenzi, Rachele De Giuseppe, Fabrizia Bamonti, Daniele Vietti, Maria Elena Ferrero**

*Journal of Inorganic Biochemistry* 152 (2015) 214–218

Efficacy of chelation therapy to remove aluminium intoxication

Aluminium (Al) levels evaluated in the urine samples of the studied subjects, following chelation test (light) and after 22 chelation therapies with EDTA (middle light), or after 34 chelation therapies with EDTA (dark), expressed as mean  $\pm$  SEM of  $\mu\text{g/g}$  creatinine.


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