Free Radical and Metal Biology 2012 – Final Oral Program

Wednesday November 28

3.30pm onwards Registration – The registration desk will be manned throughout the meeting

5.00-5.10pm Chair: Jiri Neuzil
Introductory Remarks: Greg Anderson

5.10-6.00pm Keynote Lecture 1 - Jiri Bartek
Cellular responses to genotoxic stress: Molecular mechanisms and relevance for cancer

6.00-6.50pm Keynote Lecture 2 - Carole Fierke
Metal Switching May Regulate Enzyme Activity in vivo

6.50-8.00pm Opening mixer

Thursday November 29

8.30-10.30am Plenary Session 1 – Oxidative stress and disease
Chairs: Clare Hawkins and Tony White

8.30-9.20am Keynote Lecture 3 – Ashley Bush
Alzheimer's disease and Parkinson's disease: archetypal disorders of brain metal homeostasis

9.20-9.40am Paul Witting
Selenium inhibits renal oxidation and inflammation but not acute kidney injury in an animal model of rhabdomyolysis

9.40-10.00am Shinya Toyokuni
Cancer as a ferrotoxic disease

10.00-10.10am Louise Dunn
Thioredoxin interacting protein: A culprit underpinning diabetes-related impairment of angiogenesis independent of Thioredoxin-1

10.10-10.20am Georg Degendorfer
Mechanisms and consequences of peroxynitrite-induced damage to extracellular matrix and its key components, laminin and fibronectin

10.20-10.30am Priyashiel Devi
Mechanisms and biological consequences of damage to arterial wall cells by peroxynitrite

10.30-11.00am Morning tea

11.00am-12.30pm Concurrent Session 1 – Free Radicals – Redox sensing, signalling and analysis
Chairs: Christine Winterbourn and TBA
<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Topic</th>
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<tbody>
<tr>
<td>11.00-11.20am</td>
<td>Roland Stocker</td>
<td><em>Heme oxygenase-1 regulates mitochondrial coenzyme Q and reactive oxygen species formation – possible implications for the metabolic reprogramming in response to hypoxia</em></td>
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<td>11.20-11.40am</td>
<td>Helge Rasmussen</td>
<td><em>Regulation of Na⁺-K⁺ pump activity by interacting glutathionylation sites in its multimeric molecular complex</em></td>
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<td>11.40-12.00pm</td>
<td>Marco Tomasetti</td>
<td><em>MicroRNA-126 suppresses mesothelioma malignancy by targeting IRS1 and interfering with the mitochondrial function</em></td>
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<td>12.00-12.10pm</td>
<td>Hitesh M Peshavariya</td>
<td><em>Prostacyclin signalling promotes cytoprotection and angiogenesis via up-regulation of NADPH oxidase 4</em></td>
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<td>12.10-12.20pm</td>
<td>Nora Y Hakami</td>
<td><em>HDAC inhibitors suppress activity of p300/HAT and NADPH oxidase 4-derived redox signalling in endothelial cells</em></td>
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<td>12.20-12.30pm</td>
<td>Jana Paulech</td>
<td><em>Capturing and quantifying reversibly oxidised cysteines in the myocardium by thiol-disulfide exchange</em></td>
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**11.00am-12.30pm**  
**Concurrent Session 1 – Metals – Structure and function of metallocproteins**  
**Chairs: Hugh Harris and Graeme Hanson**

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<td>11.00-11.20am</td>
<td>Megan Maher</td>
<td><em>The structure of sulfite dehydrogenase in complex with its electron acceptor</em></td>
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<td>11.20-11.40am</td>
<td>David Ascher</td>
<td><em>Structural insights into M1 aminopeptidases: Two zins are better than one</em></td>
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<td>11.40-12.00pm</td>
<td>Alistair McEwan</td>
<td><em>Characterisation of the NtrYX sensor histidine kinase/response regulator from Neisseria gonorrhoeae</em></td>
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<td>12.00-12.10pm</td>
<td>Carlos M Opazo</td>
<td><em>Copper is a cofactor for poly-ubiquitination</em></td>
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<td>12.10-12.20pm</td>
<td>Merridee A Wouters</td>
<td><em>Cysteine motifs in Zn fingers: potential role in Zn signalling</em></td>
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<td>2.20-12.30pm</td>
<td>Simon James</td>
<td><em>Quantification of ZnO Nanoparticle uptake and cellular distribution</em></td>
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**12.30-2.00pm**  
**Lunch**

**1.00-2.00pm**  
**SFRR(A) AGM**

**2.00-4.00pm**  
**Plenary Session 2 – Oxidative stress, mitochondria and cell death**  
**Chairs: Steve Bottle and Helge Rasmussen**
2.00-2.50pm  Keynote Lecture 4 – Mike Davies
*Inflammation, oxidation and protein damage – why speed matters!*

2.50-3.10pm  Mark Hampton
*Peroxisredoxins and mitochondrial redox signalling*

3.10-3.30pm  Lanfeng Dong
*Mitochondrial targeting of vitamin E succinate enhances its anti-cancer activity via mitochondrial complex II*

3.30-3.40pm  Alfons Lawen
*RCAN1 over-expression results in increased oxidative stress in neurones*

3.40-3.50pm  Trent Newman
*A developmental role for Peroxiredoxin 3*

3.50-4.00pm  Bob Anderson
*Single electron transfer within succinate: ubiquinones oxidoreductase, SQR*

4.00-6.00pm  Poster Session 1

6.30-7.00pm  Pre-dinner drinks at Victoria Park Function Venue

7.00-10.00pm  Conference dinner at Victoria Park Function Venue

**Friday November 30**

8.30-10.30am  Plenary Session 3 – Oxidative stress, metals and inflammation
*Chairs: Leigh Ackland and Shinya Toyokuni*

8.30-9.20am  Keynote Lecture 5 – Lothar Rink
*Zinc homeostasis in the immune system*

9.20-9.40am  Roger Chung
*Metallothionein protects against beta-amyloid induced oxidative stress*

9.40-10.00am  Grant Drummond
*Contrasting roles of different NADPH oxidase isoforms in atherosclerosis*

10.00-10.10am  Daniel Smith
*Iron chelation ameliorates iron induced neutrophil oxidative stress and restores oxidative burst capacity*

10.10-10.20am  Xiao Wang
*Neutrophils recruited to the myocardium after acute experimental infarct generate hypochlorous acid that modifies cardiac myoglobin*

10.20-10.30am  Nicholas Magon
*Oxidised calprotectin as a biomarker for inflammatory disease*

10.30-11.00am  Morning tea
11.00am-12.30pm  Concurrent Session 2 – Free Radicals – Oxidant chemistry
Chairs: Mike Davies and Ghassan Maghzal

11.00-11.20am  Kathryn Fairfull-Smith  
Redox-active fluorescent probes for monitoring oxidative stress

11.20-11.40am  Chris Easton  
Incorporation of oxidised amino acids during protein synthesis: Effect on structure and function

11.40-12.00pm  Tadeusz Sarna  
Role of melanin in iron homeostasis and protection of cultured retinal pigment epithelial cells against cytotoxicity induced by hydrogen peroxide

12.00-12.10pm  Elizabeth New  
Small molecule sensors for biological redox state

12.10-12.30pm  Rachel Codd  
Coordinate-bond-dependent solid-phase synthesis of molecular probes

11.00am-12.30pm  Concurrent Session 2 – Metals – Metals and pathophysiology
Chairs: Sharon La Fontaine and Brie Fuqua

11.00-11.20am  Dominic Hare  
Elemental bio-imaging: imaging mass spectrometry using LA-ICP-MS

11.20-11.40am  Debbie Trinder  
Iron-induced liver injury in Hereditary Haemochromatosis

11.40-12.00pm  Liz Milward  
Iron and Neurodegeneration: Investigations In Mouse Models of Haemochromatosis

12.00-12.10pm  Gawain McColl  
Iron accumulation in Caenorhabditis elegans: a model of ageing

12.10-12.30pm  Peng Lei  
Tau-mediated APP trafficking contributes to neurodegeneration by regulating iron export

12.20-12.30pm  Cheryl-lynn Ong  
Zinc and the pathogenesis of Group A Streptococcus

12.30-2.00pm  Lunch

12.30-1.00  Australian Biometals Group AGM

2.00-4.00pm  Concurrent Session 3 – Free Radicals - Antioxidants in health and disease
Chairs: Mark Hampton and Chris Easton

2.00-2.50pm  Greg Giles  
Oxidative Stress and Organoselenium Drugs
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<tr>
<td>2.50-3.10pm</td>
<td>Ralf Dringen</td>
<td>Antioxidative functions of astrocytes in brain</td>
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<td>3.10-3.30pm</td>
<td>Andrew Bulmer</td>
<td>Bilirubin is a physiologically important antioxidant and hypolipidemic agent in vivo contributing to cardiovascular protection: translational importance of the Gunn rat and human Gilbert’s Syndrome models</td>
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<td>3.30-3.40pm</td>
<td>Ezekial Nwose</td>
<td>Antioxidant as alternative to antiplatelet therapy: the usefulness of clinical laboratory data</td>
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<td>3.40-3.50pm</td>
<td>Michael Stapelberg</td>
<td>Mitocans target tryptophan metabolism to remove the mimicry of tumor-initiating cells</td>
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<td>3.50-4.00pm</td>
<td>Gordon Troup</td>
<td>EPR and antioxidant efficiency studies of wines and spirits</td>
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<td>Concurrent Session 3 – Metals – Metal complexes and medicine</td>
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<td>Chairs: Paul Bernhardt &amp; Paul Witting</td>
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<td>2.00-2.50pm</td>
<td>Peter Lay</td>
<td>Insights into cytotoxicity versus anti-metastatic properties of Ru anti-cancer drugs</td>
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<td>2.50-3.10pm</td>
<td>Des Richardson</td>
<td>Identification of mitochondrial “rust” in Friedreich’s Ataxia: Redox implications</td>
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<td>3.10-3.30pm</td>
<td>Zhiguang Xiao</td>
<td>Quantification of weak Cu(I) binding in proteins and peptides helps understanding the role of copper in neurodegenerative diseases</td>
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<td>3.30-3.40pm</td>
<td>Jeffrey Liddell</td>
<td>The neuroprotective copper-bis(thiosemicarbazonato) complex, Cull(atsm), activates Nrf2 and upregulates antioxidants in cultured astrocytes</td>
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<td>3.40-3.50pm</td>
<td>Adam Southon</td>
<td>Atypical ATP-binding cassette proteins and resistance to copper and platinum-based cancer drugs</td>
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<td>3.50-4.00pm</td>
<td>Cho Soe</td>
<td>Directing the Biosynthesis of Putrebackin or Desferrioxamine B in Shewanella putrefaciens through the Upstream Inhibition of Ornithine Decarboxylase</td>
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**Saturday December 1**

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<tr>
<td>8.30-10.30am</td>
<td>Plenary Session 4 – Metal transport, trafficking and homeostasis</td>
<td>Richard Burke &amp; Rachel Codd</td>
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8.30-9.20am  Keynote Lecture 6 – Nigel Robinson  
*How cells help proteins to acquire the correct metals*

9.20-9.40am  Hugh Harris  
*Imaging metal mobilisation in tissue remodelling processes*

9.40-10.00am  Jeremy Shaw  
*Analytical electron microscopy in biology*

10.00-10.10am  Sharon La Fontaine  
*New role for apolipoprotein E (ApoE) in copper regulation*

10.10-10.20am  David Frazer  
*Hepcidin-independent iron recycling in a mouse model of haemolytic anaemia*

10.20-10.30am  Christopher Richards  
*Functional characterization of the Drosophila homologues of the human Zip 1, 2 and 3 genes*

10.30-11.00am  Morning tea

11.00am-12.30pm  Concurrent Session 4 – Free Radicals – Myeloperoxidase  
Chairs: Martin Rees and Louise Dunn

11.00-11.20am  Clare Hawkins  
*A potential role for myeloperoxidase in the induction of endoplasmic reticulum (ER) stress in atherosclerosis*

11.20am-11.40am  Guy Jameson  
*Kinetics Investigations of Myeloperoxidase*

11.40am-12.00pm  Tony Kettle  
*Ceruloplasmin is an endogenous inhibitor of myeloperoxidase*

12.00-12.10pm  Luke Carroll  
*Seleno compounds are effective scavengers of myeloperoxidase-derived oxidants*

12.10-12.20pm  Ghassan Maghzal  
*In vivo detection of myeloperoxidase activity by LC/MS/MS analysis of 2-chloroethidium, a novel product identified from the reaction of hydroethidine with hypochlorous acid and chloramines*

12.20-12.30pm  Martin Rees  
*Critical protective actions of ascorbate and thiocyanate against myeloperoxidase NO oxidase activity*

11.00am-12.30pm  Concurrent Session 4 – Metals – Plant and bacterial metal interactions  
Chairs: David Reid and Maud Achard

11.00-11.20am  Ulrike Kappler  
*Bacterial metalloenzymes involved in stress responses and pathogenicity*
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<tr>
<td>11.20am-11.40am</td>
<td>Shaobai Huang</td>
<td>Complex II has a key role in mitochondrial-derived reactive oxygen species influencing plant stress gene regulation and defence</td>
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<td>11.40am-12.00pm</td>
<td>Iain Lamont</td>
<td>Siderophore-responsive gene expression in Pseudomonas aeruginosa</td>
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<td>12.00-12.10pm</td>
<td>Karrera Djoko</td>
<td>Probing the molecular basis of copper toxicity using Neisseria gonorrhoeae as model system</td>
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<td>12.10-12.20pm</td>
<td>Chris McDevitt</td>
<td>Manganese and Zinc Homeostasis in Streptococcus pneumoniae</td>
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<td>12.20-12.30pm</td>
<td>Melanie Thomson</td>
<td>Modelling host iron deficiency in a mouse model of gastric Helicobacter infection</td>
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<td>12.30-2.00pm</td>
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<td>Lunch</td>
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<tr>
<td>2.00-4.00pm</td>
<td>Plenary Session 5 – Haem, metalloenzymes and the oxidative stress metals interface Chairs: Roland Stocker and Greg Anderson</td>
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<tr>
<td>2.00-2.50pm</td>
<td>Keynote Lecture 7 – Ann Smith</td>
<td>Towards a better understanding of heme toxicity</td>
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<tr>
<td>2.50-3.40pm</td>
<td>Keynote Lecture 8 – Squire Booker</td>
<td>A radical-dependent strategy for methylation of rRNA leading to antibacterial resistance</td>
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<tr>
<td>3.40-4.00pm</td>
<td>Christine Winterbourn</td>
<td>Redox interactions between hemoglobin and peroxiredoxin 2 and possible implications for red cell storage</td>
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<tr>
<td>4.00-4.10pm</td>
<td>Robyn Midwinter</td>
<td>Heme oxygenase-1 deficiency markedly decreases macrophages in bone marrow and spleen but only modestly affects steady-state erythropoiesis and erythrocyte life span</td>
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<tr>
<td>4.10-4.20pm</td>
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<td>Close of Conference</td>
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