



Australia Society for Biophysics

30th Annual Conference

11-13 December, 2006

**School of Chemical and Biomolecular Engineering
University of Sydney**

Registration:

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|--------------------------|---------------------|
| Sunday 10/11/2006 | 6.00-8.00 pm |
| Monday 11/11/2006 | 8.00-9.00 am |

Monday 11/12/2006

- 9.00 **Opening**
9.10 – 10.00 **Robertson Lecture – Chair: Boris Martinac**
- Session I :** **Protein structure and dynamics - Chair: Ray Norton**
10.00 - 10.45 AG Palmer:
 Protein motions in folding, recognition and catalysis
- 10.45 – 11.20 **morning tea**
- 11.20 – 11.40 R.L. Koder and P.L. Dutton
 Engineered functions in designed proteins.
- 11.40 – 12.00 J. Babon, A. Soetopo, E. MacManus, S. Yao, S. Nicholson and R Norton
 Investigations of suppressor of cytokine signalling (SOCS) involvement in E3 ubiquitin ligase complexes.
- 12.00 – 12.20 M. Sunde, A. Kwan, M. Templeton and J. Mackay:
 Self-assembly of fungal hydrophobin proteins into functional monolayers.
- 12.20 – 12.40 J. Trehella, M.Guss, D. Jacques, D.Langley, A.Whitten, T.Hanley, B. Hammouda, G. King
 Neutron Contrast Variation and Understanding Regulation of Bacterial Sporulation
- 12.40 – 2.00 **Lunch**
- Session II :** **Biomimetic Materials Chair: Hans Coster**
- 2.00 - 2.20 M. Bilek, A. Kondyurin, N. Nosworthy, B.K. Gan, B Steel, J. Ho and D. McKenzie
 Covalent attachment of bioactive proteins to plasma treated polymeric surfaces.
- 2.20 - 2.40 E.L. Wong, T. Chilcott, M. James and H.G.L Coster
 Electrical impedance spectroscopy and x-ray reflectometry characterizations of alkyl-functionalised silicon (111).
- 2.40- 3.20 J. Chow, A.S. Weiss, A. Nelson and M. James
 Structural features of synthetic elastin surfaces.
- 3.20 - 2.40 D. Bax, A. Weiss, M. Bilek
 The attachment of tropoelastin to plasma immersion ion implantation treated polystyrene
- 2.40 - 4.10 **Afternoon tea**
4.10 - 4.30 **Poster introductions by authors Moderator: Paul Smith**
4.30 - 5.00 **Posters**

Tuesday 12/12/2006

- Session III : Biophysics of ion channels - Chair: Frances Separovic**
- 9.00 – 9.20 S. Kuyucak and T. Bastug
Molecular dynamics simulations of gramicidin A channel
- 9.20 – 9.40 R.J. Vandenberg, S. Huang and R.M. Ryan
Gating and ion permeation of the anion channel of the human glutamate transporter EAAT1
- 9.40 – 10.00 T. Bastug and S. Kuyucak
Energetics of K⁺ ion conduction through the shaker potassium channel
- 10.00 – 10.20 C.E. Clarke, A.M. Torres, P.W. Kuchel and J.I. Vandenberg
A helically structured M1-P1 loop “fine tunes” the pH sensitivity of acid sensitive two-pore domain potassium (TASK) channels.
- 10.20 – 11.10 **Morning tea**
- Session IV : Electrophysiology and ion channels - Chair: Peter Barry**
- 11.10-11.20 **Geoff P. Findlay: Obituary** by Alan Walker
- 11.20 – 11.40 A.P. Hill, M. Sunde, T.J. Campbell and J.I. Vandenberg
Mechanism of block of the HERG K⁺ channel by the scorpion toxin CnErg1.
- 11.40 – 12.00 W. Qu, A.J. Moorhouse, T.M. Lewis, K.D. Pierce and P.H. Barry
Effects of single-loop glutamate mutations to cysteine and alanine on the cation-anion permeability of the CNGA2 channel.
- 12.00 – 12.20 A. Nikouee, H. Mobasher and M.N. Sarbolouki
Biophysics of the interactions between nucleotides and OmpF ionic channels
- 12.20 –12.40 S. Al Khazaaly and M.J. Beilby
The proton pump in salt-tolerant charophyte *Lamprothamnium* is activated by turgor pressure decrease.
- 12.40 – 1.00 M.J. Beilby and M.A. Bisson
Pressure clamp initiates hypertonic and hypotonic response in *Ventricaria ventricosa*.
- 1.00 – 2.00 **Lunch**

Tuesday 12/12/2006

- Session V: Membrane structure and function - Chair: Brett Hambly**
- 2.00 – 2.20** P.W. Kuchel, C. Naumann, C. Garvey, B.E. Chapman, W.A. Bubb, D.J. Philp and A.M. Torres.
NMR of quadropolar nuclei in erythrocytes and gels under variable mechanical stress.
- 2.20 – 2.40** R.J. Clarke, G. Le Goff and M.F. Vitha
Membrane orientational polarisability: a mechanism of lipid-ion pump interaction?
- 2.40 – 3.00** C.C. Curtain, J.F. Boas, D.J. Tew, D.P. Smith, A.F. Hill, S. Drew, A.I. Bush, C.L. Masters, J.R. Pilbrow, R.A. Cherny, I. Volitakis, R. Cappai and K.J. Barnham.
Parkinson's disease, α -synuclein, lipids and metals
- 3.00 – 3.20** M. Falahati, H. Mobasheri and M.N. Sarbolouki
Biophysics of the effects of polyethyleneglycoles on the disrupted neural cell membranes of rat's spinal cord.
- 3.20 – 3.40** K. Krishnan, L. Bagatolli, A. Clayton and P. Moens
New insight on the interaction between phosphatidylinositol (4,5) bis-phosphate and profilin: a study in giant unilamellar vesicles.
- 3.40 – 4.30** Afternoon tea
- 4.30 – 5.00** Posters
- 5.00 – 5.30** AGM
- 6.30 for 7.00** Conference Dinner

Wednesday 13/12/2006

- Session VI : Biophysics of cellular and biochemical processes - Chair: Mary Beilby**
- 9.00 – 9.20** C. Oakley, J.M. Hwang, L. Brown, M. Kekic, Fajer and B. Hambly
Studies of the N-terminal region of cardiac myosin binding protein – C.
- 9.20 – 9.40** A. Bojovschi, M.S. Liu and R.J. Sados
Conformational dynamics of ADP/Mg:ADP and ATP/Mg:ATP in F1-ATPase and other motor proteins.
- 9.40 – 10.00** C.J. Garvey, M.J. Beilby and G.S.H. Lee
Solid state NMR study of polymer morphology in the cell wall of *Chara australis*.
- 10.00 – 10.20** C.J. Garvey, M. Strobl, R Loidl and P.W. Kuchel
Metabolic red blood cell shape and volume changes observed by small angle neutron scattering measurements.
- 10.20 – 10.40** H. Wacklin and R.K. Thomas
pH and the distribution of reaction products in phospholipase A2 hydrolysis of membrane lipids.
- 10.40 – 11.30** morning tea
- Session VII : General biophysics - Chair: Adelle Coster**
- 11.30 – 11.50** A.F. Collings, AP Sosa Pintos, PB Gwan, JLNiqui-Arroyo and JJ Ortega-Calvo
Remediation of contaminated soils by combined power ultrasonics and bioremediation
- 11.50 – 12.10** L. Fischer, M. Vorobyev, T. Plakhotnik and A. Zvyagin
Coupling of Focused and Extended Sources of Illumination in a Vertebrate Photoreceptor Model.
- 12.10 – 12.30** M. Vorobyev, O. Ganeshina and N. Hempel de Ibarra
Optical and behavioural resolution of the honeybee eye.
- 12.30 - 12.50** S.S. Mahmoud, J.D. Gehman, A Bigham and F. Separovic
Liposomal chloramphenicol preparations for ophthalmic application: encapsulation, partition or adsorption.
- 12.50 – 1.10** M. James
What to do when your reactor goes critical
- 1.10** Closing remarks
- 1.20** Lunch: BBQ lunch in the courtyard

Poster presentations

Yasuo Takahashi and Yohei Konno: **The Effect of Temperature on Cardiac Activity in Frogs**

Kannan Krishnan, Luis Bagattolli, Andrew Clayton, Pierre Moens: **Properties of profilin binding to sub-micellar concentration of phosphatidyl inositol bisphosphate.**

Yen-Hua Huang, Michelle L. Colgrave, Asbed Keleshian, Boris Martinac and David J. Craik: **Model membrane mimetics for determining the mode of action of the cyclotides.**

Annette C. Hurst, and Boris Martinac: **The prokaryotic mechanosensitive channel MCSC is inhibited by GSMTX-4, a polypeptide from the spider *Grammostola spatulata*.**

Asbed M Keleshian, Paul Rohde and Boris Martinac: **Linear free energy relationship and the MSCL channel.**

P Ju, AM Torres, PW Kuchel and JI Vandenberg: **Charged residues in the pore helix domain modulate inactivation of HERG K⁺ channels.**

Sugiharto, AJ Moorhouse, TM Lewis, PR Schofield and PH Barry: **The effect of divalent ions on the anion-cation permeability ratio in glycine receptor channels.**

PJ Smith RJ Pace, WS Chow, TJ Wydrzynski, AD Hope: **Stoichiometry of Photosystems I and II in Higher Plants.**

Brendon Conlan, Warwick Hillier, Tom Wydrzynski: **Designing Artificial Photosynthesis: An in vitro model of a light activated, metal binding protein.**

Bradley C Steel, Marcela MM Bilek, Cris G dos Remedios, Neil J Nosworthy, David R McKenzie: **Nanosecond responses of proteins to ultra-high temperature pulses.**

J.A. Cooke and L.J. Brown: **Structure and “flycasting” mechanism of the c-terminal domain of troponin I by site-directed spin labeling EPR spectroscopy.**

Camille Yip, Catherine Clarke, Jamie Vandenberg: **The role of the c-terminus in osmosensitivity of the two-pore domain acid sensitive channel, TASK-2.**

Ann Kwan, Margie Sunde, Matt Templeton and Joel Mackay: **The structural basis for hydrophobin self-assembly.**

Min Chen and Zhengli Cai: **The chlorophyll replacements in the photosynthesis.**

Gary W. Lim, Batoool Sajad, Terry C. Chilcott, Hans G.L. Coster: **Edge effects on impedance spectrometry.**

Christoph Naumann, Bogdan E. Chapman and Philip W. Kuchel: **Gelatin as a versatile alignment medium in deuterium NMR.**

Timothy J. Larkin, William A. Bubb and Philip W. Kuchel : **pH dependence of the water resonance splitting in variable angle spinning 1h NMR of erythrocytes.**

Head S. I., Kueh S. L. L., and Morley J. W.: **A reduction in the frequency and amplitude of spontaneous mIPSCs in dystrophin-deficient mdx mice.**

Lenné, T., Kent, B., Garvey, C. and Bryant, G.: **Sugar distribution around membranes during dehydration and freezing.**

Jamie I Vandenberg, Adam P Hill, Pengchu Ju: **Analysis of inactivation of human-ether-a-go-go-related gene (HERG) K⁺ channels using rate equilibrium Linear Free Energy Relationships.**

Rebecca Freeman, Rui Ping Hoo, Raffaella Mammucari, Bill Walsh, Neil R. Foster, Fariba Dehghani: **Manufacturing Polymer Scaffold by the Dense Gas Technology for Cartilage Regeneration.**

Alistair Edwards, Adrian Tchen, Stuart Cordwell and Brett Hambly: **Proteomics of myocardial ischemia/reperfusion injury.**

K.E. Wilk, P. Lelliott, Harrop S. J., Edler D., Curmi P. M.: **Cryptophyte Light Harvesting Systems.**

PJ Smith, J Hughes, N Cox, RJ Pace, E Krausz: **Low Temperature Spectroscopy of Higher Plant Photosystem II Cores**

Sandrine Azzam, Anthony Cheung, Fariba Dehghani: **Precision Cleaning of Surgical devices by a Solvent Free Technique**

R. Freeman, R.P. Hoo, R. Mammucari, B. Walsh, N. Foster and F. Dehghani: **Manufacturing polymer scaffold by the dense gas technology for cartilage regeneration.**

Anthony P. Duff, Agata Rekas, Robert A. Russell, Kerie M. Hammerton, Peter J. Holden, Karyn L. Wilde: **Conformational dynamics of Calmodulin investigated by Small Angle X-ray Scattering (SAXS) and Small Angle Neutron Scattering (SANS) using domain-specific perdeuterated protein.**

Po-chia Chen and Serdar Kuyucak: Application of simulation techniques to the characterisation of the HERG potassium ion channel exterior.

Raymond J. Ritchie: **Consistent Sets of Spectrophotometric Chlorophyll Equations for Acetone, Methanol and Ethanol Solvents.**