

ibdg

newsletter

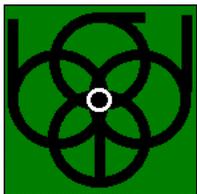
www.ibdg.org.uk

affiliated to:

The Royal Society of Chemistry (Dalton Division) & The British Biophysical Society

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Message from the Chair

Welcome to the winter issue of the IBDG newsletter. In this issue we describe our recent meetings and report on future plans. Some points of note:

- The September Dalton Discussion meeting in Nottingham was a great success. A full report can be found inside.
- This is the last chance for you (or a colleague you know) to apply for the inaugural IBDG award for outstanding achievements by a young scientist. The deadline for nominations to be received is 1st December 2005, full details on page 2.
- The 2006 annual meeting returns to Queen Mary, London in January and will be held jointly with the Electron Spin Resonance Group of the Royal Society of Chemistry. Peter Heathcote has helped us put together a really exciting scientific program and, if last time is anything to go, by John Viles will host an excellent and friendly meeting. Some of the lectures will be "high level" tutorials and we are especially pleased to have been able to get sponsorship from BBSRC. **As a result there will be no registration fee for PhD students.** Please encourage your students to attend. Good attendance should allow us to get more funding next year and stimulate lively scientific debate throughout the meeting.

And don't forget that up-to-date news on all our activities, and especially meetings, can be found on our web site:- www.ibdg.org.uk

I look forward to seeing you all in London in January

Chris Cooper (Chair IBDG)

ccooper@essex.ac.uk



The IBDG Young Investigator's Award

The Inorganic Biochemistry Discussion Group is inaugurating a young investigator's award. This award is designed to highlight and promote the next generation of outstanding UK-based inorganic biochemists. The award will be made every two years for outstanding contributions to any area of biological inorganic chemistry or inorganic biochemistry.

IBDG is therefore seeking nominations for the 2006 award. The award winner will receive a prize of £500 and present a lecture at an IBDG sponsored meeting in the following year; IBDG will pay travel and on-site costs at this meeting.

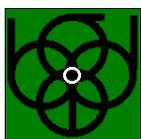
To be eligible for the award nominees must:

- normally be under the age of 35 on the 1st January 2006, although appropriate allowances will be made for career breaks
- be currently employed in the UK

Nominations for the IBDG Young Investigator's Award must be made electronically by the nominee to the Chair (currently Chris Cooper – ccooper@essex.ac.uk) and should include:

- a letter from the nominee which summarises their principal achievements in inorganic biochemistry or biological inorganic chemistry and which includes the names of two referees
- the nominee's current CV and list of publications, highlighting the 5 most significant
- the nominee is also responsible for arranging for electronic supporting letters from the two referees (to be e-mailed separately to the Chair) describing the area of work undertaken and highlighting the nominee's achievements in inorganic biochemistry or biological inorganic chemistry.

Nominations for the 2006 Award will close on December 1, 2005.



Future Meetings

Metals and Radicals in Biology: Spectroscopic Insights

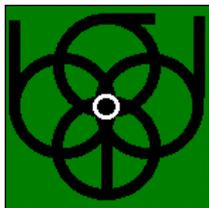
5 - 6 January 2006, Queen Mary, University of London, UK

The annual Inorganic Biochemistry Discussion Group meeting will be held at Queen Mary, University of London on 5 – 6 January 2006. The theme for this meeting is the application of advanced spectroscopic methods to probe the nature and function of free radical, and paramagnetic transition metal centres, in a wide range of biological systems. The meeting will include a series of tutorial lectures, targeted at the graduate level, detailing the physical principles and the information content of electron paramagnetic resonance (EPR), electron nuclear double resonance (ENDOR), electron spin echo envelope modulation (ESEEM) and magnetic circular dichroism (MCD) spectroscopies in addition to the more usual research presentations. Confirmed speakers include:

| | |
|---|--|
| Robert Bittl (Freie Universität Berlin) | David Richardson (University of East Anglia) |
| David Britt (University of California Davis) | John Enemark (University of Arizona) |
| Andrew Thomson (University of East Anglia) | Sun Un (CEA Saclay) |
| Stephen Rigby (Queen Mary University of London) | David Lowe (John Innes Centre) |
| Wolfgang Lubitz (Max-Planck-Institut, Mülheim) | |

Through BBSRC sponsorship of the meeting we are able to offer **free registration for PhD students** who intend to present a talk and/or poster at the meeting. The conference will be held jointly by the Inorganic Biochemistry Discussion and ESR Groups of the Royal Society of Chemistry and details of the meeting, including the scientific programme and registration details, may be found on the IBDG website, www.ibdg.org.uk.

A registration form for the meeting can be found on the final page of this Newsletter.



Meeting Report

Dalton Discussion 8 Metals: Centres of Biological Activity 7-9 September 2005, University of Nottingham, UK

The programme for the Eighth Dalton Discussion, Metals: Centres of Biological Activity, held in the School of Chemistry of the University of Nottingham on 7–9 September, 2005, was designed with reference to recent advances in our field of research. The pattern of the meeting was similar that of previous Dalton Discussions. Manuscripts of the Keynote or Discussion papers were submitted by the presenting authors and then refereed, printed and circulated to delegates prior to the conference. Familiarity with the science being presented meant that, after the Keynote lecture in each session, the presenting authors could summarise the scientific content of their papers in a ten-minute talk, leaving ample time for discussion following each presentation. Also, after lunch on the second day, over thirty researchers presented posters; each presenter gave a one-minute summary and then discussed their new science with delegates on a one-to-one basis by the posters.

The conference comprised of four main sessions, each focussed on key advances in one class of metalloprotein:

- Haem Iron: Nature's Most Versatile Redox Centre
- Multi-Copper Enzymes and Their Chemical Analogues
- Nickel Enzymes: New Perspectives and Challenges
- Molybdenum and Tungsten Enzymes: Nature and Function

Steve Chapman successfully opened the meeting with his Keynote lecture in the haem session, in which he reported recent researches on the structural and functional features of multi-haem cytochromes from the *Geobacter*, *Shewanella* and *Desulfovibrio* species of bacteria. Some of these bacteria contain genes for up to seventy different multi-haem proteins, one of which contains an astonishing twenty-seven haem groups. It has become clear that there is a high degree of conservation of the haem arrangements within these proteins, even when there is no clear global structural and sequence analogy between individual proteins. The theme of the discussion following this paper (and of those of other papers presented later in the meeting) noted that the arrangements of certain redox active prosthetic groups could have evolved, and are continuing to evolve, to maximise the efficiency of electron transfer to and from the active site.

X-ray crystallography continues to reveal new and unusual co-ordination geometries for metal centres in metalloproteins and the work described in Amy Rosenzweig's Keynote lecture in the copper session clearly illustrated this. Amy reported a new X-ray crystal structure of the copper-containing membrane-bound methane monooxygenase that has represented one of the major unsolved problems in biological inorganic chemistry for the past twenty years. Almost none of the key structural features of this enzyme had been predicted and, consequently, the solution of this structure represents a significant advance in our understanding in the nature and function of this enzyme. The identification of two novel copper centres, one mononuclear and the other binuclear, both of which possess unusual co-ordination geometry, prompted considerable discussion.

Fraser Armstrong opened the nickel enzymes session with an excellent summary of his group's recent electrochemical experiments on the [NiFe] hydrogenases. He illustrated how voltammetry has defined mechanistically significant forms of this enzyme and how these map on to spectroscopically defined species. His presentation ended with the ground-breaking demonstration of the use of laccase- and hydrogenase-coated electrodes in the construction of a membrane-less fuel-cell, as an alternative to cells that

employ platinum electrodes. This clearly illustrated both the industrial and environmental relevance of these enzymes.

Ralph Mendel presented the Keynote lecture for the molybdenum and tungsten enzymes session, describing the mechanism of Mo uptake into cells, nature of molybdopterin and detailed the various steps involved in its biosynthesis, the insertion of Mo into molybdopterin, and the nature of the catalytic centre in each of the three classes of molybdoenzymes. Two potentially important medical advances have emerged from these investigations. Firstly, a link between Cu and Mo metabolism has been demonstrated, since Cu is used to protect the dithiolene group of molybdopterin prior to Mo insertion. This may be significant in respect of the nature of the two diseases, Wilson's and Menkes, that are associated with disorders in the Cu metabolism of humans. Secondly, a deficiency in the availability of molybdenum enzymes is a well-recognised metabolic defect of plants and humans. Presently, there is no treatment for this distressing human condition that leads to death in early childhood. However, genetic analysis has shown that the majority of the individuals with this condition cannot accomplish the first step of molybdopterin biosynthesis, i.e. the formation of "precursor Z". Mendel's group have over-produced precursor Z in *E. coli* and injection of this has successfully restored the normal metabolism of mice genetically engineered to be defective in molybdopterin biosynthesis. Clinical trials of this treatment are about to commence.

This was a most enjoyable and informative meeting that amply demonstrated the significance of research into metalloproteins, including aspects of the metabolism of all life forms, medical treatments and diagnoses, the environment and alternative sources of energy. A truly international cast presented a range of exciting and interdisciplinary research, exchanged ideas freely, and made constructive suggestions for the development of many projects. We were delighted with the presence and participation of so many young scientists and the demonstrations by the remainder that they are young at heart! The future of this field, whilst challenging, is bright.

The organising committee would like to thank each of the speakers and all of the participants for making Dalton Discussion Eight such a great scientific success, by fully engaging in the spirit of the meeting – including informal international discussions about England's Fifth Test cricket performance and visits to a local site of historical significance. Also, the organising committee is very appreciative of the sterling work performed by members of staff of the RSC Conference Office and Dalton Transactions, the professional expertise and personal involvement of whom ensured that the conference ran smoothly and efficiently throughout. Also, we thank members of the Inorganic Biochemistry Discussion Group, not only for their significant and constructive support during the planning of the meeting, but also for their many and valuable scientific contributions to the proceedings.

A special issue of Dalton Transactions, dedicated to Dalton Discussion 8, is now available online at www.rsc.org.

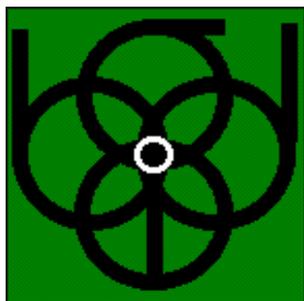
Jon McMaster (Meetings Secretary IBDG)



IBDG Committee

Prof Chris Cooper (Chair)
Dr Julea Butt (Secretary & Newsletter Editor)
Dr Jon McMaster (Meetings Secretary)
Dr Rob Evans
Dr Emma Raven
Dr Kenneth White

Dr John Reglinski (Vice-Chair)
Dr Dave Evans (Treasurer)
Dr Kate Brown
Prof. David Lowe
Dr Jon Viles



Inorganic Biochemistry Discussion Group
and the ESR Group present:

METALS AND RADICALS IN BIOLOGY: SPECTROSCOPIC INSIGHTS

www.ibdg.org.uk

Queen Mary, University of London
5-6 January 2006

REGISTRATION DETAILS:

Title: Name:.....

Affiliation:

Address:

.....

.....

Tel: Fax: E-mail:.....

REGISTRATION FEES:

| | | |
|---|----------------|---|
| Registration Fee* | £75 | = |
| Registration Fee* - IBDG member | £60 | = |
| Registration Fee* - student Free Registration for PhD Students! | £40 | = |
| One day registration (all categories) | £40 | = |
| Meeting Dinner (Jan. 5) | £25 | = |
| TOTAL | | |

* Includes lunch on day 2

DIETARY OR OTHER REQUIREMENTS

Details of any special dietary or other requirements:

ABSTRACTS

Abstracts for posters must be submitted before Dec 1. Please prepare abstracts in black and white according to the guidelines on the meeting web page.

PLEASE RETURN THIS FORM WITH YOUR CHEQUE (payable to *Inorganic Biochemistry Discussion Group*) BY 15 NOVEMBER 2005 TO:

Dr John H. Viles, School of Biological Sciences, Queen Mary, University of London, Mile End Road, London E1 4NS, UK

PLEASE ALSO SEND A COPY OF YOUR ABSTRACT (if applicable)

Please submit this by email (as Word file) to J.Viles@qmul.ac.uk (please mark your email '**IBDG Abstract**').

CHECKLIST

Registration form (by post) ; Cheque (by post) ; Abstract (sent by email)

For further information see web site: www.ibdg.org.uk