

# Non-Covalent Interactions in Chemistry and Biology

15 - 17 September 2004

Department of Chemistry, *University of Cambridge*

Non-covalent interactions account for the dynamic order of proteins, the double helix, and ligand binding. This conference will address our understanding of non-covalent interactions, and how they have been exploited in evolution from the structures of crystals to the sophistication and convergence found in biological machines.

## Speakers at this conference include:

Jack Dunitz FRS, *ETH Zurich*

Jeremy Sanders FRS, *University of Cambridge*

Chris Hunter, *University of Sheffield*

Dennis Dougherty, *Caltech*

Janet Thornton FRS, *Wellcome Trust Genome Campus*

Steve Benner, *University of Florida*

John Walker FRS, *MRC Dunn Human Nutrition Unit, Cambridge*

Simon Conway Morris FRS, *University of Cambridge*

Dudley Williams FRS, *University of Cambridge*

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Non-covalent interactions are essentially the basis of the order necessary for biological function and are vital for maintaining the folded structure of proteins, the double helix and for numerous recognition processes. This conference will consider, from various perspectives, questions pertaining to the nature of non-covalent interactions. Specifically how non-covalent interactions have been exploited by evolution for example in the sophistication of enzymes and the fine tuning of the interactions necessary for regulating macromolecular machines.

## Programme

### Wednesday, September 15

3.00 – 7.30 Registration

6.30 – 7.30 Welcoming Reception

### Thursday, September 16

**Chair: Chris Dobson FRS** *University of Cambridge*

9.00 Welcome

**Jeremy Sanders FRS** *University of Cambridge*

9.15 Are Crystal Structures Predictable?

**Jack Dunitz FRS** *ETH, Zurich*

10.00 Mass Spectrometric Structure  
Elucidation in Proteomic and  
Glycoproteomic Research: the Covalent  
Template Defining Biomolecular  
Interactions

**Howard Morris FRS** *Imperial College London*

10.45 **Tea Coffee and Biscuits**

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**Chair: Paul Barker** *University of Cambridge*

11.15 Darwinian Selection and Evolution  
in a Test Tube: Dynamic Combinatorial  
Chemistry

**Jeremy Sanders FRS** *University of Cambridge*

12.00 Quantitative Approaches  
to Molecular Recognition

**Chris Hunter** *University of Sheffield*

12.30 **Lunch**

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**Chair: Sophie Jackson** *University of Cambridge*

2.00 Peptide Models of Protein  $\beta$ -Sheets

**Mark Searle** *University of Nottingham*

2.30 Induced fit - a New View

**Mike Williamson** *University of Sheffield*

3.00 Neuroreceptor-Drug Interactions:  
How Does Nicotine Activate an  
Acetylcholine Receptor?

**Dennis Dougherty** *Caltech*

3.45 **Tea Coffee and Biscuits**

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**Chair: Chris Abell** *University of Cambridge*

4.15 Protein Folding and Misfolding

**Jon Waltho** *University of Sheffield*

5.00 Weighing the Evidence - Non-covalent  
Interactions in Macromolecular  
Complexes

**Carol Robinson** *University of Cambridge*

### Friday, September 17

**Chair: Jonathan Spencer** *University of Cambridge*

9.00 From Protein Dynamics to  
Thermodynamics: Recent Advances  
and Future Challenges

**Martin Stone** *Indiana University, Bloomington*

9.30 Designing Nano-scale Self-assembling Peptide Structures from the Bottom Up

**Derek Woolfson** *University of Sussex*

10.00 The Evolution of Enzymes, Metabolites and Pathways

**Janet Thornton, FRS**  
*Wellcome Trust Genome Campus*

10.45 **Tea Coffee and Biscuits**

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**Chair: Shankar Balasubramanian**

*University of Cambridge*

11.15 Zinc finger domains in Molecular Recognition: New Structures, New Functions and New Designs

**Joel Mackay** *University of Sydney*

11.45 Non-covalent Interactions on the Way to Artificial Life

**Steve Benner** *University of Florida*

12.30 **Lunch**

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**Chair: Steven Ley FRS** *University of Cambridge*

2.00 The Mitochondrial Proteome and its Relationship to Neurodegenerative Disease and Aging

**Bradford W. Gibson**  
*Buck Institute (Sponsored by the BMSS)*

2.30 Rotary Machines in Biology

**John Walker FRS**  
*MRC Dunn Human Nutrition Unit, Cambridge*

3.15 Evolutionary Convergence: Does it tell us Anything Important?

**Professor Simon Conway Morris FRS**  
*University of Cambridge*

3.45 **Tea Coffee and Biscuits**

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**Chair: Jeremy Sanders FRS** *University of Cambridge*

4.15 Did God make Shrinking Enzymes?

**Dudley Williams FRS**  
*University of Cambridge*

5.15 Close of Meeting

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Throughout the meeting, we will be celebrating  
Dudley Williams' contributions to science.

## Application and fees

£150 inc VAT for RSC members. £230 inc VAT for non-RSC members.

All fees include wine reception, lunch and refreshments. Students who are members of the RSC pay a reduced fee for all RSC conferences.

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Please contact Michele Sahrle by email on

[m.sahrle@mmsconferencing.com](mailto:m.sahrle@mmsconferencing.com), by phone on 07703 647189

or visit [www.mmsconferencing.com/noncovalent.html](http://www.mmsconferencing.com/noncovalent.html)

On-line registration and payment available

*Early application is advisable.*

*Deadline for receipt of applications is 31 August 2004.*

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## APPLICATION FORM Please type or print clearly (this form may be photocopied)

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