

Physical Chemist at the life science interface

PERSONAL DETAILS

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RESEARCH INTERESTS

Biophysical techniques, polarisation spectroscopy and microscopy, silk processing, silk biomechanics, fibre-forming proteins, biopolymers, molecular adaptation, animal behaviour.

EDUCATION

2004 DPhil. in natural sciences, Zoology Dept. Oxford University- Wadham College (Degree awarded 1st March).
Title "Structural changes in *Nephila edulis* silk proteins in solution".
1999 Engineer Diploma in Chemistry from the Ecole Nationale Supérieure de Chimie de Montpellier, France
(ENSCM).
1998-99 Fifth academic year at the Chemistry Institute, University of Aarhus, Denmark. (MSc)
1997-98 Fourth academic year at the ENSCM, France.
1996-97 Military service, "Ecole d' Application de l'Infanterie", Montpellier, France.
1994-96 Third academic year at the ENSCM, France.
1992-94 "Classes Préparatoires aux Grandes Ecoles", Lycee Claude-Bernard, Paris, France.
1991 Baccalauréat C, i.e. 'A' levels in mathematics, physics, chemistry.
1990 Baccalauréat D, i.e. 'A' levels in mathematics, physics, chemistry, biology.

CURRENT POSITION

Oct 07- Sept 2010 EPSRC Life Science Interface Fellowship. A novel approach to multiscale measurements in biological materials: silk as a model system.
Jan 2006- Oct 2008 Junior Research Fellow at St Edmund Hall, Oxford. Molecular aspect of silk spinning.
Oct 2003-Dec 2005 Research Assistantship at the University of Oxford with Prof. Vollrath. My work is focused on (i) understanding and making natural composites from silk fibres and resins, and, (ii) describing molecular events involved in silk production.
March 04- March 07 Three years non-stipendiary position as Adjunct Assistant Professor at the department of physics, University of East Carolina, North Carolina, USA. (Prof. John Sutherland). Development of analytical tools to understand the phylogeny of silk chemistry.
January 05- Jan 07 Visiting Fellow at the dept for Macromolecular Sciences, Fudan University, Shanghai, China (Prof. ZZ Shao). Research on the molecular mechanisms of silk processing and strength. Teaching and student supervision.

PREVIOUS TRAINING AND WORK EXPERIENCE

March- May 2004 Adjunct Assistant Professor at East Carolina University, North Carolina, USA. Biophysical chemistry of basal spiders' silk protein and its implication in the molecular evolution of silk in arthropods.
Sept 2001-Oct 2003 Research Assistantship at the University of Oxford and pursuing simultaneously a PhD. degree with Prof. Fritz Vollrath. My work was focused on the processing of spider silk liquid secretions into fibres. I have been using and developing structural tools (Circular and Linear Dichroism, Fourier Transform Infrared spectroscopy, Raman microscopy, Rheometry, Scanning Acoustic Microscopy and light microscopy) to investigate Spider silk secretions and fibres, with the final goal of resolving their structure/function relationships.
Nov-December 2002 Visiting scientist in the department of macromolecular science, Fudan University, Shanghai, China. In-situ Raman microscopy of spider silk glands and fluorescence studies of spider liquid silk.

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| <u>March 2000-Sept 2001</u> | Research assistant at the Zoology department and the Institute for Synchrotron Radiation at Aarhus University, Denmark. Development of a Synchrotron Radiation based photobiology beam line and application on spider silk proteins secondary structures. |
| <u>Sept 98- August 1999</u> | Msc. at Aarhus University: Femtosecond photodissociation dynamics of aryl and Alkyl halides, studied by ion imaging. Ultrashort laser pulse phenomena. (Coursework : Time-resolved spectroscopy of atoms, molecules, liquids and solids, physical chemistry, photochemistry, organic polymers, optics, ion imaging) |
| <u>June-August 1998</u> | Research assistant at the Institute of Molecular and Structural Biology in Grenoble, France: Synthesis and Purification of an antibody specific to the Adenovirus type II. |
| <u>July-August 1996</u> | Research assistant at QUALICHROME in Montpellier, France: recycled electrochemical waste and improved efficiency of electrochemical baths. |
| <u>October 1995</u> | Research assistant at the CNRS polymer unit in Montpellier, France. Synthesis and characterisation of polyvinylidene telomers (GC investigation). |

AWARDS AND PRICES

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| May 2003 | Short-listed for the 'L Oreal graduate of the year' award |
| March 03, Sept 2006 | Best Poster Prize. UK/EU Circular Dichroism User meeting |

WORKSHOPS AND CONFERENCES

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| May 2007 | Invited lecture "Does and Don'ts of non crystalline synchrotron radiation techniques", Hefei, China |
| May 2007 | Invited lecture "Silks from structure to function", Proteins at Work meeting in Perugia, Italy |
| August 2006 | 10 days - Marie Curie summer school-knowledge based materials: composites materials. Sweden. |
| April 2004 | Invited lecture "Analytical technique to study basal silks", ECU, North Carolina, USA |
| December 2003 | Invited lecture "Conformational changes in liquid silk proteins". Physical Chemistry Dept., ETH Zurich, Switzerland and Biophysical Chemistry Dept. Lund University Sweden. |
| June 2003 | Invited lecture: "Structural conformation of spidroin in solution: a SRCD study". Third International Silk Conference, Montreal, Canada. |
| Nov 2002 | Invited lecture: "Elastomeric proteins: Spider silk. Self-assembly and spectral artefacts". Fudan University, Shanghai, China. |
| Sept 2002 | EPSRC CD Summer School, Warwick University. 1 week of theoretical and practical course on structural tools and protein structures investigation. |
| June 2002 | Invited lecture: "Formation of spider dragline silk involves correlated changes in pH and protein folding". 4 th European Science Foundation workshop on silk, Lyon, France. |
| August 2001 | Invited lecture: "Circular and linear dichroism. Spider silk proteins: secondary structures investigation". Nordic School in Atomic Physics 2001. New trends in collisions, photons and biomolecules. |
| June 2001 | 1-week workshop on evolutionary biology, Guarda, Switzerland. Teamwork and skills on grant proposal writing. |
| Nov 2000 | 1-week workshop on evolutionary biology and spiders (Denmark). Run an afternoon session on spider silk and the impact of biophysical chemistry on the understanding of silk diversity. |

MEDIA AND PUBLIC COMMUNICATION OF SCIENCE

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| July 2005 | Invited lecture at the Royal Institution. Science for School Events 'Why I like science'. |
| February 2005 | Participation in the Duracell Exploration documentary on Science and Technology. |
| February 2004 | Participation and featured interview in the BBC program Young Foresight. |
| July 2003 | Invited lecture at the Royal Institution. Science for School Events 'Why I like science'. |
| Sept 2002 | Invited lecture: "Spider silk and applications". Kolding school of design and textile, Denmark. |

HOBBIES

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| To present | Saxophone, Spear fishing, Rugby (club level), Judo (Club level), Chess (club level), and Sailing |
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