

CURRICULUM VITAE

(updated May 2009)

Personal data

JOSÉ J. G. MOURA

Home address: Rua David de Sousa, 25 – 1º Dto. 1000-106 Lisboa, Portugal

BI 1282137

Date of birth - May 15, 1951

Place of birth - Montijo – Portugal

Married (Isabel Moura) - two children (Joana and Rita)



Affiliation - Address

REQUIMTE – Centro de Química Fina e Biotecnologia
Departamento de Química
Campus de Caparica, Faculdade de Ciências e Tecnologia
Universidade Nova de Lisboa, 2829 - 516 Caparica, Portugal

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Basic Formation – Background

University of Lisbon, Instituto Superior Técnico (1968 - 1974)
(Chemical Engineering - Classification: 17 out of 20)

D.Phil. (Bioinorganic Chemistry) New University of Lisbon (1979)

Professional Career (Resume)

| | |
|-----------------|---|
| 1971 - 1974 | - Demonstrator, Lisbon University (IST) |
| 1974 - 1977 | - Teaching Assistant, Lisbon University (IST) |
| 1977 - 1978 | - Teaching Assistant, New University of Lisbon (UNL) |
| 1979 - 1980 | - Assistant Professor, New University of Lisbon |
| 1979 - 1980 | - Research Specialist, University of Minnesota |
| 1980 - 1995 | - Associate Professor, New University of Lisbon |
| 1984 - | - Adjunct Professor, Univ. of Georgia, Athens, GA, USA |
| 1986 (6 Months) | - Sabbatical leave University of Georgia |
| 1990 (6 Months) | - Sabbatical leave University of Georgia |
| 1990 (6 Months) | - Sabbatical leave Univ. Homburg and Emory Univ.-Atlanta |
| 1990 - 1996 | - President of Pedagogic Council (Dept. Chemistry - UNL) |
| 1990 - 1991 | - Coordinator Inorganic Section (Dept. Chemistry - UNL) |
| 1991 - 1993 | - Working Party IUPAC Glossary Terms Inorganic Biochemistry |
| 1991 - 1994 | - Member Special NATO Program-Supramolecular Chemistry |
| 1991 - | - Member of the Editorial Board of Metals in Biology |
| 1992 - | - Member International Advisor Board FORBITEC |
| 1992 - 1993 | - Member Human Capital & Mobility – DGXII - Chemistry Panel |
| 1993 - | - Member COST Panel (Molecular Recognition - D7) |
| 1994 | - Agregação (Química Inorgânica) - FCT - UNL |
| 1994 - | - Member Protein Engineering Panel - Contact Person - Structural Biology - EC |

| | |
|-------------|---|
| 1994 - | - Coordinator Phys. Chem. and Inorganic Section (Dept. Chemistry UNL) |
| 1994 - | - Member COST 818 - Hydrogenases - Chairman Subsection - EC |
| 1995 - ... | - Professor of Chemistry |
| 1996 - | - Director of FCT- UNL LIBRARY |
| 1996 | - Science Honor "Fundação Marquês de Pombal" |
| 1997-2000 | - Head of Chemistry Department |
| 1999- 2004 | - Portuguese Delegate to INTAS e COST 841 |
| 2000- ... | - Portuguese Delegate to Technical Committee COST |
| 2003 - 2006 | - President of Scientific Council FCT-UNL |
| 2004 - | - MCES Research Excellence Award |
| 2006 - 2008 | - National Delegate to COST-EC Council of Scientists |
| 2007 - | - Elected Member of Academia das Ciências de Lisboa |

TEACHING EXPERIENCE

General Biochemistry, Analytical and Inorganic Chemistry, Nuclear and Electron Magnetic Resonance and Mossbauer Spectroscopy (applications to Chemistry and Biology).
Undergraduate, Master and PhD programs.

RESEARCH ACTIVITY (ABSTRACT)

Key words

Bioinorganic, Biophysics, Biocatalysis, Energy Bioconversion (Hydrogen)

Role of metals in Biology

(heme and non-heme iron, molybdenum, tungsten, nickel, vanadium and cobalt)

Inorganic systems as models for biocatalysis

Spectroscopy (NMR, EPR and Mössbauer), (Bio) Electrochemistry

Main goal is the understanding of electron transfer chains (ETC) of sulphate reducing bacteria (SRB) and methane forming bacteria (MFB). SRB have complex ETC systems which allow the reduction of sulphate by oxidation of either organic compounds or molecular hydrogen. The result of the bacterial activity results in the formation of large amounts of sulphide which presents serious health and environmental problems (metal corrosion, poisoning, etc). Another interest of these microorganisms is due to the fact that can either use or produce molecular hydrogen. In this last case, hydrogen is oxidized by other microbial groups (MFB) producing methane by reduction of carbon dioxide. The understanding of the involved mechanisms is important to study the use of new forms of energy (bioconversion - biological production of hydrogen and methane). A necessary step is the identification and isolation of metalloenzymes involved. The main goal is the use of spectroscopic techniques namely electron paramagnetic resonance (RPE) and related methods (ENDOR and ESEEM), uni- and multi-dimensional nuclear magnetic resonance RMN) and Mossbauer spectroscopy on the study of structure-function relationship of metallo-proteins and reconstitution of electron transfer chains (protein/protein interactions using Molecular graphics). The active centers that have been studied include iron-sulphur clusters (rubredoxin type, [2Fe -2S], [3Fe-4S], [4Fe-4S] and novel Fe-S centers), as well as associations with molybdenum and nickel) and hemes. Special relevance has been given to the characterization of bacterial hydrogenases (the role of the nickel in hydrogen evolution/consumption) and to the topics: engineering of iron-sulphur proteins, chemical modification of active centers, synthesis of novel metal clusters (formation of clusters containing hetero-atoms) and molecular modeling.

Research highlights:

Discovery of a novel 3Fe center and Heterometallic Fe-S sites

Isolation of novel Metalloproteins

Role of Nickel in Hydrogenases

Role of Molybdenum (and Tungsten) in Biology

Electron Transfer and Protein-Protein Interactions in Metalloproteins

Research Team – Bioinorganic Chemistry and Protein Engineer

Jorge Lampreia
Anjos Macedo
Jorge Caldeira
Pedro Tavares
Sergey Bursakov
Stephane Besson
Gabriela Almeida
Sofia Pauleta
Rui Duarte

Assistant Professor
Assistant Professor
Associate Professor-ISCS-S
Assistant Professor
Assistant Researcher
Assistant Professor, U-Lus
Assistant Professor, ISCS-S
Pos-Doc
Pos-Doc

Patricia Sousa
Pablo Gonzales
Raquel Grazina
Nuno Cerqueira
Cristina Cordas
Luísa Maia
Patricia Paes
Simmone dell'Acqua
Cristiano Mota
Célia Silveira
Anna Kladova
Rui Almeida
Ricardo Pais
Ana Teresa Lopes

Pos-Doc
Pos-Doc
Pos-Doc
Pos-Doc
Pos-Doc
Pos-Doc
PhD Student
PhD Student
PhD Student
PhD Student
PhD Student
Research Student
Research Technician

Other Activities

Member Calouste Gulbenkian Foundation Panel for Science and Innovation
Member Scientific Advisory Board – SBIC
Editorial Board JBIC
Editorial Board Port Elect Acta

Invited Representative Lectures - selected

ICCC38
MOLYBDENUM AND TUNGSTEN ENZYMES: NEW INSIGHTS FOR THE CATALYTIC
MECHANISM
Jerusalém
July 22, Tuesday 10:50 -11:20

14th Brazilian Meeting on Inorganic Chemistry/ 1st Latin American Meeting on Biological
Inorganic Chemistry
NOVEL MECHANISMS IN MONONUCLEAR MO (AND W) CONTAINING ENZYMES
31 August - 04 September 2008

EUROBIC
WROCLAW, Sept 2-6, 2008
BIOLOGICAL REDUCTION OF NITRATE - NOVEL MECHANISTIC ASPECTS

BIOINORGANIC GUIDE TO DENITRIFICATION
enzymes/metal active sites/mechanisms
Firenze - Feb 2007 - CERM

SERENDIPITY AND ENZYME MECHANISMS
Univ. Gent, Symposium in Honor of J.Van Beeumen, Feb 2007

A DIFFERENT PROPOSAL OF THE MECHANISM OF FORMATE OXIDATION
(kinetic, spectroscopic and structural studies)
GRC, Colby-Sawyer College, July 1-6, 2007

PROBING THE MECHANISM OF FORMATE DEHYDROGENASES
ICBIC 13, Vienna, July 2007

METALS IN THE NITROGEN BIOCYCLE
Molecular Views and Biotechnological Applications
ISMIBM 9, May 2006

TRANSIENT COMPLEXES IN ELECTRON TRANSFER
COST D21, Leuven, May 29-31, 2006

BIOENERGETICS OF SRB AND SULFATE ACTIVATION
International Symposium on Microbial Sulfur Metabolism
ISMSM, Münster, Germany, June 2006

Scientific Collaborations – past and present

- Laboratoire de Bioenergie Solaire, CEN, Cadarache, France (Dr.P.Lespinat).
- Department of Chemistry, School Chemical Sciences, East Anglia University, U.K. (Profs. A.J.Thomson and G.R.Moore)
- Inorganic Chemistry Laboratory, Oxford, U.K.(Prof. R.J.P.Williams)
- Department of Biochemistry, University of Georgia, Athens, GA, USA (Profs.H.D.Peck, Jean LeGall, D.V.DerVartanian, J.Wampler and R.C.Scott)
- Department of Physics, Emory University, Atlanta, GA USA (Prof. B.H.Huynh)
- Massachusetts Institute of Technology, Cambridge, USA (Prof. W.H. Orme-Johnson)
- Centre d'Océanologie, Luminy, Marseille (Dr.G.Fauque)
- Carnegie Mellon, Department of Chemistry, Pittsburgh, USA (Prof.E.Munck)
- Universidade do Minho (Prof. I. Montenegro)
- Departamento de Química Fisiológica, Faculdade de Medicina, UL (Prof.C.Manso).
- Centro de Ressonância Magnética Nuclear, Caselas (Profs. C. Mauricio e M.Secca)
- University of Saarlandes, Homburg, Germany (Prof. J. Hütterman)
- Department of Biology, University of Essex, U.K. (Prof. A. Ball)
- GBF, Germany (Dr. V.Wray)
- University of Pavia (Prof. L.Casella and Prof. L.Fabbrizzi)
- Department of Chemistry, Leiden, Netherlands (Prof. J.Reedijk)
- Department of Physics, Ioannina University, Greece (prof. V.Papafthymiou)
- USF, Tampa, UDSA (Prof. Gloria Ferreira)
- Mayo Clinic - Rochester, MIN, USA (Dr. F.Rusnak)
- Lab. Chimie Bacterienne, CNRS, Marseille (Prof. C.Cambillau, Prof.F. Guerlesquin)
- Lab Chimica Inorganica, Univ Pavia, Italy (Prof Luigi Casella)

PhD Dissertations oriented

Miguel Teixeira, Jorge Lampreia, Alice Pereira, Pedro Rodrigues, Ana Pamplona, Cristina Correia, Ricardo Franco, Belarmino Barata, Carla Ascenso, Marta Carepo, Susana Andrade, Margarida Roldão, Rui Duarte, Anjos Macedo, Nuno Palma, Ludwig Krippahl, Cristina Moreno, Cristina Cordas, Pablo Gonzalez

Others interests

Portuguese (written and spoken)
English (written and spoken)
French (written and spoken)
Spanish (reasonable spoken)

Motivated for reading (science and technology literature as well as national and foreign fiction)
Sun, Sea and Snow
Theater and Movies

Cultural activities mainly reported to the *Campus* Library:
Organization of Exhibitions, Seminars and other cultural events

Representative Indexes – Scientific Productivity and Impact – period 1988-2008

Publications found – listed Web of Science – 348
Sum of Times Cited – 8,603
Average Citations per Item – 24.72
H-index - 48

ELECTRON TRANSFER COMPLEX BETWEEN NITROUS OXIDE REDUCTASE AND CYTOCHROME C₅₅₂ FROM *Pseudomonas nautica*: KINETIC, NUCLEAR MAGNETIC RESONANCE, AND DOCKING STUDIES

S. Dell'Acqua, S. Pauleta, E. Monzani, A.S. Pereira, L. Casela, J.J.G. Moura and I. Moura
Biochemistry. 2008 14; 47 (41): 10852-62.

ENZYMATIC ACTIVITY MASTERED BY ALTERING METAL COORDINATION SPHERE

I. Moura, S.R. Pauleta and J.J.G. Moura
J. Biol. Inorg. Chem. 2008 13(8): 1185-95.

BIOCHEMICAL AND SPECTROSCOPIC CHARACTERIZATION OF THE MEMBRANE BOUND NITRATE REDUCTASE FROM *Pseudomonas nautica* 617

C. Correia, S. Besson, C.D. Brondino, P.J. González, G. Fauque, J. Lampreia, I. Moura and J.J.G. Moura
J. Biol. Inorg. Chem. 2008 13(8): 1321-33.

DIRECT ELECTROCHEMISTRY STUDY OF THE MULTIPLE REDOX CENTERS OF HYDROGENASE FROM *Desulfovibrio gigas*

I. Moura, C. Cordas and J.J.G. Moura
Bioelectrochemistry 2008 74(1): 83-9.

ELECTROACTIVE BIOFILMS OF SULPHATE REDUCING BACTERIA

C. M. Cordas, L. T. Guerra, C. Xavier and J.J.G. Moura
Electrochimica Acta 2008 54(1): 29-34.

PURIFICATION, CRYSTALLIZATION AND PRELIMINARY X-RAY DIFFRACTION ANALYSIS OF ADENOSINE TRIPHOSPHATE SULFURYLASE (ATPS) FROM THE SULFATE-REDUCING BACTERIUM *DESULFOVIBRIO DESULFURICANS* ATCC 27774

O.Y. Gavel, A.V. Kladova, S.A. Bursakov, J.M. Dias J.M., S. Teixeira, V.L. Shnyrov, J.J.G. Moura, I. Moura M.J. Romão and J. Trincão
Acta Crystallogr Select F Struct Biol. Cryst. Commun. 2008 64(PT7): 593-5.

SARCOPLASMIC RETICULUM CALCIUM ATPase IS INHIBITED BY ORGANIC VANADIUM COORDINATION COMPOUNDS: PYRIDINE-2,6-DICARBOXYLATO-DIOXOVANADIUM (V), BMOV, AND AN AMAVADINE ANALOGUE

M. Aureliano, F. Henao, T. Tiago, R.O. Duarte, J.J.G. Moura, B. Baruah and D. C. Crans
Inorg. Chem. 2008 47(13): 5677-84.

BENEFITS OF MEMBRANE ELECTRODES IN THE ELECTROCHEMISTRY OF METALLOPROTEINS: MEDIATED CATALYSIS OF *Paracoccus Pantotrophus* CYTOCHROME C PEROXIDASE BY HORSE CYTOCHROME c-a STUDY

P.M. Paes de Sousa, S.R. Pauleta, David Rodrigues, M.L. Simões Gonçalves, G.W. Pettigrew, I. Moura, J.J.G. Moura and M.M. Correia dos Santos
J. Biol. Inorg. Chem. 2008 13(5): 779-87.

A NEW TYPE OF METAL-BINDING SITE IN COBALT-AND ZINC-CONTAINING ADENYLATE KINASES ISOLATED FROM SULFATE-REDUCERS *Desulfovibrio Gigas* AND *Desulfovibrio Desulfuricans* ATCC 27774

O.Y. Gavel, S.A. Bursakov, G. Di Rocco, J. Trincão, I.J. Pickering, G.N. George, J.J. Calvete, V.L. Shnyrov, C.D. Brondino, Alice S. Pereira, J. Lampreia, P. Tavares, J.J.G. Moura and I. Moura
J. Inorg. Biochem. 2008 102(5-6): 1380-95.

PERIPLASMIC NITRATE REDUCTASE REVISITED: A SULFUR ATOM COMPLETES THE SIXTH COORDINATION OF THE CATALYTIC MOLYBDENUM

Sh. Najmudin, P.J. González, J. Trincão, C. Coelho, A. Mukhopadhyay, Nuno M.F.S.A Cerqueira, C.C. Romão, I. Moura, J.J.G. Moura, C. D. Brondino and Maria J. Romão
J. Biol. Inorg. Chem. 2008 13(5): 737-53.

REDUCTION OF ASCORBATE FREE RADICAL BY THE PLASMA MEMBRANE OF SYNAPTIC TERMINALS FROM RAT BRAIN

A. K. Samhan-Arias, R. O. Duarte, F.J.Martin-Romero, J.J.G. Moura and C. Gutierrez-Merino
A. Biochem. Biophysics 2008 469(2): 243-54.