europass Curriculum vitae

PERSONAL INFORMATION

Pietro Roversi

PERSONAL STATEMENT

I originally trained as a physical chemist and a structural scientist in Milano, Italy, and went on to become a structural biologist at the MRC-LMB in Cambridge (1996-2003) and at the University of Oxford (2003-to date).
My main interests are the use of crystalline materials for science and industry and the development of novel therapeutic avenues in human disease, but generally speaking it is at the interface between protein, material, and medical sciences that the focus of my research effort lies.

Having built my structural and biochemical credentials over the course of my postdoctoral experience 1996-2012, since 2013 I lead the structural effort in the laboratory of Prof. Nicole Zitzmann, at the Oxford Glycobiology Institute of the Biochemistry Department of Oxford University. As well as working with the her students and postdocs on the existing targets in the lab, I have started my own novel research project, in the field of eukaryotic secretion, a topic close to and yet distinct from Prof. Zitzmann's own interests in the field of virology. Having worked in industry myself in 2000-2003 in Cambridge I am now collaborating with industry within Prof. Zitzmann's group (drug development with Emergent Biosolutions Inc., U.S.A.).

The aim of my research is to understand how the eukaryotic cell checks the quality of the folding of glycoproteins in its secretory pathway. I believe that uncovering the molecular detail of the ER glycoprotein quality control (ERQC) machinery will push our understanding of this core pathway all the way to the cellular level, and explain and help curing pathogenesis that the same ERQC machinery underpins. Prof. Zitzmann is interested in the structural biology of ERQC because many enveloped viruses, after having infected a cell, hijack its ERQC in order to help their virions form correctly. I am more interested in the therapeutic potential of modulation of the same pathways in the field of rare disease

In particular, I focus on proteins in the Endoplasmic Reticulum (ER) that act as the checkpoint of eukaryotic secretion and survey glycoprotein folding. I want to test the hypothesis that partial modulation of the activity of these proteins has therapeutic potential to alleviate congenital glycoprotein folding disease, whenever a mutation in the gene for a secreted N-linked glycoprotein causes it to misfold slightly, and thus impairs but does not abrogate its function ("responsive mutants").

As well as the molecular understanding of ERQC, I am after partial inhibitors of the N-linked glycoprotein secretion checkpoint. Such molecules would have the potential to restore beneficial secretion of slightly misfolded proteins that still retain activity. In the background of rare congenital glycoprotein folding diseases, the centrality of ERQC to ER-retention of several hundreds of glycoproteins, would make small molecule ERQC modulators very appealing broad-spectrum rescuer-of-secretion drugs, to complement pharmacological chaperone therapy and gene therapy. Amongst the misfolded and yet active glycoproteins whose secretion I aim to restore are many enzymes causing lysosomal storage diseases and the cystic fibrosis ΔF508 CFTR channel.

Of course, partial inhibition of glycoprotein folding quality control also carries the potential risk of premature secretion of slowly-maturing and/or complex-fold native N-linked glycoproteins, a scenario that I dubbed the opening of the "ER Pandora's box". I aim at

characterising both the Pandora's box scenario and the therapeutic one, with techniques ranging from analytical and preparative biochemistry to structural biology to cellular microscopy.

I am a good communicator, both orally and in writing, and I excel at working in groups and collaborative research. In the past 20 years, I have worked with many very good scientists, with whom I have coauthored 80 scientific publications, twenty of which as first, joint-first orjoint corresponding author. Many of them are widely cited (5641 citations overall, my publications' H-index is 30, see Scopus and/or https://scholar.google.com/citations?user=fEOdBa8AAAAJ&hl=it) and six of them have more than 150 citations. There are about a hundred Protein Databank entries bearing my nameas a co-author, either structures I determined myself or structures by others whose determination I have contributed to through a collaborative effort.

WORK EXPERIENCE

01/07/2013–Present

Research Associate

Oxford Glycobiology Institute, Department of Biochemistry, University of Oxford, Oxford, England, UK, Oxford (United Kingdom)

Conduct research, lead research projects, supervise graduate and undergraduate students, communicate scientific results in writing and orally, contribute to grant applications

01/07/2012–30/06/2013

CIC BioGUNE, Bilbao (Spain)

Ikerbasque Visiting Fellow

Conduct research, lead research project, supervise graduate and undergraduate students, communicate scientific results in writing and orally.

01/10/2008–30/06/2013

EP Abraham Fellow in Biochemistry

Lincoln College, Oxford (United Kingdom)

Subject tutor for Biochemistry graduate and undergraduate students: organisation of the students' tutorial schedule, teaching in tutorials, pastoral care of students

01/02/2003–30/06/2012

Research Associate

Sir William Dunn School of Pathology and Depatment of Biochemistry, Oxford University, Oxford (United Kingdom)

Conduct research, lead research project, supervise graduate and undergraduate students, communicate scientific results in writing and orally, contribute to grant applications.

01/10/2007–30/06/2008

College Lecturer in Biochemistry

St. Catherine's College, Oxford (United Kingdom)

Subject tutor for Biochemistry graduate and undergraduate students: organisation of the students' tutorial schedule, teaching in tutorials, pastoral care of students

01/11/2000–31/01/2003

Researcher

Global Phasing Ltd., Cambridge (United Kingdom)

Development of software for macromolecular crystallography.

01/11/1996–31/10/2000

Post-doctoral Researcher

MRC-LMB, Cambridge (United Kingdom)

Development of software for macromolecular crystallography.

EDUCATION AND TRAINING

01/10/1987–03/03/1993

Master in Chemistry

University of Milano, Milano (Italy)

01/10/1993–30/07/1996

PhD in Structural Chemistry

University of Milano, Milano (Italy)

PERSONAL SKILLS

Mother tongue(s): Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
Spanish	B2	C2	B2	B2	B2
French	B1	C1	A2	B1	A2
German	A2	A2	A1	A1	A1

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user
Common European Framework of Reference for Languages

Communication skills

I am a good communicator, both orally and in writing, and I excel at working in groups and collaborative research.

Throughout my scientific career, I have been involved in talking to the public in order to explain and popularise science, for example by giving lessons in schools, interviews on the radio and television and taking part in Open Access days at the University.

Organisational / managerial skills

I plan and manage research projects in the laboratory.

I have organised the College side of the Biochemistry course for the Oxford undegraduates at Lincoln College Oxford for 5 years.

Job-related skills

I know the basics of protein recombinant expression and can purify both recombinant and tissue-extracted soluble and membrane proteins by a variety of biochemical techniques e.g. affinity, ion-exchange, hydrophobic interaction and size exclusion chromatography,dialysis, detergent solubilisation, ...).

I am acquainted with most protein chemistry analytical techniques (e.g. SDS- and native-PAGE gels, isoelectric focussing, Western blots, Solution Light Scattering, Surface Plasmon Resonance, ELISA, fluorescence polarisation, MTS, calorimetry, ...).

I know how to set up macromolecular crystallisation screens and follow-up the most promising conditions to lead to optimised crystals. I routinely coordinate data collection synchrotron trips. I can fish, mount and cryoprotect crystals,and have collected hundreds of protein crystal X-ray diffraction datasets, both in-house on rotating anodes and at synchrotron radiation facilities. I have an up-to-date knowledge of all crystallographic techniques and software for data reduction, phasing, phase improvement, model building and structural refinement. I have determined several macromolecular structures, either by heavy-atom phasing and solvent flattening, or by improving the initial molecular replacement phases by iterative model building and refinement. There are about a hundred Protein Databank entries associated with my name, either structures I determined myself or structures by others whose determination I have contributed to through a collaborative effort.

During my 1-year Ikerbasque Visiting Fellowship in Bilbao, I have learnt EM sample preparation and the use of the Electron Microscope and the analysis of EM single-particle and EM tomography data.

I am familiar with SAXS sample preparation, data collection, data processing and modelling.

During my PhD I routinely collected 15-20 K diffraction data on the in-house low-temperature X-ray facility in Milan (a Syntex P-1 4-circle diffractometer equipped with a closed-circuit helium cryostat, a vacuum shroud and a point detector). I used to process those high-resolution data (d_h<0.6 A) and perform the structural refinement using aspherical scattering factors.

I know how to operate X-ray diffractometers, and perform the basic tasks for their maintenance. I have solved the crystal structures of a dozen small molecule organic compounds; that work involved growing the crystals, preparing the specimens, collecting and processing the room-temperature diffraction data and solving and refining the structures.

Digital competence

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient user	Proficient user	Proficient user	Independent user	Proficient user

Digital competences - Self-assessment grid

ADDITIONAL INFORMATION

Outreach

Throughout my scientific career, I have been involved in talking to the public in order to explain and popularise science, for example by giving lessons in schools, interviews on the radio and television and taking part in Open Access days at the University.

In 2014, together with my colleagues Simona Galli and Massimo Moret, I have writ- ten a 248 pages textbook on Crystallography: Cristallogra a: la visione a raggi X, Zaccaria Editore, Napoli, Italy (ISBN 978-88-90456-16-9). The book was published by the Italian Crystallographic Association for the 100th anniversary celebrations of the discovery of X-ray diffraction. 800 copies have been distributed in Italian schools and the PDF of the book is available for download online at: http: //www.iycr2014.it/contenuti/libro/49. I have coordinated and contributed to the English and Spanish translations of the book which will be published under the sponsorship of the International Union of Crystallography next year, as part of its IYrCr2014 Legacy program http://www.iycr2014.org/legacy/conference.

In the context of the European Researcher Night, sponsored by the European Com- munity Marie Curie Actions initiative, on 30 September 2016 I broadcast a 10 minutes presentation of structural science to an audience in Parma, talking to them from the DLS source at Harwell, England, UK. The following week I took part in a debate on science and research funding on the italian national radio, RAI 1 Radio anch'io (the italian equivalent of the Today program on the BBC) and I was interviewed on italian television (http://www.rainews.it/dl/rainews/TGR/media/rubriche/ContentItem- cfbdcbe7-b7a4-4be3-a0d4-0f484ab65036.html and https://www.youtube.com/watch?v=KwQZVlgfXuA t=16s)

Congress organisation

Jointly with Dr. Helen Walden of the College of Life Sciences, University of Dundee, Dundee, I have co-organised the Scienti c Program of the January 2013 CCP4 Study Weekend, held in Nottingham, England on January 3rd-5th 2013. To- gether with Charles Ballard, Helen and I then co-edited the special issue of Acta Crystallogr D Biol Crystallogr., 2013 Nov;69(Pt 11) that gathers the contributions to that meeting.

Conscientious objection

During the period September 1993-September 1994 I served a one-year alterna- tive to the Italian compulsory military service, looking after a group of ten mentally ill patients at a psychiatric asylum run by Cooperativa Lotta Contro l'Emarginazione, Sesto San Giovanni, Milano, Italy. That experience strengthened my social skills, improving my understanding of people, my ability to care for them, and taught me about working in, and with, groups.

Patents

MODIFIED OMCI AS A COMPLEMENT INHIBITOR, Feb 4, 2010.

The method of the invention relates to a modi ed OmCI polypeptide or a polynucleotide encoding a modi ed OmCI polypeptide which lacks LK/E binding activity and the use of such polypeptides and polynucleotides for the treat- ment of a disease or condition mediated by complement. See

http://patents.justia.com/patent/20120115773

TREATMENT OF DISEASES AND CONDITIONS MEDIATED BY EICOSANOIDS, Feb 5, 2009. The method of the invention relates to an OmCI polypeptide ora polynucleotide encoding an OmCI polypeptide for the treatment of a disease or condition mediated by a leukotriene or hydroxyeicosanoid. See

http://patents.justia.com/patent/20110059885.

THEMIS PROTEIN, Feb 6, 2014 The invention relates to isolated recombinant proteins, in particular Themis proteins and also to methods of providing isolated recombinant themis protein.See

https://google.com/patents/WO2014020345A1

4.9.2017