

CATHERINE A. ROYER
Curriculum Vitae

Education:

<i>Institution:</i>	<i>Degree:</i>	<i>Year:</i>	<i>Field:</i>
Université Pierre et Marie Curie	D.E.U.G.	1978	Natural Sciences
Université Pierre et Marie Curie	Licence	1979	Biochemistry
University of Illinois at U-C	Ph.D.	1985	Biochemistry

Research and Professional Experience:

2013 – present	Professor of Biological Sciences and Chemistry, Constellation Professor - Bio-computation and Bio-informatics, Rensselaer Polytechnic Institute
2007 - 2013	Director, Centre de Biochimie Structurale, Montpellier France
2005- 2013	Research Director 1 st class, INSERM U554 Centre de Biochimie Structurale, Montpellier, France
2002-2006	Associate Director, Centre de Biochimie Structurale, Montpellier, France
2004-2005	Visiting Scientist Section for Optical Spectroscopy, LBC, NHLBI, NIH, Bethesda USA
1997-2005	Research Director 2 nd class INSERM U554 Centre de Biochimie Structurale, Montpellier, France
1996-1997:	Visiting Director of Research INSERM U414 Centre de Biochimie Structurale, Montpellier France
1995-1997:	Associate Professor of Pharmaceutical Sciences, with tenure University of Wisconsin at Madison
1990-1995:	Assistant Professor of Pharmacy, Pharmaceutics, University of Wisconsin at Madison
1988-1990	Adjunct Assistant Professor of Biochemistry, Department of Biochemistry, University of Illinois at Urbana-Champaign.
1987-1990	User Coordinator, Laboratory for Fluorescence Dynamics, Research Physicist, Department of Physics, University of Illinois at Urbana-Champaign
1986-1987	Research Associate, Centre National pour la Recherche Scientifique, Laboratoire d'Enzymologie, Gif-sur-Yvette, France.
1985-1986	Research Associate, Université de Paris VII

Awards and Recognition

128 publications, 4365 citations, average citation 34.1, H-index-38
NSF-CNRS Postdoctoral Fellow – 1985-1986
NIH FIRST Award – 1988
Whitaker Foundation Young Investigator Award in BioEngineering 1992
Teacher of the Year – University of Wisconsin Madison School of Pharmacy 1993, 1994
Elected Fellow – American Association for the Advancement of Science, 2000
Permanent Visiting Professor – The Johns Hopkins University Thomas C. Jenkins Department of

Biophysics 2006-present

PES – Prime pour l'Excellence Scientifique – INSERM - 2012

Research Interests: Biophysics of regulation, protein-DNA interactions, transcriptional control, ligand binding, protein subunit interactions, protein dynamics, protein folding, high pressure, fluorescence spectroscopy, microscopy, single molecule fluorescence.

Current Studies:

- (1) Biomolecular interactions *in vitro* and in live cells
- (2) Stochastic gene expression in bacterial cells using fluctuation microscopy
- (3) Pressure effects on protein conformation and dynamics

Patents

Quantitative Detection of Macromolecules with Fluorescent Oligonucleotides, US Patent # 5,445,935

Societies:

Biophysical Society - Member

Chair, Committee on Professional Opportunities for Women, 1996

Member, Membership Committee 1999-2001

Chair, Membership Committee, 2002-2004

Member – International Affairs Committee, 2004-present

Chair – International Affairs Committee 2007-2009

Council Member – 2008-2011

Executive board – 2009-2011

European Biophysics Societies Association – Executive Board 2010-present

International Union of Pure and Applied Biophysics – Council Member – 2011-present

French Biophysical Society – Member

President 2007-2008, Council Member, 2004-2007

American Association for the Advancement of Science - Member, Elected Fellow

American Chemical Society – Member

Protein Society – Council Member 2013 - present

Editing Experience:

Associate Editor, Biochemistry – January 2010 - present

Member - Editorial Advisory Board Biochemistry 2006-2010

Executive Editor, Analytical Biochemistry 2009-present

Editorial Board Member, Proteins 2010 - present

Editorial Board Member, Biophysical Journal 2010 - present

I was trained in bio-fluorescence spectroscopy and my research interests lie in the field of molecular biophysics. In particular I concentrate my efforts in two areas. The first is pressure effects on proteins. For many years I have concentrated on elucidating the physical basis for pressure effects on unfolding, a question that has remained unsolved for over 100 years. I have recently demonstrated, rather definitively, that the major contributing factor is the existence of packing defects, or void, in the interior of folded proteins that is largely eliminated upon unfolding. This mechanism lies in specific features of the *folded* protein, unlike denaturants, whose efficacy is determined by a feature of the *unfolded* state, namely the amount of exposed surface area. Coupling the unique effects of pressure with multi-dimensional NMR, we revealed unprecedented details of the folding landscape of a model protein and the unsuspected effects of single site mutations thereon. My second area of interest is in

protein interactions implicated in the regulation of biological function. I have focused on transcriptional regulation, although via collaboration I have worked on other types of systems. In the first part of my career I investigated the *in vitro* properties of these regulatory molecules. However in recent years I have concentrated on the quantitative characterization of such interactions in live cells.