Gerry McDermott, Ph.D.

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Education

Ph.D. Chemistry, University of Glasgow, 1997
Thesis: Structural Studies on an Integral Membrane Light Harvesting Complex
Advisors: Professor N.W. Isaacs and Professor R.J. Cogdell

B.Sc. Chemistry, University of Paisley, 1989

Appointments

2006 - **Research Biophysicist**, Department of Anatomy, University of California San Francisco
2006 - **Senior Scientist,** National Center for X-ray Tomography
2006 - **Affiliate Senior Scientist**, Physical Biosciences Division, Lawrence Berkeley National Laboratory
2004-2006 **Head,** Berkeley Center for Structural Biology, Lawrence Berkeley National Laboratory
2001-2006 **Staff Scientist,** Physical Biosciences Division, Lawrence Berkeley National Laboratory
1998-2001 **Scientist,** Physical Biosciences Division, Lawrence Berkeley National Laboratory
1997-1998 **Post-Doctoral Fellow**, Physical Biosciences Division, Lawrence Berkeley National Laboratory
1995-1996 **Research Assistant**, Department of Chemistry, University of Crete
1991-1996 **Graduate Student**, Department of Chemistry, University of Glasgow
1990-1995 **Research Assistant** Department of Chemistry, University of Glasgow

Awards and Honors

- U.S. Department of Energy, National Outstanding Mentor Award, 2004
- Renner Award, 2002
- NATO Travel Fellowship, 2000

Academic and Institutional Service

- Scientific Advisory Committee, EMSL, Pacific Northwest National Laboratory, 2012 -
- Advisor, Light Source of the Future, Louisiana State University, 2008
- Member of Advisory Committee 'Molecular Observatory', Stanford University and California Institute of Technology, 2004 - 2008
- Advanced Light Source Strategic Management Team participant, 2000 - 2004
- Co-chair, Advanced Light Source Users meeting, 2003
- Member Advisory Board, SAGE scholars, UC Berkeley, 2000-2002
- Member of Advanced Light Source Users Executive Committee (UEC), 2000-2003
- Lecturer, graduate course in Biotechnology – Cal State Fullerton, May 2000
- Founding board member of the LBNL Postdoctoral Society, 1998
- Participant in the Model Institutes of Excellence program, 1998-2001

Reviewer

- PNAS, Biology of the Cell, Protein Chemistry
- European Science Foundation, 2007 - present
- Neutron Spallation Source Proposal Review Panel, 2007 - present
- Linear Coherent Light Source, Proposal Review Panel, Stanford University, 2010 - 2013

Publications

h-index =22, 4695 citations

1. Cogdell, R.J., A.A. Freer, G. McDermott, N. Guthrie, M. Thunnissen, N.W. Isaacs, J.G. Lindsay, and M.Z. Papiz. (1992). *The Structure of Bacterial Antenna Complexes.* Photosynthesis Research. **34**, 83-83.

2. Guthrie, N., G. McDermott, R.J. Cogdell, A.A. Freer, N.W. Isaacs, A.M. Hawthornthwaite, E. Halloren, and J.G. Lindsay. (1992). *Crystallization of the B800-820 Light-Harvesting Complex from Rhodopseudomonas-Acidophila Strain 7750.* Journal of Molecular Biology. **224**, 527-528.

3. Cogdell, R.J., E. Halloren, A.M. Hawthornthwaite, M.M.G.M. Thunnissen, A.A. Freer, G. McDermott, N. Guthrie, N. Isaacs, J.G. Lindsay, and M. Papiz. (1993). *A Progress Report on the Crystallographic Studies on the B800-850 Antenna Complex from Rhodopseudomonas-Acidophila Strain-I0050.* Biochemical Society Transactions. **21**, 39-40.

4. Freer, A.A., G. McDermott, J.C. Melville, and D.J. Robins. (1993). *Structure of Diiodobis(1-Pyrroline)Zinc(Ii).* Acta Crystallographica Section C-Crystal Structure Communications. **49**, 2115-2117.

5. Emsley, P., G. McDermott, I.G. Charles, N.F. Fairweather, and N.W. Isaacs. (1994). *Crystallographic Characterization of Pertactin, a Membrane-Associated Protein from Bordetella-Pertussis.* Journal of Molecular Biology. **235**, 772-773.

6. Halloren, E., G. McDermott, J.G. Lindsay, C. Miller, A.A. Freer, N.W. Isaacs, and R.J. Cogdell. (1995). *Studies on the Light-Harvesting Complexes from the Thermotolerant Purple Bacterium Rhodopseudomonas-Cryptolactis.* Photosynthesis Research. **44**, 149-155.

7. McDermott, G., S.M. Prince, A.A. Freer, A.M. Hawthornthwaitelawless, M.Z. Papiz, R.J. Cogdell, and N.W. Isaacs. (1995). *Crystal-Structure of an Integral Membrane Light-Harvesting Complex from Photosynthetic Bacteria.* Nature. **374**, 517-521.

8. McDermott, G., S.M. Prince, A.A. Freer, N.W. Isaacs, M.Z. Papiz, A.M. Hawthornthwaitelawless, and R.J. Cogdell. (1995). *The 3-Dimensional Structure of the Light-Harvesting Antenna Complex (Lh-Ii) from Rps-Acidophila, Strain-10050, at 2.5 Angstrom Resolution.* Protein Engineering. **8**, 43-43.

9. Cogdell, R.J., S.M. Prince, A.A. Freer, N.W. Isaacs, G. McDermott, M. Papiz, and HawthornthwaiteLawless. (1996). *The structure basis of light-harvesting in purple photosynthetic bacteria.* Progress in Biophysics & Molecular Biology. **65**, Se201-Se201.

10. Freer, A., S. Prince, K. Sauer, M. Papiz, A. HawthornthwaiteLawless, G. McDermott, R. Cogdell, and N.W. Isaacs. (1996). *Pigment-pigment interactions and energy transfer in the antenna complex of the photosynthetic bacterium Rhodopseudomonas acidophile.* Structure. **4**, 449-462.

11. Papiz, M.Z., S.M. Prince, A.M. HawthornthwaiteLawless, G. McDermott, A.A. Freer, N.W. Isaacs, and R.J. Cogdell. (1996). *A model for the photosynthetic apparatus of purple bacteria.* Trends in Plant Science. **1**, 198-206.

12. Tsiotis, G., G. McDermott, and D. Ghanotakis. (1996). *Progress towards structural elucidation of Photosystem II.* Photosynthesis Research. **50**, 93-101.

13. Prince, S.M., M.Z. Papiz, A.A. Freer, G. McDermott, A.M. HawthornthwaiteLawless, R.J. Cogdell, and N.W. Isaacs. (1997). *Apoprotein structure in the LH2 complex from Rhodopseudomonas acidophila strain 10050: Modular assembly and protein pigment interactions.* Journal of Molecular Biology. **268**, 412-423.

14. Bandilla, M., B. Ucker, M. Ram, I. Simonin, E. Gelhaye, G. McDermott, R.J. Cogdell, and H. Scheer. (1998). *Reconstitution of the B800 bacteriochlorophylls in the peripheral light harvesting complex B800-850 of Rhodobacter sphaeroides 2.4.1 with BChl a and modified (bacterio-)chlorophylls.* Biochimica Et Biophysica Acta-Bioenergetics. **1364**, 390-402.

15. Prince, S.M., G. McDermott, A.A. Freer, M.Z. Papiz, A.M. Lawless, R.J. Cogdell, and N.W. Isaccs. (1999). *Derivative manipulation in the structure solution of the integral membrane LH2 complex.* Acta Crystallographica Section D-Biological Crystallography. **55**, 1428-1431.

16. Facciotti, M.T., S. Rouhani, F.T. Burkard, F.M. Betancourt, K.H. Downing, R.B. Rose, G. McDermott, and R.M. Glaeser. (2001). *Structure of an early intermediate in the M-state phase of the bacteriorhodopsin photocycle.* Biophysical Journal. **81**, 3442-3455.

17. Ireton, G.C., G. McDermott, M.E. Black, and B.L. Stoddard. (2002). *The structure of Escherichia coli cytosine deaminase.* Journal of Molecular Biology. **315**, 687-697.

18. Li, P.W., G. McDermott, and R.K. Strong. (2002). *Crystal structures of RAE-1 beta and its complex with the activating immunoreceptor NKG2D.* Immunity. **16**, 77-86.

19. He, X.L.L., J.F. Bazan, G. McDermott, J.B. Park, K. Wang, M. Tessier-Lavigne, Z.G. He, and K.C. Garcia. (2003). *Structure of the Nogo receptor ectodomain: A recognition module implicated in myelin inhibition.* Neuron. **38**, 177-185.

20. Yu, E.W., G. McDermott, H.I. Zgurskaya, H. Nikaido, and D.E. Koshland, Jr. (2003). *Structural basis of multiple drug-binding capacity of the AcrB multidrug efflux pump.* Science. **300**, 976-80.

21. Lohkamp, B., G. McDermott, S.A. Campbell, J.R. Coggins, and A.J. Lapthorn. (2004). *The structure of Escherichia coli ATP-phosphoribosyltransferase: Identification of substrate binding sites and mode of AMP inhibition.* Journal of Molecular Biology. **336**, 131-144.

22. Le Gros, M.A., G. McDermott, and C.A. Larabell. (2005). *X-ray tomography of whole cells.* Current Opinion in Structural Biology. **15**, 593-600.

23. Le Gros, M.A., G. McDermott, and C.A. Larabell. (2005). *X-ray tomography of whole cells.* Curr Opin Struct Biol. **15**, 593-600.

24. Yu, E.W., J.R. Aires, G. McDermott, and H. Nikaido. (2005). *A periplasmic drug-binding site of the AcrB multidrug efflux pump: a crystallographic and site-directed mutagenesis study.* Journal of Bacteriology. **187**, 6804-6815.

25. Li, M., X. Qiu, C.C. Su, F. Long, R.Y. Gu, G. McDermott, and E.W. Yu. (2006). *Cloning, expression, purification, crystallization and preliminary X-ray diffraction analysis of the regulator AcrR from Escherichia coli.* Acta Crystallographica Section F-Structural Biology and Crystallization Communications. **62**, 1150-1152.

26. Su, C.C., M. Li, R.Y. Gu, Y. Takatsuka, G. McDermott, H. Nikaido, and E.W. Yu. (2006). *Conformation of the AcrB multidrug efflux pump in mutants of the putative proton relay pathway.* Journal of Bacteriology. **188**, 7290-7296.

27. Gu, R.Y., C.C. Su, F. Shi, M. Li, G. McDermott, Q.J. Zhang, and E.W. Yu. (2007). *Crystal structure of the transcriptional regulator CmeR from Campylobacter jejuni.* Journal of Molecular Biology. **372**, 583-593.

28. Li, M., R.Y. Gu, C.C. Su, M.D. Routh, K.C. Harris, E.S. Jewell, G. McDermott, and E.W. Yu. (2007). *Crystal structure of the transcriptional regulator AcrR from Escherichia coli.* Journal of Molecular Biology. **374**, 591-603.

29. Su, C.C., F. Shi, R.Y. Gu, M. Li, G. McDermott, E.W. Yu, and Q.J. Zhang. (2007). *Preliminary structural studies of the transcriptional regulator CmeR from Campylobacter jejuni.* Acta Crystallographica Section F-Structural Biology and Crystallization Communications. **63**, 34-36.

30. Gu, R.Y., M. Li, C.C. Su, F. Long, M.D. Routh, F. Yang, G. McDermott, and E.W. Yu. (2008). *Conformational change of the AcrR regulator reveals a possible mechanism of induction.* Acta Crystallographica Section F-Structural Biology and Crystallization Communications. **64**, 584-588.

31. Parkinson, D.Y., G. McDermott, L.D. Etkin, M.A. Le Gros, and C.A. Larabell. (2008). *Quantitative 3-D imaging of eukaryotic cells using soft X-ray tomography.* Journal of Structural Biology. **162**, 380-386.

32. Su, C.C., F. Long, G. McDermott, W.M. Shafer, and E.W. Yu. (2008). *Crystallization and preliminary X-ray diffraction analysis of the multidrug efflux transporter NorM from Neisseria gonorrhoeae.* Acta Crystallographica Section F-Structural Biology and Crystallization Communications. **64**, 289-292.

33. Le Gros, M.A., G. McDermott, M. Uchida, C.G. Knoechel, and C.A. Larabell. (2009). *High-aperture cryogenic light microscopy.* Journal of Microscopy. **235**, 1-8.

34. McDermott, G., M.A. Le Gros, C.G. Knoechel, M. Uchida, and C.A. Larabell. (2009). *Soft X-ray tomography and cryogenic light microscopy: the cool combination in cellular imaging.* Trends in Cell Biology. **19**, 587-595.

35. Uchida, M., G. McDermott, M. Wetzler, M.A. Le Gros, M. Myllys, C. Knoechel, A.E. Barron, and C.A. Larabell. (2009). *Soft X-ray tomography of phenotypic switching and the cellular response to antifungal peptoids in Candida albicans.* Proceedings of the National Academy of Sciences of the United States of America. **106**, 19375-19380.

36. Uchida, M., Y. Sun, G. McDermott, C. Knoechel, M.A. Le Gros, D. Parkinson, D.G. Drubin, and C.A. Larabell. (2011). *Quantitative analysis of yeast internal architecture using soft X-ray tomography.* Yeast. **28**, 227-236.

37. Le Gros, M.A., C.G. Knoechel, M. Uchida, D.Y. Parkinson, G. McDermott, and C.A. Larabell, *Visualizing Sub-cellular Organization Using Soft X-ray Tomography*, in *Comprehensive Biophysics*, H.E. Edward, Editor. 2012, Elsevier: Amsterdam. p. 90-110.

38. McDermott, G., D.M. Fox, L. Epperly, M. Wetzler, A.E. Barron, M.A. Le Gros, and C.A. Larabell. (2012). *Visualizing and quantifying cell phenotype using soft X-ray tomography.* Bioessays. **34**, 320-327.

39. McDermott, G., M.A. Le Gros, and C.A. Larabell. (2012). *Visualizing Cell Architecture and Molecular Location Using Soft X-Ray Tomography and Correlated Cryo-Light Microscopy.* Annual Review of Physical Chemistry. **63**, 225-239.

40. Parkinson, D.Y., L.R. Epperly, G. McDermott, M.A. Le Gros, R.M. Boudreau, and C.A. Larabell. (2013). *Nanoimaging cells using soft X-ray tomography.* Methods Mol Biol. **950**, 457-81.

41. Smith, E.A., B.P. Cinquin, G. McDermott, M.A. Le Gros, D.Y. Parkinson, H.T. Kim, and C.A. Larabell. (2013). *Correlative microscopy methods that maximize specimen fidelity and data completeness, and improve molecular localization capabilities.* J Struct Biol. **184**, 12-20.

42. Cinquin, B.P., M. Do, G. McDermott, A.D. Walters, M. Myllys, E.A. Smith, O. Cohen-Fix, M.A. Le Gros, and C.A. Larabell. (2014). *Putting molecules in their place.* J Cell Biochem. **115**, 209-16.

43. Le Gros, M.A., G. McDermott, B.P. Cinquin, E.A. Smith, M. Do, W.L. Chao, P.P. Naulleau, and C.A. Larabell. (2014). *Biological soft X-ray tomography on beamline 2.1 at the Advanced Light Source.* Journal of Synchrotron Radiation. **21**,

44. Smith, E.A., B.P. Cinquin, M. Do, G. McDermott, M.A. Le Gros, and C.A. Larabell. (2014). *Correlative cryogenic tomography of cells using light and soft x-rays.* Ultramicroscopy. **143**, 33-40.

45. Smith, E.A., B.P. Cinquin, G. McDermott, M.A. Le Gros, and C.A. Larabell, *Correlated soft x-ray tomography and cryo-light microscopy*, in *Imaging Life: Biological Systems from Atoms to TIssues*, G.C. Howard, W.E. Brown, and M. Auer, Editors. 2014, Oxford University Press: USA.

46. Smith, Elizabeth A., G. McDermott, M. Do, K. Leung, B. Panning, Mark A. Le Gros, and Carolyn A. Larabell. (2014). *Quantitatively Imaging Chromosomes by Correlated Cryo-Fluorescence and Soft X-Ray Tomographies.* Biophysical Journal. **107**, 1988-1996.