

University of California, San Francisco
CURRICULUM VITAE

Name: Mark Le Gros, PhD
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Anatomy
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EDUCATION

1978 - 1982	Massey University, New Zealand	B.S., First Class Honors	Physics
1983 - 1989	University of British Columbia	Ph.D.	Physics
1990 - 1991	University of British Columbia	Postdoc	Physics
1991 - 1994	Lawrence Livermore National Laboratory	Postdoc	Physics

PRINCIPAL POSITIONS HELD

1994 - 1996	Lawrence Livermore National Laboratory	Physicist
1996 - 1997	Harvard Smithsonian Astrophysical Observatory	Staff Scientist
1997 - 2012	Lawrence Berkeley National Laboratory	Staff Scientist
2012 - present	Lawrence Berkeley National Laboratory	Faculty Scientist

OTHER POSITIONS HELD CONCURRENTLY

2004 - present Associate Director, National Center for X-ray Tomography

HONORS AND AWARDS

1983	UBC Graduate Fellowship
1987	UBC Graduate Fellowship
2006	Hallbach Award for Innovative Synchrotron Instrumentation

KEYWORDS/AREAS OF INTEREST

Low temperature physics, Condensed matter physics, Particle astrophysics, Nuclear magnetic resonance, X-ray detectors, X-ray tomography, Biological imaging, Synchrotron instrumentation

SERVICE TO PROFESSIONAL PUBLICATIONS

Reviewer for: Biophysics Journal, Journal of American Chemical Society, Journal of Microscopy, Nanoletters, Nature, Nature Biotechnology, Nature Materials, Nature Methods, Nature Physics, PNAS

INVITED PRESENTATIONS

INTERNATIONAL

1983	University of British Columbia, Vancouver Canada; 'Direct Detection of Two Quantum Coherence'	Speaker
1994	University of British Columbia, Vancouver Canada; 'The Applications of Low Temperature Detectors'	Speaker
2008	Center for X-ray Science, Melbourne Australia	Speaker
2008	Monash University, Melbourne Australia	Seminar Speaker
2011	Physicists and Biologists Working Together: Facilitating X-ray Biophotonics	Speaker

NATIONAL

1991	Lawrence Livermore National Laboratory; 'Novel Detectors for Neutrinos and Dark Matter'	Speaker
1996	Harvard Smithsonian Center for Astrophysics, Cambridge MA; 'X-ray Microcalorimeters for Astrophysical and Industrial Applications'	Speaker

REGIONAL AND OTHER INVITED PRESENTATIONS

2009	Advanced Light Source, Lawrence Berkeley National Laboratory	Platform Presentation
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PEER REVIEWED PUBLICATIONS

1. Callaghan, P. T. and Le Gros, M. A. (1982) Nuclear Spins in the Earth's Magnetic Field. *American Journal of Physics* 50, 27.
2. Callaghan, P. T., Le Gros, M. A. and Pinder, N. (1983) The Measurement of Diffusion Using Pulsed Field Gradient NMR. *Journal of Chemistry and Physics* 79, 6372.
3. Bloom, M., Le Gros, M.A. (1986) Direct Detection of Two Quantum Coherence. *Canadian Journal of Physics* 64, 1522.
4. Le Gros, M. A., Kotlicki, A. and Turrell, B.G. (1987) NMRON of Oriented Nuclei in Manganese Acetate. *Japanese Journal of Applied Physics* 26, 865-866.
5. Le Gros, M. A., Kotlicki, Turrell, B. G. and Drukier, A. K., (1987). Tests Of A Superconducting Colloid Using An RF SQUID, *IEEE. Transactions In Magnetics*. 719-722.
6. Le Gros M. A., Kotlicki, A. and Turrell, B. G. (1987) Pulsed Nuclear Magnetic Resonance of Oriented Nuclei In An Insulating Material. *Hyperfine Interactions*, 36, 161-170.
7. Le Gros, M. A., Turrell, B. G., Kotlicki, A., and Drukier, A. K Crooks, M., Spergle, D. N. (1988). The Superheated Superconducting Colloid Detector, A New Particle Detector. *Proceedings of the 3rd Pisa Conf. On Advanced Detectors, Nucl. Instr. and Methods*, A263, 229-232.
8. Le Gros M. A.,Kotlicki, A. and Turrell, B. G. (1988) Nuclear Orientation And Nuclear Spin Lattice Relaxation In Insulating Magnetically Ordered Crystals". *Int. Conf. Proc. On: On-Line Nuclear Orientation (Oxford)*, *Hyperfine Interactions*, 43, 311-318.
9. Le Gros, M. A., Kotlicki, A. and Turrell, B.G. (1989) Nuclear Spin Lattice Relaxation in $^{54}\text{Mn-MnCl}_2 \cdot 4\text{H}_2\text{O}$ and Lower Dimensional Systems. *Hyperfine Interactions* 51, 1111-1118.
10. Le Gros, M. A., Da Silva, A., Turrell, B.G. and Kotlicki, A. (1990) Planar Array of Superheated Superconductors: An Improved Superconducting Granule Detector. *Applied Physics Letters* 56, 2234-2236.
11. Turrell, B. G., Le Gros, M.A., Da Silva, A., Kotlicki, A., and Drukier, A.K. (1990) Recent Developments in Superheated Superconducting Granular Detectors. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors & Associated Equipment*, 512-517.
12. Le Gros M. A., Turrell, B. G. and Kotlicki, A. Drukier, A. (1990) A New Superheated Superconducting Granule Detector. *Proc. of Int. Con. on Low Temperature Detectors for Neutrinos and Dark Matter*.
13. Le Gros, M. A. Meager, G. Kotlicki, A., Turrell, B. G. and Drukier, A. K. (1990) Current Status Of The PASS Superheated Superconducting Granule Detector, *Proc of Int. Conf On Trends In Astroparticle Physics (Los Angles)* Ed. D. Cline and R. Pecci (World Scientific 1990). pg. 449-483.

14. Le Gros, M. A., Kotlicki, A. and Turrell, B.G. (1991) First Observation of Double Quantum Nuclear Magnetic Resonance of Oriented Nuclei. *Physics Letters A*154, 75-78.
15. Le Gros, M. A., Turrell, B. G., and Kotlicki, A. (1992) Pulsed NMRON Measurements On Insulators. *Proc of the 2nd International Conference On On-Line Nuclear Orientation And Related Topics. Hyperfine Interactions* 75 261-268.
16. Drukier, A. K., Cheiemiowski, M., Kotlicki, A., Le Gros, M. A., Meager, G. and Turrell, B. G. (1992) Towards Cryogenic Detection of WIMPS. *Recent Progress In Superconducting Granule Detectors. Proc. of the 2nd International Workshop On Theoretical And Phenomenological Aspects Of Underground Physics. Nucl. Phys. B, 28 A, 475-477.*
17. Labov, S., Mears, C., Morris, G., Cunningham C., Le Gros M. A., Silver, E., Madden, N., Landis, D., and Goulding, F. (1992). *Superconducting Tunnel Junction X-Ray Detectors With Niobium Absorbers And Aluminum Quasiparticle Traps. Proc. SPIE* 1743.
18. Le Gros, M., Kotlicki, A., and Turrell, B. G. (1993) NMRON studies of the antiferromagnetic and paramagnetic phases of $^{54}\text{Mn-MnCl}_2 \cdot 4\text{H}_2\text{O}$. *Hyperfine Interactions* 77, 203-214.
19. Labov, S., Mears, C., Morris, G., Cunningham C., Le Gros M. A., Silver, E., Madden, N., Landis, D., Goulding, F., Bland, R. and Dynes, R. (1993) Energy Resolving X-Ray Detectors Using Niobium Absorbers and Multiple Quasiparticle Tunneling Between Two Aluminium Traps. *IEEE Trans. In: Appl. Superconductivity. 3, 2092.*
20. Le Gros, M., Kotlicki, A., and Turrell, B. G. (1993) Pulsed NMRON studies of insulating magnetic materials. *Hyperfine Interactions* 77, 131-147.
21. Pfafman, T. E., Le Gros, M., Silver, E., Beeman, J., Madden, N., Goulding, F., and Landis, D. (1993) Pyroelectric microcalorimetry. *Journal of Low Temperature Physics* 93, 721-726.
22. Pfafman, T. E., Silver, E., Le Gros, M. A. Labov, S. et al (1993) A Dielectric Microcalorimeter for Photon Counting X-Ray Spectroscopy. *In: Remote Sensing Reviews, Vol. 8, pp 55-67.*
23. Christensen, F. E., Abdali, S., Frederiksen, P. K., Hornstrup, A., Rasmussen, I., Westergaard, N. J., Schnopper, H. W., Louis, E., Voorma, H. J., Koster, N., Wiebicke, H., Halm, I., Geppert, U., Silver, E., Le Gros, M., Borozdin, K., Joensen, K. D., Gorenstein, P., Wood, J., and Gutman, G. (1994) Some applications of nanometer scale structures for current and future x-ray space research. *Journal de Physique III* 4, 1599-1612.
24. Le Gros, M., Silver, E., Madden, N., Beeman, J., Goulding, F., Landis, D., and Haller, E. (1994) Microcalorimeters for broad band high resolution x-ray spectral analysis. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors & Associated Equipment* 345, 492-495.
25. Le Gros, M., Silver, E., Schneider, D., McDonald, J., Bardin, S., Schuch, R., Madden, N., and Beeman, J. (1995) The first high resolution, broad band x-ray spectroscopy of ion-surface interactions using a microcalorimeter. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors & Associated Equipment* 357, 110-114.
26. Silver, E., Le Gros, M., Madden, N., Beeman, J., and Haller, E. (1996) High-resolution, broad-band microcalorimeters for x-ray microanalysis. *X-Ray Spectrometry* 25, 115-122.

27. Le Gros, M. A., Silver E., et al. The First High Resolution, Broad Band X-ray Spectroscopy Of Ion-Surface Interactions Using A Microcalorimeter. (1996) Nuclear Instruments And Methods In Physics Research A 485 pg. 92-95.
28. Willetts, M., Le Gros, M., Kotlicki, A., Eska, G., Johnson, C. E., and Turrell, B. G. (1996) NMR frequency pulling in magnetic systems. Czechoslovak Journal of Physics 46, 2167-2168.
29. Le Gros, M., Kotlicki, A., and Turrell, B. G. (1997) NMRON studies of the quasi-2-dimensional ferromagnet $^{54}\text{Mn-Mn}(\text{COOCH}_3)_2 \cdot 4\text{H}_2\text{O}$. Hyperfine Interactions 108, 443-464.
30. Silver, E., Le Gros, M., Austin, G., Madden, N., Beeman, J., and Haler, E. (1997) First use of NTD germanium-based microcalorimeters for high-resolution, broadband x-ray microanalysis. X-Ray Spectrometry 26, 265-268.
31. Wang, H. X., Bryant, C., Randall, D. W., Lacroix, L. B., Solomon, E. I., Le Gros, M., and Cramer, S. P. (1998) X-ray magnetic circular dichroism sum rule analysis of the blue copper site in plastocyanin - a probe of orbital and spin angular momentum. Journal of Physical Chemistry B 102, 8347-8349.
32. Friedrich, S., Hiller, L. J., Frank, M., le Grand, J. B., Mears, C. A., Niderost, B., Labov, S. E., Barfknecht, A. T., Le Gros, M., and Cramer, S. P. (1999) Superconducting high-resolution X-ray detectors for metalloprotein L-edge spectroscopy. Journal of Electron Spectroscopy & Related Phenomena 103, 891-896.
33. Denbeaux, G., Fischer, P., Kusinski, G., Le Gros, M., Pearson, A., and Attwood, D. (2001) A full field transmission X-ray microscope as a tool for high-resolution magnetic imaging. IEEE Transactions on Magnetics 37, 2764-2766.
34. Denbeaux, G., Anderson, E., Chao, W., Eimuller, T., Johnson, L., Kohler, M., Larabell, C., Le Gros, M., Fischer, P., Pearson, A., Schultz, G., Yager, D., and Attwood, D. (2001) Soft X-ray microscopy to 25 nm with applications to biology and magnetic materials. Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors & Associated Equipment 467, 841-844.
35. Meyer-Ilse, W., Hamamoto, D., Nair, A., Lelievre, S.A., Denbeaux, G., Johnson, L., Pearson, A.L., Yager, D., LeGros, M.A., and Larabell, C.A. (2001). High Resolution Protein Localization Using Soft X-ray Microscopy. Journal of Microscopy 201, 395-403.
36. Parak, W.J., Boudreau, R., Le Gros, M.A., Gerion, D., Zanchet, D., Micheel, C.M., Williams, S.C., Alivisatos, A.P. and Larabell, C.A. (2002) Cell Motility and Metastatic Potential Studies Based on Quantum Dot Imaging of Phagokinetic Tracks. Advanced Materials. 14, 882-885.
37. Schneider, G., Anderson E., Vogt, S., Knochel, C., Weiss, D., Le Gros, M., and Larabell, C. (2002). Computed tomography of cryogenic cells. Surface Review and Letters 9, 177-183.
38. Parak W.J., Gerion D., Pellegrino T., Zanchet D., Micheel C.M., Williams S.C., Boudreau R., Le Gros M.A., Larabell C.A. & Alivisatos A.P.(2002) Biological Applications of Colloidal Nanocrystals. J. Nanosci. & Nanotech. 14, 882-885.
39. Miao, J. Hodgson, K.O., Ishikawa, T., Larabell, C.A., LeGros, M.A., and Nishino, Y. (2003). Imaging Whole *Escherichia coli* Bacteria Using Single Particle X-ray Diffraction. PNAS USA. 100, 110-112.

40. Parak, W.J., Gerion, D., Pellegrino, T., Zanchet, D., Micheel, C., Williams, S.C., Boudreau, R., Le Gros, M.A., Larabell, C.A., and Alivisatos, A.P. (2003). Biological Applications of Colloidal Nanocrystals. *Nanotechnology*, 14, R1-R13.
41. Johnson, N., Krebs, M., Boudreau, R., Giorgi, G., LeGros, M., and Larabell, C. (2003). Actin-filled nuclear invaginations indicate degree of cell de-differentiation. *Differentiation* 71, 414-424.
42. Pellegrino, T., Parak, W.J., Boudreau, R., Le Gros, M.A., Gerion, D., Alivisatos, A.P., and Larabell, C.A. (2003). Quantum dot-based cell motility assay. *Differentiation* 71, 542-548.
43. Larabell, C.A., and Le Gros, M.A. (2004). X-ray tomography generates 3-D reconstructions of the yeast, *Saccharomyces cerevisiae*, at 60-nm resolution. *Mol. Biol. Cell* 15, 957-962.
44. Attwood, D., Chao, W., Anderson, E., Liddle, J. A., Harteneck, B., Fischer, P., Schneider, G., Le Gros, M. & Larabell, C. (2006) Imaging at high spatial resolution: Soft x-ray microscopy to 15 nm. *Journal of Biomedical Nanotechnology*, 2(2), 75-78.
45. Chan, A. P., Kloc, M., Larabell, C. A., Le Gros, M. & Etkin, L. D. (2007) The maternally localized RNA FatVg is required for cortical rotation and germ cell formation. *Mechanisms of Development*, 124(5), 350-363.
46. Fu, A. H., Gu, W. W., Boussert, B., Koski, K., Gerion, D., Manna, L., Le Gros, M., Larabell, C. A. & Alivisatos, A. P. (2007) Semiconductor quantum rods as single molecule fluorescent biological labels. *Nano Letters*, 7(1), 179-182.
47. Gu, W. W., Etkin, L. D., Le Gros, M. A. & Larabell, C. A. (2007) X-ray tomography of *Schizosaccharomyces pombe*. *Differentiation*, 75(6), 529-535.
48. Ashcroft, J. M., Gu, W., Zhang, T., Hughes, S. M., Hartman, K. B., Hofmann, C., Kanaras, A. G., Kilcoyne, D. A., Le Gros, M., Yin, Y., Alivisatos, A. P. & Larabell, C. A. (2008) TiO₂ nanoparticles as a soft x-ray molecular probe. *Chemical Communications*, 21), 2471-2473.
49. Parkinson, D. Y., McDermott, G., Etkin, L. D., Le Gros, M. A. & Larabell, C. A. (2008) Quantitative 3-D imaging of eukaryotic cells using soft x-ray tomography. *Journal of Structural Biology*, 162(3), 380-386.
50. Le Gros, M.A., McDermott, G., Uchida, M., Knoechel, C.G., and Larabell, C.A. (2008) High aperture cryogenic immersion light microscopy. *J. Microscopy*, 235, 1-8.
51. Uchida, M., McDermott, G., Wetzler, M., Le Gros, M.A., Myllys, M., Knoechel, C., Barron, A.E., and Larabell, C.A. (2009). Soft X-ray Tomography of *Candida albicans*: Insights into Phenotypic Switching and the Cellular Response to Antifungal Peptoids. *PNAS* 106(46):19375-19380. PMC2780763.
52. Hanssen, E., Knoechel, C., Abu-Bakar, N., Deed, S., Le Gros, M., Larabell, C., and Tilley, L. (2010) Cryo transmission x-ray imaging of the malaria parasite, *P. falciparum*. *Journal of Structural Biology*. 173, 161-168.
53. Uchida, M., Sun, Y., McDermott, G., Knoechel, C., Le Gros, M. A., Parkinson, D., Drubin, D. G., and Larabell, C. A. (2011). Quantitative analysis of yeast internal architecture using soft X-ray tomography. *Yeast*. 28:227-236. PMID: 21181783.

54. Parkinson, D.Y., Knoechel, C., Yang, C., Larabell, C.A., and Le Gros, M.A. (2012). Automatic alignment and reconstruction of images for soft x-ray tomography. *J. Structural Biol.* 272, 259-266.
55. Hanssen, E., Knoechel, C., Dearnley, M., Dixon, M. W. A., Le Gros, M., Larabell, C., and Tilley, L. (2012). Soft x-ray microscopy analysis of cell volume and hemoglobin content in erythrocytes infected with asexual and sexual stages of *Plasmodium falciparum*. *J. Structural Biology.* 177, 224-232.
56. Murphy, S., Lim, Rebecca, Heraud, P., Cholewa, M., Le Gros, M., de Jong, M.D., Howard, D. L., Paterson, D., McDonald, C., Atala, A., Jenkin, G., Wallace, E.M. (2012). Human amnion epithelial cells induced to express functional cystic fibrosis transmembrane conductance regulator. *PLoS ONE.* 7(9): 346533. doi:10.1371/journal.pone.0046533. PMID: PMC3460882.
57. McDermott, G., Fox, D. M., Epperly, L., Wetzler, M., Barron, A.E., Le Gros, M.A., and Larabell, C. A. (2012) Visualizing and quantifying cell phenotype using soft x-ray tomography. *Bioessays.* 34, 320-327.
58. Clowney, E. J., Le Gros, M. A., Mosley, C. P., Clowney, F. G., Markenskoff-Papadimitriou, E. C., Myllys, M., Barnea, G., Larabell, C. A. and Lomvardas, S. (2012). Lamin B Receptor regulates nuclear architecture and gene expression in olfactory neurons. *Cell.* 151(4), 724-737.
59. Isaacson, S. A., Larabell, C. A., Le Gros, M. A., McQueen, D. M. and Peskin, C. S. (2013). The influence of spatial variation in chromatin density determined by x-ray tomograms on the time to find DNA binding sites. *Bulletin of Mathematical Biology.* 75(11), 2093-20117. PMID:PMC3934756
60. Smith, E. A., Cinquin, B. P., McDermott, G., Le Gros, M. A., Parkinson, D. Y., Kim, H. T., and Larabell, C. A. (2013). Correlative microscopy methods that maximize specimen fidelity and data completeness, and improve molecular localization capabilities. *J. Structural Biology.* 184, 12-20. PMID:PMC3758393.
61. Smith EA, Cinquin BP, Do M, McDermott G, Le Gros MA, Larabell CA. Correlative cryogenic tomography of cells using light and soft x-rays. *Ultramicroscopy.* 2014 Aug; 143:33-40. PMID: 24355261. PMID: PMC3984543
62. Cinquin BP, Do M, McDermott G, Walters AD, Myllys M, Smith EA, Cohen-Fix O, Le Gros MA, Larabell CA. Putting molecules in their place. *J Cell Biochem.* 2014 Feb; 115(2):209-16. PMID: 23966233. PMID: PMC363052
63. Le Gros, M.A., McDermott, G., Cinquin, B.P., Smith, E.A., Do, M., Chao, W.L., Naulleau, P.P. and Larabell, C.A. (2014). *J. Synchrotron Radiation.* 21, doi:10.1107/S1600577514015033.
64. Smith, E.A., McDermott, G., Do, M., Leung, K., Panning, B., Le Gros, M.A., and Larabell, C.A. (2014). Quantitatively imaging chromosomes using correlated cryo-fluorescence and soft x-ray tomographies. *Biophysical Journal.* 107(8), 1988-1996.

Review Articles

1. Le Gros, M. A., McDermott, G. & Larabell, C. A. (2005) X-ray tomography of whole cells. *Current Opinion in Structural Biology,* 15(5), 593-600.

2. McDermott, G. Le Gros, M. A., Knoechel, C. G., Uchida, M., and Larabell, C. A. (2009) Soft X-ray Tomography and Cryogenic Light Microscopy: The Hot Combination in Cellular Imaging. *Trends in Cell Biology*. 19(11) 587-595.

Books and Chapters

1. Le Gros M. A., Turrell, B. G., Crooks, M. J. C., Kotlicki, A. and Drukier, A. K. (1988). Squid Detection Of Superheated Granules, In: *Low Temperature Detectors for Neutrinos and Dark Matter*, Eds. Pretzl, N. Schitz and L. Stodolsky(Springer Verlag,) 37-43.
2. Da Silva, A., Le Gros, M. A., Turrell, B. G., Kotlicki, A. K. (1988). Investigation of Superheated Superconducting Granules, *Low Temperature Detectors for Neutrinos and Cold Dark Matter*, Eds. Gonzalez Mestres and D. Peret Galix. (Edition Frontiers).
3. Turrell, B. G., Le Gros, M. A., Da Silva, A., Turrell, B. G., Kotlicki, A., and Drukier, A. K. (1989). Towards The Search For WIMPS Using A Superconducting Granular Detector Operated In Liquid Helium-4. In: *Particle Astrophysics: Forefront Experimental Issues*. ed. E. B. Norman (World Scientific). 51-53.
4. Le Gros, M. A., Da Silva, A., Turrell, B. G., Kotlicki, A., and Drukier, A. K. Girard, T. A., Gross, R., Huebner, R. P. Klass, U. (1989). Tests Of Radiation Hardness Of Superconducting Particle Detectors. In: *Low Temperature Detectors for Neutrinos and Dark Matter II*. Eds. L. Gonzales Mestres (Edition Frontiers,) pg 357-376.
5. Meager, G. Graham, Le Gros, M. A., Kotlicki, A. Eska, G. and Turrell, B. G. (1992) "Progress In The Development Of The Planar Array Of Superheated Superconductors (PASS) Detector", In: *Low Temperature Detectors For Neutrinos and Dark Matter*. N. E. Booth and G. L. Salmon (Edition Frontiers) pg. 47-55.
6. Labov, S, Silver, E.S and Le Gros M. A. (1992) Aluminum Tunnel Junction Detector Operation In An Adiabatic Demagnetization Refrigerator. In: *Low Temperature Detectors For Neutrinos And Dark Matter*. Ed N. E. Booth and G. L. Salmon. Edition Frontiers.
7. Cramer, S. P., Wang, H., Bryant, C. and Le Gros, M. A. (1999) Soft X-ray Absorption Spectroscopy-Applications to Bioinorganic Chemistry. *Journal of the American chemical Society*, Symposium Series 692, Chapter 8.
8. Gu, W., Pellegrino, T. Parak, W. J., Boudreau, R., Le Gros, M. A. Alivisatos A. P., and C. A. Larabell. (2005). "Measuring Cell Motility Using Quantum Dot Probes," In: Quantum Dots in Biology, Methods in Molecular Biology series, Editor: Charles Hotz and Marcel Bruchez. Humana Press.
9. McDermott, G., Le Gros, M. A. and Larabell, C. A. (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.
10. Le Gros, M.A., Knoechel, C. G., Uchida, M., Parkinson, D. Y., McDermott, G. and Larabell, C. A. (2012). "Visualizing sub-cellular organization using soft X-ray tomography," In: Comprehensive Biophysics. Edward H. Egelman (Ed.), Vol 2, Biophysical Techniques for Characerization of Cells. Ed. P. Schwille (Ed.) Academic Press, Oxford England. pp. 90-110.

11. Parkinson, D. Y., Epperly, L.R., McDermott, G., Le Gros, M.A., Boudreau, R.M. and Larabell, C.A. (2012). Nanoimaging cells using soft x-ray tomography. *Methods in Molecular Biology*. 950:457-81.

12. Smith, E.A., Cinquin, B.P., McDermott, G., Le Gros, M.A. and Larabell, C.A. (2014). "Correlated soft x-ray tomography and cryo-light microscopy," In: Garry C. Howard, William E. Brown, and Manfred Auer, editors: Imaging Life, Biological Systems from Atoms to Tissues. Oxford University Press USA, pp. 209-227.

PATENTS ISSUED OR PENDING

1. U.S. Patent #5777336 Broadband High Resolution X-ray Spectral Analyzer
2. U.S. Patent #7822174 Cryotomography X-ray Microscopy Stage
3. U.S. Patent #7852554 Cryogenic Immersion Microscope
4. U.S. Patent #5028786 Array for a nuclear radiation and particle detector
5. Application #20030113709 Semiconductor Nanocrystal-Based Cellular Imaging