Special Issues of AMR on the Occasion of the 85th Birthday of Harold M. Swartz (HMS): Overview of Part 2 Articles and HMS’ Citations on Magnetic Resonance

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1 Special Acknowledgements from Harold M. Swartz for These Special Issues

I am extremely proud and grateful that so many outstanding scientists have contributed to this special issue highlighting the contributions of my laboratory to magnetic resonance, especially in electron paramagnetic resonance. The articles in the two parts of the special issue highlight how advances in both instrumentation and concepts have made EPR of biological systems so productive. This raises my optimism that, where there are current limitations, further technical and scientific progress will make EPR of biological systems even more productive in the future.

While I am of course both proud and humbled by the many senior colleagues with whom I have the privilege of collaborating and exchanging knowledge, I am especially proud of my ‘academic children’, i.e., those who worked with me in their formative years as students, post-docs, visiting fellows, or young academics in my laboratories. This group includes many very bright and energetic men and women who went on to have very impressive careers, including many who have established their own research groups and produced additional excellent science as well as next-generation scientists. This talented group encompasses Arif Ali, Bill R. Antholine, Goran Bačić, Hal F. Bennett, Rose Caston, Hsiao C. Chan, Eunice Y. Chen, Kai Chen, Ed S. Copeland, Franci Demsar, Jurek W. Dobrucki, Jeff F. Dunn, W. Scott Enochs, Bernard Gallez, Peter Gast, James Glockner, Fuminori Goda, Peter
Gutierrez, Xiao-Ming He, Hiroshi Hirata, Huagang Hou, W. Brian Hyslop, Anna Iannone, Akinori Iwasaki, Ron J. Jandacek, Philip James, Lesley A. Jarvis, Li Li Ji, Jingie Jiang, Ching-Sang Lai, K. Jim Liu, Kyo Kobayashi, Steve Leichtweis, Karsten Mäder, Colin Mailer, Minoru Miyake, P.D. (Reef) Morse, Susan Morris, David O. Nettleton, R. Javier Nicolalde, Mark J. Nilges, Julia A. O’Hara, Tomasz Panz, Brian W. Pogue, Fraser Robb, Yasuko S. Sakata, Tadeusz Sarna, Phil E. Schaner, Steve Shen, Toshi Shima, Wilson Schreiber, Jason W. Sidabras, Alex Smirnov, Roger Springett, W. Karol Subczynski, Tamiko Suzuki-Nishimura, Aldo Tomasi, Graham Timmins, Ichiro Yamaguchi, Ben B. Williams, Ron K. Woods, and Luigi Zecca. I bask in the light of their special accomplishments and expertise.

I am especially grateful to the editors of this issue, Ann Flood, Steve Swarts, Murali Krishna, and Bernard Gallez who have worked so hard and diligently. And, of course, I am especially grateful to Ann who has had the leading role in conceptualizing this special issue and guiding it through to its completion, including untold hours of effort to improve the clarity of each manuscript. Most of all, I am grateful to Ann because of the many ways that she has made my personal and professional life so satisfying, including her change in career, after she became emerita as a leading health services researcher, to become an outstanding collaborator for advancing so many of what started as my professional interests and making them our interests.

I also thank the tremendous help and tolerance of Kev Salikhov and Laila Mosina who have gone way beyond the responsibilities of the editorial guidance for having these issues as part of the AMR, facilitating and guiding at every step of the way to successfully herd the contributors (cat-like) into completing the manuscripts while not departing from rigorous peer review of each manuscript (except for the editorials and my histories which, in the tradition of the Journal, are not peer-reviewed).

2 Manuscripts Included in Part 2 of the Special Issue for Harold M. Swartz’ 85th Birthday

Part 2 of the special issue starts with four manuscripts which present historical overviews of Harold M. Swartz’ (HMS’) contributions to magnetic resonance. The initial histories are authored by HMS and present a detailed overview of his laboratories’ efforts in three areas of magnetic resonance: (1) free radicals and paramagnetic metals in biological systems and associated EPR instrumental developments advancing in vivo measurements, (2) biodosimetry, particularly focused on using EPR to assess dose in large-scale emergencies, and (3) oximetry, particularly focusing on improving medical decision-making where hypoxia plays a key role in therapeutic success. The fourth historical overview/review is authored by Tadeusz Sarna and colleagues, and focuses on the contributions of EPR and its important implications for understanding melamins and their biological interactions. It particularly focuses

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\(^1\) My profound apologies if I have omitted anyone who should be included in this section or the histories.
on the important and complex area of the interactions of melanin with metals and how these impact the potential cytotoxic effects of metal ions.

The next four articles present recent developments in in vivo EPR instrumental developments. Wilson Schreiber et al. describe the major modifications that were made to in vivo EPR to make the instruments better suited to the needs of both the intended end-use (for in vivo dosimetry and oximetry) and the end-users (who need to have reliable and clinically relevant data available quickly and well integrated into clinical workflow including being operated by available technicians). Sergei Petryakov et al. report on the development of surface resonators used with low-frequency continuous wave in vivo EPR. These resonators have the flexible cables needed to conveniently attach the detection loop to the skin surface and the high sensitivity needed to avoid SRN problems associated with subject motion during in vivo measurements. Hiroshi Hirata and Harold Swartz review resonator developments in three contexts: preclinical oximetry and free radical measurements in small rodents, clinical (human) oximetry, and human dosimetry. They discuss guidelines for developing and optimizing resonators for each of these specific preclinical and clinical applications. Finally, Jim Hyde and his colleagues discuss their hypothesis that, with low Q-value sample resonators, dispersion EPR can provide better signal to noise. To achieve this, high microwave power is needed, and this is problematic for these samples. They found that the primary source of noise is phase noise at the receiver from leakage of microwave through the circulator. Their paper then focuses on the design of reflector bridges with the goal of minimizing this source of noise.

The next group of articles discusses the physical underpinnings for advancing EPR, especially in vivo EPR. Jerzy Koziol and Wojciech Froncisz lead off with an analysis of influence of spurious signals on automatic frequency control (AFC) in EPR spectrometers. While the primary source of spurious signals is leakage across the circulator in the microwave bridge, the signals reflected from the connectors in the line between the circulator and resonator further modify that signal. They discuss two ways to overcome the potential degradation in performance of the AFC from these spurious signals.

Joseph Kao and colleagues at U. of Maryland in Baltimore and the Eatons’ lab at U. of Denver report on the use of EPR lineshapes of nitroxide diradicals and their relationship to spin relaxation because of their importance of their use in structural studies. It had been suggested that the usual maximum distance of 5–6 Å, for their use as a measure of interactions for relaxation enhancement, might be extended to a distance as long as 9 Å if the linker in the diradical were more flexible. Using carefully developed synthetic pathways, they made two dinitroxides with interspin distances of about 9 Å and $J > AN$, but with more flexible amide and ethylenediamine linkers. They then showed that modulation of dipolar interactions at distances of about 9 Å is not an effective electron spin relaxation mechanism, even for dinitroxides with relatively flexible linkers.

Jay Zweier and colleagues report on methods to increase the speed of EPR imaging with nitroxides. They developed and evaluated the use of fast millisecond scan EPR projection acquisition along with a novel reconstruction algorithm optimized for 3D spatial EPR image reconstruction from a high number of noisy projections. This reconstruction method utilizes the raw image projection data and zero gradient
spectrum to account for EPR line shape and hyperfine structure of any given paramagnetic probe, without the need for deconvolution that is poorly suited for high noise data. Using fast-scan EPR imaging with this reconstruction method, they found that, while the approach seems effective, excess noise due to technical limitations of currently available instrumentation limited the gains achievable with the new approach. It is likely that future developments of EPR instrumentation will overcome the problems with noise, and image resolutions approaching 100 μm should be possible.

Alex Smirnov and colleagues present an experimental verification of a prevailing but not yet verified assumption of the use of nitroxides to measure oxygen levels. They measured the effects of molecular oxygen in air and pure oxygen at atmospheric pressure on continuous wave EPR spectra of six structurally different nitroxides. Overall, the data further establish nitroxides as robust EPR molecular probes to measure the product of local oxygen concentration and its translational diffusion coefficient under a wide range of conditions such as pH and electrolyte concentrations.

The last set of articles in this special issue deal with EPR and biodosimetry, focusing on its clinical uses for retrospective biodosimetry after unplanned exposures to ionizing radiation. Beinke and colleagues review the value of biological biodosimetry and EPR spectroscopy for medical management of people experiencing acute radiation syndrome. They conclude that biological biodosimetry (based on molecular biomarkers, especially gene expression analysis) and in vivo EPR represent very promising screening tools for rapid triage dosimetry in early phase diagnostics. They also note that biological biodosimetry can be employed to estimate whole-body dose, while EPR dosimetry on nails, bone, or teeth could be used to determine partial body doses which in combination is very useful for medical management.

Vijay Singh et al. summarize the current state of development of drugs that could be given after exposures to ameliorate the damaging effects of radiation. This paper discusses the importance of determining who has actually received a life-threatening exposure, so that the drugs can be given to the people who need them. It concludes that EPR biodosimetry based on measurements in vivo of fingernails and toenails could be especially valuable, because it provides information about the heterogeneity of the dose as well as its magnitude.

Continuing a long-standing collaboration between groups in Japan and Dartmouth, Nakai et al. show that the often-expressed concern about exposure to sunlight potentially compromising EPR tooth dosimetry is not really limiting. They carefully measured the effect of plausible levels of exposure from sunlight and found that this would not result in a large enough effect to perturb the utility of EPR tooth dosimetry.

The final paper is from a leading group of EPR biodosimetry experts from France and the US reporting on the feasibility of using clipped nails for biodosimetry. Tkatchenko et al. investigated the well-known problem that the EPR signal induced by clipping overlaps with the signal induced by radiation, thereby confounding the interpretation of source of the signal. While other techniques like soaking nails have been investigated to try to overcome this problem, this team analyzed the EPR
characteristics of the potentially confounding background signal versus the radiation-induced signal. They concluded that it is very unlikely that EPR spectroscopic techniques can be utilized to remove the influence of the background signal for clipped nails.

3 **H.M. Swartz’ Citations in Magnetic Resonance**

The numbers in this listing of HMS’ citations have been used consistently throughout all three histories of EPR studies from the H.M. Swartz laboratories: Part 1—free radicals and instrumental developments of in vivo EPR, Part 2—biodosimetry, and Part 3—oximetry. The numbers are derived from the curriculum vita for Harold M. Swartz. While the overwhelming majority of his publications are related to magnetic resonance (and thus included in the histories), some deal with his other professional interests, most notably related to medical education. Consequently, some numbers are skipped in this listing, because references not included in these histories have been removed.

1. D. Hightower, H.M. Swartz. Measurement of Neutron Penetration by Tissue Activation in Biological Effects of Neutron Irradiation. Intl. Atomic Energy Agency, Vienna. pp. 141–155 (1964).
2. H.M. Swartz. Long-Lived Electron Spin Resonances in Rats Irradiated at Room Temperature. Radiat. Res. 24: 579–586 (1965).
3. H.M. Swartz, R.P. Molenda. Electron Spin Resonance Spectra of Some Normal Tissues: Effect of Microwave Power. Science. 148: 94–95 (1965).
4. H.M. Swartz, R.P. Molenda, R.T. Lofberg. Long-Lived Radiation-Induced Electron Spin Resonances in an Aqueous Biological System. Biochem. Biophys. Res. Commun. 21: 61–65 (1965).
5. H.M. Swartz, E.C. Richardson. A Correlation Between Radiation-Induced Free Radicals and Survival in Micro-Organisms Exposed to β-Mercaptoethylamine Under Oxygen or Nitrogen. Intl. J. Rad. Biol. 12: 75–88 (1967).
6. J.M. Brady, N.O. Aarestad, H.M. Swartz. In Vivo Dosimetry by Electron Spin Resonance Spectroscopy. Health Phys. 15: 43–47 (1968).
7. H.M. Swartz. Effect of Oxygen on Freezing Damage in E. coli. Ph.D. Thesis, Washington, DC: Georgetown University (1969).
8. E.S. Copeland, H.M. Swartz. Radical Formation in Cysteamine-HCl Gamma-Irradiated in the Dry State and in Frozen Aqueous Solution. Intl. J. Rad. Biol. 16: 293–296 (1969).
9. R.J. Jandacek, H.M. Swartz. The Conformation of Radioprotectant Compounds. The Crystal Structures of 2-Mercaptoethylamine Hydrochloride and 3-Mercapto-propylamine Hydrochloride. Radiat. Res. 44: 523–530 (1970).
10. H.M. Swartz, E.C. Richardson, E.S. Copeland, R.T. Lofberg, R.J. Jandacek. Structure Function Studies of the Aminothiol Radio-Protectants. In Radiation Protection and Sensitization, W.L. Morson, M. Quintiliani, (Eds.), Taylor and Francis, Ltd., London, UK, pp. 121–131 (1970).
11. H.M. Swartz. Effect of Oxygen in Freezing Damage, I. Effect on Survival of E. coli. Cryobiology 6: 546–551 (1970).
13. M.C. Johnson, H.M. Swartz, R.M. Donati. Hematological Alterations Produced by Nitrous Oxide. Radiat. Res. 44: 523–530 (1970).
14. H.M. Swartz. Effect of Oxygen on Freezing Damage, II. Physical–Chemical Effects. Cryobiology 8: 255–264 (1971).
15. H.M. Swartz. Effect of Oxygen on Freezing Damage, III. Modification by Beta-Mercaptoethylamine. Cryobiology 8: 543–549 (1971).
16. H.M. Swartz, E.S. Copeland, E.C. Richardson. Structure–Function Studies of the Aminothiol Radioprotectants, II. The Effect of Carbon Chain Length in Mercaptoethylamine Homologues. Radiat. Res. 45: 542–556 (1971).
17. H.M. Swartz, J.C. Darin, J.D. Lewis. ESR Studies of Tissue Viability. In Proc. Ist European Biophysics Congress, E. Broda, A. Locker, H. Springer-Lederer, (Eds.), pp. 557–561 (1971).
18. P.S. Fox, J.D. Lewis, H.M. Swartz, J.C. Darin. Electron Spin Resonance Spectrometry and the Determination of Organ Viability. Surgical Forum 22: 353–354 (1971).
19. H.M. Swartz, J. Bolton, D. Borg. Biological Applications of Electron Spin Resonance. New York, NY: John Wiley & Sons (1972).
20. H.M. Swartz. ESR Studies of Cells and Tissues. In Biological Applications of Electron Spin Resonance, H.M. Swartz, J.R. Bolton, D. C. Borg (Eds.) New York, NY: John Wiley & Sons, pp. 155–195 (1972).
21. J.R. Bolton, D.C. Borg, H.M. Swartz. Experimental Aspects of Biological Spin Resonance Studies. In Biological Applications of Electron Spin Resonance, J.R. Bolton, D. C. Borg, H.M. Swartz, (Eds.) New York, NY: John Wiley & Sons, pp. 63–118 (1972).
22. H.M. Swartz. Electron Spin Resonance Studies of Carcinogenesis. In Advances in Cancer Research, G. Klein, S. Weinhouse, (Eds.). New York, NY: Academic Press, pp. 227–252 (1972).
23. H.M. Swartz, J. Weisner. Radiation Effects on Plasma Electron Spin Resonance Spectra of Cancer Patients. Radiology. 104: 209–210 (1972).
24. H.M. Swartz, S. Ambegaonkar, W. Antholine, W. Mailer, D. McNellis, S. Schneller. Electron Spin Resonance Spectra of Blood in Carcinogenesis. Intl. Union for Pure and Applied Biophy. Academy of Sciences of the USSR, Symposia Papers, Puschino 14: 209–223 (1973).
25. H.M. Swartz. Use of Changes in Paramagnetic Metal Ions to Determine Cell Viability. Proc. 4th Intl. Biophysics Cong. (1972).
26. H.M. Swartz. Toxic Oxygen Effects. Intl. Rev. Cytol. 35: 321–343 (1973).
27. H.M. Swartz, S. Ambegaonkar, W. Antholine, M. Konieczny, C. Mailer. A Survey of Present and Potential Clinical Applications of Electron Spin Resonance. Ann. N.Y. Acad. Sci. 222: 989–1009 (1973).
28. W.E. Antholine, A.G. Mauk, H.M. Swartz, F. Taketa. Electron Spin Resonance Spectra of Feline NO-Hemoglobins. FEBS Letts. 38: 199–202 (1973).
29. H.M. Swartz, C. Mailer, S. Ambegaonkar, W.E. Antholine, D.R. McNellis, S.J. Schneller. Paramagnetic Changes During Development of Transplanted AKR/J
Leukemia in Mice as Measured by Electron Spin Resonance. Canc. Res. 33: 2588–2595 (1973).
30. C. Mailer, H.M. Swartz, M. Konieczny, S. Ambegaonkar, V. L. Moore. Identity of the Paramagnetic Element Found in Increased Concentrations in Plasma of Cancer Patients and Its Relationship to Other Pathological Processes. Canc. Res. 34: 637–642 (1974).
33. N.J.F. Dodd, H.M. Swartz. Effects of Ionizing Radiation on Dried Spores of Osmunda Regalis III. 35 GHz ESR Study. Intl. J. Radiat. Biol. 27: 205–210 (1975).
34. R.R. Varma, T. Sarna, H.M. Swartz. On the Nature of the Pigment in the Dubin-Johnson Syndrome (DJS). Gastroenterology. 69: 875 (1975).
35. T. Sarna, C. Mailer, J.S. Hyde, H.M. Swartz. Electron-Nuclear Double Resonance (ENDOR) in Melanins. Biophys. J. 16: 1165–1170 (1976).
36. P.L. Gutierrez, T. Sarna, H.M. Swartz. Experimental Considerations in Biological ESR Studies, II. Chromium-Tissue Complexes Detected by Electron Spin Resonance. Phys. Med. Biol. 21: 494–954 (1976).
37. T. Sarna, J.S. Hyde, H.M. Swartz. Ion Exchange in Melanin: An ESR Study with Lanthanide Probes. Science. 192: 1132–1134 (1976).
38. W.E. Antholine, C. Mailer, B. Reichling, H.M. Swartz. Experimental Considerations in Biological ESR Studies, I. Identity and Origin of the Tissue Lipid Signal—A Copper-Dithiocarbamate Complex. Phys. Med. Biol. 21: 840–846 (1976).
39. C. Mailer, T. Sarna, H.M. Swartz, J. S. Hyde. Quantitative Studies of Free Radicals in Biology: Corrections to ESR Saturation Data. J. Magn. Reson. 25: 205–210 (1977).
42. H.M. Swartz, P.L. Gutierrez. Free Radical Increases in Cancer: Evidence That There is Not a Real Increase. Science. 198: 936–938 (1977).
45. W.E. Antholine, J.S. Hyde, H.M. Swartz. Use of Dy3+ as a Free Radical Relaxing Agent in Biological Tissues. J. Magn. Reson. 29: 517–522 (1978).
46. H.M. Swartz, P. L. Gutierrez, B. A. Reichling. Electron Spin Resonance Studies of Liver. In Biochemical Mechanisms of Liver Injury. T.F. Slater (Ed.), London, UK: Academic Press, pp. 293–317 (1978).
47. H.M. Swartz. Application of Magnetic Resonance in Cancer—A Critical Summary. J. Magn. Reson. 29: 393–396 (1978).
49. H.M. Swartz, T. Sarna, R.R. Varma. On the Nature of the Hepatic Pigment in the Dubin-Johnson Syndrome, Evidence That It Is Not Melanin. Gastroenterology. 76: 958–966 (1979).
50. T. Sarna, H.M. Swartz. Identification and Characterization of Melanin in Tissue and Body Fluids. Folia Histochem. Cytochem. 16: 275–286 (1978).
51. R.C. Sealy, H.M. Swartz, P.L. Olive. Electron Spin Resonance—Spin Trapping. Detection of Superoxide Formation During Aerobic Microsomal Reduction of Nitro-Compounds. Biochem. Biophys. Res. Commun. 82: 680–684 (1978).
52. J.S. Hyde, H.M. Swartz, W.E. Antholine. The Spin-Probe—Spin-Label Method. In Spin Labeling II: Theory and Applications. L. J. Berliner (Ed.), New York, NY: Academic Press, pp. 71–113 (1979).
53. P.L. Gutierrez, H.M. Swartz. Paramagnetic Changes in Cancer: Growth of Walker 256 Carcinoma Studied in Frozen and Lyophilized Tissues. Br. J. Cancer. 39: 24–34 (1979).

54. H.M. Swartz, W.E. Antholine, B.A. Reichling. Paramagnetic Changes During Development of DMBA-Induced Mammary Tumors in Sprague–Dawley Rats. Phys. Med. Biol. 24: 416–425 (1979).

55. P.L. Gutierrez, H.M. Swartz, E.J. Wilkinson. Paramagnetic Changes in Cancer: DMBA-Induced Mammary Tumors Studied in Non-Lyophilized and Lyophilized Tissues. Br. J. Cancer. 39: 330–336 (1979).

56. H.M. Swartz. Free Radicals in Cancer. In CIBA Symposium No. 67, Submolecular Biology and Cancer, pp. 107–124 (1979).

57. H.M. Swartz, N.J. Dodd. The Role of Ascorbic Acid on Radical Reactions In Vivo. In Oxygen and Oxy-Radicals in Chemistry and Biology, M.A.J. Rodgers, E. L. Powers (Ed.) Orlando, FL: Academic Press, pp. 161–168 (1981).

58. H.M. Swartz. Electron Spin Resonance Studies of Cancer Using Complex Biological Systems. In Free Radicals and Cancer. R. A. Floyd (Ed.), New York, NY: Marcel Dekker, Inc., pp. 81–115 (1982).

59. H.M. Swartz, S.M. Swartz. Biochemical and Biophysical Applications of Electron Spin Resonance. In Methods of Biochemical Analysis, D. Glick (Ed.), New York, NY: John Wiley & Sons, pp. 207–323 (1983).
Special Issues of AMR on the Occasion of the 85th Birthday of…

Systems, F. Conti, W. E. Blumberg, J. deGier, F. Pocchiari (Eds.), New York, NY: Plenum Press, pp. 39–53 (1985).
71. P.D. Morse II, H.M. Swartz. Measurement of Intracellular Oxygen Concentration Using the Spin Label TEMPOL. Magn. Reson. Med. 2: 114–127 (1985).
72. M.J. Nilges, H.M. Swartz, P.A. Riley. Identification by Electron Spin Resonance of Free Radicals Formed During the Oxidation of 4-Hydroxyanisole Catalyzed by Tyrosinase. J. Biol. Chem. 259: 2446–2451 (1984).
73. N.J. Dodd, H.M. Swartz. The Nature of the ESR Signal in Lyophilized Tissue and Its Relevance to Malignancy. Br. J. Cancer. 49: 65–71 (1984).
74. H.M. Swartz. Electron Spin Resonance Studies of Cancer: Experimental Results and Conceptual Implications. In Free Radicals in Molecular Biology and Aging, D. Armstrong, R. Sohol, R. Cutler, T.F. Slater (Eds.), New York, NY: Raven Press, pp. 275–293 (1984).
75. L. Hopwood, H.M. Swartz, S. Pajak. Effect of Melanin on Radiation Response of CHO Cells. Intl. J. Radiat. Biol. 47: 531–537 (1985).
76. M.J. Nilges, H.M. Swartz. Quinone and Semiquinone Intermediates in the Reaction of 4-Hydroxyanisole and Tyrosinase. In Hydroxyanisole: Recent Advances in Melanoma Therapy, P. Riley (Ed.), Oxford: IRL Press, pp. 26–33 (1984).
77. P.D. Morse II, R.L. Magin, H.M. Swartz. Improved Temperature Control for Samples in Electron Paramagnetic Resonance Spectroscopy. Rev. Scientific. Inst. 56:94–96 (1985).
78. H.M. Swartz. Electron Spin Resonance and Medicine, Resident and Staff Physician Dec. 15, pp. 15–19 (1985).
79. H.M. Swartz, L. Paradisi, M. Nilges, P. Morse, M. Dianzani. Relation Between Physical State of Membrane and Lipid Peroxidation. Report to National Foundation for Cancer Research. Bethesda, MD: NFCR (1988).
80. H.M. Swartz, L. Paradisi, H. Esterbauer. Effect of 4-hydroxynonenal on the Motion of Spin Labels in Liver Microsomal Membranes in Association with Lipid Peroxidation. Report to National Foundation for Cancer Research. Bethesda, MD: NFCR (1989).
82. H.M. Swartz, H. Bennett, R.D. Brown III, P.D. Morse II, M. Pals, S.H. Koenig. Feasibility of Measuring Oxygen and Redox Metabolism in Vivo by NMR: Effect of Paramagnetic Materials and Their Cellular Metabolism on Relaxation Times of Protons of Water and Lipids. Periodic Biologorum. 87:175–183 (1985).
83. A. Tomasi, C. Benedetto, M. Nilges, T.F. Slater, H.M. Swartz, M.C.R. Symons. Studies on Human Uterine Cervix and Rat Uterus Using S-, X-, and Q-Band Electron Spin Resonance Spectroscopy. Biochem. J. 224: 431–436 (1984).
85. H.M. Swartz. Free Radicals and Clinical Disease. Soc. Magn. Reson. Med. Newsletter (1985).
86. H.M. Swartz. Use of Electron Spin Resonance Spectroscopy to Study Cancer. In Magnetic Resonance in Cancer, P.S. Allen, D. P.J. Boisvert, B.C. Lentle (Eds.), Oxford, UK: Pergamon Press, pp. 169–177 (1986).
87. H.M. Swartz, K. Chen, M. Pals, M. Sentjurc, P.D. Morse II. Hypoxia Sensitive NMR Contrast Agents. Magn. Reson. Med. 3: 169–174 (1986).
88. H.F. Bennett, R.D. Brown, III, S.H. Koenig, H.M. Swartz. Effects of Nitroxides on the Magnetic Field and Temperature Dependence of 1/T1 of Solvent Water Protons. Magn. Reson. Med. 4: 93–111 (1987).
89. H.M. Swartz, K. Chen, J.A. Roth. Further Evidence that the Pigment in the Dubin-Johnson Syndrome is not Melanin. Pigment Cell Res. 1: 69–75 (1987).
91. H.M. Swartz, M.A. Pals. Measurement of Intracellular Oxygen. In Handbook of Biomedicine of Free Radicals and Antioxidants, J. Miquel, H. Weber, A. Quintanilha (Eds.) Boca Raton, FL: CRC Press Inc., pp. 141–151 (1989).
92. M. Sentjurc, P.D. Morse, II, H.M. Swartz. Influence of Metabolic Inhibitors on the Nitroxide Reduction in the Cells. Periodic Biologicum. 88: 202–203 (1986).
93. M.A. Pals, H.M. Swartz. Oxygen Dependent Metabolism of Potential MR Contrast Agents. Invest. Radiol. 22: 497–501 (1987).
94. H.F. Bennett, H.M. Swartz, R.D. Brown III, S.H. Koenig. Modification of Relaxation of Lipid Protons by Molecular Oxygen and Nitroxides. Invest. Radiol. 22: 502–507 (1987).
95. H.M. Swartz, M. Sentjurc, P.D. Morse II. Cellular Metabolism of Water-Soluble Nitroxides: Effect on Rate of Reduction of Cell/Nitroxide Ratio, Oxygen Concentrations, and Permeability of Nitroxides. Biochim. Biophy. Acta. 888: 82–90 (1986).
96. H.M. Swartz. Use of Nitroxides to Measure Redox Metabolism in Cells and Tissues. J. Chem. Soc. Faraday Trans.1, 83:191–202 (1987).
98. M.J. Nilges, W.S. Enochs, H.M. Swartz. Identification and Characterization of a Tetracycline Semiquinone Formed During the Oxidation of Minocycline. J. Org. Chem. 56: 5623–5630 (1991).
99. H.M. Swartz. Interactions Between Cells and Nitroxides and Their Implications for Their Uses as Biophysical Probes and as Metabolically Responsive Contrast Agents for In Vivo NMR. Bull. Magn. Reson. 8: 172–175 (1986).
100. F. Demsar, H.M. Swartz, M. Schara. Use of Field Gradient EPR to Measure Diffusion of Nitroxides in Tissues. Magn. Reson. Med. Biol. 1: 17–24 (1988).
101. G. Bačić,, F. Demsar, Z. Zolnai, H.M. Swartz. Contrast Enhancement in ESR Imaging: Role of Oxygen. Magn. Reson. Med. Biol. 1: 55–65 (1988).
102. F. Demsar, T. Walczak, P. Morse II, G. Bačić, Z. Zolnai, H.M. Swartz. Detection of Diffusion of Oxygen by Fast Scan EPR Imaging. J. Magn. Reson. 76: 224–231 (1988).
104. H.M. Swartz. Measurement of Pertinent Oxygen Concentrations in Biological Systems, Acta Biochim. Biophys. Hungarica. 22: 277–293 (1987).
105. B. Pilas, T. Sarna, B. Kalyanaraman, H.M. Swartz. The Effect of Melanin on Iron Associated Decomposition of Hydrogen Peroxide. Free Rad. Biol. Med. 4: 285–293 (1988).
106. A. Tomasi, E. Albano, M.U. Dianzani, A. Iannone, T.F. Slater, H.M. Swartz, V. Vannini. Spin Trapping Studies on the Metabolic Activation of Carbon tetrachloride in Rat Liver Microsomes Incubated Under Steady-State Oxygen Pressures. In Free Radicals: Chemistry, Pathology and Medicine, C. Rice-Evens, T. Dormendy (Eds.), London, UK: Richilieu Press, pp. 213–235 (1988).
108. H.M. Swartz. Metabolically Responsive Contrast Agents. In Advances in Magnetic Resonance Imaging, E. Feig (Ed.) Norwood, NJ: Ablex Publishing Company, pp. 49–71 (1989).
109. A. Samuni, A. Samuni, H.M. Swartz. Evaluation of Dibromo Nitrosobenzene Sulfonate as a Spin Trap in Biological Systems. Free Rad. Biol. Med. 7: 37–43 (1989).
110. A. Samuni, A. Samuni, H.M. Swartz. The Cellular-Induced Decay of DMPO Spin Adducts of ·OH and ·O2. Free Rad. Biol. Med. 6: 179–183 (1989).
111. J. Glockner, H.M. Swartz, M. Pals. Oxygen Gradients in CHO Cells: Measurement and Characterization by Electron Spin Resonance. J. Cell. Physiol. 140: 505–511 (1989).
112. G. Bačić, M.R. Neisman, H.F. Bennett, R.L. Magin, H.M. Swartz. Modulation of Water Proton Relaxation Rates by Liposomes Containing Paramagnetic Materials. Magn. Reson. Med. 6: 445–458 (1988).
113. W.S. Enochs, W.B. Hyslop, H.F. Bennett, R.D. Brown III, S.H. Koenig, H.M. Swartz. Sources of Longitudinal Relaxation Rates Observed in Melanotic Melanoma: An In vitro Study of Synthetic Melanins. Invest. Radiol. 24: 794–804 (1989).
114. K. Chen, H.M. Swartz. Oxidation of Hydroxylamines to Nitroxide Spin Labels in Living Cells. Biochim. Biophys. Acta. 970: 270–277 (1988).
115. H.C. Chan, R.L. Magin, H.M. Swartz. Delivery of Nitroxide Spin Labels to Cultured Cells by Liposomes. Magn. Reson. Med. 8: 160–170 (1988).
116. G. Bačić, T. Walczak, F. Demsar, H.M. Swartz. Electron Spin Resonance Imaging of Tissues with Lipid-Rich Areas. Magn. Reson. Med. 8: 209–219 (1988).
117. D.O. Nettleton, P.D. Morse II, J.W. Dobrucki, H.M. Swartz, N.J. Dodd. Distribution of 5-Doxylstearic Acid in the Membranes of Mammalian Cells. Biochim. Biophys. Acta. 944: 315–320 (1988).
118. K. Chen, P.D. Morse, II, H.M. Swartz. Kinetics of Enzyme-Mediated Reduction of Lipid Soluble Nitroxide Spin Labels by Living Cells. Biochim. Biophys. Acta. 943: 477–484 (1988).
119. A. Tomasi, E. Albano, A.C. Iannone, H.M. Swartz, V. Vannini. Reduction Mechanism of the Spin Probe Tempol in Liver Microsomes. In Medical, Biomedical and Chemical Aspects of Free Radicals. O. Hayaishi, E. Niki, M. Kondo, T. Yoshikawa (Eds.) The Netherlands: Elsevier Science Publishers, B. V., pp. 821–824 (1988).
120. M. Sentjurc, G. Bačić, H.M. Swartz. Reduction of Doxyl Stearates by Ascorbate in Unilamellar Liposomes. Arch. Biochem. Biophys. 282: 207–213 (1990).
121. H.C. Chan, R.L. Magin, H.M. Swartz. Rapid Assessment of Liposomal Stability in Blood by an Aqueous Nitroxide Spin Label. J. Biochem. Biophys. Methods. 18: 271–276 (1989).
122. K. Chen, J.F. Glockner, P.D. Morse II, H.M. Swartz. Effects of Oxygen on the Metabolism of Nitroxide Spin Labels in Cells. Biochemistry, 28: 2496–2501 (1989).
123. G. Bačić, M.J. Nilges, R.L. Magin, T. Walczak, H.M. Swartz. In Vivo Localized ESR Spectroscopy Reflecting Metabolism. Magn. Reson. Med. 10:266–272 (1989).
126. R.K. Woods, G. Bačić, P.C. Lauterbur, H.M. Swartz. Three Dimensional Electron Spin Resonance Imaging. J. Magn. Reson. 84: 247–254 (1989).
128. A. Iannone, H. Hu, A. Tomasi, V. Vannini, H.M. Swartz. Metabolism of Aqueous Soluble Nitroxides in Hepatocytes: Effects of Cell Integrity, Oxygen and Structure of Nitroxides. Biochim. Biophys. Acta. 991: 90–96 (1989).
129. K. Strzalka, T. Walczak, T. Sarna, H.M. Swartz. Measurement of Time-Resolved Oxygen Concentration Changes in Photosynthetic Systems by Nitroxide-Based EPR Oximetry. Arch. Biochem. Biophys, 281: 312–318 (1990).
130. H.F. Bennett, R.D. Brown, III, J.F.W. Keana, S.H. Koenig, H.M. Swartz. Interactions of Nitroxides with Plasma and Blood: Effect on 1/T1 of Water Protons. Magn. Reson. Med. 14: 40–55 (1990).
131. H. Hu, G. Sosnovsky, S.W. Li, N.U.M. Rao, P.D. Morse II, H.M. Swartz. Development of Nitroxides for Selective Localization Inside Cells. Biochim. Biophys. Acta 1014:211–218 (1989).
132. M. Sentjurc, S. Pecar, K. Chen, M. Wu, H.M. Swartz. Cellular Metabolism of Proxyl Nitroxides and Hydroxylamines. Biochim. Biophy. Acta. 1073: 329–335 (1991).
133. J.W. Dobrucki, F. Demsar, T. Walczak, R.K. Woods, G. Bačić, H.M. Swartz. Electron Spin Resonance Microscopy of an In vitro Tumor Model. Br. J. Cancer 61: 221–224 (1990).
135. A. Iannone, A. Bini, H.M. Swartz, A. Tomasi, V. Vannini. Metabolism in Rat Liver Microsomes of the Nitroxide Spin Probe, Tempol. Biochem. Pharmacol. 38: 2581–2586 (1989).
136. R.L. Magin, G. Bačić, M.R. Niesman, J. C. Alameda Jr., S.M. Wright, H.M. Swartz. Dextran Magnetite as a Liver Contrast Agent. Magn. Reson. Med. 20: 1–16 (1991).
137. D.O. Nettleton, P.D. Morse, II, H.M. Swartz. Exchange and Shuttling of Electrons by Nitroxide Spin Labels. Arch. Biochem. Biophys. 271: 414–423 (1989).
138. G. Sosnovsky, N.U.M. Rao, S.W. Li, H.M. Swartz. Synthesis of Nitroxyl (Ami-noxy) Labeled Probes for Studies of Intracellular Environment by EPR and MRI. J. Org. Chem. 54: 3667–3674 (1989).
139. A. Iannone, R.L. Magin, T. Walczak, M. Federico, H.M. Swartz, A. Tomasi, V. Vannini. Blood Clearance of Dextran Magnetite Particles Determined by a Non-Invasive In Vivo ESR Method. Magn. Reson. Med. 22: 435–442 (1991).
140. K. Chen, H.M. Swartz. The Products of the Reduction of Doxyl Stearates in Cells are Hydroxylamines as Shown by Oxidation by 15 N-Perdeuterated Tempone. Biochim. Biophys. Acta 992:131–133 (1989).
141. G. Bačić, M.J. Nilges, T. Walczak, H.M. Swartz. The Use of In Vivo EPR to Follow the Pharmacokinetics of Drugs. Phys. Med. 5: 307–313 (1989).
143. P.D. Morse, II, E.K. Ruuge, M.J. Petro, H.M. Swartz. Analysis of the Reduction of Nitroxides by Flavin Mononucleotide. Biochim. Biophys. Acta. 1034: 298–302 (1990).
144. S. Morris, H.M. Swartz, G. Sosnovsky, N. U.M. Rao, B. Hui, C.O. Huber. Chemical and Electrochemical Reduction Rates of Cyclic Nitroxides (Nitro-yls). J. Pharm. Sci. 80: 149–152 (1991).
145. R.K. Woods, J.W. Dobrucki, J. Glockner, P.D. Morse, II, H.M. Swartz. Spectral-Spatial ESR Imaging as a Method of Noninvasive Biological Oximetry. J. Magn. Reson. 85: 50–59 (1989).
146. J.D. Dobrucki, R.M. Sutherland, H.M. Swartz. Nonperturbing Test for Cytotoxicity in Isolated Cells and Spheroids Using Electron Paramagnetic Resonance. Magn. Reson. Med. 19: 42–55 (1991).
147. H.C. Chan, K. Sun, R.L. Magin, H.M. Swartz. Potential of Albumin Labeled with Nitroxides as a Contrast Agent for Magnetic Resonance Imaging and Spectroscopy. Bioconjug. Chem. 1: 32–36 (1990).
148. M. Sentjurc, D.V. Apte, L. MacAllister, H.M. Swartz. Reduction of Nitroxides in Whole Blood, Erythrocytes, and Plasma. Curr. Top. Biophys. 18: 81–91 (1994).
149. H.C. Chan, J. Glockner, H.M. Swartz. Oximetry in Cells and Tissues Using a Nitroxide-Liposome System. Biochim. Biophys. Acta. 1014: 141–144 (1989).
150. H.M. Swartz, J.F. Glockner. Measurements of the Concentration of Oxygen in Biological Systems Using EPR Techniques. In Advanced EPR; Application in Biology and Biochemistry, A. J. Hoff (Ed.) Amsterdam, The Netherlands: Elsevier Science Publishers, pp. 753–782 (1989).
151. M.J. Nilges, T. Walczak, H.M. Swartz. 1 GHz In Vivo ESR Spectrometer Operating with a Surface Probe. Phys. Med. 5: 195–201 (1989).
152. A. Iannone, A. Tomasi, V. Vannini, H.M. Swartz. Metabolism of Nitroxide Spin Labels in Subcellular Fractions of Rat Liver, I. Reduction by Microsomes. Biochim. Biophys. Acta. 1034: 285–289 (1990).
153. M.R. Niesman, G. Bačić, S. M. Wright, H.M. Swartz, R.L. Magin. Liposome Encapsulated MnCl2 as a Liver Specific Contrast Agent for Magnetic Resonance Imaging. Invest. Radiol. 25: 545–551 (1990).
154. H.M. Swartz, J.F. Glockner. Measurement of Oxygen by EPRI and EPRS. In EPR Imaging and In Vivo EPR, G. R. Eaton, S. S. Eaton, K. Ohno (Eds.) Boca Raton, FL: CRC Press, Inc., pp. 261–290 (1991).
155. H.M. Swartz. Principles of the Metabolism of Nitroxides and Their Implications for Spin Trapping. Free Rad. Res. Comms. 9: 399–405 (1990).
156. A. Iannone, A. Tomasi, V. Vannini, H.M. Swartz. Metabolism of Nitroxide Spin Labels in Subcellular Fractions of Rat Liver. II. Reduction in the Cytosol. Biochim. Biophys. Acta. 1034: 290–293 (1990).
157. H.M. Swartz, J.F. Glockner. The Use of ESR to Measure Oxygen in Extended Biological Samples. Phys. Med. 5: 109–119 (1989).
158. R.K. Woods, W.B. Hyslop, H.M. Swartz. Mapping Oxygen Concentrations with 4D Electron Spin Resonance Spectral-Spatial Imaging. Phys. Med. 5:121–137 (1989).
159. T. Sarna, H.M. Swartz. Interactions of Melanin with Oxygen (and Related Species). In Atmospheric Oxidation and Antioxidants, G. Scott (Ed.) Amsterdam, The Netherlands: Elsevier Science Publishers, Vol. III, Chapter 5, pp. 129–169 (1993).
160. K. Chen, N.W. Lutz, J.P. Wehrle, J.D. Glickson, H.M. Swartz. Selective Suppression of Lipid Resonances by Lipid-Soluble Nitroxides in NMR Spectroscopy. Magn. Reson. Med. 25: 120–127 (1992).
161. J.C. Chato, H.M. Swartz, J.E. Robles. Thermal Tomography Using Electron Spin Resonance (ESR) Techniques. In Bioheat Transfer—Applications in Hyperthermia. Emerging Horizons in Instrumentation and Modeling, R.B. Romer, J.J. McGrath, H.F. Bowman (Eds.) New York, NY, NY: Amer. Society of Mech Eng. 121–128 (1989).

162. H.M. Swartz. The Use of Nitroxides in Viable Biological Systems: An Opportunity and Challenge for Chemists and Biochemists. Pure and Appl. Chem. 62: 235–239 (1990).

163. H.M. Swartz, S. Boyer, P. Gast, J.F. Glockner, H. Hu, K.J. Liu, M. Moussavi, S.W. Norby, T. Walczak, N. Vahidi, M. Wu, R.B. Clarkson. Measurements of Pertinent Concentrations of Oxygen In Vivo. Magn. Reson. Med. 20: 333–339 (1991).

164. T. Walczak, H. Gabrys, H.M. Swartz. Blue Light Photoreception in Higher Plants Studied with ESR Spectrometry. J. Plant Physiol. 137: 662–668 (1991).

165. J.F. Glockner, H.C. Chan, H.M. Swartz. In Vivo Oximetry Using a Nitroxide-Liposome System. Magn. Reson. Med. 20: 123–133 (1991).

166. H.M. Swartz, P. Gast, J. Glockner, H. Hu, L.L. Ji, K.J. Liu, M. Nilges, S.W. Norby, N. Vahidi, T. Walczak, M. Wu, R.B. Clarkson. The Importance of Measuring the Concentration of Oxygen Appropriately and How This Might Be Done. In Oxidative Damage and Repair: Clinical, Biological and Medical Aspects, K.J.A. Davies (Ed.) Oxford, UK: Pergamon Press Inc., pp. 415–420 (1991).

167. L.M. Weiner, H. Hu, H.M. Swartz. Development of EPR Method for Measurement of Cellular Sulphydryl Groups. FEBS 290: 243–246 (1991).

168. H.M. Swartz, K. Chen, H. Hu, K. Hideg. Contrast Agents for Magnetic Resonance Spectroscopy: A Method to Obtain Increased Information in In Vivo and In vitro Spectroscopy. Magn. Reson. Med. 22: 372–377 (1991).

169. J.F. Glockner, H.M. Swartz. In Vivo EPR Oximetry Using Two Novel Probes: Fusinite and Lithium Phthalocyanine. In Oxygen Transport to Tissue XIV, W. Erdmann, D. F. Bruley (Eds.) New York, NY: Plenum Publishing Corp., pp. 229–234 (1992).

170. H. Hu, G. Gosnovsky, H.M. Swartz. Simultaneous Measurement of Intra- and Extra-Cellular [O2] in Viable Cells. Biochim. Biophys. Acta. 112: 161–166 (1992).

171. J.F. Glockner, S.W. Norby, H.M. Swartz. Simultaneous Measurement of Intracellular and Extracellular Oxygen Concentrations Using a Nitroxide-Liposome System. Magn. Reson. Med. 29: 12–18 (1992).

172. K. Chen, C.E. Ng, J.L. Zweier, P. Kuppusamy, J.D. Glickson, H.M. Swartz. Measurement of the Intracellular Concentration of Oxygen in a Cell Perfusion System. Magn. Reson. Med. 31: 668–672 (1994).

173. H.M. Swartz, S. Boyer, D. Brown, K. Chang, P. Gast, J.F. Glockner, H. Hu, K.J. Liu, M. Moussavi, M. Nilges, S.W. Norby, A. Smirnov, N. Vahidi, T. Walczak, M. Wu, R.B. Clarkson. The Use of EPR for the Measurement of the Concentration of Oxygen In Vivo In Tissues Under Physiologically Pertinent Conditions and Concentrations. In Oxygen Transport to Tissue XIV, W. Erdmann, D. F. Bruley (Eds.) New York, NY: Plenum Press, pp. 221–228 (1992).
175. T. Nakashima, J. Jiang, F. Goda, T. Shima, H.M. Swartz. The Measurement of \( pO_2 \) In Mouse Liver In Vivo By EPR Oximetry Using India Ink. Magn. Reson. Med. (Japan) 6: 158–160 (1995).

176. K.J. Liu, P. Gast, M. Moussavi, S.W. Norby, N. Vahidi, T. Walczak, M. Wu, H.M. Swartz. Lithium Phthalocyanine: A Probe for EPR Oximetry in Viable Biological Systems. Proc. Natl. Acad. Sci. 90: 5438–5442 (1993).

177. N. Vahidi, R.B. Clarkson, K.J. Liu, S.W. Norby, M. Wu, H.M. Swartz. In Vivo and In vitro EPR Oximetry with Fusinite: A New Coal-Derived, Particulate EPR Probe. Magn. Reson. Med., 31: 139–146 (1994).

178. H.M. Swartz, T. Sarna, L. Zecca. Modulation by Neuromelanin of the Availability and Reactivity of Metal Ions. Annals of Neurology 32: S69-S75 (1992).

179. W.S. Enochs, M.J. Nilges, H.M. Swartz. A Standardized Test for the Identification and Characterization of Melanins Using Electron Paramagnetic Resonance (EPR) Spectroscopy. Pigment Cell Biology 6: 91–99 (1993).

180. W.S. Enochs, T. Sarna, L. Zecca, P.A. Riley, H.M. Swartz. The Roles of Neuromelanin, Binding of Metal Ions, and Oxidative Cytotoxicity in the Pathogenesis of Parkinson’s Disease: A Hypothesis. J. Neural Transm. (P-D Sect.) 7: 83–100 (1994).

181. H.M. Swartz, T. Walczak. In Vivo EPR: Prospects for the ’90’s. Phys. Med. 9:41–48 (1993).

182. L.L. Ji, R.G. Fu, E.W. Mitchell, M. Griffiths, T.G. Waldrop, H.M. Swartz. Cardiac Hypertrophy Alters Myocardial Response to Ischemia and Reperfusion In Vivo, Acta Physiol. Scand. 151: 279–290 (1994).

183. A. Liègeza, H.M. Swartz, W.K. Subczynski. Spin-Label Oximetry in Dense Cell Suspensions: Problems in Closed and Open-Chamber Methods. Current Topics in Biophy. 18: 29–38 (1994).

184. L.L. Ji, R. G. Fu, T.G. Waldrop, K.J. Liu, H.M. Swartz. Myocardial Response to Regional Ischemia and Reperfusion In Vivo in Rat Heart. Can. J. Physiol. Pharmacol. 71: 811–817 (1993).

185. L. Zecca, H.M. Swartz. Total and Paramagnetic Metals in Human Substantia Nigra and Its Neuromelanin. J. Neural Transm. 5: 203–213 (1993).

186. W.S. Enochs, M.J. Nilges, H.M. Swartz. Purified Human Neuromelanin, Synthetic Dopamine Melanin as a Potential Model Pigment, and the Normal Human Substantia Nigra: Characterization by Electron Paramagnetic Resonance Spectroscopy. J. Neurochem. 61: 68–79 (1993).

187. J.J. Eckburg, J.C. Chato, K.J. Liu, M.W. Grinstaff, K.S. Suslick, H.M. Swartz. Biological Temperature Measurements Using Electron Paramagnetic Resonance (EPR) Spectroscopy. Advances in Biological Heat and Mass Transfer, HTD-Vol. 231, ASME 47–55 (1992).

188. A.I. Smirnov, S.W. Norby, T. Walczak, K.J. Liu, H.M. Swartz. Physical and Instrumental Considerations in the Use of Lithium Phthalocyanine for Measurements of the Concentration of Oxygen. J. Magn. Reson. 103: 95–102 (1994).

189. A.I. Smirnov, S.W. Norby, R.B. Clarkson, T. Walczak, H.M. Swartz. Simultaneous Multi-Site EPR Spectroscopy In Vivo. Magn. Reson. Med. 30: 213–220 (1993).
191. L. S. Liu, R.L. Zheng, H.M. Swartz, Z. Y. Zhang, L. L. Wei. DNA Synthesis Inhibition of Nitroxide Radicals on Leukemia Cells. Science in China 34: 1063–1069 (1991).

192. W.S. Enochs, M.J. Nilges, H.M. Swartz. The Minocycline-Induced Thyroid Pigment and Several Synthetic Models: Identification and Characterization by Electron Paramagnetic Resonance (EPR) Spectroscopy. J. Pharm. Exp. Therap. 226: 1164–76 (1993).

194. M. Wu, H.M. Swartz. Evaluation of the Potential Cytotoxicity of Paramagnetic Materials Used in Measurements of the Concentration of Oxygen. Current Topics in Biophysics 18: 74–80 (1994).

195. H.M. Swartz. Measurements of Intracellular Concentrations of Oxygen: Experimental Results and Conceptual Implications of an Observed Gradient Between Intracellular and Extracellular Concentrations of Oxygen. Adv. Exp. Med. Biol. 345: 799–806 (1994).

196. N. Yumita, R. Nishigaki, K. Umemura, P.D. Morse, H.M. Swartz, C. A. Cain, S. Umemura. Sonochemical Activation of Hematoporhyrin: An ESR Study. Radiat. Res. 138: 171–176 (1994).

197. G. Bačić, K.J. Liu, J.A. O’Hara, R.D. Harris, K. Szybinski, F. Goda, H.M. Swartz. Oxygen Tension in a Murine Tumor: A Combined EPR and MRI Study. Magn. Reson. Med. 30: 568–572 (1993).

198. T. Suzuki-Nishimura, H.M. Swartz. Characterization of Redox Activity in Resting and Activated Mast Cells by Reduction and Reoxidation of Lipophilic Nitroxides. Gen. Pharmac. 31: 617–623 (1998).

199. T. Suzuki-Nishimura, H.M. Swartz. Reduction of Lipid-Soluble Nitroxides in CHO Cells and Macrophage Tumor Cells. Free Rad. Biol. Med. 17: 473–479 (1994).

200. H.M. Swartz, K.J. Liu, F. Goda, T. Walczak. India Ink: A Potential Clinically Applicable EPR Oximetry Probe. Magn. Reson. Med. 31: 229–232 (1994).

201. P.E. James, S. K. Jackson, O. Grinberg, H.M. Swartz. The Effects of Endotoxin on Oxygen Consumption of Various Cell Types In vitro: An EPR Oximetry Study. Free Rad. Biol. Med. 18: 641–647 (1995).

202. H.M. Swartz. The Concentration of Oxygen is Too Important of a Variable to be Ignored in Experiments Studying Oxidative Damage! In The Oxygen Paradox, K.J.A. Davies, F. Ursini Ed., Padova, Italy: CLEUP University Press, pp. 105–122 (1995).

203. B.J. Friedman, O.Y. Grinberg, K. Isaacs, E.K. Ruuge, H.M. Swartz. Effect of Repetitive Ischemia on Local Myocardial Oxygen Tension in Isolated Perfused and Hypoperfused Rat Hearts. Magn. Reson. Med. 35: 214–220 (1996).

204. F. Goda, G. Bačić, J.A. O’Hara, B. Gallez, H.M. Swartz, J.F. Dunn. The Relationship between pO₂ and Perfusion in Two Murine Tumors After X-ray Irradiation: A Combined Gd-DTPA Dynamic MRI and In Vivo EPR Oximetry Study. Cancer Res. 56: 3344–3349 (1996).

205. J. J. Eckburg, J. C. Chato, K.J. Liu, M. W. Grinstaff, H.M. Swartz, K. S. Suslick, F. P. Auteri. The Measurement of Temperature with Electron Paramagnetic Resonance Spectroscopy. Trans. ASME, J. Biomech. Eng. 118: 193–200 (1996).
207. H.M. Swartz, G. Bačić, B. Friedman, F. Goda, O.Y. Grinberg, P.J. Hoopes, J. Jiang, K.J. Liu, T. Nakashima, J. O’Hara, T. Walczak. Measurement of pO2 In Vivo, Including Human Subjects by Electron Paramagnetic Resonance. Adv. Exp. Med. Biol. 361: 119–128 (1995).

208. B.J. Friedman, O.Y. Grinberg, S.A. Grinberg, H.M. Swartz. Myocardial Oxygen Tension in Isolated Erythrocyte-Perfused Rat Hearts and Comparison with Crystalloid Media. J. Mol. Cell Cardiol. 29: 2855–2858 (1997).

209. K. Mäder, H.M. Swartz, R. Stösser, H. H. Borchert. The Application of EPR Spectroscopy in the Field of Pharmacy. Pharmazie 49: 97–101 (1994).

210. H.M. Swartz. Workshop Report: Biophysics of Melanin and Informal Group on the Characterization of Neuromelanin. Pigment Cell Research 7: 244 (1994).

211. B.J. Friedman, O.Y. Grinberg, K. Isaacs, T.M. Walczak, H.M. Swartz. Myocardial Oxygen Tension and Relative Capillary Density in Isolated Perfused Rat Hearts. J. Mol. Cell. Cardiol. 27: 2551–2558 (1995).

212. H.M. Swartz, G. Bačić. EPR and In Vivo EPR: Roles for Experimental and Clinical NMR Studies. In Encyclopedia of NMR, D.M. Grant, R.K. Harris (Eds.) New York, NY: John Wiley & Sons, pp 1928–1938 (1998).

213. J. Jiang, K.J. Liu, T.M. Walczak, H.M. Swartz. An Analysis of the Effects of Eddy Currents on L-Band EPR Spectra. J. Magn. Reson. 106: 220–226 (1995).

214. K.J. Liu, X. Shi, J. Jiang, F. Goda, N. Dalal, H.M. Swartz. Low Frequency Electron Paramagnetic Resonance Investigation on Metabolism of Chromium (VI) by Whole Live Mice. Annals of Clin., Lab. Sci. 26: 176–184 (1996).

215. H.M. Swartz, K. Mäder. Free Radicals in Aging: Theories, Facts, and Artifacts. Dahlem Konferenzen. Molecular Aspects of Aging 7: 77–97 (1995).

216. H.M. Swartz, H. Halpern. EPR Studies of Living Animals and Related Model Systems (In Vivo EPR). In Spin Labeling: The Next Millennium. L.J. Berliner (Ed.), New York, NY: Plenum Publishing, pp. 367–404 (1998).

217. T.M. Shima, T. Sarna, L. Zecca, H.M. Swartz. Interaction in Situ of Neuromelanin with Paramagnetic Metals in Substantia Nigra: An EPR study. Magn. Reson. Med. (Japan) 6: 353–358 (1995).

219. T.M. Shima, T. Sarna, H.M. Swartz, A. Stroppolo, R. Gerbasi, L. Zecca. The Binding of Iron to Neuromelanin of Human Substantia Nigra and Synthetic Melanin: An Electron Resonance Spectroscopy Study. Free Rad. Biol. Med. 23: 110–119 (1997).

220. K. Liu, M.W. Grinstaff, J. Jiang, K.S. Suslick, H.M. Swartz, W. Wang. In Vivo Measurement of Oxygen Concentration Using Sonochemically Synthesized Microspheres. Biophys. J. 67(2): 896–901 (1994).

221. L. Zecca, T. Shima, A. Stroppolo, C. Goj, G. Battiston, R. Gerbasi, T. Sarna, H.M. Swartz. Interaction of Neuromelanin and Iron in Substantia Nigra and Other Areas of Human Brain. Neuroscience. 73(2): 407–415 (1996).

222. F. Goda, K.J. Liu, T. Walczak, J.A. O’Hara, J. Jiang, H.M. Swartz. In Vivo EPR Oximetry Using EPR and India Ink, Magn. Reson. Med. 33: 237–245 (1995).

224. K.J. Liu, J. Jiang, H.M. Swartz, X. Shi. Low Frequency EPR Investigation on Chromium (VI) Reduction in Whole Mice. Arch. Biochem. Biophys. 313: 248–252 (1994).
225. T. Nakashima, F. Goda, J. Jiang, T. Shima, H.M. Swartz. Use of EPR Oximetry with India Ink to Measure the $pO_2$ in the Liver In Vivo in Mice. Magn. Reson. Med. 34: 888–892 (1995).

226. N. Kocherginsky, H.M. Swartz (ed). Nitroxide Spin Labels: Reactions in Biology and Chemistry. Boca Raton, FL: CRC Press (1995).

227. J. Jiang, K.J. Liu, L. Ji, H.M. Swartz. An Observation of Artifacts in EPR Spin Trapping: Free Radicals Produced by the Polytron. EPR Newsletter 7: 19–20, Fall (1995).

228. P.E. James, O.Y. Grinberg, G. Michaels, H.M. Swartz. Intraphagosomal Oxygen in Stimulated Macrophages. J. Cell. Physiol. 163: 241–247 (1995).

229. P.E. James, G. Bačić, O.Y. Grinberg, F. Goda, J. Dunn, S.K. Jackson, H.M. Swartz. Endotoxin Induced Changes in Intrarenal $pO_2$ Measured by In Vivo Electron Paramagnetic Resonance Oximetry and Magnetic Resonance Imaging. Free Rad. Biol. Med. 21: 25–34 (1996).

230. K.J. Liu, J. Jiang, L. Li, X. Shi, H.M. Swartz. An HPLC and EPR Investigation on the Stability of DMPO and DMPO Spin Adducts In Vivo. Res. Chem. Intermed. 22: 499–509 (1996).

231. J. Jiang, K.J. Liu, X. Shi, H.M. Swartz. Detection of Short-Lived Free Radicals by Low Frequency ESR Spin Trapping in Whole Living Animals: Evidence of Sulfur Trioxide Anion Free Radical Generation In Vivo. Arch. Biochem. Biophys., 319: 570–573 (1995).

232. K.J. Liu, G. Bačić, P.J. Hoopes, J. Jiang, H. Du, L. Ou, J.F. Dunn, H.M. Swartz. Assessment of Cerebral $pO_2$ by EPR Oximetry in Rodents: Effects of Anesthesia, Ischemia, and Breathing Gas. Res. Brain. Res. 685: 91–98 (1995).

233. H.M. Swartz. EPR Studies of Cells and Tissue. In Foundations of Modern EPR. S. Eaton, G. Eaton, K. Salikhov (Eds.) Singapore/New Jersey/London: World Scientific Publishing, pp. 451–458 (1998).

234. H.M. Swartz, L.J. Berliner. In Vivo EPR. In Foundations of Modern EPR. S. Eaton, G. Eaton, K. Salikhov (Eds). Singapore/New Jersey/London: World Scientific Publishing pp. 361–378 (1998).

235. B. Gallez, G. Bačić, J. Dunn, F. Goda, J. Jiang, J.A. O’Hara, H.M. Swartz. Use of Nitroxides for Assessing Perfusion, Oxygenation, and Viability of Tissues: In Vivo EPR and MRI Studies. Magn. Reson. Med. 35: 97–106 (1996).

236. J.F. Dunn, S. Ding, J.A. O’Hara, K.J. Liu, E. Rhodes, J. B. Weaver, H.M. Swartz. The Apparent Diffusion Constant Measured by MRI Correlates with $pO_2$ in a RIF-1 Tumor. Magn. Reson. Med. 34: 515–519 (1995).

237. N. M. Kocherginsky, J. K. Liu, H.M. Swartz. Thermo-Induced Phase Transitions and Regulation of Permeability of Biomimetic Membranes. In Biofunctional Membranes, D.A. Butterfield (Ed.), New York, NY: Plenum Press, pp. 163–171 (1996).

238. H.M. Swartz, G. Bačić, B. Gallez, F. Goda, P. James, J. Jiang, K.J. Liu, K. Mäder, T. Nakashima, J. O’Hara, T. Shima, T. Walczak. In Vivo EPR Spectroscopy. In Bioradicals Detected by ESR Spectroscopy. H. Ohya-Nishiguchi, L. Packers (Eds.), Basel, Switzerland: Birkhauser Verlag Publisher, pp. 285–299 (1995).
239. K. Mäder, G. Bačić, H.M. Swartz. In Vivo Detection of Anthralin-Derived Free Radicals in the Skin of Hairless Mice by Low-Frequency Electron Paramagnetic Resonance Spectroscopy. J. Invest. Derm. 104: 514–517 (1995).

240. K. Mäder, B. Gallez, K.J. Liu, H.M. Swartz. Noninvasive In Vivo Characterization of Release Processes in Biodegradable Polymers by Low Frequency Electron Paramagnetic Resonance Spectroscopy. Biomaterials 17: 457–461 (1996).

241. K.J. Liu, X. Shi, J. Jiang, F. Goda, N. Dalal, H.M. Swartz. Chromate-induced Chromium (V) Formation in Live Mice and Its Control by Cellular Antioxidants: An L-band EPR Study. Arch. Biochem. Biophys. 323: 33–39 (1995).

242. K.J. Liu, J. Jiang, X. Shi, H. Gabrys, T. Walczak, H.M. Swartz. Low Frequency EPR Study of Chromium (V) Formation from Chromium (VI) in Living Plants. Biochem. Biophys. Res. Comm. 206: 829–834 (1995).

243. J. Jiang, T. Nakashima, T. Shima, K.J. Liu, F. Goda, H.M. Swartz. Measurement of pO₂ in Liver Using EPR Oximetry. J. Appl. Physiol. 80: 552–558 (1996).

245. F. Goda, J.A. O’Hara, K.J. Liu, E.S. Rhodes, J.F. Dunn, H.M. Swartz. Comparisons of Measurements of pO₂ in Tissue In Vivo By EPR Oximetry and Micro-Electrodes. Adv. Exp. Med. Biol. 411: 543–549 (1997).

246. J.A. O’Hara, F. Goda, K.J. Liu, G. Bačić, P.J. Hoopes, H.M. Swartz. pO₂ in a Murine Tumor Following Radiation: An In Vivo Electron Paramagnetic Resonance Oximetry Study. Radiat. Res. 144: 222–229 (1995).

247. B. Gallez, G. Bačić, H.M. Swartz. Evidence for the Dissociation of the Hepatobiliary MRI Contrast Agent Mn-DPDP. Magn. Reson. Med. 35: 14–19 (1996).

248. F. Goda, J.A. O’Hara, E.S. Rhodes, K.J. Liu, J.F. Dunn, G. Bačić, H.M. Swartz. Changes of Oxygen Tension in Experimental Tumors After a Single Dose of X-Ray Irradiation. Canc. Res. 55: 2249–2252 (1995).

249. T. Sarna, H.M. Swartz. Physical Properties of Melanins. In The Pigmentary System: Physiology and Pathophysiology, J.J. Nordlund, R.E. Boissy, VJ. Hearing, R.A. King, J.P. Ortonne (Eds.), New York, NY: Oxford University Press, Chap. 25, pp. 333–358 (1998).

250. K. Mäder, A. Domb, H.M. Swartz. Gamma Sterilization Induced Radicals in Biodegradable Drug Delivery Systems. Appl. Radiat. Isot. 47: 1669–1674 (1996).

251. K. Mäder, B. Gallez, H.M. Swartz. In Vivo EPR: An Effective New Tool For Studying Pathophysiology, Physiology, and Pharmacology. Appl. Radiat. Isot. 47: 1663–1667 (1996).

252. B. Gallez, K. Mäder, H.M. Swartz. Noninvasive Measurement of the pH Inside the Gut using pH-Sensitive Nitroxides. An In Vivo EPR Study. Magn. Reson. Med. 36: 694–697 (1996).

253. N. Kocherginsky, H.M. Swartz. Terminology, Classification, and Distribution of the Nitroxides in Cells. In Nitroxide Spin Labels, Reactions in Biology and Chemistry, N. Kocherginsky, H.M. Swartz (ed). Boca Raton, FL: CRC Press Inc., pp. 15–25 (1995).

255. N. Kocherginsky, H.M. Swartz. Chemical Reactivity of Nitroxides. In Nitroxide Spin Labels, Reactions in Biology and Chemistry, N. Kocherginsky, H.M. Swartz (ed). Boca Raton, FL: CRC Press Inc., pp. 25–65 (1995).
256. N. Kocherginsky, H.M. Swartz. Applications of Reactions of Nitroxides in Biophysics. *In Nitroxide Spin Labels, Reactions in Biology and Chemistry*, N. Kocherginsky, H.M. Swartz (ed). Boca Raton, FL: CRC Press Inc., pp. 67–93 (1995).
257. N. Kocherginsky, H.M. Swartz. Biochemical Basis of Reduction of Nitroxides in Membranes *In Nitroxide Spin Labels, Reactions in Biology and Chemistry*, N. Kocherginsky, H.M. Swartz (ed). Boca Raton, FL: CRC Press Inc., pp. 95–111 (1995).
258. H.M. Swartz, M. Sentjurc, N. Kocherginsky. Metabolism of Nitroxides and Their Products in Cells. *In Nitroxide Spin Labels, Reactions in Biology and Chemistry*, N. Kocherginsky, H.M. Swartz (ed). Boca Raton, FL: CRC Press Inc., pp. 113–147 (1995).
259. H.M. Swartz, M. Sentjurc, N. Kocherginsky. Metabolism and Distribution of Nitroxides in Tissues and Organs. *In Nitroxide Spin Labels, Reactions in Biology and Chemistry*, N. Kocherginsky, H.M. Swartz (ed). Boca Raton, FL: CRC Press Inc., pp. 149–152 (1995).
260. H.M. Swartz, M. Sentjurc, N. Kocherginsky. Metabolism and Distribution of Nitroxides In Vivo *In Nitroxide Spin Labels, Reactions in Biology and Chemistry*, N. Kocherginsky, H.M. Swartz (ed). Boca Raton, FL: CRC Press Inc., pp. 153–171 (1995).
261. H.M. Swartz, M. Sentjurc, N. Kocherginsky. Toxicity and the Use of Nitroxides as Drugs. *In Nitroxide Spin Labels, Reactions in Biology and Chemistry*, N. Kocherginsky, H.M. Swartz (ed). Boca Raton, FL: CRC Press Inc., pp. 175–197 (1995).
262. M. Sentjurc, H.M. Swartz, N. Kocherginsky. Metabolism, Toxicity, and Distribution of Spin Traps. *In Nitroxide Spin Labels, Reactions in Biology and Chemistry*, N. Kocherginsky, H.M. Swartz (ed). Boca Raton, FL: CRC Press Inc., pp. 199–206 (1995).
263. G. Bačić, K.J. Liu, F. Goda, P.J. Hoopes, G.M. Rosen, H.M. Swartz. MRI Contrast Enhanced Study of Cartilage Proteoglycan Degradation in the Rabbit Knee. *Magn. Reson. Med.* 37: 764–768 (1997).
264. O.Y. Grinberg, S. A. Grinberg, B.J. Friedman, H.M. Swartz. Myocardial Oxygen Tension and Capillary Density in the Isolated Perfused Rat Heart During Pharmacological Intervention. *Adv. Exp. Med. Biol.* 411: 171–181 (1997).
265. J. Jiang, K.J. Liu, S. Jordan, H.M. Swartz, R.P. Mason. Detection of Free Radical Metabolite Formation Using EPR Spectroscopy: Evidence of Rat Hemoglobin Thiyl Radical In Vivo Formation Following Administration of Phenylhydrazine. *Arch. Biochem. Biophys.* 330: 266–70 (1996).
266. J.F. Dunn, S. Ding, J.A. O’Hara, K.J. Liu, E. Rhodes, F. Goda, H.M. Swartz. Can NMR Diffusion-Weighted Imaging Provide Quantitative Information on Tumor Interstitial pO2? *Adv. Exp. Med. Biol.* 411: 209–214 (1997).
267. F. Goda, B. Gallez, H.M. Swartz. Pharmacokinetics of the Nitroxide PCA Measured by In Vivo EPR. *Res. Chem. Intermed.* 22: 491–498 (1996).
268. H.M. Swartz, T. Walczak. An Overview of Considerations and Approaches for Developing In Vivo EPR for Clinical Applications. *Res. Chem. Intermed.* 22: 511–523 (1996).
269. K.J. Liu, P.J. Hoopes, E.L. Rolett, B. Beerle, A. Azzawi, F. Goda, J.F. Dunn, H.M. Swartz. Effect of Anesthesia on Cerebral Tissue Oxygen and Cardiopulmonary Parameters in Rats. Adv. Exp. Med. Biol. 428: 33–39 (1997).

270. P.J. Hoopes, K.J. Liu, G. Bačić, E.L. Rolett, J.F. Dunn, H.M. Swartz. Histological Assessment of Rodent CNS Tissues to EPR Oximetry Probe Material. Adv. Exp. Med. Biol., 428: 13–21 (1997).

271. P.E. James, F. Goda, O.Y. Grinberg, K.G. Szybinski, H.M. Swartz. Intrarenal \( pO_2 \) Measured by EPR Oximetry and the Effects of Bacterial Endotoxin. Adv. Exp. Med. Biol. 428: 557–568 (1997).

272. J.A. O’Hara, F. Goda, J.F. Dunn, H.M. Swartz. Potential for EPR Oximetry to Guide Treatment Planning for Tumors. Adv. Exp. Med. Biol. 428: 233–242 (1997).

273. J. Jiang, K.J. Liu, H.M. Swartz. Low Frequency EPR Surface Probe Based on Dielectric Resonator. Res. Chem. Intermed. 22: 539–547 (1996).

274. B. Gallez, R. Debuyst, K.J. Liu, R. Demeure, F. Dejehet, H.M. Swartz. Development of Biocompatible Implants of Fusinite for In Vivo Oximetry. MAGMA. 4: 71–75 (1996).

275. P. James, O. Grinberg, F. Goda, T. Panz, J. O’Hara, H.M. Swartz. Gloxy: An Oxygen-Sensitive Coal for Accurate Measurement of Low Oxygen Tensions in Biological Systems. Magn. Reson. Med. 37: 48–58 (1997).

276. P.E. James, O.Y. Grinberg, H.M. Swartz. Superoxide Production by Phagocytosing Macrophages in Relation to the Intracellular Distribution of Oxygen. J. Leukocyte Biol. 64: 78–84 (1998).

277. K. Mäder, G Bačić, A. Domb, O. Elmalak, R. Langer, H.M. Swartz. Noninvasive In Vivo Monitoring of Drug Release and Polymer Erosion from Biodegradable Polymers by EPR Spectroscopy and NMR Imaging. J. Pharm. Sciences 86: 126–134 (1997).

278. K. Mäder, Y. Cremmilleux, A. Domb, J.F. Dunn, H.M. Swartz. In vitro/In Vivo Comparison of Drug Release and Polymer Erosion from Biodegradable (P(FAD-SA) Polyanhydrides—A Noninvasive Approach by the Combined Use of Electron Paramagnetic Resonance Spectroscopy and Nuclear Magnetic Resonance Imaging. Pharm. Res. 14: 820–826 (1997).

279. H.M. Swartz, J. Dunn, O. Grinberg, J. O’Hara, T. Walczak. What Does EPR Oximetry with Solid Particles Measure—And How Does This Relate to Other Measures of \( pO_2 \)? Adv. Exp. Med. Biol. 428: 663–670 (1997).

280. S.K. Jackson. P.E. James, H.M. Swartz. The Effect of Lipopolysaccharide on Intra-Phagosomal Oxygen Concentration as Measured by EPR Oximetry. Adv. Exp. Med. Biol. 428: 613–620 (1997).

281. J.F. Dunn, H.M. Swartz. Blood Oxygenation: Heterogeneity of Hypoxic Tissues Monitored Using Bold MR Imaging. Adv. Exp. Med. Biol., 428: 645–650 (1997).

282. J.A. O’Hara, P.E. James, T. Panz, O. Grinberg, N. Jain, J. Dunn, H.M. Swartz. Determining the Anatomic Position and Histological Effects in Tumors of Gloxy, an Oxygen Sensitive Paramagnetic Material. Adv. Exp. Med. Biol. 428: 107–113 (1997).
284. P.E. James, J.A. O’Hara, O.Y. Grinberg, T. Panz, H.M. Swartz. Intratumoral pO2 Measured Using a New Oxygen Sensitive Paramagnetic Material, Gloxy. Adv. Exp. Med. Biol. 428: 97–106 (1997).

285. O.Y. Grinberg, B.J. Friedman, H.M. Swartz. Intramyocardial pO2 Measured by EPR. Adv. Exp. Med. Biol. 428: 261–268 (1997).

286. H. Hirata, T. Walczak, H.M. Swartz. An Improved Inductive Coupler for Suppressing a Shift in the Resonance Frequency of Electron Paramagnetic Resonance Resonators. Rev. Sci. Inst. 68: 3187–3191 (1997).

287. K.J. Liu, K. Mäder, X. Shi, H.M. Swartz. Reduction of Carcinogenic Chromium (VI) on the Skin of Living Rats. Magn. Reson. Med. 38: 524–526 (1997).

288. H.M. Swartz. Potential Use of In Vivo Electron Paramagnetic Resonance (EPR, ESR) for In Vivo Dosimetry under Field Conditions. Proceedings: Triage of Irradiated Personnel—An Armed Forces Radiobiology Research Institute Workshop, D21-D23 (1998).

289. B. Gallez, R. Debuyst, F. Dejehet, K.J. Liu, T. Walczak, H.M. Swartz, F. Goda, R. Demeure, H. Taper. Small Particles of Fusinite and Carbohydrate Chars Coated with Aqueous Soluble Polymers: Preparation and Applications for In Vivo EPR Oximetry. Magn. Reson. Med. 40:152–159 (1998).

290. P.E. James, K.J. Liu, H.M. Swartz. Direct Detection of Tissue Nitric Oxide in Septic Mice. Adv. Exp. Med. Biol. 454: 181–187 (1998).

291. H.M. Swartz, T. Walczak. Developing In Vivo EPR Oximetry for Clinical Use. Adv. Exp. Med. Biol. 454: 243–252 (1998).

292. O.Y. Grinberg, P.E. James, H.M. Swartz. Are There Significant Gradients of pO2 in Cells? Adv. Exp. Med. Biol. 454: 415–423 (1998).

293. H.M. Swartz, K.J. Liu, T. Walczak, T. Panz, M. Kobayashi, W. Zavadoski. Effects of Coatings on the Reactivity of Inorganic Sunscreen Agents to Light. J. Cosmet. Sci. 49: 125–135 (1998).

294. H.M. Swartz, R.B. Clarkson. The Measurement of Oxygen In Vivo Using EPR Techniques. Phys. Med. Biol. 43: 1957–1975 (1998).

295. F. Goda, H.M. Swartz, M. Goda, M. Tanabe, H. Maeta. In Vivo ESR Oximetry. Magn. Reson. Med. (in Japanese) 8: 71–74 (1997).

296. B.J. Friedman, O.Y. Grinberg, N.R. Ratcliffe, H.M. Swartz, W.F. Hickey. Acute Hemodynamic and Coronary Circulatory Effects of Experimental Autoimmune Myocarditis. Heart Vessels. 13: 58–62 (1998).

297. M. Miyake, J.A. O’Hara, P.E. James, T. Panz, H.M. Swartz. Histological Examination of the Biological Interactions of the Oxygen Sensitive Paramagnetic Material Gloxy with Various Tissues of Mice. Proceedings of ESR (EPR) Imaging and In Vivo ESR Spectroscopy, H. Kamada, H. Ohya (Eds.), Yamagata, Japan, pp. 252–254 (1998).

298. H.M. Swartz, T. Walczak. Initial Clinical EPR Studies: Potential Problems and their Solutions. Proceedings of ESR (EPR) Imaging and In Vivo ESR Spectroscopy, H. Kamada, H. Ohya (Eds.), Yamagata, Japan, pp. 189–192 (1998).

299. K.J. Liu, Y. Kotake, H.M. Swartz. Direct Detection of Reactive Species by In Vivo EPR. Proceedings of ESR (EPR) Imaging and In Vivo ESR Spectroscopy, H. Kamada, H. Ohya (Eds.), Yamagata, Japan, pp. 197–201 (1998).
300. K.J. Liu, M. Miyake, P.E. James, H.M. Swartz. Separation and Enrichment of the Active Component of Carbon Based Paramagnetic Materials for Use in EPR Oximetry. J. Magn. Reson. 133: 291–298 (1998).

301. J.A. O’Hara, F. Goda, E. Demidenko, H.M. Swartz. Effect on Regrowth Delay in a Murine Tumor of Scheduling Split Dose Irradiation Based on Direct pO₂ Measurements by Electron Paramagnetic Resonance Oximetry. Radiat. Res. 150: 549–556 (1998).

302. H.M. Swartz, Graham S. Timmins. The Metabolism of Nitroxides in Cells and Tissues Used to Study Functional Biological Systems In vitro and In Vivo. In Toxicology of the Human Environment: The Critical Role of Free Radicals, C.J. Rhodes (Ed.) New York, NY, NY: Taylor & Francis Inc. pp. 91–112 (2000).

303. P.E. James, J.A. O’Hara, S. Grinberg, T. Panz, H.M. Swartz. Impact of the Antimetastatic Drug Batimastat on Tumor Growth and pO₂ Measured by EPR Oximetry in a Murine Mammary Adenocarcinoma. Adv. Exp. Med. Biol. 471: 487–496 (1999).

304. K.J. Liu, M. Miyake, T. Panz, H.M. Swartz. Evaluation of DEPMPO as a Spin Trapping Agent in Biological Systems. Free Rad. Biol Med. 26: 714–721 (1999).

305. H.M. Swartz, A. Iwasaki, T. Walczak, P. Starewicz, D. Schauer. Measurements of Clinically Significant Doses Using Non-Invasive In Vivo EPR Spectroscopy of Teeth In Situ. Proceedings: 36th Midyear Meeting of the Health Physics Society (2003).

306. F. Goda, J.A. O’Hara, H. Usuki, M. Goda, H. Maeta, H.M. Swartz. Effect of Tumor pO₂ on Tumor Control after Split Dose of Radiation. Proceedings of ESR (EPR) Imaging and In Vivo ESR Spectroscopy, H. Kamada, H. Ohya (Eds.), Yamagata, Japan, pp. 246–248 (1998)

307. L. Honzak, M. Sentjurc, H.M. Swartz. In Vivo EPR of Topical Delivery of a Hydrophilic Substance Encapsulated in Multilamellar Liposomes Applied to the Skin of Hairless and Normal Mice. J. Control. Release. 66: 221–228 (2000).

308. S. Taie, S. Leichtweis, K.J. Liu, M. Miyake, O. Grinberg, E. Demidenko, H.M. Swartz. The Effects of Ketamine-Xylazine and Pentobarbital Anesthesia on Cerebral Tissue Oxygen Tension. Blood Pressure. and Arterial Blood Gas in Rats. Adv. Exp. Med. Biol. 471: 189–198 (1999).

309. P.E. James, M. Miyake, H.M. Swartz. Simultaneous Measurement of NO and pO₂ from Tissue by In Vivo EPR. Nitric Oxide. 3: 292–301 (1999).

310. K.J. Liu, Y. Kotake, M. Lee, M. Miyake, K. Sugden, Z. Yu, H.M. Swartz. HPLC Study of the Pharmacokinetics of Various Spin Traps for Application to In Vivo Spin Trapping. Free Rad. Biol. Med. 27: 82–89 (1999).

311. M. Miyake, K.J. Liu, T. Walczak, H.M. Swartz. In Vivo EPR Dosimetry of Accidental Exposures to Radiation: Experimental Results Indicating the Feasibility of Practical Use in Human Subjects. Appl. Rad. Isot. 52: 1031–1038 (2000).

312. S.W. Norby, H.M. Swartz, R.B. Clarkson. Electron and Light Microscopy Studies on Particulate EPR Spin Probes Lithium Phthalocyanine, Fusinite and Synthetic Chars. J. Microsc. 12: 172–185 (1998).
313. E.L. Rollett, A. Azzawi, K.J. Liu, N.M. Yongbi, H.M. Swartz, J.F. Dunn. Critical Oxygen Tension in Rat Brain: A Combined (31)P-NMR and EPR Oximetry Study. Am. J. Physiol. Regul. Integr. Comp. Physiol. 279(1): R9-R16 (2000).

314. G.S. Timmins, K.J. Liu, E.J.H. Bechara, Y. Kotake, H.M. Swartz. Trapping of Free Radicals with Direct In Vivo EPR Detection: A Comparison of 5,5-Dimethyl-1-Pyrroline-N-oxide (DMPO) and 5-Diethoxycarbonyl-5-Methyl-1-Pyrroline-N-oxide (DEPMPO) as Spin Traps for HO· and SO4·-. Free Rad. Biol. Med. 27: 329–333 (1999).

315. H. Hirata, T. Walczak, H.M. Swartz. Electronically Tunable Surface-Coil-Type Resonator for L-Band EPR Spectroscopy. J. Magn. Reson. 142: 159–167 (2000).

316. A. Barchowsky, L.R. Klei, E.J. Dudek, H.M. Swartz, P.E. James. Stimulation of Reactive Oxygen, but not Reactive Nitrogen Species, in Vascular Endothelial Cells Exposed to Low Levels of Arsenite. Free Rad. Biol. Med. 27: 1405–1412 (1999).

317. P.E. James, L.R. Klei, H.M. Swartz, A. Barchowsky. Intracellular Free Radicals Detected Within Porcine Endothelial Cells. Free Rad. Bio. Med. 25 (1): S 22 (1998).

318. H.M. Swartz, L. Berliner. Introduction to In Vivo EPR. In In Vivo EPR (ESR): Theory and Application. Biological Magnetic Resonance – Vol. 18, L.J. Berliner (Ed.) New York, NY: Plenum Publishing Co. pp. 1–21 (2003).

319. H.M. Swartz. The Measurement of Oxygen In Vivo Using EPR Techniques. In In Vivo EPR (ESR): Theory and Application. Biological Magnetic Resonance – Vol. 18, L.J. Berliner (Ed.), New York, NY: Plenum Publishing Co., pp. 403–440 (2003).

320. J.F. Dunn, H.M. Swartz. Combining NMR and EPR/ESR for In Vivo Experiments. In In Vivo EPR (ESR): Theory and Application. Biological Magnetic Resonance – Vol. 18, L.J. Berliner (Ed.), New York, NY: Plenum Publishing Co. pp. 579–597 (2003).

321. B.W. Pogue, J.A. O’Hara, K.J. Liu, T. Hasan, H.M. Swartz. Photodynamic Treatment of the RIF-1 Tumor with Verteporfin with Online Monitoring of Tissue Oxygen using Electronic Paramagnetic Resonance Oximetry. SPIE 3601: 108–114 (1999).

322. G.S. Timmins, C.A.A. Penatti, E.J.H. Bechara, H.M. Swartz. Measurement of Oxygen Partial Pressure, Its Control During Hypoxia and Hyperoxia, and Its Effect Upon Light Emission in a Bioluminescent Elaterid Larva. J. Exp. Biol. 202: 2631–2638 (1999).

323. J.A. O’Hara, R.D. Blumenthal, O.Y. Grinberg, S. Grinberg, C.M. Martin, D.M. Goldenberg, H.M. Swartz. Tumor pO2 Assessments in Human Xenograft Tumors Measured by EPR Oximetry: Location of Paramagnetic Materials. Adv. Exp. Biol. Med. 530: 205–214 (2003).

324. J.A. O’Hara, R.D. Blumenthal, O.Y. Grinberg, E. Demidenko, S. Grinberg, C.M. Wilmot, A.M. Taylor, D.M. Goldenberg, H.M. Swartz. Response to Radioimmunotherapy Correlates with Tumor pO2 Measured by EPR Oximetry in Human Tumor Xenografts. Radiat. Res. 155: 466–473 (2001).

325. O.Y. Grinberg, H. Hou, H.M. Swartz. Direct Repeated Measurements of pO2 in the Brain During Ischemia and Reperfusion. In Ischemic Blood Flow in the
Brain (Keio University Symposia for Life Science and Medicine Vol. 6, Y. Fukuchi, M. Tomita, A. Koto, (Eds.), Tokyo, Japan: Springer-Verlag, Pp 381–389 (2000).

328. J.L. Evelhoch, R.J. Gillies, G.S. Karczmar, J.A. Koutcher, R.J. Maxwell, O. Nalcioglu, N. Raghunand, S.M. Ronen, B.D. Ross, H.M. Swartz. Applications of Magnetic Resonance in Model Systems: Cancer Therapeutics. Neoplasia. 2: 1–14 (2000).

329. G.S. Timmins, E.J.H. Bechara, H.M. Swartz. Direct Determination of the Kinetics of Oxygen Diffusion to the Photocytes of a Bioluminescent Elaterid Larva, Measurement of Gas and Aqueous Phase Diffusional Barriers and Modeling of Oxygen Supply. J. Exper. Biol. 203: 2479–2484 (2000).

330. H.M. Swartz. Potential Medical (Clinical) Applications of EPR: Overview and Perspectives. In In Vivo EPR (ESR): Theory and Application. Biological Magnetic Resonance – Vol. 18, L.J. Berliner (Ed.), New York, NY: Plenum Publishing Co., pp. 599–621 (2003).

331. P.E. James, M. Madhani, W. Roebuck, H.M. Swartz. Endotoxin-Induced Liver Hypoxia, Defective Oxygen Delivery Versus Oxygen Consumption. Nitric Oxide. 6(1): 18–28 (2002).

332. H. Hirata, T. Walczak, H.M. Swartz. Characteristics of an Electronically Tunable Surface-Coil-Type Resonator for L-Band EPR Spectroscopy. RSI 72: 2839–2841 (2001).

333. H. Swartz, S. Taie, M. Miyake, O. Grinberg, H. Hou, H. El-Kadi, J. Dunn. The Effects of Anesthesia on Cerebral Tissue Oxygen Tension: Use of EPR Oximetry to Make Repeated Measurements. Adv. Exp. Med. Biol. 530:569–575 (2003).

334. M. Miyake, O.Y. Grinberg, H. Hou, R.P. Steffen, H. El-Kadi, H.M. Swartz. The Effect of RSR13, a Synthetic Allosteric Modifier of Hemoglobin, on Brain Tissue $pO_2$ (Measured by EPR Oximetry) Following Severe Hemorrhagic Shock in Rats. Adv. Exp. Med. Biol. 530: 319–329 (2003).

335. O.Y. Grinberg, M. Miyake, H. Hou, R.P. Steffen, H.M. Swartz. The Dose-Dependent Effect of RSR13, a Synthetic Allosteric Modifier of Hemoglobin, on Physiological Parameters and Brain Tissue Oxygenation in Rats. Adv. Exp. Med. Biol. 530: 287–296 (2003).

336. H.M. Swartz, J.F. Dunn. Measurements of Oxygen in Tissues: Overview and Perspectives on Methods. Adv. Exp. Med. Biol. 530:1–12 (2003).

337. T. Sarna, H.M. Swartz. Physical Properties of Melanins. In The Pigmentary System: Physiology and Pathophysiology, 2nd Edition. J.J. Nordlund, R.E. Boissy, V.J. Hearing, R.A. King, W. Oetting, J.P. Ortonne (Eds.) New York, NY: Oxford University Press, Chap. 16, pp. 311–341 (2006).

338. P.E. James, M. Madhani, C. Ross, L. Klei, A. Barchowsky, H.M Swartz. Tissue Hypoxia during Bacterial Sepsis is Attenuated by PR-39, an Anti-Bacterial Peptide. Adv. Exp. Med. Biol. 530: 645–652 (2003).

339. J.F. Dunn, O. Grinberg, M. Roche, C.I. Nwaigwe, H.G. Hou, H.M. Swartz. Non-invasive Assessment of Cerebral Oxygenation During Acclimation to Hypobaric Hypoxia. J. Cereb. Blood Flow Metab. 20(12): 1632–1635 (2000).
340. J. He, N. Beghein, R.B. Clarkson, H.M. Swartz, B. Gallez. Microencapsulation of Carbon Particles Used as Oxygen Sensors in EPR Oximetry to Stabilize Their Responsiveness to Oxygen In vitro and In Vivo. Phys. Med. Biol. 46: 3323–3329 (2001).

341. J.F. Dunn, J. O’Hara, Y. Zaim-Wadghiri, H. Lei, M.E. Meyerand, O.Y. Grinberg, H. Hou, P.J. Hoopes, E. Demidenko and H.M. Swartz. Changes in Oxygenation of Intracranial Tumors with Carbogen: A BOLD MRI and EPR Oximetry Study. J. Magn. Reson. Imaging. 16: 511–521 (2002).

342. B.W. Pogue, J.A. O’Hara, C.M. Wilmot, K.D. Paulsen, H.M. Swartz. Estimation of Oxygen Distribution in RIF-1 Tumors by Diffusion Model-Based Interpretation of Pimonidazole Hypoxia and Eppendorf Measurements. Radiat. Res. 155: 15–25 (2001).

343. G.S. Timmins, F.J. Robb, C.M. Wilmot, S.K. Jackson, H.M. Swartz. Firefly Flashing is Controlled by Gating Oxygen to Light Emitting Cells. J. Exper. Biol. 204: 2795–2801 (2001).

344. J. He, N. Beghein, P. Ceroke, R.B. Clarkson, H.M. Swartz, B. Gallez. Development of Biocompatible Oxygen-Permeable Films Holding Paramagnetic Carbon Particles: Evaluation of their Performance and Stability in EPR Oximetry. Magn. Reson. Med. 46: 610–614 (2001).

345. M. Sentjurc, M. Krzic, J. Kristl, O. Grinberg, H.M. Swartz. EPR Oximetry In Vivo in the Mouse Skin. Polish J. Med. Phys. Eng. 7:1 65–174 (2001).

346. B.W. Pogue, K.D. Paulsen, J.A. O’Hara, P.J. Hoopes, H.M. Swartz. Modeling of Tumor Oxygen Micro-Heterogeneity for Photodynamic Therapy Dosimetry. Proceed. SPIE, 3909: 104–112 (2000).

347. H. Hou, O.Y. Grinberg, S. Taie, S. Leichtweis, M. Miyake, S. Grinberg, H. Xie, M. Csete, H.M. Swartz. Electron Paramagnetic Resonance (EPR) Assessment of Brain Tissue Oxygen Tension in Anesthetized Rats. Anesth. Analg. 96: 1467–1472 (2003).

348. M. Madhani, P. James, A. Barchowsky, L. Klei, C. Ross, S.K. Jackson, H.M. Swartz. Anti-Bacterial Peptide PR-39 Affects Local Nitric Oxide and Preserves Tissue Oxygenation in the Liver During Septic Shock. Biochim. Biophys. Acta. 1588(3): 232–240 (2002).

349. G. Sersa, M. Krzic, M. Sentjurc, T. Ivanusa, K. Beravs, V. Kotnik, A. Coer, H.M. Swartz, M. Cemazar. Reduced Blood Flow and Oxygenation in SA-1 Tumors after Electrochemotherapy with Cisplatin. Br. J. Cancer. 87: 1047–1054 (2002).

350. G. Sersa, M. Krzic, M. Sentjurc, T. Ivanusa, K. Beravs, M. Cemazar, M. Auerlsparg, H.M. Swartz. Reduced Tumor Oxygenation by Treatment with Vinblastine. Canc. Res. 6: 4266–4271 (2001).

351. B.W. Pogue, J.A. O’Hara, I.A. Goodwin, G.P. Fournier, C.J. Wilmot, A.R. Akay, H.M. Swartz. Tumor pO2 Changes During Photodynamic Therapy Depend upon Photosensitizer Type and Time After Injection. Comp. Biochem. Physiol. Part a. Mol. Integr. Physiol. 132: 177–184 (2002).

352. O.Y. Grinberg, A.I. Smirnov, H.M. Swartz. High Spatial Resolution Multi-Site EPR Oximetry: The Use of a Convolution-Based Fitting Method. J. Magn. Reson. 152: 247–258 (2001).
355. J. Shen, S. Bottle, N. Khan, O. Grinberg, D. Reid, A. Micallef, H.M. Swartz. Development of Isoindoline Nitroxides for EPR Oximetry in Viable Systems. Appl. Magn. Reson. 22: 357–368 (2002).

356. H. Lei, O. Grinberg, C.I. Nwaigwe, H.G. Hou, H. Williams, H.M. Swartz, J.F. Dunn. The Effects of Ketamine-Xylazine Anesthesia on Cerebral Blood Flow and Oxygenation Observed Using Nuclear Magnetic Resonance Perfusion Imaging and Electron Paramagnetic Resonance Oximetry. Brain Res. 913: 174–179 (2001).

357. G.S. Timmins, S.K. Jackson, H.M. Swartz. The Evolution of Bioluminescent Oxygen Consumption as an Ancient Oxygen Detoxification Mechanism. J. Mol. Evol. 52: 321–332 (2001).

358. H. Hou, N. Khan, H. Swartz. Applications of EPR (ESR or EMR) in Medicine and Biology. Chapter 16 in Applied Electron Magnetic Resonance – Elementary Principle and Practical Applications (in Chinese), X. Yuanzhi (Ed.). Beijing, China: Science Press, pp. 388–427 (2008).

359. R.A. Towner, S.A. Sturgeon, N. Khan, H.G. Hou, H. Swartz. In Vivo Assessment of Nodularin-Induced Hepatotoxicity in the Rat Using Magnetic Resonance Techniques (MRI, MRS and EPR Oximetry). Chem. Biol. Interact. 139(3): 231–250 (2002).

360. J. Shen, N. Khan, L.D. Lewis, R. Armand, O. Grinberg, E. Demidenko, H. Swartz. Oxygen Consumption Rates and Oxygen Concentration in Molt-4 Cells and their mtDNA Depleted (rho0) Mutants. Biophys. J. 84: 1291–1298 (2003). https://doi.org/10.1016/S0006-3495(03)74944-3

361. N. Khan, J. Shen, T.Y. Chang, C.Y. Chang, P.C.W. Fung, O. Grinberg, E. Demidenko, H. Swartz. Plasma Membrane Cholesterol: A Possible Barrier to Intracellular Oxygen in Normal and Mutant CHO Cells Defective in Cholesterol Metabolism. Biochem. 42: 23–29 (2003).

362. H. Swartz. Measuring Real Levels of Oxygen In Vivo: Opportunities and Challenges. Biochem. Soc. Trans. 30: 248–252 (2002).

363. N. Khan, H. Swartz. Measurements of In Vivo Parameters Pertinent to ROS/RNS Using EPR Spectroscopy. Mol. Cell. Biochem. 234–235(1–2): 341–357 (2002).

364. P.E. James, H.M. Swartz. Simultaneous detection of pO2 and NO by electron paramagnetic resonance. Methods Enzymol. 2002;359:52–66. https://doi.org/10.1016/S0076-6879(02)59171-0. PMID: 12,481,559

365. J.F. Dunn, H.M. Swartz. In Vivo Electron Paramagnetic Resonance Oximetry with Particulate Materials. Methods 30:159–166 (2003). https://doi.org/10.1016/s1046-2023(03)00077-x.

366. W.K. Subczynski, H.M. Swartz. EPR Oximetry in Biological and Model Samples. In Biomedical ESR, S.S. Eaton, G.R. Eaton, L.J. Berliner (Eds.). The Netherlands: Kluwer Publisher, Chapter 10, pp. 229–282 (2005).

367. H.M. Swartz, N. Khan. EPR Spectroscopy of Function In Vivo: Origins, Achievements, and Future Possibilities. In Biomedical ESR, S.S. Eaton, G.R. Eaton, L.J. Berliner (Eds.). The Netherlands: Kluwer Publisher, Chapter 9, pp. 197–228 (2005).
368. N. Khan, C.M. Wilmot, G.M. Rosen, E. Demidenko, J. Sun, J. Joseph, J. O’Hara, B. Kalyanaraman, H.M. Swartz. Spin Traps: In vitro Toxicity and Stability of Radical Adducts. Free Rad. Biol. Med. 11: 1473–1481 (2003).

369. B.W. Pogue, J.A. O’Hara, E. Demidenko, C.M. Wilmot, I.A. Goodwin, B. Chen, H.M. Swartz, T. Hasan. Photodynamic Therapy with Verteporfin in the RIF-1 Tumor Causes Enhanced Radiation Sensitivity. Canc. Res. 163: 1025–1033 (2003).

370. I. Salikhov, H. Hirata, T. Walczak, H.M. Swartz. An Improved External Loop Resonator for In Vivo L-band EPR Spectroscopy. J. Magn. Reson. 164: 54–59 (2003).

371. N. Khan, C.M. Wilmot, E. Demidenko, J. Sun, J. Joseph, J. O’Hara, B. Kalyanaraman, H.M. Swartz. Spin Traps: In vitro Toxicity and Stability of Radical Adducts. Free Rad. Biol. Med. 11: 1473–1481 (2003).

372. B.W. Pogue, J.A. O’Hara, E. Demidenko, C.M. Wilmot, I.A. Goodwin, B. Chen, H.M. Swartz, T. Hasan. Photodynamic Therapy with Verteporfin in the RIF-1 Tumor Causes Enhanced Radiation Sensitivity. Canc. Res. 163: 1025–1033 (2003).

373. J.F. Dunn, B. Friedman, H.M. Swartz. Axial Oxygen Diffusion in the Krogh Model: Modifications to Account for Myocardial Oxygen Tension in Isolated Perfused Rat Hearts Measured by EPR Oximetry. Adv. Exp. Med. Biol. 566: 127–134 (2005).

374. N. Khan, H. Hou, O.Y. Grinberg, S.A. Grinberg, N. Khan, H.M. Swartz. Cer-

375. O. Grinberg, B. Novozhilov, S. Grinberg, B. Friedman, H.M. Swartz. Axial Oxygen Diffusion in the Krogh Model: Modifications to Account for Myocardial Oxygen Tension in Isolated Perfused Rat Hearts Measured by EPR Oximetry. Adv. Exp. Med. Biol. 566: 127–134 (2005).

376. Y.S. Sakata, O.Y. Grinberg, S. Grinberg, R. Springett, H.M. Swartz. Simultaneous NIR-EPR Spectroscopy of Rat Brain Oxygenation. Adv. Exp. Med. Biol. 566:357–362 (2005).

377. H. Hou, O.Y. Grinberg, S.A. Grinberg, N. Khan, J.F. Dunn, H.M. Swartz. Cerebral PtO2, Acute Hypoxia, and Volatile Anesthetics in the Rat Brain. Adv. Exp. Med. Biol. 566:179–186 (2005).

378. H.M. Swartz, N. Khan, V.V. Khramstov. Use of Electron Paramagnetic Resonance Spectroscopy to Evaluate the Redox State In Vivo. Antioxid. Redox. Signal. 9: 1757–1771 (2007).

379. J.A. O’Hara, N. Khan, H. Hou, C.M. Wilmot, E. Demidenko, J.F. Dunn, H.M. Swartz. Comparison of EPR Oximetry and Eppendorf Polarographic Electrode Assessments of Rat Brain PtO2. Physiol. Meas. 25: 1413–1423 (2004).

380. V.O. Grinberg, A.I. Smirnov, O.Y. Grinberg, S.A. Grinberg, J.A. O’Hara, H.M. Swartz. Practical Experimental Conditions and Limitations for High Spatial Resolution Multi-Site EPR Oximetry. Appl. Magn. Reson. 28: 69–78 (2005).
382. H.M. Swartz, R.P. Mason, N. Hogg, B. Kalyanaraman, T. Sarna, P.M. Plonka, M. Zareb, P.L. Gutierrez, L.J. Berliner. Free Radicals and Medicine. In Biomedical ESR, S.S. Eaton, G.R. Eaton, L.J. Berliner (Eds.). The Netherlands: Kluwer Publisher, Chapter 3, pp. 25–74 (2004).

383. O.Y. Grinberg, H. Hou, S.A. Grinberg, K.L. Moodie, E. Demidenko, B.J. Friedman, M.J. Post, H.M. Swartz. pO2 and Regional Blood Flow in a Rabbit Model of Limb Ischemia. Physiol. Meas. 25: 659–670 (2004).

384. A. Iwasaki, O. Grinberg, T. Walczak, H.M. Swartz. In Vivo Measurements of EPR Signals in Whole Human Teeth. Appl. Radiat. Isotop. 62: 187–190 (2005).

385. A. Iwasaki, T. Walczak, O. Grinberg, H.M. Swartz. Differentiation of the Observed Low Frequency (1200 MHz) EPR Signals in Whole Human Teeth. Appl. Radiat. Isotop. 62: 133–139 (2005).

386. H. Hou, N. Khan, J.A. O’Hara, O.Y. Grinberg, J.F. Dunn, M.A. Abajian, C.M. Wilmot, E. Demidenko, S.Y. Lu, R.P. Steffen, H.M. Swartz. Increased Oxygenation of Intracranial Tumors by EFAPROXYN (Efaproxiral) an Allosteric Hemoglobin Modifier: An In Vivo EPR Oximetry Study. Int. J. of Radiat. Onc. Biol. Phys. 61: 1503–1509 (2005).

387. H. Hou, O.Y. Grinberg, S. Grinberg, H.M. Swartz. Cerebral Tissue Oxygenation in Reversible Focal Ischemia in Rats: EPR Oximetry Measurements. Physiol. Meas. 26: 131–141 (2005).

389. N. Khan, O. Grinberg, C. Wilmot, H. Kiefer, H.M. Swartz. Distant Spin Trapping: A Method for Expanding the Availability of Spin Trapping Measurement. J. Biochem. Biophys. Methods. 62: 125–130 (2005).

390. T. Walczak, P. Lesniewski, I. Salikhov, A. Sucheta, K. Szybinski, H.M. Swartz. L-Band EPR Spectrometer for the Use In Vivo and in the Studies of Aqueous Biological Samples. Rev. Sci. Instrum. 76, 013,107:1–6 (2005).

391. T. Walczak, P. Lesniewski, O.Y. Grinberg, H. Hou, A. Sucheta, H.M. Swartz. Implantable Resonators – A New Direction for In Vivo Application of EPR Spectroscopy. Working Document of the EPR Center. Hanover, NH: Dartmouth Medical School (2005).

392. J.A. O’Hara, H. Hou, C.M. Wilmot, E. Demidenko, R.J. Springett, N. Khan, H.M. Swartz. Simultaneous Measurement of Rat Brain Cortex pO2 Using EPR Oximetry and a Fluorescence Fiber-Optic Sensor During Normoxia and Hyperoxia. Physiol. Meas. 26: 203–213 (2005).

393. I. Salikhov, H.M. Swartz. Measurement of Specific Absorption Rate for Clinical EPR at 1200 MHz. Appl. Magn. Reson. 29: 287–291 (2005).

394. I. Salikhov, T. Walczak, P. Lesniewski, N. Khan, A. Iwasaki, R. Comi, J. Buckey, H.M. Swartz. EPR Spectrometer for Clinical Applications. Magn. Reson. Med. 54: 1317–1320 (2005).

396. B. Gallez, H.M. Swartz. In Vivo EPR: When, How and Why? NMR Biomed. 17: 223–225 (2004).

397. H.M. Swartz, N. Khan, J. Buckey, R. Comi, L. Gould, O. Grinberg, A. Hartford, H. Hopf, H. Hou, E. Hug, A. Iwasaki, P. Lesniewski, I. Salikhov, T. Walczak. Clinical Applications of EPR: Overview and Perspectives. NMR Biomed. 17: 335–351 (2004).
398. D.A. Schauer, A. Iwasaki, A.A. Romanyukha, H.M. Swartz, S. Onori. Electron Paramagnetic Resonance (EPR) in Medical Dosimetry. Radiat. Meas. 41: S117-S123 (2007).

399. A.A. Romanyukha, D. Ivanov, D.A. Schauer, J.A. Thomas, H.M. Swartz. Spectrum File Size Optimization for EPR Tooth Dosimetry. Appl. Radiat. Isot. 62:197–200 (2005).

400. H.M. Swartz, A. Iwasaki, T. Walczak, E. Demidenko, I. Salikhov, P. Lesniewski, P. Starewicz, D. Schauer, A. Romanyukha. Measurements of Clinically Significant Doses of Ionizing Radiation Using Non-Invasive In Vivo EPR Spectroscopy of Teeth In Situ. Appl. Radiat. Isot. 62: 293–299 (2005).

401. H.M. Swartz, A. Iwasaki, T. Walczak, E. Demidenko, I. Salikhov, P. Lesniewski, J. Thomas, A. Romanyukha, D. Schauer, P. Starewicz. In Vivo EPR Dosimetry to Quantify Exposures to Clinically Significant Doses of Ionizing Radiation. Radiat. Prot. Dosimetry. 120 (1–4): 163–170 (2006).

402. A. Helisch, S. Wagner, N. Khan, S. Wolfram, M. Drinane, M. Heil, T. Ziegelhoeffer, U. Brandt, G. Bachmann, J.D. Pearlman, H.M. Swartz, W. Schaper. Impact of Mouse Strain Differences in Innate Hindlimb Collateral Vasculature. Arterioscler. Thromb. Vasc. Biol. 26(3): 520–526 (2006).

403. H.M. Swartz. Seeing is Believing – Visualizing Drug Delivery In Vitro and In Vivo. Adv. Drug Deliv. Rev. 57(8): 1085–1086 (2005).

404. M. Dinguizli, S. Jeumont, N. Beghein, J. He, T.M. Walczak, P.N. Lesniewski, H. Hou, O.Y. Grinberg, A. Sucheta, H.M. Swartz, B. Gallez. Development and Evaluation of Biocompatible Films of Polytetrafluoroethylene Polymers Holding Lithium Phthalocyanine for their Use in EPR Oximetry, Biosens. Bioelectron. 21(7): 1015–1022 (2006).

405. N. Khan, B.B. Williams, H.M. Swartz. Clinical Applications of In Vivo EPR: Rationale and Initial Results. Applied Magn. Reson. 30:185–199 (2006).

406. Z. Abramovic, J. Kristl, N. Khan, H. Hou, M. Sentjurc, H. Swartz. Influence of Different Anesthetics on Skin Oxygenation Studied by Electron Paramagnetic Resonance In Vivo. Skin Pharmacol. Physiol. 20(2): 77–84 (2007).

407. B.B. Williams, H. Hou, O.Y. Grinberg, E. Demidenko, H.M. Swartz. High Spatial Resolution Multi-Site EPR Oximetry of Transient Focal Cerebral Ischemia in the Rat. Antioxid. Redox. Signal. 9:1691–1698 (2007).

408. J.M. Arbeit, J.M. Brown, K.S.C. Chao, J.D. Chapman, B. Croft, W.C. Eckelman, A.W. Fyles, A.J. Giaccia, R.P. Hill, J. Hoffman, C.J. Koch, M.C. Krishna, K.A. Krohn, J.S. Lewis, G. Liu, R.P. Mason, G. Melillo, A.R. Padhani, G. Powis, J.G. Rajendran, R. Reba, S.P. Robinson, G.L. Semenza, H. Stone, D. Sullivan, H.M. Swartz, P. Vaupel, D. Yang. Hypoxia: Importance in Tumor Biology, Noninvasive Measurement by Imaging, and Value of its Measurement in the Management of Cancer Therapy. Int. J. Radiat. Biol. 82(10): 699–757 (2006).

409. H.M. Swartz. What is the Actual Heterogeneity to be Expected in Tumors – and How Can We Resolve It? in Hypoxia: Importance in Tumor Biology, Noninvasive Measurement by Imaging, and Value of Its Measurement in the Management of Cancer Therapy. Int. J. Radiat. Biol. 82(10): 711 (2006).

410. H.M. Swartz. In Vivo EPR Oximetry Based on Spectroscopy of Particulates, in Hypoxia: Importance in Tumor Biology, Noninvasive Measurement by Imag-
ing, and Value of Its Measurement in the Management of Cancer Therapy. Int. J. Radiat. Biol. 82(10): 725–728 (2006).

411. H.M. Swartz, G. Burke, M. Coey, E. Demidenko, R. Dong, O. Grinberg, J. Hilton, A. Iwasaki, P. Lesniewski, M. Kmiec, K.M. Lo, R.J. Nicolalde, A. Ruuge, Y. Sakata, A. Sucheta, T. Walczak, B.B. Williams, C. Mitchell, A. Romanyukha, D.A. Schauer. In Vivo EPR for Dosimetry. Radiat. Meas. 42: 1075–1084 (2007).

412. A. Romanyukha, F. Trompier, B. LeBlanc, C. Calas, I. Clairand, C. Mitchell, J.G. Smirniotopoulos, H.M. Swartz. EPR Dosimetry in Chemically Treated Fingernails. Radiat. Meas. 42: 1110–1113 (2007).

413. F. Trompier, L. Kornak, C. Calas, A. Romanyukha, B. LeBlanc, I. Clairand, C.A. Mitchell, H.M. Swartz. Protocol for Emergency EPR Dosimetry in Fingernails. Radiat. Meas. 42: 1085–1088 (2007).

414. B.B. Williams, A. Sucheta, R. Dong, Y. Sakata, A. Iwasaki, G. Burke, O. Grinberg, P. Lesniewski, M. Kmiec, H.M. Swartz. Experimental Procedures for Sensitive and Reproducible In Situ EPR Tooth Dosimetry. Radiat. Meas. 42: 1094–1098 (2007).

415. E. Demidenko, B. Williams, A. Sucheta, R. Dong, H.M. Swartz. Radiation Dose Reconstruction from L-Band In Vivo EPR Spectroscopy of Intact Teeth: Comparison of Methods. Radiat. Meas. 42: 1089–1093 (2007).

416. A. B. Flood, H.M. Swartz, S. Bhattacharyya, J. Nicolalde. Implementing EPR Dosimetry for Life-Threatening Incidents: Factors Beyond Technical Performance. Radiat. Meas. 42: 1099–1109 (2007).

417. A. Romanyukha, C.A. Mitchell, D.A. Schauer, L. Romanyukha, H.M. Swartz. Q-band EPR Biodosimetry in Tooth Enamel Microsamples: Feasibility Test and Comparison with X-band. Health Phys. 93: 631–635 (2007).

418. O.Y. Grinberg, B.B. Williams, A.E. Ruuge, S.A. Grinberg, D.E. Wilcox, H.M. Swartz, J.H. Freed. Oxygen Effects on the EPR Signals from Wood Charcoals: Experimental Results and the Development of a Model. J. Phys. Chem. 111(46): 13316–13324 (2007).

419. H. Hou, N. Khan, O. Grinberg, H. Yu, S.A. Grinberg, S. Lu, E. Demidenko, R.P. Steffen, H.M. Swartz. The Effects of EFAPROXYN™ (efaproxiral) on Subcutaneous RIF-1 Tumor Oxygenation and Enhancement of Radiotherapy Mediated Tumor Growth Inhibition in Mice. Radiat. Res. 168: 218–225 (2007).

420. H. Hou, O. Grinberg, B. Williams, S. Grinberg, H. Yu, D.L. Alvarenga, H. Wallach, J. Buckey, H.M. Swartz. Effect of Oxygen Therapy on Brain Damage and Cerebral \( pO_2 \) in Transient Focal Cerebral Ischemia in the Rat. Physiol. Meas. 28: 963–976 (2007).

421. R. Springett, H.M. Swartz. Measurements of Oxygen In Vivo: Overview and Perspectives on Methods to Measure Oxygen within Cells and Tissues. Antioxid. Redox. Signal. 9(8): 1295–1301 (2007).

422. N. Khan, B. Williams, H. Hou, H. Li, H.M. Swartz. Repetitive Tissue \( pO_2 \) Measurements by Electron Paramagnetic Resonance: Current Status and Future Potential for Experimental and Clinical Studies. Antioxid. Redox. Signal. 9(8): 1169–1182 (2007).

423. H.M. Swartz. On Tissue Oxygen and Hypoxia: An Editorial, Introduction to the Forum Issue. Antioxid. Redox. Signal. 9(8): 1111–1113 (2007).
424. G.A. Alexander, H.M. Swartz, S. A. Amundson, W.F. Blakely, B. Buddemeire, B. Gallez, N. Dainiak, R.E. Goans, R.B. Hayes, P.C. Lowry, M.A. Noska, P. Okunieff, A.L. Salner, D.A. Schauer, F. Trompier, K.W. Turteltaub, P. Voisin, A.L. Wiley Jr., R. Wilkins. Biodose-EPR-2006 Meeting: Acute Dosimetry Consensus Committee Recommendations on Biodosimetry Applicants in Events Involving Uses of Radiation by Terrorists and Radiation Accidents. Radiat. Meas. 42: 972–996 (2007).

426. M.I. Ibragimova, V. Petukhov, E.P. Zheglov, H. Hou, H.M. Swartz, G.V. Konjukhov, R.N. Nizamov. Quinoid Radio-Toxin (QRT) Induced Metabolic Changes in Mice: An Ex Vivo and In Vivo EPR Investigation. Nitric Oxide. 18(3): 216–222 (2008).

427. H. Fujii, K. Sakata, Y. Katsumata, R. Stao, M. Kinouchi, M. Someya, S. Masunaga, M. Hareyama, H.M. Swartz, H. Hirata. Tissue Oxygenation in a Murine SCC VII Tumor after X-Ray Irradiation as Determined by EPR Spectroscopy. Radiother. Oncol. 86: 354–360 (2008).

428. M. Patel, L. Liang, H. Hou, B.B. Williams, M. Kmiec, H.M. Swartz, J.P. Fessel, L.J. Roberts. Seizure-Induced Formation of Isofurans: Novel Products of Lipid Peroxidation Whose Formation is Positively Modulated by Oxygen Tension. J. Neurochem. 104(1): 264–270 (2008).

429. R.A. Reyes, A. Romanyukha, F. Trompier, C.A. Mitchell, I. Clairand, T. De, L.A. Benevides, H.M. Swartz. Electron Paramagnetic Resonance in Human Fingernails: The Sponge Model Implication. Radiat. Environ. Biophys. 47: 515–516 (2008).

430. C. Lu, M. Rollins, H. Hou, H.M. Swartz, H. Hopf, T. Miclau, R.S. Marcucio. Tibial Fracture Decreases Oxygen Levels at the Site of Injury. Iowa Orthop. J. 28: 14–21 (2008).

432. F. Trompier, A. Romanyukha, L. Cornak, C. Calas, B. LeBlanc, C. Mitchell, H. Swartz, I. Clairand. Electron Paramagnetic Resonance Radiation Dosimetry in Fingernails. Radiat. Meas. 44(1): 6–10 (2009).

433. H. Hou, J.P. Lariviere, E. Demidenko, D. Gladstone, H. Swartz, N. Khan. Repeated Tumor pO2 Measurements by Multi-Site EPR Oximetry as a Prognostic Marker for Enhanced Therapeutic Efficacy of Fractionated Radiotherapy. Radiother. Oncol. 91: 126–131 (2009).

434. N. Khan, S.P. Mupparaju, D. Mintzopoulos, M. Kesarwani, V. Righi, L.G. Rahme, H.M. Swartz, A.A. Tzika. Burn Trauma in Skeletal Muscle Results in Oxidative Stress as Assessed by In Vivo Electron Paramagnetic Resonance. Mol. Med. Report. 1(6): 813–819 (2008).

435. N. Khan, H. Li, H. Hou, J.P. Lariviere, D.J. Gladstone, E. Demidenko, H.M. Swartz. Tissue pO2 of Orthotopic 9L and C6 Gliomas and Tumor Specific Response to Radiotherapy and Hyperoxygenation. Int. J. Radiat. Oncol. Biol. Phys. 73(3): 878–885 (2009).
436. N. Khan, S.P. Mupparaju, H. Hou, J.P. Lariviere, E. Demidenko, H.M. Swartz, A.R. Eastman. Radiotherapy in Conjunction with 7-Hydroxystaurosporine: A Multimodal Approach with Tumor pO2 as a Prognostic Marker of Therapeutic Response. Radiat Res. 172: 592–597 (2009).

438. H. Li, H.G. Hou, A. Sucheta, B.B. Williams, J.P. Lariviere, N. Khan, P. Lesniewski, H.M. Swartz. Implantable Resonators: A Technique for Repeated Measurement of Oxygen at Multiple Deep Sites with In Vivo EPR. Adv. Exp. Med. Biol. 662: 265–272 (2010).

439. G. Meenakshisundaram, E. Eteshola, R. Pandian, A. Bratasz, K. Selvendiran, S.C. Lee, M.C. Krishna, H.M. Swartz, P. Kuppusamy. Oxygen Sensitivity and Biocompatibility of an Implantable Paramagnetic Probe for Repeated Measurements of Tissue Oxygenation. Biomed. Microdevices. 11(4): 817–826 (2009).

440. Z. Abramovic, H. Hou, K. Julijana, M. Sentjurc, J.P. Lariviere, H.M. Swartz, N. Khan. Modulation of Tumor Hypoxia by Topical Formulations with Vasodilators for Enhancing Therapy. Adv. Exp. Med. Biol. 915: 75–82 (2011).

441. H.M. Swartz, A.B. Flood, B.B. Williams, R.M. Gougelet, M.E. Rea, R.J. Nicolalde. A Critical Assessment of Biodosimetry Methods for Large Scale Incidents. Health Phys. 98(2): 95–108 (2010).

442. J.C. Doloff, N. Khan, J. Ma, E. Demidenko, H.M. Swartz, Y. Jounaidi. Increased Tumor Oxygenation and Drug Uptake During Anti-Angiogenic Weekly Low Dose Cyclophosphamide Enhances the Anti-Tumor Effect of Weekly Tipra-pazamine. Curr. Cancer Drug Targets. 9(6): 777–788 (2009).

443. B.B. Williams, R. Dong, R.J. Nicolalde, T.P. Matthews, D.J. Gladstone, E. Demidenko, B.I. Zaki, I.K. Salikhov, P.N. Lesniewski, H.M. Swartz. Physically-Based Biodosimetry Using In Vivo EPR of Teeth in Patients Undergoing Total Body Irradiation. Int. J. Radiat. Biol. 87(8):766–75 (2011).

444. B. Liu, X. Zhu, C.L. Chen, K. Hu, H.M. Swartz, Y.R. Chen, G. He. Opening of the MitoKATP Channel and Decoupling of Mitochondrial Complex II and III Contribute to the Suppression of Myocardial Reperfusion Hyperoxygenation. Mol. Cell. Biochem. 337(1–2): 25–38 (2010).

445. Y. Li, M. Cai, Y. Xu, H.M. Swartz, G. He. Late Phase Ischemic Preconditioning Attenuates Hyperoxygenation in the Post-Ischemic Mouse Heart: An In Vivo EPR Oximetry Study. Life Sci. 88(1–2): 57–64 (2011).

446. M.E. Rea, R.M. Gougelet, R.J. Nicolalde, J.A. Geiling, H.M. Swartz. Proposed Triage Categories for Large-Scale Radiation Incidents Using High-Accuracy Biodosimetry Methods. Health Phys. 98(2): 136–144 (2010).

447. R.M. Gougelet, M.E. Rea, R.J. Nicolalde, J.A. Geiling, H.M. Swartz. The View from the Trenches Part 1: Emergency Medical Response Plans and the Need for EPR Screening. Health Physics. 98(2): 118–127 (2010).

448. D. Wilcox, X. He, J. Gui, A.E. Ruuge, H. Li, B.B. Williams, H.M. Swartz. Dosimetry Based on EPR Spectral Analysis of Fingernail Clippings. Health Phys. 98(2): 309–317 (2010).

449. B.B. Williams, R. Dong, M. Kmiec, G. Burke, E. Demidenko, D. Gladstone, R.J. Nicolalde, A. Sucheta, P. Lesniewski, H.M. Swartz. Development of In Vivo Tooth EPR for Individual Radiation Dose Estimation and Screening. Health Phys. 98(2): 327–338 (2010).
450. J.D. Pollock, B.B. Williams, J.W. Sidabras, O. Grinberg, I. Salikhov, P. Lesniewski, M. Kmiec, H.M. Swartz. Surface Loop Resonator Design for In Vivo EPR Tooth Dosimetry Using Finite Element Analysis. Health Phys. 98 (2): 339–344 (2010).

451. R.J. Nicolalde, R.M. Gougelet, M. Rea, B.B. Williams, R. Dong, M. Kmiec, P.N. Lesniewski, H.M. Swartz. The View from The Trenches: Part 2-Technical Considerations for EPR Screening. Health Phys. 98(2): 128–135 (2010).

452. H. Suzuki, K. Tamukai, N. Yoshida, H. Ohya, K. Kato, K Anzai, H.M. Swartz. Development of a Compact Electron Spin Resonance System for Measuring ESR Signals of Irradiated Fingernails. Health Phys. 98(2): 318–321 (2010).

453. E. Demidenko, B.B. Williams, H.M. Swartz. Radiation Dose Prediction Using Data on Time to Emesis in the Case of Nuclear Terrorism. Radiat. Res. 171(3): 817–826 (2009).

454. H.M. Swartz, N. Khan, B.B. Williams, A.C. Hartford, B. Zaki, M. Ernstoff, J.C. Buckey, F.F. Gubaidullin, H. Hou, P. Lesniewski, M. Kmiec, O.Y. Grinberg, A. Sucheta, T. Walczak. Clinical Applications of In Vivo EPR: EPR Oximetry. In Electron Paramagnetic Resonance: From Fundamental Research to Pioneering Applications & Zavoisky Award. K.M. Salikhov (Ed.) Wellington, N.Z: AXAS Publishing Ltd. pp. 178–179 (2009).

455. H.M. Swartz, G. Burke, M. Coey, E. Demidenko, R. Dong, O. Grinberg, J. Hilton, A. Iwasaki, P. Lesniewski, M. Kmiec, K. Lo, R.J. Nicolalde, A. Ruuge, Y. Sakata, A. Sucheta, T. Walczak, B.B. Williams, C. Mitchell, A. Romanyukha, D. Schauer. Use of EPR for Dosimetry After the Potential Exposure of Large Numbers of People to Doses of Radiation that are Potentially Life Threatening. In Electron Paramagnetic Resonance: From Fundamental Research to Pioneering Applications & Zavoisky Award. K.M. Salikhov (Ed.) Wellington, N.Z: AXAS Publishing Ltd., pp. 180–181 (2009).

456. B.B. Williams, N. Khan, B. Zaki, A. Hartford, M.S. Ernstoff, H.M. Swartz. Clinical Electron Paramagnetic Resonance (EPR) Oximetry Using India Ink. Adv. Exp. Med. Biol. 662: 149–156 (2010).

457. H. Hou, Z. Abramovic, J.P. Lariviere, M. Sentjurc, H.M. Swartz, N. Khan. Effect of a Topical Vasodilator on Tumor Hypoxia and Tumor Oxygen Guided Radiotherapy using EPR Oximetry. Radiat. Res. 173(5): 651–658 (2010).

458. M. Cai, Y. Li, Y. Xu, H.M. Swartz, C.L. Chen, Y.R. Chen, G. He. Endothelial NOS Activity and Myocardial Oxygen Metabolism Define the Salvageable Ischemic Time Window for Ischemic Postconditioning. Am. J. Physiol. Heart Circ. Physiol. 300(3): H1069–H1077 (2011).

459. A.B. Flood, R.J. Nicolalde, E. Demidenko, B.B. Williams, A. Shapiro, A.L. Wiley, H.M. Swartz. A Framework for Comparative Evaluation of Dosimetric Methods to Triage a Large Population Following a Radiological Event. Radiat. Meas. 46(9): 916–922 (2011).

460. H.M. Swartz, B.B. Williams, R.J. Nicolalde, E. Demidenko, A.B. Flood. Overview of Biodosimetry for Management of Unplanned Exposures to Ionizing Radiation. Radiat. Meas. 46: 742–748 (2011).

461. B.B. Williams, R. Dong, A.B. Flood, O. Grinberg, M. Kmiec, P.N. Lesniewski, T.P. Matthews, R.J. Nicolalde, T. Raynolds, I. Salikhov, H.M. Swartz. A Deploy-
able In Vivo EPR Tooth Dosimeter for Triage After a Radiation Event Involving Large Populations. Radiat. Meas. 46(9): 772–777 (2011).

462. X. He, J. Gui, T.P. Matthews, B.B. Williams, S.G. Swarts, O. Grinberg, J. Sidabras, D.E. Wilcox, H.M. Swartz. Advances Towards Using Finger/Toenail Dosimetry to Triage a Large Population After Potential Exposure to Ionizing Radiation. Radiat. Meas. 46: 882–887 (2011).

463. J.F. Dunn, N.M. Khan, H.G. Hou, J. Merlis, M.A. Abajian, E. Demidenko, O.Y. Grinberg, H.M. Swartz. Cerebral Oxygenation in Awake Rats during Acclimation and Deacclimation to Hypoxia: An In Vivo Electron Paramagnetic Resonance Study. High Alt. Med. Biol. 12: 71–77 (2011).

464. H.G. Hou, H.B. Li, R. Dong, S.P. Mupparaju, N. Khan, H.M. Swartz. Cerebral Oxygenation of the Cortex and Caudate Putamen Following Normobaric Hypoxia and Mild Hypoxia in the Rats-EPR Oximetry with Multi-Probe Implantable Resonators. Adv. Exp. Med. Biol. 915: 61–67 (2011).

465. S. Mupparaju, H. Hou, J.P. Lariviere, H.M. Swartz, N. Khan. Tumor pH2 as a Surrogate Marker to Identify Therapeutic Window during Metronomic Chemotherapy of 9L Gliomas. Adv. Exp. Med. Biol. 915: 107–113 (2011).

466. S. Mupparaju, H. Hou, J.P. Lariviere, H.M. Swartz, Y. Jounaidi, N. Khan. Repeated Tumor Oximetry to Identify Therapeutic Window During Metronomic Cyclophosphamide Treatment of 9L Gliomas. Oncol. Rep. 26: 281–286 (2011).

467. N. Khan, J.P. Blinco, S.E. Bottle, K. Hosokaway, H.M. Swartz, A.S. Micalef. The Evaluation of New and Isotopically Labeled Isoindoline Nitroxides and an Azaphenalene Nitroxide for EPR Oximetry. J. Magn. Reson. 211(2): 170–177 (2011).

468. Z. Abramovic, H. Hou, K. Julijana, M. Sentjurc, J.P. Lariviere, H.M. Swartz, N. Khan. Modulation of Tumor Hypoxia by Topical Formulations with Vasodilators for Enhancing Therapy. Adv. Exp. Med. Biol. 701: 75–82 (2011).

469. H. Hou, R. Dong, J.P. Lariviere, S.P. Mupparaju, H.M. Swartz, N. Khan. Synergistic Combination of Hyperoxygenation and Radiotherapy by Repeated Assessments of Tumor pH2 with EPR Oximetry. J. Radiat. Res. 52(5): 568–574 (2011).

470. C. Lu, N. Saless, D. Hu, X. Wang, Z. Xing, H. Hou, B. Williams, H.M. Swartz, C. Colnot, T. Miclau, R.S. Marcucio. Mechanical Stability Affects Angiogenesis During Early Fracture Healing. J. Orthop. Trauma. 25(8): 494–499 (2011).

471. H. Hou, R. Dong, H. Li, B.B. Williams, J.P. Lariviere, S. Hekmatyar, R. Kauppinen, N. Khan, H.M. Swartz. Dynamic Changes in Oxygenation of Intracranial Tumor and Contralateral Brain During Tumor Growth and Carbogen Breathing: A Multi-Site EPR Oximetry with Implantable Resonators. J. Magn. Reson. 214(1): 22–28 (2012).

472. N. Khan, S. Mupparaju, H. Hou, B.B. Williams, H.M. Swartz. Repeated Assessment of Orthotopic Glioma pH2 by Multi-site EPR Oximetry: A Technique with the Potential to Guide Therapeutic Optimization by Repeated Measurements of Oxygen. J. Neurosci. Methods 204: 111–117 (2012).

473. H.M. Swartz, A.B. Flood, B.B. Williams, R. Dong, S.G. Swarts, X. He, O. Grinberg, J. Sidabras, E. Demidenko, J. Gui, D.J. Gladstone, L.A. Jarvis, M.M Kmiec, K. Kobayashi, P.N. Lesniewski, S.D. Marsh, T.P. Matthews, R.J. Nicolalde, P.M. Pennington, T. Raynolds, I. Salikhov, D.E. Wilcox, B.I. Zaki.
tron Paramagnetic Resonance Dosimetry for a Large-Scale Radiation Incident. Health Phys. 103(3): 255–267 (2012). PMID: 22,850,230

474. C. Lu, N. Saless, X. Wang, A. Sinha, S. Decker, G. Kazakia, H. Hou, B.B. Williams, H.M. Swartz, T.K. Hunt, T. Miclau, R. Marcucio. The Role of Oxygen During Fracture Healing. Bone. 52: 220–229 (2013).

475. H. Hou, S.P. Mupparaju, J.P. Lariviere, S. Hodge, J. Gui, H.M. Swartz, N. Khan. Assessment of the Changes in 9L and C6 Glioma pO2 by EPR Oximetry as a Prognostic Indicator of Differential Response to Radiotherapy. Radiat Res. 179(3):343–51 (2013). https://doi.org/10.1667/RR2811.1.

476. E. Demidenko, B.B. Williams, A.B. Flood, H.M. Swartz. Standard Error of Inverse Prediction for Dose–Response Relationship: Approximate and Exact Statistical Inference. Stat Med. 32(12) 2048–2061 (2013) [Epub 2012 Nov 5.] (https://doi.org/10.1002/sim.5668) PMID: 23,124,816

477. A.B. Flood, R.J. Nicolalde, B.B. Williams, E. Demidenko, J. Evans, M.A. Greene, H.M. Swartz. Comparative Evaluation of Dosimetric Methods for Triage in Large-scale Radiation Events. Proceedings: HFM-223 NATO Symposium on Biological Effects of Ionizing Radiation Exposure and Countermeasures: Current Status and Future Perspectives, Paper 34: http://www.cso.nato.int/Pubs/rdp.asp?RDP=STO-MP-HFM-223 (2012).

478. R.J. Nicolalde, A.B. Flood, B.V. Watts, H.M. Swartz, L.E. Ma, A.J. Toler, R.M. Gougelet. A Decision Support Tool for Evaluating the Logistical Considerations of Bodosimetry Methods. Proceedings: HFM-223 Symposium on Biological Effects of Ionizing Radiation Exposure and Countermeasures: Current Status and Future Perspectives, Paper 35: (http://www.cso.nato.int/Pubs/rdp.asp?RDP=STO-MP-HFM-223) (2012).

479. H.M. Swartz, B.B. Williams, R. Dong, S.G. Swarts, X. He, O. Grinberg, J. Sidabras, S. Varanasi, A.B. Flood. Electron Paramagnetic Resonance Dosimetry for a Large-Scale Radiation Incident, Proceedings:MP-HFM-223 Symposium on Biological Effects of Ionizing Radiation Exposure and Countermeasures: Current Status and Future Perspectives, Paper 15: (http://www.cso.nato.int/Pubs/rdp.asp?RDP=STO-MP-HFM-223). (2012).

481. H.M. Swartz, A.B. Flood, R.J. Nicolalde, A. Shapiro. Overview of Methods for Establishing Dose to Individuals for Managing Unplanned, Clinically Significant Exposures to Ionizing Radiation. In The Medical Basis for Radiation-Accident Preparedness: Medical Management. D.M. Christensen, S.L. Sugarman, F.M. O’Hara, Jr. (Eds.) Oak Ridge, TN: Oak Ridge Associated Universities, pp. 91–108 (2014).

482. R.J. Nicolalde, A.B. Flood, B. Watts, H.M. Swartz, L. Ma, A. Toler, S. Peterson, R.M. Gougelet. A Decision Support Tool for Evaluating the Effectiveness and Logistical Considerations of Bodosimetry Methods—Comparing Guidelines and New Technologies for the Response to a Nuclear Event. Proceedings: Twelfth Annual IEEE Conference on Technologies for Homeland Security (https://doi.org/10.1109/THS.2012.6459820) pp. 18–23 (2012).

483. R. J. Nicolalde, H.M. Swartz, G.T. Blike, A. B. Flood, M.E. Rea, B.B. Williams, R.M. Gougelet. A Method to Advance and Evaluate New Emergency Response Technologies –A Case Study Implementation using EPR Dosimetry. Proceed-
ings: Twelfth Annual IEEE Conference on Technologies for Homeland Security (https://doi.org/10.1109/THS.2012.6459847) pp. 184–189 (2012).
484. T. Haga, H. Hirata, P. Lesniewski, K. M. Rychert, B.B. Williams, A. B. Flood, H.M. Swartz. L-band Surface-Coil Resonator with Voltage-Control Impedance-Matching for EPR Tooth Dosimetry. Concepts Magn. Reson. Part B Magn. Reson. Eng. 43B (1):32–40 (2013).
485. V. Righi, C. Constantinou, D. Mintzopoulos, N. Khan, S.P. Mupparaju, L.G. Rahme, H.M. Swartz, H.H. Szeto, R.G. Tompkins, A.A. Tzika. Mitochondria-targeted Antioxidant Promotes Recovery of Skeletal Muscle Mitochondrial Function after Burn Trauma Assessed by in Vivo 31P Nuclear Magnetic Resonance and Electron Paramagnetic Resonance Spectroscopy. FASEB J. 27(6):2521–2530 (June 2013), PMID: 23,482,635 (https://doi.org/10.1096/fj.12-220764)
486. H.M. Swartz, B.B. Williams, L.A. Jarvis, B.I. Zaki, D.J. Gladstone. Repeated Monitoring of Tumor Oxygen While Breathing Carbogen to Determine the Therapeutic Potential of Hyperoxic Therapy. Prac. Radiat. Onc. 3 (2): S23-S24 (April-June Supplement 2013).
487. Y. Li, M. Cai, Q. Sun, Z. Liu, A.J. Cardounel, H.M. Swartz, G. He. Hyperoxia and Transforming Growth Factor β1 Signaling in the Post-ischemic Mouse Heart. Life Sci. 92(10):547–554 (2013) [Epub 2013 Jan 24.] (https://doi.org/10.1016/j.lfs.2013.01.018)
488. H.M. Swartz, A.B. Flood, B.B. Williams, V. Meineke, H. Dörr. Comparison of the Needs for Biodosimetry for Large-scale Radiation Events for Military versus Civilian Populations. Health Phys. 106(6):755–763 (2014).
489. B.K. Rivera, S.K. Naidu, K. Subramanian, M. Joseph, H. Hou, N. Khan, H.M. Swartz, P. Kuppusamy. Real-time, in Vivo Determination of Dynamic Changes in Lung and Heart Tissue Oxygen Levels using EPR Oximetry Adv. Exp. Med. Biol. 812:81–86 (2014) (https://doi.org/10.1007/978-1-4939-0620-8_11)
490. H.M. Swartz, B.B. Williams, B.I. Zaki, A.C. Hartford, L.A. Jarvis, E.Y. Chen, R.J. Comi, M.S. Ernstoff, H. Hou, N. Khan, S.G. Swarts, A.B. Flood, P. Kuppusamy. Clinical EPR: Unique Opportunities and Challenges. Acad. Radiol. 21(2):197–206 (2014).
491. H.M. Swartz, B.B. Williams, A.B. Flood. Overview of the Principles and Practice of Biodosimetry. Radiat. Environ. Biophys. 53(2):221–232 (2014) (https://doi.org/10.1007/s00411-014-0522-0).
492. H.M. Swartz, H. Hou, N. Khan, L.A. Jarvis, E. Chen, B.B. Williams, P. Kuppusamy. Advances in Probes and Methods for Clinical EPR Oximetry. Adv. Exp. Med. Biol. 812:73–79 (2014) (https://doi.org/10.1007/978-1-4939-0620-8_11)
493. X. He, S.G. Swarts, E. Demidenko, A.B. Flood, O. Grinberg, J. Gui, M. Mariani, S.D. Marsh, A.E. Ruuge, J.W. Sidabras, D. Tipikin, D.E. Wilcox, H.M. Swartz. Development and Validation of an Ex Vivo Electron Paramagnetic Resonance Fingernail Biodosimetric Method. Radiat. Prot. Dosimetry 159(1–4):172–181 (2014) (https://doi.org/10.1093/rdp/ncu129).
494. A.I. Ivannikov, A.M. Khailov, S.P. Orlenko, V.G. Skvortsov, V.F. Stepunenko, K.S. Zhumadilov, B.B. Williams, A.B. Flood, H.M. Swartz. Determination of the Average Native Background and the Light-induced EPR signals and their
Variation in the Teeth Enamel based on Large-Scale Survey of the Population. Radiat. Prot. Dosimetry 172 (1–3): 265–274 (2016) https://doi.org/10.1093/rpd/ncw150.

495. H. Sugawara, H. Hirata, S. Petryakov, P. Lesniewski, B.B. Williams, A.B. Flood, H.M. Swartz. Design and Evaluation of a 1.1-GHz Surface Coil Resonator for Electron Paramagnetic Resonance-Based Tooth Dosimetry. IEEE T. Bio-Med. Eng. 61(6):1894–1901 (2014).

496. N. Khan, H. Hou, E. Chen, L. Jarvis, P. Schaner, B.B. Williams, H.M. Swartz, P. Kuppusamy. Bench-to-Bedside Oximetry for Real-time Monitoring of Tumor pO2: A Critical Parameter which Influences Radiotherapeutic Outcome. J. Radiol. Radiat. Ther. 1(3):1017–1026 (2013).

497. A.B. Flood, H.K. Boyle, G. Du, E. Demidenko, R.J. Nicolalde, B.B. Williams, H.M. Swartz. Advances in a Framework to Compare Bio-Dosimetry Methods for Triage in Large-Scale Radiation Events. Radiat. Prot. Dosimetry 159(1–4):77–86 (2014) [https://doi.org/10.1093/rpd/ncu120]

498. B.B. Williams, A.B. Flood, I. Salikhov, K. Kobayashi, R. Dong, K. Rychert, G. Du, W. Schreiber, H.M. Swartz. In Vivo EPR Tooth Dosimetry for Triage after a Radiation Event Involving Large Populations. Radiat. Environ. Biophys. 53(2):334–346 (2014) (https://doi.org/10.1007/s00411-014-0534-9)

499. H. Hou, H. Li, R. Dong, N. Khan, H. Swartz. Real-time Monitoring of Ischemic and Contralateral Brain pO2 during Stroke by Variable Length Multisite Resonators. Magn. Reson. Imaging 32(5):563–569 (2014).

500. H. Hou, N. Khan, J. Lariviere, S. Hodge, E.Y. Chen, L.A. Jarvis, A. Eastman, B.B. Williams, P. Kuppusamy, H.M. Swartz. Skeletal Muscle and Glioma Oxygenation by Carbogen Inhalation in Rats: A Longitudinal Study by EPR Oximetry Using Single-Probe Implantable Oxygen Sensors. Adv. Exp. Med. Biol. 812:97–103 (2014).

501. N. Khan, H. Hou, S. Hodge, M.L. Kuppusamy, E.Y. Chen, A. Eastman, P. Kuppusamy, H.M. Swartz. Recurrent Low-dose Chemotherapy to Inhibit and Oxygenate Head and Neck Tumors. Adv. Exp. Med. Biol. 812:105–111 (2014).

502. H. Hou, VK. Nemani, G. Du, R. Montano, R. Song, B. Gimi, H.M. Swartz, A. Eastman, N. Khan. Monitoring oxygen levels in orthotopic human glioma xenograft following carbogen inhalation and chemotherapy by implantable resonator-based oximetry. Int. J. Cancer 136(7):1688–1696 (2015) https://doi.org/10.1002/ijc.29132.

503. N. Khan, S. Mupparaju, S.K. Hekmatyar, H. Hou, J.P. Lariviere, E. Demidenko, D.J. Gladstone, R.A. Kauppinen, H.M. Swartz. Effect of Hyperoxygenation on Tissue pO2 and its Effect on Radiotherapeutic Efficacy of Orthotopic F98 Gliomas. Int. J. Radiat. Oncol. Biol. Phys. 78(4):1193–1200 (2010).

504. N. Khan, H. Hou, C.J. Eskey, K. Moodie, S. Gohain, G. Du, S. Hodge, W.C. Culp, P. Kuppusamy, H.M. Swartz. Deep-Tissue Oxygen Monitoring in the Brain of Rabbits for Stroke Research. Stroke 46(3):e62-e66 (2015) https://doi.org/10.1161/STROKEAHA.114.007324.

505. J.W. Sidabras, S.K. Varanasi, R.R. Mett, S.G. Swarts, H.M. Swartz, J.S. Hyde. A Microwave Resonator for Limiting Depth Sensitivity for Electron Paramagnetic
Resonance Spectroscopy of Surfaces. Rev. Sci. Instrum. 85(10):104,707/1–9 (2014) https://doi.org/10.1063/1.4898179.

506. N. Bahar, K. Roberts, F. Stabile, N. Mongillo, R.D. Decker, L.D. W., Z. Husain, J. Contesse, B.B. Williams, A.B. Flood, H.M. Swartz, D.J. Carlson. SU-C-BRD-05: Non-Invasive in Vivo Biodosimetry in Radiotherapy Patients Using Electron Paramagnetic Resonance (EPR) Spectroscopy. Med. Phys. 42:3192 (2015) https://doi.org/10.1118/1.4923800.

507. K.M. Rychert, G. Zhu, M.M. Kmiec, V.K. Nemani, B.B. Williams, A.B. Flood, H.M. Swartz, B. Gimi. Imaging Tooth Enamel using Zero Echo Time (ZTE) Magnetic Resonance Imaging. Proceedings: Medical Imaging 2015: Biomedical Applications in Molecular, Structural, and Functional Imaging, 94171I (March 19, 2015) https://doi.org/10.1117/12.2083995.

508. A.M. Khailov, A.I. Ivannikov, V.G. Skortsov, V.F. Stepanenko, S.P. Orlenko, A.B. Flood, B.B. Williams, H.M. Swartz. Calculation of Dose Conversion Factors for Doses in the Fingernails to Organ Doses at External Gamma Irradiation in Air. Radiat. Meas. 82:1–7 (2015) https://doi.org/10.1016/radmeas.2015.07.004.

509. L.A. Jarvis, B.B. Williams, P.E. Schaner, E.Y. Chen, C.V. Angeles, H. Hou, W. Schreiber, V.A. Wood, A.B. Flood, H.M. Swartz, P. Kuppusamy. Phase 1 Clinical Trial of OxyChip, an Implantable Absolute pO₂ Sensor for Tumor Oximetry. Int. J. Radiat. Oncol. Biol. Phys. 2016 Oct;96 (2S):S109-S110.

510. P.A. Meaney, S. Geimer, B.B. Williams, A.B. Flood, H.M. Swartz. Coaxial Dielectric Probe Technique for Distinguishing Tooth Enamel from Dental Resin. Adv. Biomed. Eng. Res. 3:8–17 (2015) https://doi.org/10.14355/aber.2015.03.002.

511. N. Khan, H. Hou, H.M. Swartz, P. Kuppusamy. Direct and Repeated Measurement of Heart and Brain Oxygenation Using In Vivo EPR Oximetry. In Electron Paramagnetic Resonance Investigations of Biological Systems by Using Spin Labels, Spin Probes and Intrinsic Metal Ions, Part B. P. Z. Qin, K. Warncke (Eds.), Waltham, MA: Elsevier Publishers, pp 529–552 (2015).

512. C. Constantinou, Y. Apidianakis, N. Psychogios, V. Righi, M.N. Mindrinos, N. Khan, H.M. Swartz, H.H. Szeto, R.G. Tompkins, L.G. Rahme, A.A. Tzika. In Vivo High-Resolution Magic Angle Spinning Magnetic and Electron Paramagnetic Resonance Spectroscopic Analysis of Mitochondria-Targeted Peptide in Drosophila Melanogaster with Trauma-Induced Thoracic Injury. Int. J. Mol. Med. 37(2):299–308 (2015) https://doi.org/10.3892/ijmm.2015.2426.

513. D.J. Brenner, N.J. Chao, J.S. Greenberger, C. Guha, W.H. McBride, H.M. Swartz, J.P. Williams. Are We Ready for a Radiological Terrorist Attack Yet? Report From the Centers for Medical Countermeasures Against Radiation Network. Int. J. Radiation Oncol. Biol. Phys. 92(3):504e-505 (2015).

514. A.S. Camarata, J.M. Switchenko, E. Demidenko, A.B. Flood, H.M. Swartz, A.N. Ali. Emesis as a Screening Diagnostic for Low Dose Rate (LDR) Total Body Radiation Exposure. Health Phys. 110(4):391–394 (2016) https://doi.org/10.1097/HP.0000000000000476.
515. B.B. Williams, H. Hou, R. Coombs, H.M. Swartz. EPR Oximetry for Investigation of Hyperbaric O₂ Pre-Treatment for Tumor Radiosensitization. Adv. Exp. Med. Biol. 923: 367–374 (2016).

516. A.B. Flood, V.A. Satinsky, H.M. Swartz. Comparing the Effectiveness of Methods to Measure Oxygen in Tissues for Prognosis and Treatment of Cancer. Adv. Exp. Med. Biol. 923: 113–120 (2016).

517. H.M. Swartz, B.B. Williams, H. Hou, N. Khan, L.A. Jarvis, E.Y. Chen, P. Schaner, A. Ali, B. Gallez, P. Kuppasamy, A.B. Flood. Direct and Repeated Clinical Measurements of pO₂ for Enhancing Cancer Therapy and Other Applications. Adv. Exp. Med. Biol. 923: 95–104 (2016).

518. H. Hou, N. Khan, M. Nagane, S. Gohain, E. Y. Chen, L. A. Jarvis, P.E. Schaner, B.B. Williams, A. B. Flood, H.M. Swartz, P. Kuppasamy. Skeletal Muscle Oxygenation Measured by EPR Oximetry Using a Highly Sensitive Polymer-Encapsulated Paramagnetic Sensor. Adv. Exp. Med. Biol. 923: 351–357 (2016)

519. A.B. Flood, A.N. Ali, H.K. Boyle, G. Du, V.A. Satinsky, S.G. Swarts, B.B. Williams, E. Demidenko, W. Schreiber, H.M. Swartz. Evaluating the Special Needs of the Military for Radiation Biodosimetry for Tactical Warfare against Deployed Troops: Comparing Military to Civilian Needs for Biodosimetry Methods. Health Phys. 111(2):169–182 (2016) https://doi.org/10.1097/HP.0000000000000538.

520. K. Kobayashi, R. Dong, R.J. Nicolalde, B.B. Williams, G. Du, H.M. Swartz, A.B. Flood. Evolution and Optimization of Tooth Models for Testing In Vivo EPR Tooth Dosimetry. Radiat. Prot. Dosimetry 172 (1–3): 248–253 (2016) https://doi.org/10.1093/rpd/ncw214.

521. S. Petryakov, W. Schreiber, M. Kmiec, B.B. Williams, H.M. Swartz. Surface Dielectric Resonators For X-Band EPR Spectroscopy. Radiat. Prot. Dosimetry 172 (1–3): 127–132 (2016) https://doi.org/10.1093/rpd/ncw167.

522. D.S. Tipikin, S.G. Swarts, J.W. Sidabras, F. Trompier, H.M. Swartz. Possible Nature of the Radiation-Induced Signal in Nails: High-Field EPR, Confirming Chemical Synthesis, and Quantum Chemical Calculations. Radiat. Prot. Dosimetry 172 (1–3): 112–120 (2016) https://doi.org/10.1093/rpd/ncw216.

523. M. Miyake, Y. Nakai, I. Yamaguchi, H. Hirata, Naoki Kunugita, B.B. Williams, H.M. Swartz. In-Vivo Radiation Dosimetry Using Portable L Band EPR: On-Site Measurement of Volunteers in Fukushima Prefecture, Japan. Radiat. Prot. Dosimetry (2016) 172 (1–3): 248–253 first published online August 13, 2016 https://doi.org/10.1093/rpd/ncw214.

524. O. Grinberg, J.W. Sidabras, D. Tipikin, V. Krymov, M. Mariani, Matthew Feldman, M. Kmiec, S. Petryakov, Spencer Brugger, Brandon Carr, W. Schreiber, S.G. Swarts, H.M. Swartz. Dielectric-Backed Aperture Resonators For X-Band In Vivo EPR Nail Dosimetry. Radiat. Prot. Dosimetry 172 (1–3): 121–126 (2016) https://doi.org/10.1093/rpd/ncw163.

525. A.B. Flood, B.B. Williams, W. Schreiber, G. Du, V.A. Wood, M. M. Kmiec, S. V. Petryakov, E. Demidenko, H.M. Swartz, EPR Center Tooth Dosimetry Project Team. Advances In In Vivo EPR Tooth Biodosimetry: Meeting the Targets for Initial Triage Following a Large-Scale Radiation Event. Radiat. Prot. Dosimetry 172 (1–3): 72–80 (2016) https://doi.org/10.1093/rpd/ncw165.
526. W. Schreiber, S. Petryakov, M.M. Kmiec, M.A. Feldman, P.M. Meaney, V.A. Wood, H.K. Boyle, A.B. Flood, B.B. Williams, H.M. Swartz. Flexible, Wireless, Inductively Coupled Surface Coil Resonator for EPR Tooth Dosimetry. Radiat. Prot. Dosimetry 172 (1–3):87–95 (2016) https://doi.org/10.1093/rpd/ncw153.

527. B.B. Williams, A.B. Flood, E. Demidenko, H.M. Swartz. ROC Analysis for Evaluation of Radiation Biodosimetry Technologies. Radiat. Prot. Dosimetry 172 (1–3): 145–151 (2016) https://doi.org/10.1093/rpd/ncw168.

528. H.M. Swartz. Using Stable Free Radicals to Obtain Unique And Clinically Useful Data In Vivo in Human Subjects. Radiat. Prot. Dosimetry 172 (1–3): 3–15 (2016) https://doi.org/10.1093/rpd/ncw323.

529. H.M. Swartz, A.B. Flood, R.C. Wilkins. Introduction to the Special Issue from EPR Biodose 2015. Radiat. Prot. Dosimetry 172(1–3):1–2 (2016). https://doi.org/10.1093/rpd/ncw355.

530. A.B. Flood, V.A. Wood, H.M., Swartz. Using India ink as a Sensor for Oximetry: Evidence of its Safety as a Medical Device. Adv. Exp. Med. Biol. 977: 297–312 (2017). https://doi.org/10.1007/978-3-319-55231-6_40.

531. R.M. Caston, W. Schreiber, H. Hou, B.B. Williams, E.Y. Chen, P.E. Schaner, L.A. Jarvis, A.B. Flood, S.V. Petryakov, M. M. Kmiec, P. Kuppusamy, H.M. Swartz. Development of the Implantable Resonator System for Clinical EPR oximetry. Cell Biochem Biophys 75(3–4):275–283 (2017). https://doi.org/10.1007/s12013-017-0809-2.

532. H. Hou, N. Khan, S. Gohain, C.J. Eskey, K.L. Moodie, K.J. Maurer, H.M. Swartz, P. Kuppusamy. Dynamic EPR Oximetry of Changes in Intracerebral Oxygen Tension During Induced Thromboembolism. Cell Biochem. Biophys. 75, 285–294 (2017). https://doi.org/10.1007/s12013-017-0798-1.

533. H. Hou, N. Khan, G. Du, S. Hodge, H.M. Swartz. Temporal Variation in the Response of Tumors to Hyperoxia with Breathing Carbogen and Oxygen. Med. Gas. Res. 6(3):138–146. (2016). PMCID: PMC5110141.

534. H.M. Swartz, B.B. Williams, A.B. Flood. Overview of the Principles and Practice of Biodosimetry. 2016 IEEE International Symposium on Technologies for Homeland Security (conference at Waltham, MA, May 10–12, 2016.) INSPEC Accession Number: 16305025 https://doi.org/10.1109/THS.2016.7568913.

535. J.G. Vostal, P.W. Buehler, M.P. Gelderman, A.I. Alayash, A. Doctor, J.C. Zimring, S. Glynn, J.R. Hess, H. Klein, J. Acker, P. Spinella, A. D’Alessandro, B. Palsson, T. J. Raife, M. P. Busch, T.J. McMahon, M. Intaglia, H.M. Swartz, M.A. Dubick, S. Cardin, R.P. Patel, C. Natanson, J.W. Weisel, J.A. Muszynski, P.J. Norris, P.M. Ness. Proceedings of the Food and Drug Administration’s Public Workshop on New Red Blood Cell Product Regulatory Science 2016. Transfusion 58(1):255–266 (2018). https://doi.org/10.1111/trf.14435. Epub 2017 Dec 15. PMID: 29,243,830.

536. M. Umakoshi, I. Yamaguchi, H. Hirata, N. Kunugita, B.B. Williams, H.M. Swartz, M. Miyake. In Vivo Electron Paramagnetic Resonance Tooth Dosimetry: Dependence of Radiation-Induced Signal Amplitude on the Enamel Thickness and Surface Area of Ex Vivo Human Teeth. Health Physics 113(4):262–270 (2017). https://doi.org/10.1097/HP.0000000000000698 PMID: 28,796,750.
537. A.B. Flood, V.A. Wood, W. Schreiber, B.B. Williams, B. Gallez, H.M. Swartz. Guidance for Academics to Transfer ‘Bench-ready’ Medical Technology into Usual Clinical Practice. Case Study: Sensors and Spectrometer used in EPR Oximetry. Adv. Exp. Med. Biol. 1072:233–239. (2018) https://doi.org/10.1007/978-3-319-91287-5_37. PMID: 30,178,351 ISBN10 3,319,912,852; suppl. at 314496_1_En_37_MOESM1_ESM.docx.

538. S.G. Swarts, J.W. Sidabras, O. Grinberg, D. S. Tipikin, M. Kmiec, S. Petryakov, W. Schreiber, V.A. Wood, B.B. Williams, A.B. Flood, H.M. Swartz. Developments in Biodosimetry Methods for Triage, with a Focus on X-band Electron Paramagnetic Resonance In Vivo Fingernail Dosimetry. Health Phys. 115(1):140–150 (2018).

539. K. Kobayashi, R. Dong, R.J. Nicolalde, P. Calderon, G. Du, B.B. Williams, M. Lee, H.M. Swartz, A.B. Flood. Development of the Novel Mouth Model as an Alternative Tool for the Improvement of In Vivo EPR Dosimetry System. Phys. Med. Biol. 10:63(16):165,002. (2018) https://doi.org/10.1088/1361-6560/aad518. PMID: 30,033,935.

540. A.B. Flood, P.E. Schaner, P. Vaupel, B.B. Williams, B. Gallez, E.Y. Chen, A. Ali, T. Liu, V.H. Lawson, W. Schreiber, H.M. Swartz. Clinical and Statistical Considerations When Assessing Oxygen Levels in Tumors: Illustrative Results from Clinical EPR Oximetry Studies. Adv. Exp. Med. Bio. 1232:155–168 (2020). https://doi.org/10.1007/978-3-030-34461-0_20.

541. H.M. Swartz, P. Vaupel, B.B. Williams, P.E. Schaner, B. Gallez, W. Schreiber, A. Ali, A.B. Flood. ‘Oxygen Level in a Tissue”—What Do Available Measurements Really Report? (2020). Adv. Exp. Med. Bio. 1232: 145–153 (2020) https://doi.org/10.1007/978-3-030-34461-0_19.

542. H.M. Swartz, A.B. Flood, V.K. Singh, S.G. Swarts. Scientific and Logistical Considerations When Screening for Radiation Risks by Using Biodosimetry Based on Biological Effects of Radiation Rather Than Dose: The Need for Prior Measurements of Homogeneity and Distribution of Dose. Health Physics 119(1): 72–82, 2020.

543. H. Hou, J.H. Baek, H. Zhang, F. Wood, Y. Gao, A.B. Flood, H.M. Swartz, P.W. Buehler. Electron Paramagnetic Resonance (EPR) Oximetry as a Novel Approach to Monitor the Effectiveness and Quality of Red Blood Cell Transfusions. Blood Transfus. 17(4): 296–306 (2019). https://doi.org/10.2450/2019.0037-19.

544. J.J. Jeong, T. Liu, X. Yang, M. Torres, J. Lin, W. Schreiber, A.B. Flood, P. Kuppusamy, H.M. Swartz, B.B. Williams, P.E. Schaner, A. Ali. Measurements of Normal Tissue Oxygenation Via Electron Paramagnetic Resonance (EPR) Oximetry During and After Breast Radiation Therapy: Baseline Evaluations and Response to Hyperoxygenation. J. Radiol. Radiat. Ther. 7(1): 1082 (6 pp) (2019).

545. P.W. Buehler, A.B. Flood, H.M. Swartz. Measurement of Tissue Oxygen Homeostasis and pO2 as a Novel Approach to Optimizing Red Blood Cell Quality Assessment. Adv. Exp. Med. Bio. 1269:379–386. (2021). PMID: 33966246. https://doi.org/10.1007/978-3-030-48238-1_60.
546. H.M. Swartz, A.B. Flood, B.B. Williams, B.W. Pogue, P.E. Schaner, P. Vaupel. What is the Meaning of an Oxygen Measurement? Analysis of Methods Purporting to Measure Oxygen in Targeted Tissues. Adv. Exp. Med. Bio. 1269:301–308 (2021). PMID: 33,966,234 https://doi.org/10.1007/978-3-030-48238-1_48

547. J. Waller, B. Onderdonk, A.B. Flood, H. M. Swartz, J. Shah, A. Shah, B. Aydogan, H. Halpern, Y. Hasan. The Clinical Utility of Imaging Methods Used to Measure Hypoxia in Cervical Cancer. Brit J. Radiol. 93:1111 (2020) https://doi.org/10.1259/bjr.20190640.

548. X. Cao, S. Jiang, J. R Gunn, C. Yao, X. Jing, P. Bruza, D. Gladstone, L.A. Jarvis, J. Tian, H.M. Swartz, S.A Vinogradov, B.W. Pogue. High Resolution \( pO_2 \) Imaging Improves Quantification of the Hypoxic Fraction in Tumors during Radiotherapy. Internat. J. Radiat. Onc. Biol. Phys. 109(2):603–613 (2021). https://doi.org/10.1016/j.ijrobp.2020.09.046603.

549. H.M. Swartz, A.B. Flood, P.E. Schaner, H. Halpern, B.B. Williams, B.W. Pogue, B. Gallez, P. Vaupel. How Best to Interpret Measures of Levels of Oxygen in Tissues to Make Them Effective Clinical Tools for Care of Patients with Cancer and Other Oxygen-Dependent Pathologies. Physiol. Rep. 8:e14541;1–20 (2020) https://doi.org/10.14814/phy2.14541.

550. O. Grinberg, J.W. Sidabras, D. Tipikin, V. Krymov, S.G. Swarts, H.M. Swartz. Dielectric-Backed Aperture Resonators for X-band Depth-Limited in Vivo EPR Nail Dosimetry. Appl. Magn. Reson. 51:1093–1101 (2020) https://doi.org/10.1007/s00723-020-01259-1.

551. P.E. Schaner, J.R. Pettus, A.B. Flood, B.B. Williams, L.A. Jarvis, E.Y. Chen, D.A. Pastel, R.A. Zuurbier, R.M. diFlorio-Alexander, H.M. Swartz, P. Kuppusamy. OxyChip Implantation and Subsequent Electron Paramagnetic Resonance Oximetry in Human Tumors Is Safe and Feasible: First Experience in 24 Patients. Front. Oncol. 10:572,060 (2020). https://doi.org/10.3389/fonc.2020.572060.

553. M.J. Ochocinska, S.L. Spitalnik, A. Abuhamad, E. Bennett-Guerrero, W.A. Carlo, M. Cherukuri, A. Doctor, W. Dzik, C.L. Evans, E. Forzani, P. Kuppusamy, N.L. Moan, L. Li, N. Luban, N. Mohandas, R.M. Patel, J. Roback, H.M. Swartz, S. Textor, S. Vinogradov, L.V. Wang, N. Wisniewski, S. Glynn. NIH Workshop 2018: Towards Minimally-invasive or Non-invasive Approaches to Assess Tissue Oxygenation Pre- and Post-Transfusion. Transfus. Med. Rev. 2021 Jan;35(1):46–55. https://doi.org/10.1016/j.tmrv.2020.12.003.

554. I. Yamaguchi, K. Inoue, M. Natsuhori, K. Okada, H. Sat, J. Sasaki, C.A.B. Gonzales, H. Yasuda, Y. Nakai, M. Miyake, H.M. Swartz. L-Band Electron Paramagnetic Resonance Tooth Dosimetry Applied to Affected Cattle Teeth in Fukushima. Appl. Sci. 11(3):1187 (2021) https://doi.org/10.3390/app11031187.

555. H. Hirata, H.M. Swartz. RF/Microwave Resonators for Preclinical and Clinical EPR Applications: Current Status and Challenges. Appl. Magn. Reson. (2022). In press. https://doi.org/10.1007/s00723-021-01413-3.

556. H.M. Swartz, S.G. Swarts, E. Ainsbury, R.C. Wilkins, M. Port, F. Trompier, A.B. Flood, L. Roy, the Scientific Council of IABERD. Complementary Lessons Learned from the Testing Strategies Used for Radiation Emergencies and COVID-19: A White Paper from the International Association of Biological
557. H.M. Swartz, R.C. Wilkins, E. Ainsbury, M. Port, A.B. Flood, F. Trompier, L. Roy, S.G. Swarts. What if a Major Radiation Incident Happened during a Pandemic? Considerations of the Impact on Biodosimetry. Internat. J. Radiat. Biol. In press. (2021) https://doi.org/10.1080/09553002.2021.2000659.

558. V. Singh, H.M. Swartz, T.M. Seed. Radiation Medical Countermeasures and Use of EPR Biodosimetry to Facilitate Effectiveness of Applied Clinical Procedures. Appl. Magn. Reson. (2021) In press https://doi.org/10.1007/s00723-021-01444-w.

559. B.W. Pogue, X. Cao, H.M. Swartz, S.A. Vinogradov. Review of Tissue Oxygenation Sensing During Radiotherapy Based Upon Cherenkov-Excited Luminiscence Imaging. Appl. Magn. Reson. 52(10): 1521–1536 (2021). https://doi.org/10.1007/s00723-021-01400-8.

560. W.K. Subczynski, J. Widomska, N. Stein, H.M. Swartz. Factors Determining Barrier Properties to Oxygen Transport Across Model and Cell Plasma Membranes Based on EPR Spin-Label Oximetry. Appl. Magn. Reson. (2022). In press. https://doi.org/10.1007/s00723-021-01412-4.

561. S. Petryakov, W. Schreiber, M.M. Kmiec, H.M. Swartz, P.E. Schaner, P. Kuppusamy, B.B. Williams. Flexible Segmented Surface Coil Resonator for In Vivo EPR Measurements in Human Subjects. Appl. Magn. Reson. (2022). In press. https://doi.org/10.1007/s00723-021-01408-0.

562. X. Cao, R. Zhang, T.V. Esipova, S. Rao, Allu, R. Ashraf, M. Rahman, J.R. Gunn, P. Bruza, D.J. Gladstone, B.B. Williams, H.M. Swartz, P.J. Hoopes, S.A. Vinogradov, B.W. Pogue. Quantification of Oxygen Depletion During FLASH Irradiation in vitro and in Vivo. Int. J. Radiat. Oncol. Biol. Phys. 111(1):240–248 (2021 https://doi.org/10.1016/j.ijrobp.2021.03.056.

563. J.I. Park, K. Choi, C.U. Koo, J. Oh, H. Hirata, H.M. Swartz, S-J. Ye. Dependence of Radiation-induced Signals on Geometry of Tooth Enamel using a 1.15 GHZ Electron Paramagnetic Resonance Spectrometer: Improvement of Dosimetric Accuracy. Health Phys. 120(2):152–162 (2021)

565. P.W. Buehler, A.B. Flood, H.M. Swartz. Expanding EPR Oximetry into Transfusion Medicine. Appl. Magn. Reson. 52(10):1509–1519 (2021) https://doi.org/10.1007/s00723-021-01394-3.

566. Y. Nakai, I. Yamaguchi, H. Hirata, H.M. Swartz, A.B. Flood, B.B. Williams, W. Schreiber, M. Miyake. Effects of Ultraviolet Rays on L-Band In Vivo EPR Dosimetry Using Tooth Enamel. Appl. Magn. Reson. (2022). In press https://doi.org/10.1007/s00723-021-01340-3.

567. W. Schreiber, S.V. Petryakov, M.M. Kmiec, A.B. Flood, H.M. Swartz. P.E. Schaner, B.B. Williams. In Vivo CW-EPR Spectrometer Systems for Dosimetry and Oximetry in Preclinical and Clinical Applications. Appl Magn Reson (2022) in press. https://doi.org/10.1007/s00723-021-01382-7.

568. E.Y. Chen, D. Tse, H. Hou, W.A. Schreiber, P.E. Schaner, M.M. Kmiec, K.A. Hebert, P. Kuppusamy, H.M. Swartz, B.B. Williams. Evaluation of a Refined Implantable Resonator for Deep-Tissue EPR Oximetry in the Clinic. Appl.
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