

## CURRICULUM VITAE

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Education: University of Chicago - 1951-1953  
Loyola University of Chicago - 1953-1955  
University of Illinois College of Medicine - 1955-1959, M.D.  
Michael Reese Hospital, Rotating Internship - 1959-1960  
University of North Carolina (Chapel Hill) - 1961-1962, M.S.P.H. (Radiation Biology)  
Georgetown University Medical School, Department of Biochemistry - 1966-1969, Ph.D.

Military Service: Army Medical Corps - 1961-1970

Professional License: Wisconsin License 17279  
Illinois License 003-036-037117-1

Board Certification: American Board of Nuclear Medicine, June, 1972

Faculty Appointments: Professor of Community and Family Medicine, Dartmouth Medical School, Hanover, NH  
Professor of Radiology, Dartmouth Medical School, Hanover, NH  
Adjunct Professor of Engineering, Thayer School of Engineering, Hanover, NH  
Adjunct Professor of Chemistry, Dartmouth College, Hanover NH  
Professor of Physiology, Dartmouth Medical School, Hanover, NH  
Professor of Medicine, College of Medicine, University of Illinois at Urbana-Champaign (1980-1991)  
Professor of Biophysics, School of Life Sciences, University of Illinois at Urbana-Champaign (1980-1991)  
Professor of Health & Safety Studies, University of Illinois at Urbana-Champaign (1986-1991)  
Affiliate Dept. of Nuclear Engineering, University of Illinois at Urbana-Champaign (1980-1991)  
Affiliate, Institute for Environmental Studies, University of Illinois at Urbana-Champaign (1980-1991)  
Member, Bioengineering Program, University of Illinois at Urbana-Champaign (1988-1991)  
Member, Nutritional Science Division, University of Illinois at Urbana-Champaign (1988-1991)  
Clinical Professor of Radiology, Medical College of Wisconsin (1980-1993)  
Visiting Professor of Radiology, Johns Hopkins School of Medicine (1988-1989)  
Visiting Professor of Biochemistry, University of Oxford (1989)

Professor of Radiology and Biochemistry, Medical College of Wisconsin (1974-1980)

Associate Professor of Radiology and Biochemistry, Medical College of Wisconsin (1970-1973)

Administrative Appointments:

Director, MD/PhD Program, Dartmouth Medical School (1992-1995)  
Director, Educational Programs, Center for the Evaluative Clinical Sciences, Dartmouth Medical School (1992-1995)

Director of Research, Radiology, Dartmouth Medical School (1992-present)  
Director, Medical Scholars Program, University of Illinois at Urbana-Champaign (1984-1991)

Head, Program in Medical Humanities and Social Sciences, University of Illinois College of Medicine at Urbana-Champaign (1984-1990)

Associate Dean for Academic Affairs, University of Illinois College of Medicine at Urbana-Champaign (1980-1984)

Director, University of Illinois EPR Research Center (1985-1991)

Director, Radiation Biology and Biophysics, Medical College of Wisconsin (1970-1980)

Director, National Biomedical ESR Center, Medical College of Wisconsin (1975-1980)

Director, Independent Study Program, Medical College of Wisconsin (1974-1979)

Director, Biophysics Department, Walter Reed Army Institute of Research (1966-1969)

Director, Department of Biological Chemistry, Walter Reed Army Institute of Research (1970)

Professional Societies - Present and Past :

Radiation Research Society, Society of Nuclear Medicine, (New York Academy of Science), (Society of Cryobiology), Biophysics Society, (AMA), (Wisconsin State Medical Society), (Milwaukee County Medical Society), (Radiological Society of North America), (American Academy of Family Physicians), Society of Magn. Reson. Med.--[Secretary (1985-1990) and Member of Board of Trustees (1982-1990)], Pigment Cell Society, Society for Photobiology and Photochemistry, Oxygen Society, International EPR (ESR) Society--[President (1990-1993), Founder President (lifetime appointment)], International Society for Oxygen Transport to Tissue: executive committee 1996-; President-elect 1997-98; President 1998-99.

Honors:

The International Zavoisky Award (2005)  
Fellow of International EPR (ESR) Society (2005)  
Special Gold Medal as Founder of the International EPR Society (2005)  
Fellow of International Society for Magnetic Resonance in Medicine (1997)  
Silver Medal (Biomedicine) from International EPR Society (1994)  
Silver Medal from the Society for Magnetic Resonance in Medicine (1993)

Patents:

“Apparatus and Methodology for Determining Oxygen Tension in Biological Systems” (#5,706,805, 1/13/98)

“Apparatus and Methodology for Determining Oxygen in Biological Systems” (#5,494,030, 2/27/96)

“Methodology for Determining Oxygen in Biological Systems” (#5,833,601, 11/10/98)

“Methods and Apparatus for Post-Exposure Determination of Ionizing Radiation Dose.” (pending)

Publications:

1. D. Hightower and 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," Radiation Res., 24:579-586 (1965).
3. H. M. Swartz and 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, and 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 and E. C. Richardson, "A Correlation Between Radiation-Induced Free Radicals and Survival in Micro-Organisms Exposed to  $\beta$ -Mercaptoethylamine Under Oxygen or Nitrogen," Intl. J. Rad. Biol., 12:75-88 (1967).
6. J. M. Brady, N. O. Aarestad, and H. M. Swartz, "In Vivo Dosimetry by Electron Spin Resonance Spectroscopy," Health Physics, 15:43-47 (1968).
7. H. M. Swartz, "Effect of Oxygen on Freezing Damage in E. coli," Ph.D. Thesis, Georgetown University (1969).
8. E. S. Copeland and 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 and 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, and R. J. Jandacek, "Structure Function Studies of the Amino-thiol Radio-Protectants," in Radiation Protection and Sensitization, W. L. Moroson and M. Quintiliani, (Eds.), Taylor and Francis, Ltd., London, 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).
12. H. M. Swartz, "Clinical-Basic Science Paradox in Medicine," Pharos, 33:130-131 (1970).
13. M. C. Johnson, H. M. Swartz, and R. M. Donati, "Hematological Alterations Produced by Nitrous Oxide Radiation 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, and E. C. Richardson, "Structure-Function Studies of the Amino-thiol Radioprotectants, II. The Effect of Carbon Chain Length in Mercaptoethylamine Homologues," Radiation Res., 45:542-556 (1971).
17. H. M. Swartz, J. C. Darin, and 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, and 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, and D. Borg, "Biological Applications of Electron Spin Resonance," [Book] John Wiley & Sons, New York, (1972).
20. H. M. Swartz, "ESR Studies of Cells and Tissues," in Biological Applications of Electron Spin Resonance, H. M. Swartz, J. R. Bolton, and D. C. Borg, (Eds.), John Wiley & Sons, New York, pp. 155-195 (1972).
21. J. R. Bolton, D. C. Borg, and H. M. Swartz, "Experimental Aspects of Biological Spin Resonance Studies," in Biological Applications of Electron Spin Resonance, J. R. Bolton, D. C. Borg, and H. M. Swartz, (Eds.), John Wiley & Sons, New York, pp. 63-118 (1972).
22. H. M. Swartz, "Electron Spin Resonance Studies of Carcinogenesis," in Advances in Cancer Research, G. Klein and S. Weinhouse, (Eds.), Academic Press, New York, pp. 227-252 (1972).
23. H. M. Swartz and 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, and S. Schneller, "Electron Spin Resonance Spectra of Blood in Carcinogenesis," *Intl. Union for Pure and Applied Biophys., 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. Cytology*, 35:321-343 (1973).
27. H. M. Swartz, S. Ambegaonkar, W. Antholine, M. Konieczny, and 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, and 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, and 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).
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31. H. M. Swartz, "Radiation Risks From Chest Examinations," *JAMA*, 228:696 (1974).
32. J. Kinzie, G. Walter, and H. M. Swartz, "Daily Portal Irradiation of Non-Anesthetized Rats: Experience with a New Device," *Radiology*, 113:734-737 (1974).
33. N. J. F. Dodd and 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).
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41. H. M. Swartz, "On Conservative Estimates of Radiation Hazards," *Radiology*, 126:267-268 (1978).
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43. J. S. Soin, J. D. Cox, J. E. Youker, and H. M. Swartz, "Cardiac Localization of <sup>99m</sup>Tc (Sn)-Pyrophosphate Following Irradiation of the Chest," *Radiology*, 124:165-168 (1977).
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45. W. E. Antholine, J. S. Hyde, and H. M. Swartz, "Use of Dy<sup>3+</sup> as a Free Radical Relaxing Agent in Biological Tissues," *J. Magn. Reson.*, 29:517-522 (1978).
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47. H. M. Swartz, "Application of Magnetic Resonance in Cancer--A Critical Summary," *J. Magn. Reson.*, 29:393-396 (1978).
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50. T. Sarna and 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, and 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, and W. E. Antholine, "The Spin-Probe--Spin-Label Method" in *Spin Labeling: Theory and Applications*, Vol. II, L. J. Berliner, (Ed.), Academic Press, New York, pp. 71-113 (1979).
53. P. L. Gutierrez and 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, and B. A. Reichling, "Paramagnetic Changes During Development of DMBA-Induced Mammary Tumors in Sprague-Dawley Rats," *Phys. Med. Biol.*, 24:416-425 (1979).
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56. H. M. Swartz, "Free Radicals in Cancer," in *CIBA Symposium No. 67, Submolecular Biology and Cancer*, pp. 107-124 (1979).
57. R. C. Sealy, C. C. Felix, J. S. Hyde, and H. M. Swartz, "Structure and Reactivity of Melanins: Influence of Free Radicals and Metals Ions," *Free Radicals in Biology*, 4:210-251 (1980).
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59. C. Lai, L. E. Hopwood, and H. M. Swartz, "Electron Spin Resonance Studies of Changes in Membrane Fluidity of Chinese Hamster Ovary Cells During the Cell Cycle," *Biochim. Biophys. Acta*, 602:117-126 (1980).
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61. H. M. Swartz, "Electron Spin Resonance Studies of Cancer Using Complex Biological Systems," in *Free Radicals and Cancer*, R. A. Floyd, (Ed.), Marcel Dekker, Inc., New York, NY, pp. 81-115 (1982).
62. H. M. Swartz, B. Reichling, R. Stark, A. Been, and J. F. Wilson, "Modifications of Gastrointestinal Death in Mice Exposed to Whole and Partial Body Exposures of Low Dose Rate Irradiation," *Am. J. Roentgenology*, 131:1108 (1978).
63. H. M. Swartz and N. J. F. Dodd, "The Role of Ascorbic Acid on Radical Reactions *In Vivo*," in *Oxygen and Oxy-Radicals in Chemistry and Biology*, M. A. I. Rodgers and E. L. Powers, (Ed.), Academic Press, Orlando, Fla., pp. 161-168 (1981).
64. N. J. F. Dodd and H. M. Swartz, "ESR Signals of Lyophilized Tissue," *Br. J. Cancer*, 42: 349-351 (1980).
65. H. M. Swartz, "Electron Spin Resonance Studies of Cancer: A Status Report," in *Free Radicals, Lipid Peroxidation and Cancer*, David McBrien and Trevor Slater, (Eds.), Academic Press, Orlando, Fla., pp. 5-26 (1982).
66. H. M. Swartz and S. M. Swartz, "Biochemical and Biophysical Applications of Electron Spin Resonance," in *Methods of Biochemical Analysis*, David Glick, (Ed.), John Wiley & Sons, New York, pp. 207-323 (1983).
67. H. M. Swartz, "The Future Development and Role of Clinical Anthropology--The Perspectives of a Medical Educator," in *Clinical Anthropology: A New Approach to American Health Problems?*, Demetri Shimkin and Peggy Golde, (Eds.), University of Illinois: Urbana, IL, pp. 15-24 (1983).
68. R. C. Sealy, J. Hyde, C. C. Felix, I. A. Menon, G. Prota, and H. M. Swartz, "Novel Free Radicals in Synthetic and Natural Pheomelanins: Distinction Between Dopa Melanins and Cysteinyl-dopa Melanins by Electron Spin Resonance Spectroscopy," *Proc. Nat. Acad. Sciences*, 79:2885-2889 (1982).
69. H. M. Swartz, "*In Vivo* Electron Spin Resonance (ESR) Determinations" in *Proceedings of Conference on Non-Invasive Studies of Body Chemistry*, W. Wolf (Ed.) (1982).
70. H. M. Swartz, "Use of Electron Spin Resonance to Study Complex Biological Membranes," *Proceedings from the NATO ASI on Physical Methods on Biological Membranes and Their Model Systems*, F. Conti, W. E. Blumberg, J. deGier, and F. Pocchiari, (Eds.), Plenum Press, New York, NY, pp. 39-53 (1985).
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73. N. J. F. Dodd and 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, and T. F. Slater, (Eds.), Raven Press, New York, NY, pp. 275-293 (1984).
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77. P. D. Morse II, R. L. Magin, and 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," in *Resident and Staff Physician*, Dec. 15, pp. 15-19 (1985).
79. H. M. Swartz, L. Paradisi, M. Nilges, P. Morse, and M. Dianzani, "Relation Between Physical State of Membrane and Lipid Peroxidation," Report to NFCR (1988).
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81. A. B. Flood, H. M. Swartz, K. Sharp, J. C. Bonello, and W. H. Forrest, Jr., "A Comparison Between Preoperative and Postoperative Diagnoses for Non malignant Biliary Tract Disease," working papers, Medical Humanities and Social Sciences Program, University of Illinois (1988).
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84. E. M. Melhado, W. Feinberg, H. M. Swartz, (Eds.) (Book), "Money, Power, and Health Care," Health Administration Press, Ann Arbor, MI (1988).
85. H. M. Swartz, "Free Radicals and Clinical Disease," *Soc. Magn. Reson. Med. Newsletter* (1985).
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101. G. Bacic, F. Demsar, Z. Zolnai, and 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. Bacic, Z. Zolnai, and H. M. Swartz, "Detection of Diffusion of Oxygen by Fast Scan EPR Imaging," *J. Magn. Reson.*, 76:224-231 (1988).
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