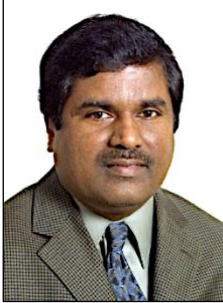


PERIANNAN KUPPUSAMY MS, PHD, MD (*honoris causa*), DLitt



PROFESSOR OF RADIOLOGY ■
PROFESSOR OF MEDICINE ■
PROFESSOR OF ENGINEERING ■
PROFESSOR OF CHEMISTRY ■

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DEPARTMENT OF MEDICINE
DEPARTMENT OF CHEMISTRY
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CITIZENSHIP USA

EDUCATION & TRAINING

DEGREE / TRAINING	DATES	INSTITUTION/AFFILIATION	FIELD OF STUDY
B. S.	1972 - 1975	University of Madras, Chennai, India	Chemistry, Math, Physics
M. S.	1975 - 1977	University of Madras, Chennai, India	Chemistry
Ph. D.	1980 - 1985	Indian Institute of Technology, Chennai, India	EPR Spectroscopy
Fogarty Fellowship	1986 - 1987	National Institute on Aging, National Institutes of Health, Baltimore, Maryland, USA	Cellular and Molecular Biology
Research Fellowship	1987 - 1990	Johns Hopkins University, School of Medicine, Baltimore, Maryland, USA	Cardiovascular

PROFESSIONAL APPOINTMENTS

POSITION	DEPARTMENT/INSTITUTION	DATES
CURRENT		
Professor (tenured)	Department of Radiology, Dartmouth College, Hanover, NH	2013 –
Professor (adjunct)	Department of Medicine, Dartmouth College, Hanover, NH	2013 –
Professor (adjunct)	Thayer School of Engineering, Dartmouth College, Hanover, NH	2019 –
Professor (adjunct)	Department of Chemistry, Dartmouth College, Hanover, NH	2019 –
PAST		
Professor (tenured)	Department of Internal Medicine, Ohio State University, OH	2005 - 2013
Professor (adjunct)	Department of Biomedical Engineering, Ohio State University, OH	2005 - 2013
Director	Center for Biomedical EPR Spectroscopy and Imaging, OSU	2002 - 2013
Director	Small Animal Imaging Core, Ohio State University, OH	2005 - 2011
Director	Small Animal Shared Resources, Comprehensive Cancer Center	2005 - 2011
Associate Director	Division of Cardiovascular Medicine, Ohio State University (OSU)	2007 - 2013
Associate Director	Davis Heart and Lung Research Institute, OSU	2005 - 2009
Associate Professor	Department of Internal Medicine, OSU	2002 - 2005
Associate Professor	Biomedical Engineering, OSU	2002 - 2005
Associate Professor	Department of Medicine, Johns Hopkins University, Baltimore, MD	2001 - 2002
Assistant Professor	Department of Medicine, Johns Hopkins University, Baltimore, MD	1993 - 2000
Instructor	Department of Medicine, Johns Hopkins University, Baltimore, MD	1990 - 1992
Assistant Professor	University of Madras, Chennai, India	1985 - 1986
Lecturer	University of Madras, Chennai, India	1978 - 1980

AWARDS & HONORS

AWARD/HONOR	DESCRIPTION	PERIOD
Sir William Wedderburn Award (Gold Medal)	FIRST RANK in M.Sc. (among 240 graduates), University of Madras, Chennai, India	1977
B.B. Day Commemoration Award (Outstanding Recognition)	FIRST RANK in M.Sc. (among 240 graduates), University of Madras, Chennai, India	1977
Teacher/Research Fellowship Award	University Grants Commission, Govt. of India	1980-1984
NIH Fogarty (International) Fellowship for Post-doctoral Research in USA	National Institutes of Health, Bethesda, MD	1986-1987
CERT Research Award	Seed grant for development of EPR imaging by Chesapeake Education & Research Trust, Baltimore, MD	1990
AHA Established Investigator Award	American Heart Association, National Center	1996-2001
William D. and Jacquelyn L. Wells Chair in Imaging Research	Endowed chair for imaging research at OSU	2005 - 2013
Silver Medal for Biology & Medicine	Awarded by the International EPR Society for development of biomedical EPR imaging	2006
Outstanding Investigator Award	Awarded by American Tamil Medical Association (ATMA) for outstanding achievements in biomedical research	2006
Distinguished Mentor Award	Awarded by Davis Heart and Lung Research Institute for mentoring/teaching	2006
Doctor of Medicine	Doctor of Medicine, <i>Honoris Causa</i> awarded by the University of Pecs, Pecs, Hungary for Medical Sciences. ▶ <i>Honoris Causa</i>	
Lumley Award of Excellence for Interdisciplinary Research	Awarded by the OSU College of Engineering for Interdisciplinary Research	2011
Doctor of Letters	Awarded by the International Tamil University, Maryland, USA for pioneering efforts and	2012

contributions to the advancement of Tamil
Language and Culture

Lawrence H. Piette Award

Awarded by the International EPR Society for In vivo EPR ([link](#)) 2014

**Indian Institute of Technology (IIT-M)
Distinguished Alumni Award**

[Distinguished Alumni Award from IIT Madras](#)
(Chennai) 2015

ADMINISTRATIVE RESPONSIBILITIES

POSITION	YEAR	RESPONSIBILITY/DESCRIPTION
Director	2002 - 2013	Center for Biomedical EPR Spectroscopy and Imaging The center was created in 2002. The center has a wide range of EPR spectrometers (X-band, S-band, L-band; spectroscopy and imaging systems), and more than 20 research personnel in the entire first floor of the Tzagournis Medical Research Facility. Accomplishments: I have established a team-work culture providing effective mentorship, care, and joyful work experience for the members of the group.
Director	2002 - 2013	Small Animal Imaging Core, Davis Heart and Lung Research Institute The EPR/MRI Core, <i>aka</i> Small Animal Imaging Core , was established in 2002 to provide imaging resources to HDLRI investigators. The core has EPR, MRI, and high-frequency ultrasound imaging capabilities for small-animal imaging. Accomplishments: I have spent enormous amount of time, energy, and resources to build this core. I have invited, educated, and supported a number of DHLRI and CCC investigators on the use of these modern imaging technologies.
Director	2005 - 2013	Small Animal Imaging Shared Resource, Comprehensive Cancer Center (OSU/CCC) The Small Animal Imaging Shared Resource was created in 2005. The goal was to bring the imaging resources scattered across the campus including the College of Medicine, DHLRI, College of Veterinary Sciences, and Department of Radiology under one-roof to provide a comprehensive array of imaging opportunities for cancer investigators. The shared resource initiative is supported by OSU Comprehensive Cancer Center funded by the National Cancer Institute. Accomplishments: I have established a comprehensive strategic plan to develop and manage the resource. I recruited a Co-Director (Dr. Kimerly Powell) to support the operation of the resource. Presently, we are in the process of recruiting 3 more staff for imaging. We have started a biweekly educational lecture on different imaging modalities and opportunities. We are also preparing NIH shared instrumentation grants to acquire new systems, e.g, clinical EPR oximeter, and bioluminescence imaging.
Associate Director	2005 - 2009	Davis Heart and Lung Research Institute (DHLRI) The Davis Heart and Lung Research Institute (DHLRI) was comprised of 500+ faculty, staff and student employees. The Institute had funded research programs in four major thematic program areas including inflammation and immune function, ischemia and metabolism, myocyte biology, and regenerative medicine.

Accomplishments: I served in many important administrative roles including the chair of space committee, co-director of regenerative medicine thematic program, and director of Small Animal Imaging Core.

Associate Director	2007 - 2013	Division of Cardiovascular Medicine
Chair	2005 - 2011	DHLRI Space Committee
Chair	2012 - 2013	DHLRI Education Committee
Co-Director	2005 - 2013	DHLRI Regenerative Medicine - Thematic Program
Member	2008 - 2011	Promotion and Tenure Committee, College of Medicine

RESEARCH PUBLICATIONS

PEER-REVIEWED ORIGINAL RESEARCH PUBLICATIONS, REVIEWS AND BOOK CHAPTERS

1983 (3)

1. **Kuppusamy, P.**, and Manoharan, P. T. Spin correlation functions in the weak exchange Heisenberg linear chain $[(NMP)_2][Cu(mnt)_2]$. *Bull. Mag. Res.*, 5, 207 (1983).
2. Mahadevan, C., **Kuppusamy, P.**, Murthy, B. V. R., Seshasayee, M., and Manoharan, P. T. Structure of trimethylammonium bis(maleonitriledithiolato)nickelate(III). *Acta Cryst.*, C39, 1335-1343 (1983).
3. Ramakrishna, B. L., **Kuppusamy, P.**, Manoharan, P. T., and Hunziker, M. Structural and magnetic investigations on the charge transfer ion radical salt, $[TMPD][Ni(mnt)_2]$. *J. Phys. Colloq.*, 44, 1409-1412 (1983).

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4. **Kuppusamy, P.**, Ramakrishna, B. L., and Manoharan, P. T. EPR, magnetic and structural investigations on the weak exchange Heisenberg linear chain $[(NMP)_2][Cu(mnt)_2]$. *Inorg. Chem.*, 23, 3886-3892 (1984).
5. **Kuppusamy, P.**, Ramakrishna, B. L., and Manoharan, P. T. Exchange interactions in some low-dimensional metal dithiolene complexes. *Proc. Ind. Acad. Sci.*, 93, 977-1001 (1984).
6. Mahadevan, C., **Kuppusamy, P.**, Seshasayee, M., and Manoharan, P. T. Crystal and molecular structure of tetra-*n*-butylammonium bis(stilbene-1,2-dithiolato)nickelate(III). *J. Cryst. Spec. Res.*, 4, 177-190 (1984).

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7. **Kuppusamy, P.**, Mahadevan, C., Seshasayee, M., and Manoharan, P. T. Crystal and molecular structure of N-methylphenazinium bis(maleonitriledithiolato) nickelate(III). *J. Cryst. Spect. Res.*, 15, 359-376 (1985).
8. **Kuppusamy, P.**, and Manoharan, P. T. Exchange interactions in $[NMe_4]_2[Cu(mnt)_2]$: A quasi 1-d weak exchange system. *Inorg. Chem.*, 24, 3053-3057 (1985).
9. **Kuppusamy, P.**, Venkatalakshmi, N., and Manoharan, P. T. Structure of N-methylphenazinium bis(maleonitriledithiolato) gold(III). *J. Cryst. Spect. Res.*, 15, 629-641 (1985).
10. **Kuppusamy, P.**, and Manoharan, P. T. Anisotropic exchange interaction in tetra-*n*-butylammonium bis(stilbene-1,2-dithiolato)nickelate(III). *Chem. Phys. Lett.*, 188, 159-163 (1985).
11. **Kuppusamy, P.**, and Manoharan, P. T. Hyperfine and exchange interactions in tetraethylammonium bis(maleonitriledithiolato)cuprate(II). *J. Ind. Chem. Soc.*, 63, 95-101 (1985).
12. Mahadevan, C., **Kuppusamy, P.**, Seshasayee, M., and Manoharan, P. T. Crystal and molecular structure of N-methylphenazinium bis(benzene-1,2-dithiolato)nickel(III). *J. Cryst. Spec. Res.*, 15, 305-316 (1985).

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13. **Kuppusamy, P.**, and Manoharan, P. T. Magnetic properties of some exchanged coupled $[Ni(mnt)_2]^-$ dimers. *Proc. Ind. Acad. Sci.*, 98, 115-129 (1987).

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14. Radha, A., Seshasayee, M. and **Kuppusamy, P.** Structure of bis[1,2-bis(diphenylphosphino ethylene)] iodocobalt(II) tetraphenylborate. *Acta Cryst.* C44, 1008-1011 (1988).
15. Zweier, J. L., **Kuppusamy, P.**, and Luty, G. A. Measurement of endothelial cell free radical generation: Evidence for a central mechanism of free radical injury in post ischemic tissues. *Proc. Natl. Acad. Sci. USA*, 85, 4046-4050 (1988). [[PubMed](#)]

16. Zweier, J. L., and **Kuppusamy, P.** Electron paramagnetic resonance measurements of free radicals in the intact beating heart: A technique for detection and characterization of free radicals in whole biological tissues. Proc. Nat. Acad. Sci. USA, 85, 5703-5707 (1988). [[PubMed](#)]

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17. **Kuppusamy, P.**, and Zweier, J. L. Characterization of free radical generation by xanthine oxidase: Evidence for hydroxyl radical generation. J. Biolog. Chem., 264, 9880-9884 (1989). [[PubMed](#)]
18. Rajalakshmi, A, Radha, A., Seshasayee, M., **Kuppusamy, P.**, and Manoharan, P. T. Crystal and molecular structure of tetraethyl ammonium bis(stilbene-1,2-dithiolato)nickelate(III). Zeitschr. Kristallogr. 187, 159-164 (1989).
19. Zweier, J. L., **Kuppusamy, P.**, Williams, R., Rayburn, B. K., Smith, D., Weisfeldt, M. L., and Flaherty, J. T. Measurement and characterization of postischemic free radical generation in the isolated perfused heart. J. Biolog. Chem., 264, 18890-18895 (1989). [[PubMed](#)]
20. Zweier, J. L., and **Kuppusamy, P.** Electron paramagnetic resonance studies of free radicals in the perfused heart. Phys. Med., 5, 289-296 (1989).
21. Zweier, J. L., Duke, S. S., **Kuppusamy, P.**, Sylvester, J. T., and Gabrielson, E. Electron paramagnetic resonance evidence that cellular oxygen toxicity is caused by the generation of superoxide and hydroxyl free radicals. FEBS Lett., 252, 12-16 (1989). [[PubMed](#)]

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22. Levy, A., **Kuppusamy, P.**, and Rifkind, J. M. Multiple heme pocket subconformations of methemoglobin associated with distal histidine interactions. Biochem., 29, 9311-9316 (1990). [[PubMed](#)]
23. Zweier, J. L., and **Kuppusamy, P.** Study of free radicals in the intact beating heart using low frequency EPR spectroscopy. Phys. Med., 7, 1-9 (1990).

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24. Guyton, K. Z., Bhan, P., **Kuppusamy, P.**, Zweier, J. L., Trush, M. A., and Kensler, T. W. Free radical derived quinone methide mediates skin tumor promotion by butylated hydroxytoluene hydroperoxide: Expanded role for electrophiles in multistage carcinogenesis. Proc. Nat. Acad. Sci. USA, 88, 946-950 (1991). [[PubMed](#)]
25. Kukreja, R. C., Kearns, A. A., Zweier, J. L., **Kuppusamy, P.**, Hess, M. L. Singlet oxygen interaction with Ca²⁺-ATPase of cardiac sarcoplasmic reticulum. Circulation Research. 69, 1003-1014 (1991). [[PubMed](#)]
26. Swauger, J. E., Dolan, P. M., Zweier, J. L., **Kuppusamy, P.**, Kensler, T. W. Role of benzoyloxyl radical in DNA damage mediated by benzoyl peroxide. Chemical Research in Toxicology, 4, 228-233 (1991). [[PubMed](#)]
27. Zweier, J. L., Thompson-Gorman, S., and **Kuppusamy, P.** Measurement of oxygen concentrations in the intact heart using electron paramagnetic resonance spectroscopy: A technique for measuring oxygen concentrations in situ. J. Bioenerg., and Biomem., 23, 855-871 (1991). [[PubMed](#)]

1992 (6)

28. Gabrielson, E. W., **Kuppusamy, P.**, Povey, A. C., Zweier, J. L., and Harris, C. C. Measurement of neutrophil activation and epidermal cell toxicity by palytoxin and 12-o-tetradcanoylphorbol-13-acetate. Carcinogenesis, 13, 395-401 (1992). [[PubMed](#)]
29. Grill, H. P., Zweier, J. L., **Kuppusamy, P.**, Weisfeldt, M. L., and Flaherty, J. T. Direct measurement of myocardial free radical generation in an in-vivo model: Effects of post-ischemic reperfusion and treatment with human recombinant superoxide dismutase. J. Amer. Coll. Cardio. 20, 1604-1611 (1992). [[PubMed](#)]
30. **Kuppusamy, P.** and Zweier, J. L. Study of free radical generation in isolated cells and whole tissues using electron paramagnetic resonance spectroscopy. Cellular Membrane: A Key to Disease Processes (Edited by Ohnishi/Ohnishi) Chapter 10, CRC Press, Inc., 1992.
31. **Kuppusamy, P.**, and Zweier, J. L. Identification and quantitation of free radicals and paramagnetic centers from complex multicomponent EPR spectra. Appl. Radiat. Isotopes. 44, 367-372 (1992).

32. Povey, A. C., Wilson, V. L., Zweier, J. L., **Kuppusamy, P.**, O'Neil, I. K., and Harris, C. C. Detection by ³²P-post-labeling of DNA adducts induced by free radicals and unsaturated aldehydes formed during the aerobic decomposition of fecapentaene-12. Carcinogenesis, 13, 395-401 (1992). [[PubMed](#)]
33. Zweier, J. L., **Kuppusamy, P.**, Shandelya, M. L., Thompson-Gorman, S., Weisman, H. F., Fearon, D. T., and Weisfeldt, M. L. Electron paramagnetic resonance measurements of free radical generation in isolated cells and whole tissues. *The Molecular Basis of Oxidative Damage by Leukocytes* (Editor: Jesaitis/Dratz), CRC Press, Inc. pp. 181-202 (1992).

1993 (6)

34. Ambrosio, G., Zweier, J. L., Duilio, C., **Kuppusamy, P.**, Santoro, G., Elia, P., Tritto, I., Cirillo, P., Condorelli, M., Chiariello, M., and Flaherty, J. T. Evidence that mitochondrial respiration is a source of potentially toxic oxygen Free radicals in intact rabbit hearts subjected to ischemia and reflow. J. Biolog. Chem., 268, 18532-18541 (1993). [[PubMed](#)]
35. Chzhan, M., Shteynbuk, M., **Kuppusamy, P.**, and Zweier, J. L. An optimized L-band resonator for EPR imaging of biological samples. J. Magn. Reson. A105, 49-53 (1993).
36. Lefer, D. J., Shandelya, S. M. L., Serrano Jr., C. V., Becker, L. C., **Kuppusamy, P.**, and Zweier, J. L. Cardioprotective actions of monoclonal antibody against CD-18 in myocardial ischemia-reperfusion injury. Circulation, 88, 1779-1787 (1993). [[PubMed](#)]
37. Sanders, S. P., Zweier, J. L., **Kuppusamy, P.**, Harrison, S. J., Bassett, D. J., Gabrielson, E. W., and Sylvester, J. T. Hyperoxic sheep pulmonary microvascular endothelial cells generate free radicals via mitochondrial electron transport. J. Clin. Invest. 91, 46-52 (1993). [[PubMed](#)]
38. Shandelya, S. M. L., **Kuppusamy, P.**, Weisfeldt, M. L., and Zweier, J. L. Evaluation of the role of polymorphonuclear leukocytes on contractile function in myocardial reperfusion injury. Circulation, 87, 536-546 (1993). [[PubMed](#)]
39. Shandelya, S. M. L., **Kuppusamy, P.**, Herskowitz, A., Weisfeldt, M.L., and Zweier, J. L. Soluble complement receptor type 1 inhibits the complement pathway and prevents contractile failure in the postischemic heart: Evidence that complement activation is required for neutrophil-mediated reperfusion injury. Circulation, 88, 2812-2826 (1993). [[PubMed](#)]

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40. Chen, K., Ng, C. E., Zweier, J. L., **Kuppusamy, P.**, Glickson, J. D., and Swartz, H. M. Measurement of the intracellular concentration of oxygen in a cell perfusion system. Magn. Reson. Med. 31, 1-5 (1994). [[PubMed](#)]
41. **Kuppusamy, P.**, Chzhan, M., Vij, K., Shteynbuk, M., Lefer, D. J., Gianella, E., and Zweier, J. L. Three dimensional spectral-spatial EPR imaging of free radicals in the heart: A technique for imaging tissue metabolism and oxygenation. Proc. Natl. Acad. Sci. USA , 91, 3388-3392 (1994). [[PubMed](#)]
42. Sanders, S. P., Harrison, S. J., **Kuppusamy, P.**, Sylvester, J. T., and Zweier, J. L. A comparative study of EPR spin trapping and cytochrome c reduction techniques for the measurement of superoxide anions. Free Rad. Biolog. Med. 16, 753-761(1994). [[PubMed](#)]
43. Zweier, J. L., Chzhan, M., Ewert, U., Schneider, G., and **Kuppusamy, P.** Development of a highly sensitive probe for measuring oxygen in biological tissues. J. Magn. Reson. B 105, 52-57(1994). [[PubMed](#)]
44. Zweier, J. L., **Kuppusamy, P.**, Thompson-Gorman, S., Klunk, D., and Luty, G. A. Measurement and characterization of free radical generation in reoxygenated human endothelial cells. Am. J. Physiol. (Cell Physiology) 266, C700-C708 (1994). [[PubMed](#)]
45. Zweier, J. L., and **Kuppusamy, P.** In vivo EPR spectroscopy of free radicals in the heart. Environ. Health Perspectives, 102, 45-51(1994). [[PubMed](#)]
46. Zweier, J. L., Broderick, R., **Kuppusamy, P.**, Thompson-Gorman, S., and Luty, G. A. Determination of the mechanism of free radical generation in human aortic endothelial cells exposed to anoxia and reoxygenation. J. Biolog. Chem. 269, 24156-24162 (1994). [[PubMed](#)]

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47. Chzhan, M., **Kuppusamy, P.**, and Zweier, J. L. Development of an electronically tunable L-band resonator for EPR spectroscopy and imaging of biological samples. J. Magn. Reson. B 108, 67-72 (1995). [[PubMed](#)]
48. Desrosiers, M. F., Burlinska, G., **Kuppusamy, P.**, Zweier, J. L., Yaczko, D.M., Auteri, F.P., McClelland, M. R., Dick, C.E., and McLaughlin, W. L. Research and development activities in electron paramagnetic resonance dosimetry. Radiat. Phys. Chem. 46, 1181-1184 (1995).
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50. **Kuppusamy, P.**, Chzhan, M., and Zweier, J. L. Development and optimization of three-dimensional spatial EPR imaging for biological organs and tissues. J. Magn. Reson. B 106, 122-130 (1995). [[PubMed](#)]
51. **Kuppusamy, P.**, Chzhan, M., Samouilov, A., Wang, P., and Zweier, J. L. Mapping the spin-density and lineshape distribution of free radicals in the heart using 4D spectral-spatial EPR imaging. J. Magn. Reson. B 107, 116-125 (1995). [[PubMed](#)]
52. **Kuppusamy, P.**, Chzhan, M., and Zweier, J. L. 3D and 4D electron paramagnetic resonance imaging of the rat heart. Magn. Reson. Med. (Japan) 6, 59-61 (1995).
53. **Kuppusamy, P.**, Wang, P., and Zweier, J. L. Three-dimensional spatial EPR imaging of the rat heart. Magn. Reson. Med. 34, 99-105 (1995). [[PubMed](#)]
54. **Kuppusamy, P.**, Ohnishi, S. T., Numagami, Y., Ohnishi, T., and Zweier, J. L. Three-dimensional imaging of nitric oxide production in the rat brain subjected to ischemia-hypoxia. J. Cereb. Blood Flow Metab. 15, 899-903 (1995). [[PubMed](#)]
55. **Kuppusamy, P.**, Wang, P., and Zweier, J. L. Evaluation of nitroxides for the study of myocardial metabolism and oxygenation. Magn. Reson. Chem. 33, S123-S128 (1995).
56. Li, Y., **Kuppusamy, P.**, Zweier, J. L., and Trush, M. A. ESR evidence for the generation of reactive oxygen species from the copper mediated oxidation of the benzene metabolite, hydroquinone: Role in DNA damage. Chemico-biological Interactions 94, 101-120 (1995). [[PubMed](#)]
57. Yan, S. D., Yan, S. F., Chen, X., Fu, J., Chen, M., **Kuppusamy, P.**, Yen, S. H., Smith, M. A., Perry, G., Nawroth, P., Godman, G. C., Zweier, J. L., and Stern, D. Non-enzymatically glycosylated tau in Alzheimer's disease induces neuronal oxidant stress resulting in cytokine gene expression and release of amyloid- β peptide. Nature Medicine 1, 693-699 (1995). [[PubMed](#)]
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59. Zweier, J. L., Wang, P., Samouilov, A., and **Kuppusamy, P.** Enzyme independent formation of nitric oxide in biological tissues. Nature Medicine, 1, 804-809 (1995). [[PubMed](#)]
60. Zweier, J. L., Wang, P., and **Kuppusamy, P.** Direct measurement of nitric oxide generation in the ischemic heart using electron paramagnetic resonance spectroscopy. J. Biol. Chem., 270, 304-307 (1995). [[PubMed](#)]

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61. **Kuppusamy, P.**, Ohnishi, S. T., Numagami, Y., Ohnishi, T., and Zweier, J. L. Imaging of nitric oxide generation in the brain. Res. Chem. Interm. 22, 605-613 (1996).
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63. **Kuppusamy, P.**, and Zweier, J. L. Hyperfine artifacts in electron paramagnetic resonance imaging. Res. Chem. Interm. 22, 593-604 (1996).
64. **Kuppusamy, P.**, Chzhan, M., Wang, P., and Zweier, J. L. Three-dimensional gated EPR imaging of the beating heart: Time-resolved measurements of free radical distribution during the cardiac contractile cycle. Magn. Reson. Med., 35, 323-328 (1996). [[PubMed](#)]
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68. Li, Y., **Kuppusamy, P.**, Zweier, J. L., and Trush, M. A. Role of Cu, Zn-superoxide dismutase (Cu,ZnSOD) in xenobiotic activation: I. Chemical reactions involved in the Cu, ZnSOD-accelerated oxidation of the benzene metabolite, 1,4-hydroxyquinone. Mol. Pharmacol. 49, 404-411 (1996). [[PubMed](#)]
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72. Serrano, C. V., Mikhail, E. A., Wang, P., Noble, B., **Kuppusamy, P.** and Zweier, J. L. Superoxide and hydrogen peroxide induce CD-18 mediated adhesion in the post ischemic heart. Biochim. Biophys. Acta, 1310, 5 (1996). [[PubMed](#)]
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(Incomplete)

PATENTS

- US 8,568,694** **Nanoparticulate probe for in vivo monitoring of tissue oxygenation.**
Inventors: Periannan Kuppusamy, Ramasamy P. Pandian, Narasimham L. Parinandi, Jay L. Zweier
Filing Date: 01-15-2010; Issue Date: 10-29-2013
A new class of micro- and nanoparticulate paramagnetic spin probes especially useful for magnetic resonance imaging techniques, including electron paramagnetic resonance (EPR) and magnetic resonance imaging (MRI). The probes are lithium phthalocyanine derivative compounds. Also provided are suspensions and emulsions comprising lithium phthalocyanine derivative probes. Also provided are noninvasive methods for measuring noninvasive methods of measuring oxygen concentration, oxygen partial pressure, oxygen metabolism, and nitric oxide concentration in a specific tissue, organ, or cell in vivo or in vitro.
- US 8,569,482** **Nanoparticulate probe for in vivo monitoring of tissue oxygenation**
Inventors: Periannan Kuppusamy, Vijay Kutala, Jay L. Zweier, Pawel Kwiatkowski
Filing Date: 01-15-2010; Issue Date: 10-29-2013
A new class of micro- and nanoparticulate paramagnetic spin probes useful for magnetic resonance imaging techniques, including electron paramagnetic resonance (EPR) and magnetic resonance imaging (MRI). The probes are lithium phthalocyanine derivative compounds. Also provided...
- US 20120296188** **Devices and methods for measuring oxygen**
Inventors: Periannan Kuppusamy, Brian Rivera, Edward Eteshola, Guruguhan Meenakshisundaram
Filing Date: 05-16-2012; Published Date: 11-22-2012
A sensor for measuring oxygen concentration in a tissue or an organ of a subject is provided. The sensor includes a sensory element comprising at least one paramagnetic spin probe compound encapsulated in a biocompatible oxygen permeable material. A barrier layer partially covers the sensory element and is comprised of at least one biocompatible oxygen impermeable material. Oxygen concentration data may be acquired by applying the sensor to the tissue or the organ of the subject, and subsequently applying a magnetic resonance spectroscopy or imaging technique.
- US 8,066,973** **Nanoparticulate probe for in vivo monitoring of tissue oxygenation**
Inventors: Periannan Kuppusamy, Vijay Kutala, Jay L. Zweier, Pawel Kwiatkowski
Filing Date: 03-01-2006; Issue Date: 11-29-2011
A new class of micro- and nanoparticulate paramagnetic spin probes useful for magnetic resonance imaging techniques, including electron paramagnetic resonance (EPR) and magnetic resonance imaging (MRI). The probes are lithium phthalocyanine derivative compounds. Also...
- US 20120316203** **Compositions and Methods for Inhibition of Cancers**
Inventors: Periannan Kuppusamy, Kalman Hideg
Filing Date: 07-06-2010; Published Date: 12-13-2012
Methods and compositions for treating cancers, including ovarian cancers, are described. The compositions generally include a redox based curcumin derivative, diarylidenylpiperiden-4-one (DAP) having a hydroxylamine moiety attached thereto.
- US 7,662,362** **Nanoparticulate probe for in vivo monitoring of tissue oxygenation**
Filing Date: 09-07-2004; Issue date 02-16-2010
Inventors: Periannan Kuppusamy, Ramasamy P. Pandian, Narasimham L. Parinandi, Jay L. Zweier
A new class of micro- and nanoparticulate paramagnetic spin probes especially useful for magnetic resonance imaging techniques, including electron paramagnetic resonance (EPR) and magnetic resonance imaging (MRI). The probes are lithium phthalocyanine derivative compounds.
- 20130127466** **Systems and methods for assessment of oxygenation**
Published Date: 05-23-2013
Inventors: Periannan Kuppusamy, Brian K Rivera, Rizwan Ahmad, Aharon Blank

A scanner for assessing localized oxygenation of a desired region of interest includes a handheld housing having a proximal end and a distal end. A resonator coil is disposed within the housing and also disposed adjacent the distal end of the housing. The resonator coil is configured to both excite and read paramagnetic materials. A magnet is disposed within the housing and also disposed adjacent the distal end of the housing. The magnet is configured to provide a substantially uniform magnetic field over the desired region of interest. The scanner is configured to use electron paramagnetic resonance to assess localized oxygenation in the desired region.

RESEARCH GRANTS

THE FOLLOWING IS A LIST OF ACTIVE (ALL), PENDING (PI & CO-I) & COMPLETED (PI & CO-I) GRANTS

1. R01	PRINCIPAL INVESTIGATOR	ACTIVE
TITLE	:	“Probes and methods for clinical oximetry”
DESCRIPTION	:	The continuing award is to develop a pulse EPR technology with a suite of oxygen-sensing probes (OxyChips) to develop an advanced pulse EPR scanner, as well as procedures for the scanner’s use in human subjects in a clinical setting. The availability of this capability would be a new addition to clinical medicine that would immediately and significantly enhance the treatment of various disease states and malignancies.
DATES	:	03/01/2004 - 07/31/2026
SPONSOR	:	National Institutes of Health
IDENTIFICATION NUMBER	:	R01 EB004031
AMOUNT	:	\$ 2,298,187 (2021-2026)
ROLE	:	Principal Investigator
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy
2. P01 (PPG)	PROGRAM DIRECTOR (PI: ADMINISTRATIVE CORE)	ACTIVE
TITLE	:	“Direct and Repeated Clinical Measurement pO ₂ for Enhancing Cancer Therapy”: Administrative Core
DESCRIPTION	:	The goal is to establish the clinical applicability of in vivo EPR oximetry for measuring intra-tumor oxygen pressure on a routine basis in superficial tumors; using new oximetry approaches based on biocompatible implantable sensors that have been developed and validated in preclinical models to extend the applicability of EPR oximetry to tumors at any site in the body; and to characterize baseline and changes in tumor oxygen in cancer patients under conditions of tumor progression, treatment, and interventions.
DATES	:	07/01/2015 - 06/30/2022 (NCE)
SPONSOR	:	National Cancer Institute
IDENTIFICATION NUMBER	:	P01 CA190193
AMOUNT	:	\$ 6,420,105
ROLE	:	Program Director (PI: Administrative Core)
3. P01 (PPG)	PRINCIPAL INVESTIGATOR	ACTIVE
TITLE	:	“Direct and Repeated Clinical Measurement pO ₂ for Enhancing Cancer Therapy”: Project 2 Title: “Direct & repeated pO ₂ measurements for cancer using EPR oximetry with OxyChip”
DESCRIPTION	:	To establish the clinical applicability of in vivo EPR oximetry for measuring intra-tumor oxygen pressure on a routine basis in superficial tumors; using new oximetry approaches based on biocompatible implantable sensors that have been developed and validated in preclinical models to extend the applicability of EPR oximetry to tumors at any site in the body; and to characterize baseline and changes in tumor oxygen in cancer patients under conditions of tumor progression, treatment, and interventions.
DATES	:	07/01/2015 - 06/30/2022 (NCE)
SPONSOR	:	National Cancer Institute
IDENTIFICATION NUMBER	:	P01 CA190193

AMOUNT : \$ 6,420,105
 ROLE : Principal Investigator (Project 2)

4. R21	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE :	"Miniature EPR system for on-site oximetry"	
DESCRIPTION :	We propose to design, build, and test a new implantable EPR system for on-site clinical oximetry applications.	
DATES :	6/01/2016 - 03/31/2020	
SPONSOR :	National Institutes of Health	
IDENTIFICATION NUMBER :	R21 EB022247	
AMOUNT :	\$ 445,500	
ROLE :	Principal Investigator	
PRINCIPAL INVESTIGATOR :	Periannan Kuppusamy	

5. R01	CO-INVESTIGATOR	COMPLETED
TITLE :	"Dissecting the role of STAT3 and targeting ovarian cancer"	
DESCRIPTION :	To elucidate the role of hypoxia and hypoxia-mediated STAT3 signaling in ovarian tumor growth and treatment.	
DATES :	05/15/2014 - 05/31/2019	
SPONSOR :	NIH/NCI	
IDENTIFICATION NUMBER :	CA R01 CA176078	
AMOUNT :	\$ 124,840	
ROLE :	Co-Investigator (Sub-Award)	
PRINCIPAL INVESTIGATOR :	(PI: Selvendiran Karuppaiyah, OSU, OH)	

6. R21	CO-INVESTIGATOR	COMPLETED
COMPLETEDTITLE :	"Caveolae as capacitors for oxygen"	
DESCRIPTION :	The goal of this proposal is to determine what aspects of caveolin serve as membrane oxygen capacitors and the impact of age and caveolin expression on organ oxygen storage capacity and toxicity.	
DATES :	08/01/2017 - 07/30/2019	
SPONSOR :	NIH	
IDENTIFICATION NUMBER :	AG052722	
AMOUNT :	\$ 144,787	
ROLE :	Co-Investigator	
PRINCIPAL INVESTIGATOR :	(PI: Patel, UCSD)	

7. R01	CO-INVESTIGATOR	COMPLETED
TITLE :	"The critical role of the coronary microcirculation in heart failure"	
DESCRIPTION :	The goal of this proposal is to test the hypothesis that impaired regulation of blood flow in the heart - the failure to connect coronary blood flow to the metabolic needs of the myocardium (metabolic dilation) - underlies the development of some types of heart failure.	
DATES :	06/01/2017 - 05/31/2021	
SPONSOR :	NIH	
IDENTIFICATION NUMBER :	HL135024	
AMOUNT :	\$ 325,354	
ROLE :	Co- Investigator	
PRINCIPAL INVESTIGATOR :	(PI: Chilian, NEOMED, OH)	

8. DARPA	CO-INVESTIGATOR	COMPLETED
TITLE	:	“Wireless microsystems for in-vivo biomarker monitoring and targeted drug deliver”
DESCRIPTION	:	To develop an implantable microsensor for wireless monitoring of biomarkers including oxygen in glioma tumors.
DATES	:	01/01/2016 - 06/30/2018
SPONSOR	:	DARPA
IDENTIFICATION NUMBER	:	HR0011-15-2-0050
AMOUNT	:	\$ 360,000
ROLE	:	Co- Investigator
PRINCIPAL INVESTIGATOR	:	(PI: Ari Gaur, Dartmouth)

9. R01	CO-INVESTIGATOR	COMPLETED
TITLE	:	“Mechanisms of Coronary Vasomotor Control”
DESCRIPTION	:	To elucidate vascular effectors that transduce metabolic signals that enable the connection of flow to cardiac metabolism-metabolic dilation
DATES	:	08/01/2013 - 12/31/2017
SPONSOR	:	NIH/NINDS
IDENTIFICATION NUMBER	:	HL115114
AMOUNT	:	\$ 301,042
ROLE	:	Co- Investigator (Sub-Award)
PRINCIPAL INVESTIGATOR	:	(PI: William M. Chilian, NEOMED, OH)

10. R21 (RFA)	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE	:	“Hand-held scanner for EPR oximetry”
DESCRIPTION	:	We propose to design, build, and test a new, portable EPR system for clinical oximetry applications.
DATES	:	9/01/2012 - 08/31/2016
SPONSOR	:	National Institutes of Health
IDENTIFICATION NUMBER	:	R21 EB016189
AMOUNT	:	\$ 550,000 (total award)
ROLE	:	Principal Investigator
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy

11. R21	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE	:	“Real-time monitoring of cerebral tissue oxygen in ischemic stroke”
DESCRIPTION	:	We propose to develop in vivo electron paramagnetic resonance (EPR) oximetry with deep-tissue implantable resonators for real-time monitoring of cerebral pO ₂ during ischemic stroke induced by embolic clot in rabbits.
DATES	:	9/01/2013 - 08/31/2016
SPONSOR	:	National Institutes of Health
IDENTIFICATION NUMBER	:	R21 EB022247
AMOUNT	:	\$ 445,500 (total award)
ROLE	:	Principal Investigator
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy

12. US-ISRAEL - BSF	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE	:	“Oxygen sensing in live systems at micro-scale ESR”
DESCRIPTION	:	Development of micro-imaging for oxygen sensing in live systems
DATES	:	10/01/2010 - 09/30/2014
SPONSOR	:	US-ISRAEL Binational Science Foundation
IDENTIFICATION NUMBER	:	
AMOUNT	:	\$ 160,000
ROLE	:	Principal Investigator
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy
13. U19 – PILOT PROJECT	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE	:	U19 Title: “Physically-Based Biodosimetry for Triage after a Large Radiation Incident”
DESCRIPTION	:	Pilot project: “Intensity Standard for L-band EPR Tooth Dosimetry” This grant is a NIAID, Dart-Dose CMCR pilot project to develop an intensity reference standard for EPR dosimetry
DATES	:	12/01/2013 - 11/30/2016
SPONSOR	:	National Institutes of Health/NIAID
IDENTIFICATION NUMBER	:	U19AI091173
AMOUNT	:	\$ 100,000
ROLE	:	Principal Investigator (PILOT PROJECT)
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy
14. R01	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE	:	“Development of spin probes for cell-tagging and oximetry”
DATES	:	07/01/2004 - 7/31/2013
SPONSOR	:	National Institutes of Health
IDENTIFICATION NUMBER	:	R01 EB004031
AMOUNT	:	\$ 2.70 M
ROLE	:	Principal Investigator
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy
15. R01	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE	:	“Novel trityl probes for determination of superoxide”
DATES	:	05/01/2008 - 04/30/2013
SPONSOR	:	National Institutes of Health
IDENTIFICATION NUMBER	:	R01 EB007373
AMOUNT	:	\$ 2.70 M
ROLE	:	Principal Investigator
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy
16. BSF	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE	:	“EPR microscopy for oximetry”
DATES	:	10/01/2010 - 09/30/2014
SPONSOR	:	US-Israel Binational Science Foundation (BSF)
IDENTIFICATION NUMBER	:	28290100
TOTAL DIRECT COST	:	\$ 120,000
ROLE	:	Principal Investigator
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy

17. K01	MENTOR	COMPLETED
TITLE	:	“KLF2 as a novel regulator for monocyte activation and function”
DATES	:	03/15/2008 - 03/14/2013
SPONSOR	:	NIH/NIAMS
IDENTIFICATION NUMBER	:	K01 - R054114
AMOUNT	:	\$ 750,000
ROLE	:	Mentor
PRINCIPAL INVESTIGATOR	:	Hiranmoy Das
18. R21	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE	:	“PTENuating Restenosis: an innovative PTEN promoter for cardioprotection”
DATES	:	07/01/2009 – 06/30/2011
SPONSOR	:	NIH
IDENTIFICATION NUMBER	:	R21 HL0955066
AMOUNT	:	\$ 412, 500
ROLE	:	Principal Investigator
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy
19. R01	PRINCIPAL INVESTIGATOR	COMPLETED
TITLE	:	“Biophysical and medical applications of ESR microscopy”
DATES	:	10/01/2006 - 09/30/2010
SPONSOR	:	US-Israel Binational Science Foundation (BSF)
IDENTIFICATION NUMBER	:	28290100
TOTAL DIRECT COST	:	\$ 96,000
ROLE	:	Principal Investigator
PRINCIPAL INVESTIGATOR	:	Periannan Kuppusamy
20. CAREER DEVELOPMENT	MENTOR	COMPLETED
TITLE	:	“Safe, targeted antitumor therapeutics (STAT3 inhibitors) for ovarian cancer”
DATES	:	04/01/2008 - 06/30/2010
SPONSOR	:	Kaleidoscope of Hope Foundation for Ovarian Cancer, New Jersey
IDENTIFICATION NUMBER	:	-
AMOUNT	:	\$ 129,900
ROLE	:	Mentor
PRINCIPAL INVESTIGATOR	:	Selvendiran Karuppaiyah
21. RESEARCH FELLOWSHIP	MENTOR	COMPLETED
TITLE	:	“Studies of low flow reperfusion in the heart”
DATES	:	07/01/2009 - 06/30/2010
SPONSOR	:	Society for Academic Emergency Medicine
IDENTIFICATION NUMBER	:	-
AMOUNT	:	\$ 75,000
ROLE	:	Mentor
PRINCIPAL INVESTIGATOR	:	Mark Angelos
22. R21	CO-INVESTIGATOR	COMPLETED
TITLE	:	“Sparse multispectral processing for accelerated EPR oximetry in three dimensions”
DATES	:	04/01/2009 – 03/31/2011

SPONSOR : NIH
 IDENTIFICATION NUMBER : R21 EB008836
 AMOUNT : \$ 412,500 (Requested)
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Lee C Potter

23. R01 **PRINCIPAL INVESTIGATOR** **COMPLETED**

TITLE : "Oxygenation in stem cell therapy for myocardial infarction"
 DATES : 07/01/2007 - 06/30/2011
 SPONSOR : National Institutes of Health
 IDENTIFICATION NUMBER : R01 EB006153
 AMOUNT : \$ 1.35 M
 ROLE : Principal Investigator
 PRINCIPAL INVESTIGATOR : Periannan Kuppusamy

24. R01 **PRINCIPAL INVESTIGATOR** **COMPLETED**

TITLE : "In vivo EPR imaging of redox status and thiols in tumor"
 DATES : 04/01/2004 - 03/31/2009
 SPONSOR : National Institutes of Health
 IDENTIFICATION NUMBER : R01 CA102264
 TOTAL DIRECT COST : \$ 1.50 M
 ROLE : Principal Investigator
 PRINCIPAL INVESTIGATOR : Periannan Kuppusamy

25. R01 **PRINCIPAL INVESTIGATOR** **COMPLETED**

TITLE : "Novel methods for in vivo imaging of tissue oxygenation"
 DATES : 04/01/2005 - 03/31/2009
 SPONSOR : National Institutes of Health
 IDENTIFICATION NUMBER : R01 EB005004
 AMOUNT : \$ 1.20 M
 ROLE : Principal Investigator
 PRINCIPAL INVESTIGATOR : Periannan Kuppusamy

26. K01 **MENTOR** **COMPLETED**

TITLE : "In vivo imaging and spectroscopy of pH and thiols status"
 DATES : 03/15/2004 - 03/14/2009
 SPONSOR : National Institutes of Health
 IDENTIFICATION NUMBER : K01 - EB003519
 AMOUNT : \$ 750,000
 ROLE : Mentor
 PRINCIPAL INVESTIGATOR : Valery V. Khramtsov

27. BRTT **CO-INVESTIGATOR** **COMPLETED**

TITLE : "Cardiovascular Bioengineering Enterprise"
 DATES : 01/01/2003 - 12/31/2005
 SPONSOR : Biomedical Research Technology Transfer (BRTT), State of Ohio
 IDENTIFICATION NUMBER :
 TOTAL DIRECT COST : \$ 450,000 (sub-project only)

CURRENT YR DIRECT COST :
 SUB-PROJECT TITLE : Node 1.3 “Noninvasive measurement of myocardial oxygenation during cell therapy using EPR imaging technique”
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Periannan Kuppusamy

28. R01 **CO-INVESTIGATOR** **COMPLETED**

TITLE : “Measurement of free radical generation in the heart”
 DATES : 12/01/2004 – 11/30/2009
 SPONSOR : NIH
 IDENTIFICATION NUMBER : R01 HL038324
 TOTAL DIRECT COST : \$ 1,650,000
 CURRENT YR DIRECT COST :
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Jay L. Zweier

29. R01 **CO-INVESTIGATOR** **COMPLETED**

TITLE : “Development of proton-electron double resonance imaging”
 DATES : 09/04/2004 - 06/30/2009
 SPONSOR : NIH
 IDENTIFICATION NUMBER : EB004658
 TOTAL DIRECT COST : \$ 2,505,000
 CURRENT YR DIRECT COST :
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Jay L. Zweier

30. BRTT **CO-INVESTIGATOR** **COMPLETED**

TITLE : “Biomedical Structural, Functional and Molecular Imaging Enterprise”
 DATES : 01/01/2004 - 12/31/2007
 SPONSOR : Biomedical Research Technology Transfer (BRTT), State of Ohio
 IDENTIFICATION NUMBER :
 TOTAL DIRECT COST : \$ 360,000 (sub-project only)
 CURRENT YR DIRECT COST :
 SUB-PROJECT TITLE : “Development of a noninvasive EPR technique for imaging thiols in human ovarian cancer cells grown as solid tumor xenografts”
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Michael V. Knopp

31. R01 **PRINCIPAL INVESTIGATOR** **COMPLETED**

TITLE : “EPR imaging of tumor heterogeneity and oxygenation”
 DATES : 08/15/1998 - 06/30/2006
 SPONSOR : National Cancer Institute/NIH
 IDENTIFICATION NUMBER : RO1 CA78886
 TOTAL DIRECT COST : \$ 1,800,100
 CURRENT YR DIRECT COST :
 ROLE : Principal Investigator
 PRINCIPAL INVESTIGATOR : Periannan Kuppusamy

32. R13 **PRINCIPAL INVESTIGATOR** **COMPLETED**

TITLE : “Conference/Workshop on EPR Spectroscopy & Imaging”
 DATES : 09/04/2004 - 09/09/2005
 SPONSOR : National Institutes of Health/NIBIB
 IDENTIFICATION NUMBER : R13 EB004754

TOTAL DIRECT COST : \$ 30,400
 CURRENT YR DIRECT COST :
 ROLE : Principal Investigator
 PRINCIPAL INVESTIGATOR : Periannan Kuppusamy

33. R01 **CO-INVESTIGATOR** **COMPLETED**

TITLE : "Center for biomedical EPR spectroscopy and imaging"
 DATES : 06/01/1998 - 05/31/2004
 SPONSOR : NIH
 IDENTIFICATION NUMBER : RO1 RR 12190
 TOTAL DIRECT COST : \$ 1,196,617
 CURRENT YR DIRECT COST :
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Jay L. Zweier

34. R01 **CO-INVESTIGATOR** **COMPLETED**

TITLE : "In vivo EPR imaging of free radicals at 300 MHz"
 DATES : 04/01/1999 - 03/31/2005
 SPONSOR : NIH
 IDENTIFICATION NUMBER : RO1 GM58582
 TOTAL DIRECT COST : \$ 1,467,711
 CURRENT YR DIRECT COST :
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Jay L. Zweier

35. R01 **CO-INVESTIGATOR** **COMPLETED**

TITLE : "Oxygen radicals and nitric oxide in post-ischemic injury"
 DATES : 02/01/2000 - 01/31/2005
 SPONSOR : NIH-NHLBI
 IDENTIFICATION NUMBER : RO1 HL63744
 TOTAL DIRECT COST : \$ 1,028,817
 CURRENT YR DIRECT COST :
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Jay L. Zweier

36. P01 **CO-INVESTIGATOR** **COMPLETED**

TITLE : "Oxidants and nitric oxide in post-ischemic heart injury"
 DATES : 07/01/2000 - 06/30/2005
 SPONSOR : NIH-NHLBI
 IDENTIFICATION NUMBER : PO1 HL656608
 TOTAL DIRECT COST : \$ 1,022,956 (component only)
 CURRENT YR DIRECT COST :
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Lewis C. Becker (PD), Jay L. Zweier (PI, component)

37. R01 **CO-INVESTIGATOR** **COMPLETED**

TITLE : "MRI/EPRI – Co-imaging of biological samples"
 DATES : 07/01/2002 - 05/31/2006
 SPONSOR : NIH
 IDENTIFICATION NUMBER : R01 EB000890
 TOTAL DIRECT COST : \$ 1,996,617

CURRENT YR DIRECT COST :
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Jay L. Zweier

38. R01 **CO-INVESTIGATOR** **COMPLETED**

TITLE : "Reperfusion-Induced Endothelial Cell Dysfunction"
 DATES : 12/01/2001 - 11/30/2005
 SPONSOR : NIH-NHLB
 IDENTIFICATION NUMBER : HL67027
 TOTAL DIRECT COST : \$ 1,000,000
 CURRENT YR DIRECT COST :
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : B. Rita Alevriadou

39. P20 **CO-INVESTIGATOR** **COMPLETED**

TITLE : "Center for grid-enabled medical image analysis"
 DATES : 07/01/2002 - 06/30/2007
 SPONSOR : NIH
 IDENTIFICATION NUMBER : P20 - EB000591
 TOTAL DIRECT COST : \$ 350,000 (sub-project only)
 CURRENT YR DIRECT COST :
 SUB-PROJECT TITLE : "Development and processing of high-resolution cardiac magnetic resonance imaging"
 ROLE : Co-Investigator
 PRINCIPAL INVESTIGATOR : Joel H. Saltz

40. EIA - AHA **PRINCIPAL INVESTIGATOR** **COMPLETED**

TITLE : Established Investigator Award -"Measurement of oxygen concentration and distribution in the heart"
 DATES : 07/01/1996 - 06/30/2001
 SPONSOR : American Heart Association (National Center)
 IDENTIFICATION NUMBER : 96003210
 TOTAL DIRECT COST : \$ 291,750
 CURRENT YR DIRECT COST :
 ROLE : Principal Investigator
 PRINCIPAL INVESTIGATOR : Periannan Kuppusamy

41. GIA - AHA **PRINCIPAL INVESTIGATOR** **COMPLETED**

TITLE : Grant-in-Aid -"Measurement of oxygen concentration in the heart using electron paramagnetic resonance spectroscopy/imaging"
 DATES : 07/01/1995 - 06/30/1998
 SPONSOR : American Heart Association (National Center)
 IDENTIFICATION NUMBER : 95012010
 TOTAL DIRECT COST : \$ 132,000
 CURRENT YR DIRECT COST :
 ROLE : Principal Investigator
 PRINCIPAL INVESTIGATOR : Periannan Kuppusamy

42. CERT - AWARD **PRINCIPAL INVESTIGATOR** **COMPLETED**

TITLE : "Development of spectral-spatial EPR imaging for heart"
 DATES : 07/01/1990 - 06/30/1991

SPONSOR : Chesapeake Education & Research Trust
IDENTIFICATION NUMBER : -
TOTAL DIRECT COST : \$ 5,000
CURRENT YR DIRECT COST :
ROLE : Principal Investigator
PRINCIPAL INVESTIGATOR : Periannan Kuppusamy

MENTORING

Mentee – Name & Degree during Mentorship	Mentorship Period	Position & Honors Received during Mentorship	Publications with the Mentee	Whereabouts (Last known)
Ravi A Shankar, MD	1996 -1999	Post-Doctoral Fellow	6	Radiation Oncologist Melbourne, FL
Haiquan Li, MD	1998 - 2002	Post-Doctoral Fellow	13	Scientific Officer Otsuka America Pharmaceuticals, Rockville, MD
Govindasamy Ilangovan, PhD	1999 - 2002 2002 - 2007	Post-Doctoral Fellow (<i>AHA Post-Doctoral Award</i>) Assistant Professor	25	Associate Professor Cardiovascular Medicine The Ohio State University Columbus, OH
Ramasamy P Pandian, PhD	2001 - 2006 2007 - 2011	Post-Doctoral Fellow Research Scientist	22	Senior Scientist Olon Ricerca Bioscience Concord, OH
Sathesh P Evalappan, MD	2001 - 2002	Post-Doctoral Fellow	2	Internist, Robert Wood Johnson University Hospital Somerset, NJ
Anna Bratasz, PhD	2002 - 2007 2008 - 2012	Post-Doctoral Fellow Research Associate	21	Research Scientist, MRI /US Shared Resources, The Ohio State University, Columbus, OH
Ashish Sharma, MD	2002 - 2004	Graduate Student (MPH)	1	Medical profession/Clinician
Nathan M Weir	2002 - 2005	Research Associate	3	MD, PhD Dermatologist Mason, Ohio
Deepti S Vikram, PhD	2003 - 2008	Graduate Student (PhD, Biophysics)	12	Department of Radiology Johns Hopkins University Baltimore, MD
Haihong Li, MS	2003 - 2005	Graduate Student (MS, Biophysics)	6	Engineer MR Services PR China

Sola Osinbowale, BS, MHA	2003 - 2005	Research Assistant	2	Administrative Fellow VA Medical Center West Palm Beach, FL
Vijay Kumar Kutala, PhD	2003 - 2005	Post-Doctoral Fellow (<i>James Warren Award for Outstanding Post-Doc Researcher</i>)	40	Professor Department of Clinical Pharmacology Nizam's Inst. of Medical Sciences, Hyderabad, India
	2005 - 2007	Research Scientist		
Vandana Potaraju BS	2004 - 2005	Research Associate	1	MD Medical/Clinician
Aditi C Kulkarni, MS	2005 - 2008	Graduate Student (PhD, Biophysics)	5	PhD Research Associate La Jolla Bioengineering Institute, La Jolla, CA
Simi M Chacko, MS	2005 - 2010	Graduate Student (PhD, Biophysics) (<i>AHA Pre-doctoral Fellowship Award</i>)	7	PhD, MPH Scientific Writer Cactus Communications – Medical Communications
	2010 - 2012	Post-Doctoral fellow		
Mahmood Khan, PhD	2005 - 2007	Post-Doctoral Researcher (<i>James Warren Award for Outstanding Post-Doc Researcher</i>)	30	Associate Professor Dep. of Emergency Medicine The Ohio State University Columbus, Ohio
	2007 - 2010	Research Scientist		
Joe Z Sostaric, PhD	2005 - 2006	Post-Doctoral Researcher	4	American Chemical Society Publishing Washington DC
Rajarsi Mandal, BS	2005 - 2007	Research Assistant (<i>Roessler Research Scholarship</i>)	3	MD Head & Neck Surgeon Dep. Of Otolaryngology Johns Hopkins Medical School Baltimore, MD
Rizwan Ahmad, MS	2005 - 2007	Graduate Student (PhD, Elect Engineering)	28	PhD Assistant Professor Biomedical Engineering The Ohio State University Columbus, OH
	2007 -2010	Research Scientist		
Shilpa Viswanath, BS	2005 - 2007	Research Associate	2	-

Karuppaiyah Selvendiran, PhD	2006 - 2008 2008 - 2010	Post-Doctoral Researcher Research Scientist	35	Associate Professor Department of OBGYN The Ohio State University Columbus, OH
Iyappu K Mohan, PhD	2006 - 2009	Post-Doctoral Researcher	11	Associate Professor Nizams Inst. Medical Science Hyderabad, India
Liyue Tong, MS	2006 - 2008	Research Associate	5	PhD CDRH/FDA, Silver Spring, MD
Brian K Rivera, MS	2006 - 2013	Research Associate	27	Research Associate Nationwide Children's Hospital Columbus, OH
Guruguhan Meenakshi Sundaram, BE, MS	2006 - 2008 2009 - 2010	Graduate Student (PhD, BioMed Eng) Research Associate	7	PhD Systems Engineer Becton Dickinson
Vinh Dang, BS	2006 - 2007	Research Assistant	5	-
Wisel, Sheik PhD	2005 - 2008	Post-Doc Researcher	7	
Mia F Tazi	2008 - 2009	Undergrad student BioOhio Best Presenter Award	2	PhD Research Scientist Vertex Pharmaceuticals San Diego, CA
Shabnam Ahmed BS	2009 - 2010	Research Assistant	4	MD Medical practice
Sarath Meduru MS	2008 - 2011	Research Associate	4	Vet/Clinical Practice
Yazhini Ravi MBBS	2009 - 2013	Post-Doctoral Fellow	5	Assistant Professor Department of Surgery UConn Health
Balazs Bogнар PhD	2011 - 2012	Post-Doctoral Fellow	2	Associate Professor (Pecs Univ)
Lucas A Citro BS	2007 - 2013	Graduate Student (MS & PhD)	5	PhD Presidential Management Fellow (STEM), NASA

Alexander R Dayton BS	2009 - 2011	Research Assistant	6	MD/PhD (MCW) Resident, Internal Medicine University of Minnesota, MN
Rajan Gogna, PhD	2014-2016	Post-doctoral Fellow	15	Scientist Champalimaud Foundation Lisbon, Portugal
Esha Madan, PhD	2014 - 2016	Post-doctoral Fellow	14	Scientist Champalimaud Foundation Lisbon, Portugal
Masaki Nagane, PhD	2015-2016	Post-doctoral fellow	9	Assistant Professor School of Veterinary Medicine Azabu University, Japan
Anjali Prabhat	2016 - 2018	Undergrad student	4	MD student Harvard Medical School Boston, MA
Tomas Drews	2017 - 2017	Undergrad student	2	UMass, Amherst, MA
Jesse Mast, BS	2015 - 2019	Graduate (PhD) student	7	PhD Biology Teaching Lebanon, NH

EDITORIAL

EDITORIAL BOARD APPOINTMENTS

Antioxidants and Redox Signaling
Journal of Clinical Biochemistry and Nutrition
Journal of Radiology and Radiation Therapy

GUEST EDITORSHIP (INVITED)

Antioxidants and Redox Signaling – June 2004 Issue
Forum issue on “EPR Spectroscopy in Biology and Medicine”

Antioxidants and Redox Signaling – June 2007 Issue
Forum issue on “EPR Oximetry & Redox”

Israel Journal of Chemistry – 2008 Issue
Special issue on “EPR Imaging”

Cell Biochemistry and Biophysics – Oct 2013 Issue
Special Issue on “Oxidative Stress in Health and Disease”

JOURNAL PEER-REVIEW ACTIVITIES (AD HOC)

American Journal of Physiology	Antioxidants and Redox Signaling
Applied Magnetic Resonance	Archives of Biochem. and Biophysics
Biochimica et Biophysica Acta	Biochemistry
Biosensors and Bio-electronics	British Journal of Cancer
Cancer Research	Cardiovascular Research
Chemistry of Materials	Circulation Research
Clinical Cancer Research	European Journal of Biochemistry
Experimental Biology	Experimental Eye Research
Free Radical Biology and Medicine	Int. J. of Radiation Oncology*Biology*Physics
Journal of Cardiovascular Pharmacology	Journal of Lipids Research
Journal of Magnetic Resonance	Journal of Materials Chemistry
Journal of Medicinal Chemistry	Journal of Molecular and Cellular Cardiology
J. Pharmacol. and Experimental Therapeutics	Journal of American Chemical Society
Journal of Physical Chemistry	Magnetic Resonance in Chemistry
Magnetic Resonance in Medicine	Medical Physics
Molecular Cancer Therapeutics	Molecular Cancer Research
Molecular and Cellular Biochemistry	Molecular Imaging
Mutation Research	Ophthalmic Research
Proc National Academy of Sciences, USA	Reproductive Sciences
Rejuvenation Research	Stroke
Bioorganic and Medicinal Chemistry	OncoTarget
Biophysics Journal	

PROFESSIONAL SOCIETIES

MEMBERSHIP

American Association for the Advancement of Science (AAAS)	1997 -
American Cancer Society	2007 -
American Chemical Society	1995 -
American Heart Association (AHA)	1995 -
American Physiological Society	2007 -
American Society for Biochemistry and Molecular Biology (ASBMB)	1999 -
American Society for Pharmacology and Experimental Therapeutics	2007 -
Biophysical Society	1998 -
International EPR Society (IES)	1993 -
International Society for Heart Research	2007 -
International Society for Magnetic Resonance in Medicine (ISMRM)	1996 -
New York Academy of Sciences	1994 -
Society for Free Radical Biology and Medicine (Oxygen Society)	1997 -

CONFERENCES

- Organized one-day symposium on "In vivo EPR Spectroscopy and Imaging" as part of the 23rd International EPR Symposium & 42nd annual Rocky Mountain Conference, Broomfield, Colorado, July 30- Aug 3, 2000.
- Organized an International Conference/Workshop on In Vivo EPR Spectroscopy/Imaging & Spin-trapping EPR – held in Easton Hilton, Columbus, OH during September 4-9, 2005.



<http://www.heartlung.osu.edu/epr/3140.cfm>

- Organized a Mini Symposium of on Redox Biology in Blackwell Inn on May 26-27, 2008 under US-JSPS research exchange program.
- Organized a mini symposium on In Vivo EPR Spectroscopy/Imaging on Mar 2, 2010 in Conrad Hilton Hotel, San Juan, PR.

CONFERENCE SESSION CHAIR

- "International Conference on In Vivo ESR and ESR Imaging", L' Aquila, Italy, September 10-14, 1995.
- "International Workshop on Nitric Oxide and Immune Response to Allografts and Tumors", Krakow, Poland, December 2-7, 1995.
- "International EPR Symposium and Workshop on In Vivo EPR and Related Studies", Dartmouth College, Hanover, NH, September 12-17, 1998.
- "International Workshop on Techniques and Bio-Medical Applications of In Vivo EPR and PEDRI", Aberdeen, Scotland, September 12-17, 1999.
- "International EPR Symposium and Workshop on In Vivo EPR and Related Studies", Dartmouth College, Hanover, NH, September 09-14, 2001.
- "SPIN-2001 Conference", Kaiserslautern, Germany, September 22-27, 2001.
- "International *In Vivo* Electron Paramagnetic Resonance Workshop", Krakow, Poland, Sept. 29-Oct 03, 2001.
- "Oxygen/Nitrogen Radicals: Cells Injury & Disease", Morgantown, WV, June 01-06, 2002
- "The 10th International Workshop on Biomedical ESR Spectroscopy and Imaging", Fukuoka, Japan, April 1-3, 2003.
- "26th International EPR Symposium & 43rd Rocky Mountain Conference on Analytical Chemistry", Denver, CO, July 27-31, 2003.
- "32nd Annual Conference of International Society on Oxygen Transport to Tissues (ISOTT)", Bari, Italy, August 21-26, 2004.

INCOMPLETE LIST

NIH REVIEWS

REVIEWER

Division of Research Resources, NIH, Special Study Section
National Cancer Institute, NIH, Special Study Section
Reparative Medicine, NIH, Special Study Section
National Institute of Bio-imaging and Bioengineering (NIBIB)
National Institute for Environmental Health (NIEHS)

INCOMPLETE LIST

INVITED & PLENARY LECTURES

1. **1994 Invited Symposium Speaker:** "3D and 4D electron paramagnetic resonance imaging of rat heart", International Conference on Bio-radicals Detected by ESR Spectroscopy", Yamagata, Japan, June 13-16, 1994.
2. **1994 Symposium Presentation:** "Oximetry Studies using 3D/4D Spectral-spatial EPR Imaging of Biological Organs and Tissues at L-band", 17th International EPR Symposium & 36th Rocky Mountain Conference on Analytical Chemistry, Denver, CO, July 31 - August 5, 1994.
3. **1995 Invited Symposium Speaker:** "Gated EPR imaging of cardiac contractile cycle", International Conference on In Vivo ESR and ESR Imaging, L' Aquila, Italy, September 10-14, 1995.
4. **1995 Keynote Speaker:** "Measurement and imaging of nitric oxide in biological systems using EPR imaging", International Workshop on Nitric Oxide and Immune Response to Allografts and Tumors, Krakow, Poland, December 2-7, 1995.
5. **1996 Symposium Presentation:** "Gated EPR imaging of cardiac contractile cycle", 19th International EPR Symposium & 36th Rocky Mountain Conference on Analytical Chemistry, Denver, CO, July 25-29, 1996.
6. **1996 Invited Symposium Speaker:** "Pharmacokinetic and pharmacodynamics studies on free and macromolecule-bound nitroxides by EPR spectroscopy and imaging", VI International Symposium on Blood Substitutes, Montreal, Quebec, Canada, August 5-7, 1996.
7. **1997 Symposium Presentation:** "EPR imaging of tumor heterogeneity and oxygenation in a Murine Tumor Model", 20th International EPR Symposium & 39th Rocky Mountain Conference on Analytical Chemistry, Denver, CO, August 3-7, 1997.
8. **1997 Presentation:** "A new technique for measuring and imaging free radical metabolism and oxygenation in the heart", 70th Scientific Sessions, American Heart Association, Orlando, FL, November, 9-12, 1997.
9. **1998 Symposium Lecture:** "Principles of EPR imaging and its application to biological samples", International EPR Symposium and Workshop on In Vivo EPR and Related Studies, Dartmouth College, Hanover, NH, September, 1998.
10. **1999 Invited lecture:** "cw EPR Imaging: Principle and Application", National Cancer Institute, NIH, Bethesda, March 1999.
11. **1999 Invited Lecture:** "In vivo EPR spectroscopy and imaging", National Institute for Occupational Safety and Health (NIOSH), Center for Disease Control, Morgantown, WV, May 1999.
12. **1999 Invited Lecture:** "EPR imaging of oxygen in tissues", International Society for Oxygen Transport in Tissues, Dartmouth College, Hanover, NH, September 1999.
13. **2000 Symposium Presentation:** "Function EPR imaging of biological samples" in "Functional imaging and tissue oxygen determination using electron paramagnetic resonance", 47th Annual meeting of the Radiation Research Society of North America, Albuquerque, NM, April 29- May 03, 2000.
14. **2000 Plenary Lecture:** "Nitroxide probes for functional electron paramagnetic resonance imaging of biological systems", 6th International Symposium on Spin Trapping, Marseille, France, August 27-31, 2000.
15. **2001 Inaugural Address:** "EPR imaging of biological systems", as inaugural address of the Chemical Society at Pachaiyappa's College, University of Madras, Chennai, India, Feb. 16, 2001.
16. **2001 Invited Lecture:** "Functional EPR imaging of biological tissues", Department of Chemistry, Indian Institute of Technology, Chennai, India, Feb. 26, 2001.
17. **2001 Invited Lecture:** "Nitroxides as functional EPR imaging probes", SPIN-2001 Conference, Kaiserslautern, Germany, September 22-27, 2001.

18. **2001 Invited Lecture:** "Measurement of oxygenation and redox imaging of tumors", International *In Vivo* EPR Workshop, Krakow, Poland, Sept. 29-Oct 03, 2001.
19. **2002 Invited Lecture:** "EPR spectroscopy - spying on unpaired electrons" in Sunrise Free Radical School, Annual Meeting of the Society of Free Radical Biology and Medicine, San Antonio, TX, November 20-24, 2002.
20. **2003 Plenary Lecture:** "Measurement of intracellular oxygen concentration using nanoparticulate probes", The 10th International Workshop on Biomedical ESR Spectroscopy and Imaging, Fukuoka, Japan, April 1-3 (2003).
21. **2003 Presentation:** "Nanoparticulate spin probes for cell-tagging", 45th Rocky Mountain Conference on Analytical Chemistry, Denver, Colorado, July 27-31, 2003.
22. **2003 Plenary Talk:** "EPR imaging of tumor oxygenation using embedded probe" in the 31st scientific meeting of the International Society on Oxygen Transport to Tissue (ISOTT), held August 16 - 20, 2003 at the University of Rochester in Rochester, NY, USA.
23. **2003 Symposium Lecture:** "Functional imaging using EPR Spectroscopy and imaging", 7th International Conference on Magnetic Resonance Microscopy, 7th "Heidelberg" Conference, Snowbird, UT, September 20-25, 2003.
24. **2004 Presentation:** "In vivo imaging of tissue oxygenation during tumor growth and after irradiation", 32nd scientific meeting of the International Society on Oxygen Transport to Tissue (ISOTT), held August 21-26, 2004 in Bari, Italy.
25. **2004 Invited Lecture:** "Detection of superoxide in time and space", International *In Vivo* EPR Workshop, Krakow, Poland, Oct 5-10, 2004.
26. **2004 Presentation:** "New probes for oxygen and superoxide", EPR Workshop, Dartmouth College, Hanover, NH, Sept 19-22, 2004.
27. **2005 Invited Presentation:** "Cardioprotective effects of nitroxyl-conjugated derivatives of Trimetazidine against ischemia-reperfusion injury", Annual meeting of the Society for Free Radical Research, Bangalore, India, Jan 11, 2005.
28. **2005 Symposium Presentation:** "Open Molecular Framework in LiNc-BuO Paramagnetic Crystal: Implications for the Detection of O₂, NO and NO₂", International EPR Symposium & Rocky Mountain Conference on Analytical Chemistry, Denver, CO, August 3-7, 2005.
29. **2005 Presentation:** "Noninvasive oximetry in stem-cell therapy, organ transplantation, tissue repair, and wound healing", Joint Conference of the 11th "In Vivo EPR Spectroscopy and Imaging" and the 8th "International EPR Spin Trapping", (EPR 2005), Columbus, OH, Sep 8, 2005.
30. **2006 Invited Talk:** "Biological Oximetry using EPR Spectroscopy/Imaging", Annual meeting of the Indian Biophysical Society (IBS), Kolkata, India, Jan 07, 2006.
31. **2006 Invited Talk:** "Derivatives of trimetazidine, covalently modified with pro-antioxidant functions, offer enhanced protection against myocardial ischemia-reperfusion injury", Annual meeting of the Society for Free Radical Research, Kolkata, India, Jan 11, 2006.
32. **2006 Guest Lecture:** "Oxygen sensors for cell therapy in the heart", Department of Chemistry, Pachaiyappa's College, Chennai, India, Jan 19, 2006.
33. **2006 Invited Presentation:** "Monitoring cell therapy in the heart", Bio-dosimetry meeting, Bethesda, MD, Jul 12, 2006.
34. **2006 Plenary (EPR Society Silver Award) Lecture:** "From single crystals to stem cells: images of proliferation, differentiation, and engraftment" International EPR Symposium & Rocky Mountain Conference on Analytical Chemistry, Breckenridge, CO, Jul 26, 2006.
35. **2006 Presentation:** "Non-invasive monitoring of *in situ* oxygenation in the infarct heart transplanted with skeletal myoblasts", 34th scientific meeting of the International Society on Oxygen Transport to Tissue (ISOTT), held in Aug 13, 2006 in Louisville, KY.

36. **2007 Guest Lecture:** "From single crystals to stem cells: images of proliferation, differentiation, and engraftment", Department of Inorganic Chemistry, University of Madras, India. Organized by the Royal Society of Chemistry (South India Chapter) Jan 03, 2007.
37. **2007 Invited Talk:** "Oxygen in Myocardial Cell Therapy", Annual meeting of the Society for Free Radical Research, Lonavala, India, Jan 9, 2007.
38. **2007 Invited Talk:** "Oxygen in Myocardial Cell Therapy" Kyushu University, Fukuoka, Japan. Feb 9, 2007
39. **2007 Invited Talk:** "Oxygen-sensing in myocardial cell therapy", Virginia College of Osteopathic Medicine (VCOM), Virginia Tech, Blacksburg, VA. Mar 11, 2007.
40. **2007 Presentation:** "Oxygen in Myocardial Cell Therapy", Joint Conference of the 12th "In Vivo EPR Spectroscopy and Imaging" and the 9th "International EPR Spin Trapping", (EPR 2007), Chicago, IL. Apr 30, 2007.
41. **2007 Guest Lecture:** "Oxygen-sensing in myocardial cell therapy", Department of Chemistry, Cornell University, Ithaca, NY. Aug 07, 2007.
42. **2007 Guest Lecture:** "EPR oximetry in myocardial cell therapy", VIITH International Workshop on EPR (ESR) in Biology and Medicine. Krakow, Poland. Oct 3-6, 2007.
43. **2007 Invited Talk:** "Cardioprotection by Sulfaphenazole, a Cytochrome P450 Inhibitor: Role of Oxygen, ROS and RNS - An In Vivo EPR Study" Redox-Navi, Kyushu University, Fukuoka, Japan. Nov 2, 2007.
44. **2007 Invited Talk:** "Cardioprotection by Sulfaphenazole, a Cytochrome P450 Inhibitor: Role of Oxygen, ROS and RNS - An In Vivo EPR Study" Redox-Navi, Kyushu University, Fukuoka, Japan. Nov 2, 2007.
45. **2007 Invited Talk:** "EPR oximetry in myocardial cell therapy", Core-to-Core (JSPS), Shizuoka, Japan. Nov 4, 2007.
46. **2007 Invited Talk:** "Oxygen-sensing in myocardial stem-cell therapy", 46th Annual International Meeting of the Society of ESR Spectroscopy Science and Technology (SEST), Shizuoka, Shimizu, Japan. Nov 7, 2007.
47. **2007 Invited Talk:** "Redox Imaging", Winter School on Redox Biology, Chemistry, and Imaging – sponsored by JSPS Core-to-Core program. Washington DC, Nov 12, 2007.
48. **2008 Invited Talk:** "Sensitization of Recurrent Ovarian Tumor to Cisplatin by NCX-4040, a Nitric Oxide-releasing Derivative of Aspirin", Annual meeting of the Society for Free Radical Research, Jaipur, India. Feb 15, 2008.
49. **2008 Invited Talk:** "Visualizing Tissue Oxygen: Wound Care Technology of the Future" in the annual meeting of the Symposium on Advanced Wound Care (SAWC) and Wound Healing Society (WHS), San Diego, Apr 24, 2008.
50. **2008 Guest Lecture:** "Oxygenation in Myocardial Stem-Cell Therapy", Kanagawa Dental College, Kanagawa, Japan. Sep 26, 2008.
51. **2008 Invited Talk:** "Hyperbaric Oxygenation in Myocardial Stem-Cell Therapy", Joint Conference of the 13th "In Vivo EPR Spectroscopy and Imaging" and the 10th "International EPR Spin Trapping", (EPR 2008), Fukuoka, Japan. Sep 28, 2008.
52. **2008 Award (MD honoris causa) Lecture:** "Cellular and molecular therapy for myocardial ischemia and infarction", University of Pecs, Pecs, Hungary. Nov 07, 2008.
53. **2008 Guest Lecture:** "EPR imaging of free radicals", Proctor and Gamble (P&G) Health Science Institute, Cincinnati, OH. Nov 12, 2008.
54. **2008 Invited Talk:** "PTEN"uation of restenosis by a synthetic curcuminoid", Innovations in Atherosclerosis and Cardiac Disease & 21st Annual conference of Indian Society for Atherosclerosis Research. Annamalai Nagar, India. Dec 8-10, 2008.
55. **2009 Invited Lecture:** "Imaging of tissue oxygenation", Mathematical Biomedical Institute (MBI) Workshop on Wound Healing, Columbus, OH. Mar 11, 2009.

56. **2009 Guest Lecture:** "Myocardial stem-cell therapy: Oxygen, oxidants, and opportunities", Delhi Institute of Pharmaceutical Science & Research (DIPSAR), Mini Symposium on "Molecular Cardiovascular Pharmacology". Mar 16, 2009.
57. **2009 Invited Lecture:** "Stem-cell therapy for heart", Satellite Symposium (SFRR), Aligarh Muslim University, Aligarh, India. Mar 18, 2009.
58. **2009 Invited Talk:** "PTEN"uation of restenosis by a synthetic curcuminoid", Annual meeting of the Society for Free Radical Research, Lucknow, India. Mar 20, 2009.
59. **2009 Invited Talk:** "EPR Oximetry: new probes & opportunities for clinical applications", 37th scientific meeting of the International Society on Oxygen Transport to Tissue (ISOTT), Cleveland, OH. Jul 06, 2009.
60. **2009 Invited Talk:** "Effect of Oxygenation on Stem-cell Therapy for Myocardial Infarction", In vivo EPR Symposium, Rocky Mountain Conference on Analytical Chemistry, Snowmass, Colorado. July 23, 2009.
61. **2009 Invited Talk:** "EPR oximetry in myocardial stem-cell therapy", SFRR International Free Radical School, Niigata, Japan. Sep 4, 2009.
62. **2009 Guest Lecture:** "In vivo oximetry in the heart: Effect of oxygenation on stem-cell therapy for myocardial infarction", Schulich Faculty of Chemistry Colloquium, Technion University, Haifa. Nov 5, 2009.
63. **2009 Guest Lecture:** "Stem-cell Therapy for Cardiac Repair: Is Oxygen a Neglected factor?" Dr. Norman F. Paradise Memorial Lecture Series, Northeastern Ohio Universities, College of Medicine and Pharmacy, Rootstown, OH. Dec 1, 2009.
64. **2010 Symposium Talk:** "Oxygenation and Angiogenesis in Stem-cell Therapy for MI", Annual meeting of the Society for Free Radical Research, Hyderabad, India, Jan 10, 2010.
65. **2010 Invited Talk:** "Cardiac drugs: Teaching old drugs new tricks", Annual meeting of the Society for Free Radical Research, Hyderabad, India, Jan 11, 2010.
66. **2010 Grand Rounds Talk:** "Cancer drugs: Teaching old molecules new tricks – a translational perspective", Department of Internal Medicine, Ohio State University College of Medicine, Columbus, OH. Feb 4, 2010.
67. **2010 Special Report:** "Redox: US-Japan Society for Promotion of Science (JSPS) Core-to-Core Program", Fukuoka, Japan, Mar 5, 2010.
68. **2010 Session Organizer and Speaker:** "Redox Imaging: Tissue Oximetry – Novel probes & opportunities", Annual meeting of the Oxygen Club of California (OCC), Santa Barbara, CA. Mar 20, 2010.
69. **2010 Education Lecture:** "How to prepare your manuscript?" Special Symposium of US-JSPA Core-to-Core program, San Juan, Puerto Rico. May 2, 2010.
70. **2010 Education Lecture:** "How to prepare your manuscript?" Special Symposium of US-JSPA Core-to-Core program, San Juan, Puerto Rico. May 2, 2010.
71. **2010 Invited Talk:** "Role of Oxygen in Stem-cell Therapy for Cardiac Repair", ", Joint Conference of the 14th "In Vivo EPR Spectroscopy and Imaging" and the 11th "International EPR Spin Trapping", (EPR 2010), May 5, 2010.
72. **2010 Invited Talk:** "Novel Probes & Opportunities for Clinical Oximetry", In vivo EPR Symposium, Rocky Mountain Conference on Analytical Chemistry, Snowmass, Colorado. Aug 5, 2010.
73. **2010 Invited Talk:** "Novel Sensors & Opportunities for EPR-based Clinical Oximetry", 2010 OSU Biomaterials week. Sep 15, 2010.
74. **2010 Invited Talk:** "Novel Sensors & Opportunities for EPR-based Clinical Oximetry", 2010 OSU Biomaterials week. Sep 15, 2010.
75. **2010 Guest Lecture:** "Novel Sensors & Opportunities for EPR-based Clinical Oximetry", Battelle Memorial Institute, Columbus, OH. Sep 29, 2010.

76. **2011 Invited Lecture:** “Novel Sensors for EPR Oximetry”, Presented at 2010 Cleveland Nanomedicine Summit, Cleveland, OH. Oct 19, 2010.
77. **2011 Invited Lecture:** “Novel Sensors and Opportunities for EPR-based Clinical Oximetry”, Presented at Redox Core-to-Core (JSPS) Winter School, Fukuoka, Japan. Jan 9, 2011.
78. **2011 Invited Lecture:** “Molecular and Crystalline Spin Probes Encapsulated in Polymeric Materials for Oxygen Sensing”, Presented at ACERT Workshop “ESR Microscopy”, Cornell University, Ithaca. Jan18, 2011.
79. **2011 Invited Lecture:** “Oxygen and Oxidants in Cardiovascular Disease & Therapy”, 32nd Annual Meeting of the American College of Toxicology. Tutorial #7: Cardiovascular Toxicology, Nov 06, 2011.
80. **2011 Invited Lecture:** “Making sense of oxygenation for cardiovascular & cancer therapy”, presented as part of Cancer Imaging and Radiobiology (CIR) seminar series of Norris Cotton Cancer at the Dartmouth-Hitchcock Medical Center at Dartmouth College, Hanover, NH. Oct 25, 2011.
81. **2011 Guest Lecture:** “Making sense of oxygenation for MI”, presented at the Johns Hopkins University School of Medicine, Baltimore, MD on Oct 31, 2011.
82. **2011 Invited Lecture:** “Oxygen in Myocardial Infarction and Therapy: Sense & Sensibility”, Presented at Redox Core-to-Core (JSPS) Symposium, Fukuoka, Japan. Feb 05, 2011.
83. **2012 Invited Talk:** “Sense & Sensibility of Oxygen in Myocardial Infarction and Therapy”, In vivo EPR Symposium, Rocky Mountain Conference on Analytical Chemistry, Copper Mountains, Colorado. Jul 19, 2012.
84. **2012 Presentation:** “Sense & Sensibility of Oxygen in Myocardial Infarction and Therapy”, Annual retreat of the Center for Regenerative Medicine and Cell -based Therapies (CRMCBT), Mohican State Park, OH. Aug 07, 2012.
85. **2012 Guest Lecture:** “Sense & Sensibility of Oxygen in Myocardial Infarction and Therapy”, Annual conference of Indian Society for Atherosclerosis Research. Annamalai Nagar, India. Sep 02, 2012.
86. **2012 Guest Lecture:** “Oxygen therapy for acute myocardial infarction: Take a deep breath and relax”, Department of Chemistry, Indian Institute of technology (IIT), Chennai, India. Sep 04, 2012.
87. **2012 Guest Lecture:** “Oxygen therapy for acute myocardial infarction: Take a deep breath and relax”, Department of Biotechnology, Dr. MGR University, Chennai, India. Sep 07, 2012.
88. **2012 Guest Lecture:** “Oxygen therapy for acute myocardial infarction: Take a deep breath and relax”, Department of Chemistry, University of Madras, Chennai, India. Organized by the Royal Society of Chemistry (South India Chapter) Sep 14, 2012.
89. **2012 Guest (Award) Lecture:** “Cardiac drugs: Teaching old drugs new tricks”, University of Pecs, Pecs, Hungary. Sep 24, 2012.
90. **2012 Guest Lecture (1):** “Bifunctional drugs for cardiovascular and cancer treatment”, Tbilisi State Medical University, Tbilisi, Georgia. Oct 15, 2012.
91. **2012 Guest Lecture (2):** “Making sense of oxygenation for cardiovascular and cancer therapy”, Tbilisi State Medical University, Tbilisi, Georgia. Oct 16, 2012.
92. **2012 Guest Lecture (3):** “STAT3 inhibitors for safe and targeted ovarian cancer therapy”, Tbilisi State Medical University, Tbilisi, Georgia. Oct 17, 2012.
93. **2012 Invited Talk:** “Oxygen in Stem-cell Therapy for Myocardial Infarction: Sense & Sensibility”, Presented at the 2012 Annual Scientific Sessions of the American Heart Association (AHA), Los Angeles, CA. Nov 06, 2012.
94. **2012 Invited Talk:** “Mitochondria-targeting curcuminoids as effective anticancer agents”, Presented at the 2012 Meeting of the Society of Free Radicals in Biology and Medicine, San Diego, CA. Nov 17, 2012.

95. **2013 Presentation:** "Oxygen therapy for acute myocardial infarction: Take a deep breath and relax", Presented at the 41st annual meeting of the International Society for Oxygen Transport in Tissues (ISOTT) and EPR-2013 Conference in Hanover, NH. Jun 26, 2013.
96. **2013 Invited Speaker:** "Probes and Methods for Clinical Oximetry", Presented at the Rocky Mountain Conference on Magnetic Resonance, Denver, CO. Sep 1, 2013.
97. **2013 Grand Rounds Presentation:** "Teaching old drugs new tricks: In pursuit of safe and effective cancer therapy", Norris Cotton Cancer Center Grand Rounds. Sep 24, 2013.
98. **2013 Plenary Lecture:** "Oxygen, oximetry, and oxygenomics in the MI heart", IXTH International Workshop on EPR (ESR) in Biology and Medicine. Krakow, Poland. Oct 7-10, 2013.
99. **2014 Invited Talk:** "Sense and sensibility of oxygen in myocardial infarction and therapy", Gordon Research Conferences - Oxygen radicals. Ventura Beach, CA. Feb 10, 2014.
100. **2014 Invited Talk:** "Measurement and mechanism of oxygen in myocardial injury and protection", Redox Molecular Imaging Symposium in the annual meeting of the Society for Free Radical Research International (SFRRRI), Kyoto, Japan. Mar 25, 2014.
101. **2014 Award Lecture:** "EPR oximetry: Of mice and men", Lawrence H. Piette Memorial Lecture, 37th Int. EPR Conference, Rocky Mountain Conference, Copper Mountain, CO, USA. Jul 13-17, 2014.
102. **2014 Invited Lecture:** "Sense and sensibility' of novel paramagnetic phthalocyanine crystals for clinical oximetry", Chemistry Colloquium Lecture Series, Dartmouth College, Oct 02, 2014.
103. **2014 Invited Lecture:** "Sense & sensibility of oxygen in acute myocardial infarction and protection", First Adriatic Symposium on Biophysical Approaches in Biomedical Studies. Split, Croatia, Aug 28, 2014.
104. **2015 Invited Lecture:** "Sense and sensibility of oxygen in acute myocardial infarction", International Conference on Recent Advances in Research and Treatment of Human Diseases & 4th Annual Meeting of Indian Academy of Biomedical Sciences: Hyderabad Jan 9-11, 2015.
105. **2015 Invited Lecture:** "A Hand-held EPR Scanner for Transcutaneous Oximetry", Biomedical Applications In Molecular, Structural, And Functional Imaging, Orlando, FL, Feb 24, 2015
106. **2015 Invited Lecture:** "Bifunctional" curcuminoids for health and disease", University of Pecs, Pecs, Hungary, Mar 23, 2015.
107. **2015 Invited Lecture:** "Bifunctional curcuminoids: Teaching old drugs new tricks", Experimental Therapeutics Program, NCCC, Dartmouth-Hitchcock, May 7, 2015.
108. **2015 Invited Lecture:** "Initial results of phase I clinical trial of OxyChip: an implantable sensor for pO₂ monitoring. Meeting of the International Society for Oxygen Transport in Tissues, Chicago, Jul 2016.
109. **2015 Invited Lecture:** "Bifunctional curcuminoids: Teaching old drugs new tricks". Creighton University, Jul 15, 2016.
110. **2016 Invited Lecture:** "Initial results of phase I clinical trial of OxyChip: an implantable sensor for pO₂ monitoring". 39th International EPR Symposium, Breckenridge, CO, Jul 21, 2016.
111. **2016 Invited Lecture:** "EPR oximetry using OxyChip: Initial results of Phase 1 clinical trial", Xth International Workshop on EPR in Biology and Medicine, Krakow, Poland, Oct 2-6, 2016.
112. **2016 Invited Lecture:** "OxyChip: an implantable sensor for pO₂ monitoring in tissues. Initial results of Phase I clinical study in cancer patients at DHMC", Biophysics Graduate Seminar Series, Medical College Of Wisconsin, Oct 21, 2016.
113. **2016 Invited Lecture:** "Repeated measurements of tumor pO₂ using EPR oximetry with OxyChip: Initial results of a Phase I clinical study", Cancer Imaging Program, National Cancer Institute, Nov 15, 2016.
114. **2016 Invited Lecture:** "EPR oximetry with OxyChip: Initial results of a Phase I clinical study", The Ohio State University, Columbus, Ohio. Nov 21, 2016.

115. **2017 Invited Lecture:** “EPR oximetry with OxyChip: Initial results of a Phase I clinical study”, West Virginia University, Morgantown, WV. Jan 9, 2017.
116. **2017 Invited Lecture:** “Oxygen in cancer therapy: What was missing? Initial results of our Phase I clinical trial using OxyChip”, University of Arkansas Medical School. Feb 13, 2017.
117. **2017 Invited Lecture:** “Clinical Trial for Tumor Oximetry using EPR with OxyChip”, the International Conference on Electron Paramagnetic Resonance spectroscopy and imaging of biological systems and the 13th Spin Trapping/Spin Labeling conferences. West Virginia University, Morgantown, WV. Jul 18, 2017.
118. **2017 Invited Lecture:** “EPR oximetry in human subjects”, Second Adriatic Symposium on Biophysical Approaches in Biomedical Studies. Split, Croatia, Sep 24-28, 2017
119. **2017 Invited Lecture:** “Sense and sensibility of hypoxia in cancer”, University of Massachusetts Medical School, Worcester, MA, Nov 15, 2017.
120. **2018 Invited Lecture:** “Tissue Oxygen Measurement in Humans using EPR Oximetry with OxyChip”, Towards Minimally invasive or Non-invasive Approaches to Assess Tissue Oxygenation Pre- and Post-Transfusion Workshop 2018, Bethesda, MD. Apr 23-24, 2018.
121. **2019 Invited Lecture:** “Measurement of Oxygen Concentration (pO₂) in Human Tumors using EPR Oximetry with OxyChip”, Conference on Magnetic Resonance in Medicine and 25th National Magnetic Resonance Society Meeting, Indian National Science Academy, New Delhi. Feb 16, 2019.
122. **2019 Invited Lecture:** “Tumor Oxygenation for Enhancing Radiation Therapy: Making Sense and Sensibility”, West Virginia University, Jul 11, 2019.
123. **2019 Invited Lecture:** “Measurement of oxygen concentration (pO₂) in human tumors using OxyChip”, XIth International Workshop on EPR in Biology and Medicine, Krakow, Poland, Oct 6-10, 2019.
124. **2020 Invited Lecture (CME):** “Tumor Hypoxia: Cause and Effect”. Sri Ramachandra Institute of Higher Education and Research. Chennai (India). Feb 15, 2020.
125. **2020 Invited Lecture (CME):** “Tumor oxygenation for enhancing radiation therapy: Sense and Sensibility”. Sri Ramachandra Institute of Higher Education and Research. Chennai (India). Feb 15, 2020.
126. **2020 Invited Lecture (CME):** “Oxygen in acute myocardial infarction and protection: Take a deep breath”. Sri Ramachandra Institute of Higher Education and Research. Chennai (India). Feb 15, 2020.
127. **2020 Invited Lecture (CME):** “Bi-functional curcuminoids for cancer therapy: Teaching old dogs new tricks”. Sri Ramachandra Institute of Higher Education and Research. Chennai (India). Feb 15, 2020.
128. **2020 Special Lecture:** “Take a Deep Breath: Sense & Sensibility of Oxygen – Chemistry to Clinic”. Royal Society of Chemistry (South India Chapter) Indian Chemical Society (Tamil Nadu Branch) Stella Maris College, Chennai (India) Feb 17, 2020.
129. **2020 Special Lecture:** “Bifunctional curcuminoids for cancer therapy: Teaching old drugs new tricks”. Royal Society of Chemistry (South India Chapter) Indian Chemical Society (Tamil Nadu Branch). Department of Biotechnology, Sri Ramachandra Institute of Higher Education and Research. Chennai (India). Feb 18, 2020.
130. **2020 Special Lecture:** “Bifunctional Cardiac drugs”. Department of Biotechnology, Sri Ramachandra Institute of Higher Education and Research. Chennai (India). Feb 19, 2020.
131. **2021 Invited Lecture:** “Phase-1 Clinical Trial using EPR Oximetry with OxyChip Establishes Feasibility and Potential Utility of Repeated Measurements of Tumor Oxygen”. 22nd International Society of Magnetic Resonance Conference; 9th Asia-Pacific NMR Symposium; and 60th Annual Meeting of the Society of Electron Spin Science and Technology. Kyoto (Japan), Aug 26, 2021

132. **2021 Invited Webinar Presentation:** “Phase I clinical study establishing the feasibility of EPR oximetry using OxyChip for repeated measurements of tumor oxygen”. O2M Technologies, Chicago. Sep 10, 2021.

OTHER SCHOLARLY ACTIVITIES

Developer & Producer: Multilingual (Tamil/English/French/Malay) multimedia software for learning Tamil language/literature to the Tamil diaspora and foreigners

1. **TamilBook 2000** - A multimedia CD-ROM for Windows. Helped/helping more than 20,000 Tamil children and non-Tamils (foreigners) to learn Tamil language - winner of several awards!
2. **Kalvi**, Tamil Tutor Software – the Ministry of Education (MOE) in Singapore adopted this software as part of the Primary School curriculum.
3. **Amildham – Kuva Kuva Vaaththu** – A multimedia CD-ROM of Nursery Rhymes in Tamil language
4. **Amildham – Painthamil Kaadhali** (*The greatest love story ever told!*) – A multimedia CD-ROM & Music CD which brings the 2100-year-old Thirukkural (Tamil Epic written by Valluvar) to live demonstration.
5. **TamilPad** – a bilingual word processor and TrueType® fonts for desktop-publishing and e-mail communication using Tamil language.

Invited Speaker: Invited participant in several national and international conferences on Tamil language and literature

1. United States of America - Army Language Conference, Monterey, CA (1999)
2. World Tamil Teachers Conference, Kuala Lumpur, Malaysia (1994)
3. University of Singapore, Singapore (1993)
4. World Tamil Teachers Conference, Port Louis, Mauritius (1996)
5. Natal Vedic Society, Durban, South Africa (1996)
6. Tamil Church, Johannesburg, South Africa (1996)
7. Reunion Island (A French colony in Indian Ocean) - 1996
8. World Tamil Teachers Conference, Singapore (2000)
9. Bangkok, Thailand (1999)
10. Chennai, India (1999)
11. Sidney, Australia (1998)
12. Toronto, Canada (1995)
13. Vancouver, Canada (1995)
14. Paris, France (2000)

Co-Director & Founder Member: International Tamil Language Foundation

The International Tamil Language Foundation was established to develop and maintain the traditions of Tamil language and culture in the U.S.A. and other nations. The Foundation is a tax exempt, not for profit, service organization with members and supporters throughout the world.

Editor: Handbook of Tamil Culture and Heritage – tirukkural, *the Holy Scripture*, written by tiruvalluvar circa 100 bc.

An 1800-page book (National Press, Philadelphia) illustrating 3000+ years of history, culture and heritage of Tamil language and Tamils (Tamil-speaking people, currently over 70 million world-wide).