



Dr. Rama Jayasundar
Professor & Head
Department of NMR
All India Institute of Medical Sciences
New Delhi - 110 029, India

Tel: 91-11-2659 3253

Fax: 91-11-26588663 / 26588641

Email : ramajayasundar@hotmail.com; ramajayasundar@gmail.com

Dr. Rama Jayasundar is the Professor and Head, Department of NMR, All India Institute of Medical Sciences (AIIMS), New Delhi, India. She has a unique and unusual career trajectory. A PhD from University of Cambridge, UK, she is trained in physics and Nuclear Magnetic Resonance (NMR). While pioneering biomedical NMR work in India, she enrolled for the 5 1/2 years undergraduate medical degree in ayurveda as a full time student at the age of 41. She now holds a professional BAMS (Bachelor of Ayurvedic Medicine and Surgery) degree in Ayurveda and has this unique academic combination of being an MR physicist and a professionally trained ayurvedic doctor.

As an MR physicist with specialisation in biomedical MR, Dr. Rama Jayasundar has wide experience in experimental, clinical and high resolution MR systems. Her areas of specialisation are clinical spectroscopy and imaging, low cost Radiofrequency (RF) coil designing & building, and RF pulse sequence programming. Her indigenously developed low-cost RF coils for clinical MR scanners cost less than 5% of that of the manufacturer's. She has won many awards and has many publications to her credit. Her current research interests harness her distinctive training in physics, experimental MR, ayurveda and modern medicine for innovative research in ayurveda.

Education

B.Sc (Physics)	1978 - 1981, Queen Mary's College, Madras University, Chennai, India.
M.Sc (Medical Physics)	1981 - 1983, Guindy Engineering College, Anna University, Chennai, India
PhD (Physics - NMR)	1986 - 1990, St John's College, University of Cambridge, U.
BAMS *	2002 - 2008, SJS Ayurveda College, SCSVMV University, Chennai, India.

*Bachelor of Ayurvedic Medicine and Surgery - includes Compulsory Rotating Internship in Departments of Internal Medicine, Surgery, Obstetrics & Gynecology, ENT, Ophthalmology, Community Medicine and Pediatrics in modern medicine . Trained also in modern medicine.

Domain knowledge

Nuclear Magnetic Resonance (NMR); Magnetic Resonance Imaging (MRI); Physics; Ayurveda; modern medicine.

Domain expertise

NMR - Biomedical NMR; MR applications in neuroscience - MR of brain tumours, infections & other brain pathologies, Functional MRS; low cost RF coil for MR; RF pulse sequence programming.

Medicine - Dr. Rama Jayasundar is a professionally qualified ayurvedic physician (Reg No. AA 27960) and also trained in modern medicine.

Research experience

MR on clinical and animal scanners; High Resolution NMR; NMR RF coil design and building; RF pulse sequence programming; MR applications in neuroscience - Functional MRS; MR of brain tumours, infections and other brain pathologies.

Current research interests

MR-based phenotyping for personalised medicine; MRI & MRS in patients for studying therapeutic response to Ayurveda and Yoga interventions; NMR of phytometabolomics; NMR applications in combinatorial chemistry; Applications of MR in Ayurveda and yoga.

Key contributions

Dr. Rama Jayasundar's major scientific contributions span two conceptual domains - Applications of MR in neurosciences and Novel applications of MR in ayurveda.

MR in Neuroscience - key contributions

Normal subjects

Neurochemical laterality: Although structural and functional asymmetries in normal brain are well known, there were no reports of neurochemical asymmetries till the ones by RJ. Her proton MRS studies on chemical asymmetries in normal human brain (all regions) in over 250 volunteers have demonstrated neurochemical laterality to be an inherent characteristic of the human brain as anatomic and functional asymmetries are.

Functional MRS: She had developed techniques for time resolved functional spectroscopy to study the lateralisation of activations.

Patients - contributions towards the development of diagnostic procedures

Diagnostic potential of proton MRS in brain infections: Infectious brain pathologies are often the cause of seizures in tropical countries like India. Potential of these pathologies (eg. neurocysticercosis, tuberculoma) for being fatal in the absence of appropriate therapy underlines the importance of non-invasive differential diagnosis. Rama Jayasundar's work on proton MRS on over 100 patients with brain infections have contributed towards this.

Brain tumours: Nearly 500 patients with different brain tumors have been studied. This study and that on post-surgery tumor recurrence have contributed towards non-invasive diagnostic tests for brain tumors. The *in vivo* and *in vitro* (high resolution multinuclear NMR studies on surgically excised brain tumor tissues) studies have also contributed to the existing knowledge on brain tumor physiology.

Non-invasive MR-based temperature measurements in brain tumours in vivo: Local temperatures, in addition to influencing a number of normal biological functions are also known to play an important role in diseases. Their knowledge can therefore provide clinically useful information about the pathophysiology. Rama Jayasundar developed an MRS based method to determine the local temperatures in brain and estimated them in brain tumors *in vivo*. Statistically significant differences in temperature were observed between some of the brain tumors, adding yet another parameter which can be of use in diagnosis of tumors.

Low cost indigenous hardware development - contributions towards the development of diagnostic MR RF coils

Low cost MR RF coil: Inductively coupled RF surface coils were developed indigenously for clinical MR scanners to study thyroid disorders and brain tumors. Cost of the coil was roughly about Rs. 2,000.

Current research interests: Post medical degree, Dr. Rama Jayasundar's research has sought to harness the distinctive facets of her expertise (NMR & MRI, physics, ayurveda and allopathy) to carry out scientific studies of ayurveda and yoga exploring their concepts and therapeutic efficacies with modern scientific tools. These studies not only contribute richly to ayurveda and yoga but can also provide important leads to the changing paradigms in modern medicine such as systems approach to health and disease, personalised & preventive healthcare, new health metrics, phenotyping for personalised medicine, etc.

MR in Ayurveda - key contributions

The growing interest in systemic viewpoint in medicine brings into focus one of the longest unbroken healthcare system in the world, i.e. ayurveda, indigenous to Indian subcontinent. The ability of MR to study whole systems and generate a wide range of information non-invasively makes it ideally suited to study ayurveda. MR (*in vitro* and *in vivo*) offers a powerful means to not only validate ayurveda but also gain understanding of its concepts and working. Novel applications of MR spanning different aspects of ayurveda are being studied -

- MR based phenotyping and health metrics using ayurvedic concepts of personalised and preventive healthcare
- MR based novel diagnostic and physiological biomarkers
- *In vivo* MRI and MRS for monitoring therapeutic response to Ayurveda and yoga interventions
- NMR of medicinal plants
- NMR phytometabolomics for chemosensory fingerprinting of medicinal plants
- NMR spectroscopy for combinatorial and therapeutic effects of anticancer classical ayurvedic formulations

These studies not only validate ayurvedic concepts, therapies and use of medicinal plants but also have the potential to provide leads to mainstream science and medicine such as in drug discovery and systems medicine.

Select Publications (Journals and Proceedings)

1. **Rama Jayasundar**, Aruna Singh, Dushyant Kumar. Challenges in using Electronic tongue to study *rasa* of plants: I. Finding the right tool for the right job. J Ayu Integr Med (under revision).
2. Dushyant Kumar, Aruna Singh, **Rama Jayasundar**. Challenges in using Electronic tongue to study *rasa* of plants: II. Impact of the type of water used as solvent. J Ayu Integr Med (under revision).
3. Aruna Singh, Dushyant Kumar, **Rama Jayasundar**. Challenges in using Electronic tongue to study *rasa* of plants: III. Is taste ranking of ayurvedic *rasa* in medicinal plants possible?. J Ayu Integr Med (under revision).
4. Dushyant Kumar, Rajesh Mishra, Chahat, Priyanka Bhagat, Padma Srivastava, **Rama Jayasundar**. MRI for studying yoga-induced cortical structural changes in stroke patients. Proc Intl Soc Magn Reson Med, USA, 27, 2020.
5. **Rama Jayasundar**, Dushyant Kumar, Rajesh Mishra, Govind Maurya, Priyanka Bhagat, Surbhi Kaura, Senthil Kumaran, Padma Srivastava. Physiotherapy-induced changes in brain in post-stroke rehabilitation : a longitudinal MRI study. Proc Intl Soc Magn Reson Med, USA, 27, 2020.
6. **Rama Jayasundar**, Aruna Singh, Dushyant Kumar. Proton NMR metabolomics guided prediction of anti-obesity properties of medicinal plants. Proc Intl Soc Magn Reson Med, USA, 27, 2020.
7. **Rama Jayasundar**, Somenath Ghatak, Makhdoomi Muzamil, Kalpana Luthra, Aruna Singh Thirumurthy Velpandian. Challenges in integrating component level technology and system level information from ayurveda: insights from NMR phytometabolomics and anti-HIV potential of select ayurvedic medicinal plants. J Ayu Integr Med. 10, 94-101, 2019.
8. A Venkatraman, R Nandy, S Sudarshan Rao, DH Mehta, A Viswanathan, **Rama Jayasundar**. Tantra and Modern Neurosciences: Is there any Correlation?. Neurology India. 67, 1188-1193, 2019.
9. Rajesh Mishra, Dushyant Kumar, Surbhi Kaura, Senthil Kumaran, Priyanka Bhagat, Padma Srivastava, **Rama Jayasundar**. Evaluating yoga and physiotherapy induced changes in stroke recovery using MR. Proc Experimental NMR, 60, 32, 2019.
10. **Rama Jayasundar**, Aruna Singh, Dushyant Kumar. Novel chemosensory application of ¹H and ¹³C NMR metabolomics in medicinal plants of nutritional value. Proc Experimental NMR, USA, 60, 54, 2019.
11. Ankita Singh, Aruna Singh, Dushyant Kumar, **Rama Jayasundar**. Evaluation of chemosensory property of taste using NMR chemometrics. Proc Experimental NMR, 60, 74, 2019.
12. Rajesh Mishra, Dushyant Kumar, Senthil Kumaran, Priyanka Bhagat, Padma Srivastava, **Rama Jayasundar**. Physiotherapy induced changes in stroke recovery using MRI. Proc Intl Soc Magn Reson Med, 27,3567, 2019.
13. **Rama Jayasundar**, Aruna Singh, Muzzamil Makhduni, Kalpana Luthra, Thirumurthy Velpandian, *In vitro* screening of drug response in HIV-1 pseudovirus infected cells using NMR. Proc Intl Soc Magn Reson Med, 26, 5736, 2018
14. Aruna Singh, Dushyant Kumar, **Rama Jayasundar**. Targeted and untargeted NMR phytometabolomics for polar chemosensory markers and signatures. Proc Intl Soc Magn Reson Med, Canada, 26, 7577, 2018.
15. Rama Jayasundar. Neurochemical changes observed by in vivo proton MRS during vocal meditation. Proc Experimental NMR, 59, 40, 2018
16. Aruna Singh, Dushyant Kumar, **Rama Jayasundar**. Non-polar phytometabolites as chemosensory markers by NMR Metabolomics. Proc Experimental NMR, USA, 59, 31, 2018
17. **Rama Jayasundar**, Aruna Singh. NMR phytometabolomics for evaluation of non-polar chemosensory signatures. Proc Intl Soc Magn Reson Med, 25, 2989, 2017.
18. **Rama Jayasundar**. Altered inter-hemispheric neurochemical asymmetry in brain due to conscious mental routine evaluated in vivo by proton MRS. Proc World Mol Imaging Congress, P433, 2017.
19. **Rama Jayasundar**. If systems approach is the way forward, what can ayurvedic theory of tridosha teach us?. Curr Sci, 112, 1127-1133, 2017.
20. Aruna Singh, **Rama Jayasundar**. NMR metabolomics based analysis of polar chemosensory markers in nutraceutical plants. Proc Experimental NMR, 58, 94, 2017.

21. **Rama Jayasundar**, Divya Singh, Aruna Singh. NMR spectroscopy of milk processed with supplements: a novel application of NMR in ethnomedicine. Proc Experimental NMR, 58, 95, 2017.
22. Aruna Singh, Muzamil Makhdoomi, Kalpana Luthra, Thirumurthy Velpandian, **Rama Jayasundar**. NMR metabolic profiling of HIV pseudovirus infected TZM-bl cells in response to treatment. Proc Experimental NMR, 58, 96, 2017.
23. **Rama Jayasundar**, Somenath Ghatak. Spectroscopic and E-tongue evaluation of medicinal plants: a taste of how *rasa* can be studied. J Ayu Integr Med, 7, 191-197, 2016.
24. **Rama Jayasundar**, G Sharma, T Velpandian. Can NMR be used for Pharmacological Screening of Polyherbal Ayurvedic Formulations?. Proc Experimental NMR, 57, 128, 2016.
25. A Singh, S Ghatak, **Rama Jayasundar**. Determination of polarity based sensorial descriptors of nutraceutical plants using ¹H NMR?. Proc Experimental NMR, 57, 160, 2016.
26. **Rama Jayasundar**, S Ghatak. Chemosensory analysis of medicinal plants by NMR phytometabolomics. Proc Intl Soc Magn Reson Med, 24, 5237, 2016.
27. **Rama Jayasundar**, S Ghatak, AC Ammini, AK Mukhopadhyaya, A Sharma. MR based body composition analysis correlates ayurvedic phenotyping. Proc Intl Soc Magn Reson Med, 24, 5493, 2016.
28. S Ghatak, **Rama Jayasundar**. Differential association of MR evaluated abdominal subcutaneous and visceral adipose tissue with body mass index and lipid profile. Proc World Mol Imaging, 9, P454, 2016.
29. **Rama Jayasundar**, G Sharma, SS Chauhan, T Velpandian. NMR-based analysis of combinatorial effects of chemotherapy drug and polyherbal formulation. Proc World Mol Imaging, 9, P455, 2016.
30. Yashonath S, Girija PLT, Savitri G, **Rama Jayasundar**, Gangadharan GG. Nagashayana N. Ayurvedic treatment and modern medicine - A report of the meeting on 'Human body as a complex system'. Curr Sci, 108, 476-478, 2015.
31. **Rama Jayasundar**, S Ghatak, PK Rai, G Sharma. NMR phytometabolomics for chemosensory signatures. Proc Intl Soc Magn Reson Med, 22, 806, 2014.
32. S Ghatak, PK Rai, S Sharma, **Rama Jayasundar**. Can NMR metabolomics play a role in nutritional healthcare? Proc Intl Soc Magn Reson Med, 22, 3751, 2014.
33. **Rama Jayasundar**, S Ghatak, A Poddar, AC Ammini, AK Mukhopadhyay. MR based evaluation of subcutaneous, visceral and intermuscular adipose tissue as markers for metabolic disorders. Proc Intl Soc Magn Reson Med, 22, 6358, 2014.
34. **Rama Jayasundar**. Expanding the role of NMR beyond its traditional boundaries. Proc Experimental NMR, 55, 62, 2014.
35. **Rama Jayasundar**, S Ghatak, PK Rai. Metabolosensory signatures using NMR. Proc Experimental NMR, 55, 72, 2014.
36. **Rama Jayasundar**, G Sharma, S Sharma, A Verma, T Velpandian. NMR phytometabolomics for characterising an anticancer polyherbal formulation and its ingredients. Proc Experimental NMR, 55, 73, 2014.
37. S Ghatak, PK Rai, **Rama Jayasundar**. NMR metabolomics based pattern recognition in hypoglycemic plants. Proc Experimental NMR, 55, 74, 2014.
38. S Ghatak, PK Rai, **Rama Jayasundar**. Spectroscopic metabolomics using NMR, FTIR and LIBS to study medicinal plants. Proc Experimental NMR, 55, 75, 2014.
39. G Sharma, **Rama Jayasundar**, A Verma, T Velpandian. Metabolomic profiling of Antiangiogenic drug responses on Chick Chorioallantoic membrane. Proc Experimental NMR, 55, 76, 2014.
40. AK Verma, G Sharma, T Velpandian, **Rama Jayasundar**. NMR phytoanalysis and evaluation of anti-neovascularisation potential of medicinal plants. National Magnetic Resonance Society, 20, 90, 2014.
41. S Ghatak, PK Rai, G Watal, **Rama Jayasundar**. Spectroscopic metabolomics : a potential tool for studying nutraceuticals. National Magnetic Resonance Society, 20, 117, 2014.
42. S Ghatak, PK Rai, **Rama Jayasundar**. NMR in sensory sciences. National Magnetic Resonance Society, 20, 118, 2014.
43. **Rama Jayasundar**. Spectroscopic analysis for quality control of medicinal plants, Proc Indo-US Symposium on Botanical Drug Development, 7, 2013.

44. G Sharma, **Rama Jayasundar**, T Velpandian, SS Chauhan. NMR in the study of polyherbal formulations. Proc World Mol Imaging Congress, P479, 2013.
45. **Rama Jayasundar**, S Ghatak, AC Ammini, AK Mukhopadhyay. Can MR based body composition analysis help in identifying individuals at risk for developing metabolic diseases?. Proc World Mol Imaging Congress, P553, 2013.
46. **Rama Jayasundar**, S Ghatak, AC Ammini, AK Mukhopadhyay. MRI and Ayurveda: The odd match for phenotyping. Proc World Mol Imaging Congress, P554, 2013.
47. G Sharma, **Rama Jayasundar**, T Velpandian, R Singh, SS Chauhan. NMR metabolomics of drug response to antineoplastic polyherbal formulations. Proc Intl Soc Magn Reson Med, 21, 912, 2013.
48. **Rama Jayasundar**. Innovative applications of MR in the complementary and alternative medical system of ayurveda. Proc Intl Soc Magn Reson Med, 21, 1523, 2013.
49. **Rama Jayasundar**, S Ghatak, A Poddar, AC Ammini, AK Mukhopadhyay. Is there a predictive role for MRI assessed subcutaneous adipose tissue in identification of risk group for diabetes?. Proc Intl Soc Magn Reson Med, 21, 1525, 2013.
50. S Ghatak, PK Rai, P Kumar, **Rama Jayasundar**. Can NMR be used as a magnetic tongue?. Proc Experimental NMR, 54, 184, 2013.
51. S Ghatak, PK Rai, P Kumar, S Mewar, **Rama Jayasundar**. NMR Metabolomics in validating traditional Indian Medicine classification of medicinal plants. Proc Experimental NMR, 54, 186, 2013.
52. G Sharma, **Rama Jayasundar**, T Velpandian, R Singh, SS Chauhan. NMR metabolic profiling of the response in Hep-G2 cancer cells to treatment with anticancer polyherbal formulations. Proc Experimental NMR, 54, 187, 2013.
53. G Sharma, **Rama Jayasundar**, T Velpandian, SS Chauhan. MR phytochemical profiling of polyherbal formulations. Proc Experimental NMR, 54, 191, 2013.
54. **Rama Jayasundar**, MGK Menon. Complexity in Biology: the systemic approach of ayurveda. Proc Complexity and Analogy in Science, 2012.
55. **Rama Jayasundar**. Healthcare, the ayurvedic way. Ind J Medical Ethics, 9, 177-179, 2012.
56. G Sharma, **Rama Jayasundar**, SS Chauhan, T Velpandian. NMR spectroscopic characterization and evaluation of anticancer potential of a polyherbal formulation on HepG2 cell line. Proc Experimental Nuclear Magnetic Resonance, 53, 293, 2012.
57. S Ghatak, PK Rai, G Watal, AK Rai, **Rama Jayasundar**. NMR Spectroscopic analysis and in-vitro Antioxidant Efficacy of the medicinal plant Tribulus Terrestris. Proc Experimental Nuclear Magnetic Resonance, 53, 287, 2012.
58. **Rama Jayasundar**, A Poddar, AC Ammini, AK Mukhopadhyay. Body composition analysis using MRI, Dual Energy X-ray Absorptiometry and Bio-impedance. Proc Intl Soc Magn Reson Med, 20, 4089, 2012.
59. **Rama Jayasundar**, G Sharma, PK Rai, SS Chauhan, T Velpandian. NMR Metabolomic and LIBS elemental profiling of anticancer herbal formulation. Proc Intl Soc Magn Reson Med, 20, 1542, 2012.
60. **Rama Jayasundar**. Systems biology approach of ayurveda in cancer management. J Carcinogenesis, 11, S11, 2012.
61. G Sharma, **Rama Jayasundar**, T Velpandian, SS Chauhan. Evaluation of antiangiogenic activity of ayurvedic formulation using Chick Chorioallantoic Membrane Assay. J Carcinogenesis, 11, S31, 2012.
62. G Sharma, **Rama Jayasundar**, T Velpandian, R Singh, SS Chauhan, V Kapoor, SN Das. Antineoplastic activity in human hepatoma cell line and NMR spectroscopy based metabolic fingerprinting of polyherbal formulations. J Carcinogenesis, 11, S31, 2012.
63. R Rastogi, N Gulati, RK Kotnala, U Sharma, **Rama Jayasundar**, V Kaul. Evaluation of folate conjugated pegylated thermosensitive magnetic nanocomposites for tumor imaging and therapy. Colloids and Surface Biointerfaces, 82, 160-167, 2011.
64. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. In vivo MRS of intraventricular tumors. J Magn Reson Imaging, 34, 1053-1059, 2011.
65. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. MRS characterization of central neurocytomas using glycine. NMR in Biomedicine, 24, 1408-1413, 2011.
66. **Rama Jayasundar**. Effect of mantras on human brain : a study using Magnetic Resonance Spectroscopy. Proc Intl Conf Indigenous Medicine 27, 2011.

67. **Rama Jayasundar**. Applications of Magnetic Resonance in scientific validation of traditional medicine. Proc Intl Conf Indigenous Medicine 28, 2011.
68. **Rama Jayasundar**, A_Poddar, AC Ammini, AK Mukhopadhyay. Correlation of lipid profile and insulin sensitivity with body fat evaluated using MRI, Dual Energy X-ray Absorptiometry and Bio-impedance. Proc Intl Soc Magn Reson Med,19, 6790, 2011.
69. **Rama Jayasundar**. Ayurveda : a distinctive approach to health and disease. Current Science, 98, 908-914, 2010.
70. **Rama Jayasundar**. Ayurveda and biomedicine : a comparison. Ayuh Sri, 1, 79-84, 2010.
71. **Rama Jayasundar**. The distinctive approach of ayurveda to health, disease and plants. Proc Intl Conf Integrative and Personalised Med, 143-144, 2009.
62. **Rama Jayasundar**. The approach of ayurveda to health and disease. Proc Intl Soc Medicinal and Nutraceutical Plants, 2, 6, 2009.
63. **Rama Jayasundar**. Health and disease : distinctive approaches of biomedicine and ayurveda. Leadership Medica, 15, 6-21, 2009.
64. **Rama Jayasundar**. Ayurveda and Green medicine. Ayurveda and Green medicine, 9, 81-86, 2008.
65. **Rama Jayasundar**. Ayurveda: The science of life. Ayurveda and Green medicine, 8, 73-79, 2008.
66. **Rama Jayasundar**. Quantum physics and Spirituality. Proc Intl Conf on Science and Spirituality in Healing, 5, 11-12, 2008.
67. T Shah, **Rama Jayasundar**, VP Singh, CS Bal, C Sarkar. Post-therapy Evaluation of Cerebral Tumors using MRS and SPECT. Proc Intl Soc Magn Reson Med, 11, 1296, 2003.
68. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. Spectral profile of cerebral tumors - A Proton Spectroscopy Study. Proc Intl Soc Magn Reson Med, 11, 1295, 2003.
69. **Rama Jayasundar**. In Vivo Measurements of Temperature and Diffusion Coefficient of Brain tumors. Proc Intl Soc Magn Reson Med, 11, 1294, 2003.
70. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. Proton Magnetic Resonance Spectroscopy of intra-ventricular tumors. Proc Intl Soc Magn Reson Med, 11, 1293, 2003.
71. **Rama Jayasundar**. ³¹P MR Diffusion Spectroscopy in Human Muscle and Tumors. Proc Intl Soc Magn Reson Med, 11, 1288, 2003.
72. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. Characterization of choline compounds in cerebral tumors using multinuclear high resolution MR Studies. Proc Intl Soc Magn Reson Med, 11, 834, 2003.
73. **Rama Jayasundar**, T Shah, VP Singh, C Sarkar. In vivo and in vitro spectroscopic profile of a central neurocytoma. J Magnetic Resonance Imaging, 17, 256 - 260, 2003.
74. **Rama Jayasundar**, AK Sahani, S Gaikwad, S Singh, M Behari. Proton MR spectroscopy in Wilson's Disease. Magnetic Resonance Imaging, 20, 131-135, 2002.
75. **Rama Jayasundar**. Human Brain : Biochemical lateralisation in normal subjects. Neurology India, 50, 267-271, 2002.
76. **Rama Jayasundar**, VP Singh. In vivo temperature measurements in brain tumors using proton MR spectroscopy. Neurology India, 50, 436 - 439, 2002.
77. **Rama Jayasundar**. In vivo 31P MR characterization of malignant and benign thyroid nodules. Proc Intl Soc Magn Reson Med, 10, 2051, 2002.
78. T Shah, **Rama Jayasundar**, VP Singh, CS Bal, S Gaikwad, C Sarkar. Diagnostic potential of proton MRS in identifying tumor recurrence. Proc Intl Soc Magn Reson Med, 10, 2037, 2002.
80. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. Proton MRS in the differential diagnosis of intraventricular meningiomas and central neurocytomas. Proc Intl Soc Magn Reson Med, 10, 694, 2002.
81. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. Grading of gliomas - an in vivo proton MRS study. Proc Intl Soc Magn Reson Med, 10, 451, 2002.
82. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. Does Taurine and Inositol have a role in characterizing medulloblastomas? - an in vivo and in vitro proton MRS study. Proc Intl Soc Magn Reson Med, 10, 449, 2002.

87. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. Correlation between in vivo and in vitro proton MRS and histology of brain tumors. Proc Intl Soc Magn Reson Med, 9, 2291, 2001.
89. **Rama Jayasundar**. Evaluation of cold/solid thyroid nodules. Proc Intl Soc Magn Reson Med, 9, 200, 2001.
90. T Shah, **Rama Jayasundar**, M Behari. ¹H NMR studies on cerebrospinal fluid in neurological disorders. Proc Intl Sym on Spatially Resolved Magnetic Resonance, 7, P 61, 2001.
91. T Shah, **Rama Jayasundar**, VP Singh. In vitro multinuclear NMR studies on cerebral tumors. Proc Intl Symp on Spatially Resolved Magnetic Resonance, 7, P 60, 2001.
93. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. High resolution proton and phosphorus spectroscopy of cerebral tumors. Neurology India, 49 (S), 10, 2001.
94. T Shah, **Rama Jayasundar**, VP Singh, C Sarkar. Medulloblastomas: A Magnetic Resonance Spectroscopy study. Neurology India, 49 (S), 15, 2001.
95. **Rama Jayasundar**, LD Hall, NM Bleehen. RF coils for combined MR and hyperthermia studies: I. Hyperthermia applicator as an MR coil. Magnetic Resonance Imaging, 19, 111-116, 2001.
96. **Rama Jayasundar**, LD Hall, NM Bleehen. RF coils for combined MR and hyperthermia studies : II. MR coil as an hyperthermic applicator. Magnetic Resonance Imaging, 19, 117-122, 2001.
97. **Rama Jayasundar**. Single Radiofrequency source for MR and hyperthermia studies. Current Science, 80, 101-104, 2001.
98. T Shah, **Rama Jayasundar**, VP Singh. In vivo and in vitro proton MRS studies of cerebral tumor. Neurology India, 48 (S), 2000.
99. **Rama Jayasundar**, VP Singh, In vivo temperature measurements in brain tumors using proton MR Spectroscopy. Neurology India, 48 (S), 2000.
103. T Shah, **Rama Jayasundar**, M Behari. High resolution proton MRS of CSF: effects of lyophilization. Proc Symp Magn Reson and Biomol Structure and Function, 6, P8, 2000.
106. **Rama Jayasundar**, D Honess, NM Bleehen, LD Hall. Simultaneous evaluation of the effects of RF hyperthermia on the intra- and extracellular tumor pH. Magnetic Resonance in Medicine, 43, 1-8, 2000.
108. **Rama Jayasundar**, LD Hall, NM Bleehen. An MR-compatible hyperthermia system : in vivo studies of intra- and extracellular tumour pH. Proc Intl Symp on Recent Trends in Bio-Medical Research, P10-P11, 1999.
109. **Rama Jayasundar**, VP Singh, P Raghunathan. Differentiation of cerebral radiation necrosis from tumour recurrence by proton MRS. Neurology India, 47 (S), 1999.
110. MN Degaonkar, **Rama Jayasundar**, P Raghunathan, NR Jagannathan. Longitudinal evaluation of apparent diffusion coefficients of edema and demyelinating lesion in progressive experimental allergic encephalomyelitis. Proc Intl Soc Magn Reson Med, 7, 1777, 1999.
111. MN Degaonkar, P Raghunathan, **Rama Jayasundar**, NR Jagannathan. In vivo volume selective T1 and T2 relaxation measurements during pre-acute stage of experimental allergic encephalomyelitis in rat brain. Proc Intl Soc Magn Reson Med, 7, 965, 1999.
112. **Rama Jayasundar**, NM Bleehen, LD Hall. An MR compatible experimental set-up for hyperthermia studies. Australasian Radiology, 43, 466-471, 1999.
113. **Rama Jayasundar**, VP Singh, K Jain, P Raghunathan, AK Banerji. Inflammatory granulomas : Evaluation with proton MRS. NMR in Biomedicine, 12, 1-6, 1999.
114. **Rama Jayasundar**, KD Merboldt, J Frahm. Functional Imaging and Functional Spectroscopy during focal brain activation in normal volunteers. Proc Symp on Magnetic Resonance, 5, 83, 1999.
115. MN Degaonkar, P Raghunathan, **Rama Jayasundar**, NR Jagannathan. Diffusion weighted MR imaging in progressive experimental allergic encephalomyelitis. Proc Symp on Magnetic Resonance, 5, 73, 1999.
116. MN Degaonkar, P Raghunathan, **Rama Jayasundar**, NR Jagannathan. Comparative study of Gadodiamide (Gd-DTPA-BMA) and Gadopentitate dimeglumine (Gd-DTPA) contrast agents in MRI of experimental allergic encephalomyelitis (EAE) lesion of central nervous system. Journal of Biosciences, 24 (S1), 189, 1999.
117. **Rama Jayasundar**, NM Bleehen, LD Hall. MR, hyperthermia and oncology. Current Science, 76, 63-68, 1999.
118. **Rama Jayasundar**, AC Ammini, R Gupta, P Raghunathan. Evaluation of pituitary gland in idiopathic hypogonadotropic hypogonadism. Acta Radiologica , 40, 88-94, 1999.

119. **Rama Jayasundar**, KD Merboldt, J Frahm. Functional Imaging and Functional Spectroscopy during visual stimulation. *Neurology India*, 46 (S), 43, 1998.
120. **Rama Jayasundar**, P Raghunathan. Human brain: In vivo evidence of biochemical asymmetry in normal subjects. *Neurology India*, 46 (S), 33, 1998.
121. **Rama Jayasundar**, P Raghunathan. Biochemical lateralization of brain metabolites assessed by proton Magnetic Resonance Spectroscopy. *European Journal of Neuroscience*, 10, 3305 iii, 1998.
123. **Rama Jayasundar**, P Raghunathan. Lateralization of activation of motor cortex studied by functional MRS. *Proc Intl Soc Magn Reson Med*, 5, 1644, 1997.
124. **Rama Jayasundar**, K Jain, VP Singh, P Raghunathan. Proton MRS in the monitoring of therapeutic response in tuberculomas. *Proc Intl Soc Magn Reson Med*, 5, 1235, 1997.
125. **Rama Jayasundar**, A Bakshi, VP Singh, P Raghunathan. Diagnostic potential of proton MRS in differentiating between tumor recurrence and radiation necrosis. *Proc Intl Soc Magn Reson Med*, 5, 1142, 1997.
126. **Rama Jayasundar**, NM Bleehen, LD Hall. The effects of anesthesia and physical restraint on intra- and extra cellular tumor pH, tumor temperature and bioenergetics in murine RIF-1 tumors. *Magn Reson Imaging*, 15, 847-855, 1997.
127. **Rama Jayasundar**, S Ayyar, P Raghunathan. MR investigation of the internal structures and relaxation times in raw and boiled hen eggs. *Magnetic Resonance Imaging*, 15, 709-717, 1997.
128. **Rama Jayasundar**, P Raghunathan. Evidence for left-right asymmetries in the proton MRS of brain in normal volunteers. *Magnetic Resonance Imaging*, 15, 223-234, 1997.
130. **Rama Jayasundar**, VP Singh, K Jain, AK Banerji, P Raghunathan. Diagnostic potential of proton MRS in differentiating between tuberculomas and neurocysticercos. *Proc Intl Soc Magn Reson Med*, 4, 970, 1996.
132. **Rama Jayasundar**, VP Singh, P Raghunathan. Metabolic Imaging of the brain. *Neurology India*, 44 (S), 1996.
133. **Rama Jayasundar**, P Raghunathan. Functional spectroscopy - a tool to study brain activation. *Neurology India*, 44 (S), 1996.
134. **Rama Jayasundar**, M Goyal, R Sharma, P Raghunathan. Proton MRS in Pott's spine. *Magn Reson Imaging*, 4, 691-695, 1996.
135. M Goyal, NK Mishra, S Gaikwad, **Rama Jayasundar**. Cervical intramedullary lipoma with unusual MRI features: a case report. *Neuroradiology*, 38, S117-119, 1996.
136. **Rama Jayasundar**, A Bakshi, VP Singh, P Raghunathan. Proton spectroscopy in brain tumours. *Neurology India*, 43 (S), 61, 1995.
137. **Rama Jayasundar**, VP Singh, K Jain, P Raghunathan, AK Banerji. Proton MRS of intracranial inflammatory granulomas. *Neurology India*, 43 (S), 43, 1995.
138. **Rama Jayasundar**, P Raghunathan. Left-right asymmetries in the proton MRS of brain in normal volunteers. *Neurology India*, 43 (S), 43, 1995.
139. **Rama Jayasundar**, AK Banerji, P Raghunathan. Proton MRS similarity between central nervous system Non-Hodgkins lymphoma and intracranial tuberculoma. *Magnetic Resonance Imaging*, 13, 489-493, 1995.
140. NR Jagannathan, **Rama Jayasundar**, V Govindaraju, P Raghunathan. Applications of high resolution MRI and MRS techniques to plant materials. *Proc Ind Acad Sci*. 106, 1595-1604, 1994.
141. **Rama Jayasundar**, P Raghunathan, AK Banerji. In vivo proton NMR spectroscopy of normal and diseased brain. *Neurology India*, 42 (S), 52, 1994.
142. **Rama Jayasundar**, P Raghunathan, AK Banerji. In vivo H-1 spectroscopy of human intracranial tumors at 1.5 Tesla - preliminary results. *Neurology India*, 42 (S), 51, 1994.
143. **Rama Jayasundar**, LD Hall, NM Bleehen. Comparison of pH measurements made using P-31 NMR and a fibre optic pH meter. *NMR in Biomedicine* 5, 360-363, 1992.
144. **Rama Jayasundar**, TJ Norwood, LD Hall, NM Bleehen. P-31 NMR Spectral Editing Technique for Blood with short T₂ values. *J Magnetic Resonance*, 84, 616-619, 1989.
145. **Rama Jayasundar**, TJ Norwood, LD Hall, NM Bleehen. Spectral Editing Techniques for P³¹ NMR Spectroscopy of Blood. *Magnetic Resonance in Medicine*, 10, 89-96, 1989.

Chapter in Books

146. **Rama Jayasundar**. Relevance of ayurveda in management of sleep disorders. In: Serotonin and Melatonin: Their Functional Role in Plants and Implications in Human Health (Eds: GA Ravishankar and A Ramakrishna), CRC Press/Taylor & Francis Group, USA, pp. 388-393, 2016
147. **Rama Jayasundar**. Ayurvedic approach to functional foods. In: Introduction to Functional Food Science (Ed. DM Martirosyan), Food Science Publisher, USA, pp. 454-479, 2013.
148. **Rama Jayasundar**. Quantum logic in ayurveda. In: An integrated model of Health and well-being. From Indian tradition to globalized knowledge (Ed. A Morandi), Springer Verlag, Germany, pp. 115-139, 2013.
149. **Rama Jayasundar**. Contrasting approaches to health and disease - Ayurveda and Biomedicine. In: Medicine, State and Society – Indigenous medicine and medical pluralism in contemporary India (Eds. V Sujata, L Abraham), Orient BlackSwan, India, pp. 37-58, 2012.
150. **Rama Jayasundar**. Modern insights into the foundations of ayurveda. In: Bi-monthly Lecture Series - 2010, Morarji Desai National Institute of Yoga, Department of AYUSH, Govt. of India, pp. 16-30, 2010.
151. **Rama Jayasundar**. Indian Medical System – Ayurveda. In: Encyclopedia on Hinduism, Volume V, 2010.
152. **Rama Jayasundar**. Ayurveda – the science of well-being. In: Towards the wellness of body, mind and self, (Ed. J Chavan), Institute of Science and Religion, Mumbai, pp. 83-92, 2010.
153. **Rama Jayasundar**. Health : distinctive approaches of biomedicine and ayurveda. In: Bridging Science and Spirituality (Eds. SC Mishra, AB Samaddar, S Ghosh), Motilal Nehru National Institute of Technology (Allahabad) and Bhaktivedanta Institute (Kolkata), pp. 167-178, 2010.
154. **Rama Jayasundar**. Quantum Physics, Ayurveda and Spirituality. In: Science and Spirituality Quest (Eds. SC Mishra and S Ghosh), National Institute of Technology (Trichy) and Bhaktivedanta Institute (Kolkata), pp. 11-28, 2008.
155. **Rama Jayasundar**. On MR microscopy, microimaging and microangiography. In: Image Analysis in Materials and Life Sciences (Eds. C Babu Rao, P Kalyanasundaram, KK Ray, B Raj), Science Publishers Inc., USA, pp. 223-227, 2001.
156. **Rama Jayasundar**. Basics of Magnetic Resonance. In: MRI and MRS in Pharmaceutical and Physiological Research, MacMillan Press, New Delhi, India, pp. 10-19, 2001.
157. **Rama Jayasundar**, K Rajshekar. A preliminary study of the shift in Left/Right biochemical asymmetry by conscious mental routine. In: Cognitive Systems : Reviews & Previews (Eds. JR Isaac and K Batra), Phoenix Publishing House, New Delhi, pp. 667-674, 2000.

Presentations

In National and International Conferences - over 300
Invited and keynote clectures - over 150

Honours / Awards

1. Nominated Member of Government of India's Interdisciplinary AYUSH Research and Development Task Force for initiating, coordinating and monitoring the R&D activities in the AYUSH sector related to SARS-Cov-2 virus and the COVID-19 disease, 2020.
2. Honourable President of India's nominee for Nagaland University.
3. Vice Chancellor, Jawaharlal University (JNU)'s nominee as a member of the Academic Council for Annual Refresher Program in Teaching Course in History of Indian Science and Technology.
4. Nominated by Hon'ble President of India as a member of the Executive Council of Delhi University for a period of three years from March 2019
5. Nominated by Hon'ble President of India as a Visitor's nominee for Indian Institute of Technology (IIT), Mumbai for a period of three years from Nov 2018
6. Member of Advisory Committee of CSIR-Traditional Knowledge Digital Library (CSIR-TKDL), Council of Scientific and Industrial Research, New Delhi for three years from November 2018.

7. Nominated by Hon'ble President of India as a Visitor's nominee for Indian Institute of Technology (IIT), Hyderabad for a period of three years from July 2018
8. Interviewed by Australian Radio about the MRI studies on the effect of sanskrit carried out by an American neuroscientist, 2018.
9. Member of the Scientific Advisory Committee, Centre of Excellence, Interdisciplinary School of Health Sciences, Savitribhai Phule Pune University 3 years till 2021
10. Nominated by Ministry of Human Resource Development (MHRD), Government of India for the Board of Governors of Indian Institute of Science Education & Research (IISER), Kolkata for a period of three years till 2020
11. Nominated by Ministry of Human Resource Development (MHRD), Government of India has nominated me as a Council's Nominee on the selection committee for appointment of Professors in the Indian Institute of Science Education & Research (IISER), Mohali till 2020
12. Invited lectures in International Universities - Department of Radiology, Stony Brook Medicine (USA), University of Arkansas at Little Rock (USA), Fordham University (USA), Department of MR, Institute of Neuroscience and Medicine, Julich (Germany)
13. Chief Guest for the National Science Day, Jaipur, Government of Rajasthan, 2018.
14. Women Achiever Award, Gandhi Smriti and Darshan Samiti, India, 2017
15. Invited as a keynote speaker keynote in 2nd National Conference on Women health: Challenges and Solutions, Pune, 2015
16. Invited by National Research Development Corporation (NRDC), Department of Scientific and Industrial Research (DSIR), DST, Govt. of India to be on their board as a Non-official part-time Director
17. Invited to be on the advisory board of International Scientific Research Group on Ayurveda, Germany , 2014
18. Invited as a keynote speaker at the 6th World Ayurveda Congress, Department of AYUSH, Ministry of Health & Family Welfare, Govt. of India.
19. Elected to the Executive Committee of National Magnetic Resonance Society of India, 2014.
20. Achiever Award, Chetana - Conscience of Women, New Delhi, India, 2014.
21. Women and Innovation in Technology National Award 2013, Bharatiya Stree Shakti, India, 2013.
22. Sarath Chandran Memorial Lecture, University of Delhi, 2013.
23. Invited to contribute article to the Plenary Session on 'Complexity and Analogy in Science', Pontificia Academia Scientiarum, Vatican, 2012.
24. GCIM Oration, Sri Ramachandra Medical University, Chennai, India, 2012.
25. Cambridge Hamied Visiting Lectureship, University of Cambridge, UK, 2011.
26. Featured on the cover page of the scientific European Journal 'Leadership Medica' for contribution to ayurvedic research, 2009.
27. Chief Guest for the National Science Day, Bhavan's Rajaji Vidyashram School, Chennai, India, 2008.
28. One of the two scientists to be interviewed and featured for the 'Biotechcellence 2008' conference, Centre for Biotechnology, Anna University, India, 2008.
29. Invited by World Bank to deliberate in the 2nd Indigenous Knowledge Workshop by World Bank, Delhi, 2006.
30. Best Student (BAMS), SJS Ayurveda College, Chennai, India, 2005.
31. Woman of the Year Award, Lion's Club International, Chennai, India, 2004.
32. Elected to Executive Committee of the National Magnetic Resonance Society, India, 2002.
33. Invited to chair the scientific session in the Annual Meeting, 2002 & 2003 - International Society for Magnetic Resonance in Medicine, USA.
34. Featured in Marquis' Who's Who, USA, 2000.
35. Best Poster, Neurological Society of India, 2000.
36. BOYSCAST fellowship for research abroad, 1996 to 1997 - Department of Science and Technology, Govt. of

- India. Spent a sabbatical year at Max Planck Institute for Biophysical Chemistry, Gottingen, Germany.
37. Young Scientist Award, 1991 - for indigenous development of a low cost MR RF coil, India (the cost of the coil was about Rs. 2,000 as against the manufacturer's cost of Rs. 15,00,000).
 38. Overseas Research Studentship, Cambridge University, UK, 1986 to 1989.
 39. Cambridge Nehru Scholarship, Nehru Trust for Cambridge University, UK, 1986 to 1989.
 40. Proficiency, MSc, Guindy Engineering College, Chennai, India, 1983.
 41. Proficiency in Mathematics (BSc), Queen Mary's College, Chennai, India, 1981.
 42. General Proficiency in Physics (BSc), Queen Mary's College, Chennai, India, 1981.
 43. Best outstanding outgoing student, St. Francis Xaviers Anglo-Indian High School, Chennai, India, 1977.

Membership of National / International Organisations (Present and Past)

1. Cambridge Commonwealth Trust, UK.
2. Cambridge Philosophical Society, UK.
3. International Society of Magnetic Resonance in Medicine, California, USA.
4. New York Academy of Sciences, New York, USA.
5. The Oxford and Cambridge Society of India.
6. Neurological Society of India.
7. National Magnetic Resonance Society of India.
8. Anna University Medical Physics Alumni Association, India.

Visits and training

<i>Organisation</i>	<i>Period</i>	<i>Details</i>
Advanced Training Institute, Chennai, India	June 1982	Practical Electronics
Bhaba Atomic Research Centre (BARC), Mumbai, India	June 1982	Radiation Protection
Medical Division, Siemens, Erlangen, Germany	June - July 1994	Training on the 1.5 T Siemens clinical unit & visits to Siemens user sites at Heidelberg and Buhlerhohe, Germany.
Medical Division, Siemens, Erlangen, Germany	June 1997	Training in Sequence control language, Sequence Programming Language.
Department of NMR, Max Planck Institute of Biophysical Chemistry, Gottingen, Germany.	1997-1998	Visiting professor

Other Interests

Dr. Rama Jayasundar has varied interests. In addition to being a voracious reader, she also writes and is involved in social work. She is professionally trained in vocal Carnatic music and veena, and is currently learning to play violin. She is also proficient in arts and handicrafts. Her adeptness ranges from painting (glass, mat and fabric), hand embroidery, doll making, bead work, tailoring, lace making, paper cutting, collage work to Tanjore painting.