CURRICULUM VITAE

Seiji Ogawa

Birth Date and Place: January 19, 1934 in Tokyo, Japan
Citizenship Japan

Affiliation Kansei Fukushi Research Center,
Tohoku Fukushi University
6-149-1 Kunimigaoka, Aobaku, Sendai, Japan 989-3201
Tel +81 22 728 7434 fax 022 728 6040
Email: ogawa-s@tfu-mail.tfu.ac.jp
Title Special University Professor Emeritus

Education

1957 B.S., Applied Physics
University of Tokyo, Tokyo, Japan
1967 PhD in Chemistry, Stanford University, Stanford, California

Professional Experiences

1962 - 1964 Research Associate
Radiation Research Laboratories
Mellon Institute, Pittsburgh,
PA 1967-1968 Postdoctoral Fellow
Stanford University, Stanford, CA
1968 -1984 Member of the Technical Staff to Principal Investigator
Biophysics Research Bell Laboratories, AT&T, Murray Hill, NJ
1984 -2001 Distinguished Member of the Technical Staff,
Biophysics Research, later the name was changed to Biological Computation Research
Bell Laboratories, AT&T, / Lucent Technologies, Murray Hill, NJ 2001– 2004 Visiting Professor, Biophysics/Physiology Department
Albert Einstein College of Medicine, Yeshiva University Bronx, New York
2001 - 2008 Director, Ogawa Laboratories for Brain Function
Research Hamano Life Science Research Foundation
Tokyo, Japan
2008-2021 Professor (special appointment), Kansei Fukushi Research Center, Tohoku Fukushi University,
Sendai, Japan
2008-2012 Visiting Professor, Graduate School of Human Relations, Keio University, Tokyo, Japan
2008- Visiting Professor, Neuroscience Research Institute, Gachon University of Medicine and Science, Incheon, Korea
2009- Visiting Professor, Biophysics/Physiology Department

Albert Einstein College of Medicine, Yeshiva University Bronx, New York

2011-2015 R&D advisor, NICT(National Institute of Information and Communications Technology)

2013- Guest Professor, Graduate school of Frontier Biosciences, Osaka University

2016- Guest Specialist at CiNet (Center for Information and Neural Networks)

2019- Guest Professor, Brain and Mind Research Center, Nagoya University

2021- Special University Professor Emeritus, Tohoku Fukushi University

Professional Society Affiliation

International Society for Magnetic Resonance in Medicine
Society for Neuroscience (USA)
International Society for Magnetic Resonance (ISMAR)
Japanese Society for Magnetic Resonance in Medicine
Japanese Society for Nuclear Magnetic Resonance
Japanese Society for Neuroscience

Research Activities

Mid 1960's Radiation research: Studies of radiation effects on polymers and of free radical formation.

Late 1960's: Development of spin label technique (with Prof. H. M. McConnell at Stanford University) for studying protein structure and function.

1970's: Structure and function of proteins by high resolution NMR

1978 – 1980's: Pioneering in and Development of the field of in vivo NMR Late 80's -: MRI and MRS of the brain.

1990-92 Opened the field of functional MRI of the brain (fMRI). 90's - Research in fMRI of the brain.

2014-2018 Lead a project "Longitudinal study of education induced neuro-plasticity "

Relevant papers for the current interests: functional MRI of the brain

1. S. Ogawa and YW Sung, "Selected topics relating to functional MRI study of the brain", Keio. J Med. 2019 Apr 11 (2019).
2. YW Sung, M. Kamba, S. Ogawa, "An fMRI study of the functional distinction of neuronal circuits at the sites on ventral visual stream co-activated by visual stimuli of different objects. Exp Brain Res. 181(4):657-63. (2007)
3. S. Ogawa, T-M. Lee, R. Stepnoski, W. Chen, X.-H. Zhu, and K. Ugurbil, "An approach to probe some neural systems interaction by functional MRI at neural time scale down to milliseconds**",** Proc. Natl. Acad. Sci.(USA), 2000 97: 11026-11031.
4. S. Ogawa, R. S. Menon, S-G. Kim and K. Ugerbil, "On the characteristics of functional magnetic resonance imaging of the brain" Annual Review of Biophysics and Biomolecular Structure 27 447-474 1998.

5. P. P. Mitra, S. Ogawa, X. Hu and K. Ugurbil, "The Nature of Spatiotemporal Changes in Cerebral Hemodynamics as Manifested in Functional Magnetic Resonance Imaging", Magnetic Resonance in Medicine, 37 511-518 (1997).
6. R. S. Menon, S. Ogawa, X. Hu, J. Strupp, P. Anderson, and K. Ugurbil, "BOLD Based Functional MRI at 4 Tesla Includes a Capillary Bed Contribution: Echo-Planar Imaging Correlates with Previous Optical Imaging Using Intrinsic Signals", Magnet Resonance in Medicine 33, 453-459 (1995)
7. S. Ogawa, T. M. Lee and B. Barrere, "The Sensitivity of Magnetic Resonance Image Signals of a Rat Brain to Changes in the Cerebral Venous Blood Oxygenation", Magnetic Resonance in Medicine, 29 205-210, 1993
8. S. Ogawa, R. S. Menon, D. W. Tank, S-G. Kim, H. Merkle, J. M. Ellermann and K. Ugurbil, "Functional Brain Mapping by Blood Oxygenation Level-Dependent Contrast Magnetic Resonance Imaging: A Comparison of Signal Characteristics with a Biophysical Model", Biophysical Journal, 64 (3), March 1993.
9. S. Ogawa, D. W. Tank, R. Menon, J. M. Ellermann, S.-G. Kim, H. Merkle and K. Ugurbil, "Intrinsic Signal Changes Accompanying Sensory Stimulation: Functional Brain Mapping With Magnetic Resonance Imaging" Proc. Natl. Acad. Sci. (USA), 89, 5951-5955 (1992).
10. Ogawa, T. M. Lee, A. R. Kay and D. W. Tank, "Brain Magnetic Resonance Imaging with Contrast Dependent on Blood Oxygenation", Proc. Natl. Acad. Sci. (USA), 87, 9868-9872 (1990)
11. S. Ogawa, T. M. Lee, A. S. Nayak and P. Glynn, "Oxygenation Sensitive Contrast in Magnetic Resonance Image of Rodent Brain at High Magnetic Fields", Magn. Reson. Med., 14, 68-78 (1990).

Honors and Awards

1967 Eastman Kodak Award in Chemistry for PhD student
1995 GOLD Medal Award from Society for Magnetic Resonance in Medicine
1996 Biological Physics Prize from The American Physical Society
1997 Fellow, International Society for Magnetic Resonance in Medicine
1998 Nakayama Prize from Nakayama Foundation for Human Science, Japan
1999 Asahi Prize from Asahi-Shinbun Cultural Foundation, Japan
2000 Member, Institute of Medicine (IOM) of National Academy of Sciences, USA
2003 Japan International Prize 2003 from Japan Science Technology Foundation
2003 Gairdner International Award from Gairdner Foundation, Canada
2004 Honorary Member, Japanese Society for Magnetic Resonance in Medicine
2004 Honorary Member, Japanese Society for Nuclear Magnetic Resonance
2005 Honorary Member, National Magnetic Resonance Society of India
2005 Foreign Fellow, The National Academy of Sciences of India
2007 ISMAR Prize from International Society of Magnetic Resonance
2008 Honorary Doctor of Science, S. Gandi Post-graduate University for Medical, Lucknow, Science India
2008 Olli V. Lounasmaa Memorial Prize, Helsinki University of Technology, Finland.
2009 Named as a Thomson-Reuter Citation Laureate in Medicine
2011 Linus Pauling Medal & Lectureship from Stanford University Medical School
2011 Mansfield Lecturer at ISMRM 2011 Society Meeting, Montreal
2011-2015 Fellow, National Institute Radiological Sciences (NIRS) of Japan 2014 Tateishi Grand Prize, Tateishi Science and Technology Foundation, Japan

2016 Honorary Fellow, National Institute for Quantum and Radiological Science
and Technology, Japan
2017 Keio Medical Science Prize
2018 Prime Minister's Prize, The Japan Medical Research and Development Grand Prize
2020 Distinguished Honorary Professor, Osaka University

Publications

Edition and review

1. S. Ogawa, "Nuclear Magnetic Resonance Studies on Hemoglobin", Biophysics, (SEITAI BUTSURI) Japan, 14, 1-17, 1974)
2. RG Shulman, Hopfield JJ, Ogawa S, "Allosteric Interpretation of hemoglobin properties" Q. Review Biophysics 8, 325-420 (1975)
3. RG Shulman, Brown TR, Ugurbil K, Ogawa S, Cohen SM, Holander JA den, "Cellular Applications of 31P and 13C Nulear Magnetic Resonance" Science 205, 160-166 (1979)
4. S. Ogawa, "Mapping of Brain Function by Magnetic Resonance", Kagaku (Iwanami) 63 (11) 691-2 (1993) in Japanese (Kagaku no me)
5. Y. Hashimoto, C. Okada and S. Ogawa "Recent Advances in MEG and Functional MRI" in EEG and Clinical Neurophysiology Suppl. 47, 1996, Elsever, Amsterdam, 1996
6. S. Ogawa, R. S. Menon, S-G. Kim and K. Ugurbil, "On the characteristics of functional magnetic resonance imaging of the brain" Annual Review of Biophysics and Biomolecular Structure 27 447-474 1998
7. K.Ugurbil, S.Ogawa, SG Kim, X.Hu, W.Chen, X-H Zhu,: "Imaging brain activity using nuclear spins" (Maraviglia B. Editor) Magnetic Resonance and Brain Function: Approaches from Physics Amsterdam, Oxford, Tokyo, Washington DC IOS Press pages 261-310 1999
8. S-G Kim and S. Ogawa "Insights into new techniques for high resolution functional MRI", Curr Opin Neurobiol, (5), 607-15 2002
9. Handbook of Non-Invasive Visualization Technologies (from nano-biomedical to information system) (Ogawa S and Ueno S editors) NTS Publishing Co, Tokyo 2007-
10. S-G Kim and S.Ogawa "Biophysical and physiological origins of blood oxygenation level-dependent fMRI signals", J. Cereb Blood Flow Metab. 32(7) 1188-206 2012
11. PET/MRI system Zang Hee Cho, Young Don Son, Eun Jung Choi, Hang Keun Kim, Jeong Hee Kim, Sang Yoon Lee, Seiji Ogawa and Young Bo Kim, "In-vivo human brain molecular imaging with a brain-dedicated PET/MRI system" Magn Reson Mater Phy (2013) 26:71–79

Research Paper

1. US Choi, YW Sung, S Ogawa, "Brain plasticity reflects specialized cognitive development induced by musical training", *Cereb Cortex Commun.* 2021 May 31;2 (2): tgab037 (2021).
2. US Choi, YW Sung, S Ogawa, "Measurement of ultra-fast signal progression related to face processing by 7T fMRI" Human Brain Mapping 41(7): 1754–1764 (2020).
3. S. Ogawa and YW Sung, "Selected topics relating to functional MRI study of the

brain", Keio. J Med. 2019 Apr 11 (2019).
4. YW. Sung, Y. Kawachi, U.S. Choi, D. Kang, C. Abe, Y. Otomo, S. Ogawa, "A Set of Functional Brain Networks for the Comprehensive Evaluation of Human Characteristics", Front Neurocsi. 2018 Mar 14;12:149. doi: 10.3389/fnins.2018.00149. eCollection (2018).
5. YW. Sung, Y. Kawachi, U.S. Choi, D. Kang, C. Abe, Y. Otomo, S. Ogawa, "Estimation of vocational aptitudes using functional brain networks", Hum Brain Mapp. 39(9) 3636-3651 (2018).
6. US Choi, YW Sung, S Ogawa, "Steady-state and dynamic network modes for perceptual expectation" Sci Rep. 7: 40626 (2017)
7. US Choi, YW Sung, S Hong, JY Chung, S Ogawa, "Structural and functional plasticity specific to musical training with wind instruments" Front Hum Neurosci. 9:597(2015)
8. ZH Cho, N Kim, S Bae, JG Chi, CW Park, S Ogawa, YB Kim, "Neural substrates of Hanja (Logogram) and Hangul (Phonogram) character readings by functional magnetic resonance imaging", J Korean Med Sci. Oct;29(10):1416-24 (2014)
9. US Choi, Sung YW, Choi SH, Kim N, Kim YB, Cho ZH, Ogawa S, "Intermixed structure of voxels with different hemispheric characteristics in the fusiform face area" Neuroreport. 24(2):53-7 (2013)
10. S Ogawa "Finding BOLD effect in Brain Images" NeuroImage 62 (2) 608-9 (2012)
11. TJ Ozaki, N Sato, K Kitajo, Y Someya, K Anami, H Mizuhara, S Ogawa, Y Yamaguchi, "Traveling EEG slow oscillation along the dorsal attention network initiates spontaneous perceptual switching" Cognitive Neurodynamics 6 (2), 185-198 (2012)
12. M. Makuuchi, Someya Y, Ogawa S, Takayama Y.," Hand shape selection in pantomimed grasping: interaction between the dorsal and the ventral visual streams and convergence on the ventral premotor area." Hum Brain Mapp. 33(8):1821-33 2012
13. YW. Sung, Cho ZH, Ogawa S et al, "Involvement of low-level visual areas in hemispheric superiority for face processing." Brain Res.1930 118-25 (2011)
14. ZH. Cho, Son YD, Kim HK, Ogawa S "Observation of glucose metabolism in the thalamic nuclei by fusion PET/MRI." J. Nucl Med. 52 (3) (2011)
15. RW Sung, Choi SH, Ogawa S. et al, "An fMRI study of neuronal interactions in face- selective areas of the brain." Brain Res.1366:54-9. (2010)
16. G. Liu, Oshio K, Ogawa S, Murata T, "Correction of Shearing Distortions in Echo- Planar Imaging", IEEE Transactions on Magnetics, 46(7) 2628-2634 (2010)
17. N. Sato, TJ Ozaki, Y. Someya, K. Anami, S. Ogawa, H. Mizuhara, Y. Yamaguchi, "Subsequent memory-dependent EEG theta correlates to parahippocampal blood oxygenation level-dependent response." Neuroreport. 21 (3) 168-72. (2010)
18. S. Dehaene, Nakamura K, Jobert A, Kuroki C, Ogawa S, Cohen L. "Why do children make mirror errors in reading? Neural correlates of mirror invariance in the visual word form area." Neuroimage. 2010 Jan 15; 49(2):1837-48. Epub 2009 Sep 19.
19. K. Nakamura, Kouider S, Makuuchi M, Kuroki C, Hanajima R, Ugawa Y, Ogawa S. "Neural Control of Cross-language Asymmetry in the Bilingual Brain." Cereb Cortex. 2010 Jan 4. [Epub ahead of print]
20. TJ Ozaki, S Ogawa, "Causality analysis defines neural streas of orienting and holding of attention" Neuroreport. 20(15) 1371-5 (2009)

21. A. Fukunaga, Ohira T, Kamba M, Ogawa S, Akiyama T, Kawase T. “Why do children make mirror errors in reading? Neural correlates of mirror invariance in the visual word form area.” Brain Topogr. Sep;22(2):109-18 (2009)
22. TJ Ozaki, S Ogawa and T Takeda, “Dissociable neural correlates of reorienting within versus across visual hemifields” Neuroreport. Mar 25;20(5):497-501 (2009)
23. YW Sung, S. Ogawa . “A property of face representation at the categorical level.” Neurosci Lett. 448(1):1-5. (2008)
24. YW Sung and S. Ogawa, “Using fMRI for elucidating dynamic interactions” Methods Mol Biology 489 243-54 (2008)
25. YW Sung, M. Kamba and S. Ogawa, “Building specific categorical processing in the retrosplenial cortex” Brain Research 1234 87-93 (2008)
26. S. Tomatsu, Y. Someya, YW Sung, S. Ogawa and S. Kakei, “Temporal feature of BOLD responses varies with temporal patterns of movement” Neurosci Res. 62(3) 160-167 (2008)
27. M. Kamba, YW Sung and S.Ogawa, “Alteration of blood oxygenation level dependent signaling by local circulatory condition.” J Magn Reson Imaging. 26(6), 1506-13. (2007)
28. N. F. Hara, K. Nakamuraa, C. Kuroki, Y. Takayamaa and S. Ogawa, “Functional neuroanatomy of speech processing within the temporal cortex” NeuroReport 18(15), 1603-7 (2007)
29. YW Sung, M. Kamba, S. Ogawa, “An fMRI study of the functional distinction of neuronal circuits at the sites on ventral visual stream co-activated by visual stimuli of different objects. Exp Brain Res., 181(4), 657-63. (2007)
30. YW Sung, M. Kamba, S. Ogawa, “Progression of neuronal processing of visual objects.” NeuroReport; 18 (5), 411-4 (2007)
31. M. Abe, T. Hanakawa, Y. Takayama, C. Kuroki, S. Ogawa, H.Fukuyama, “Functional coupling of human prefrontal and premotor areas during cognitive manipulation”, J. Neurosci. 27(13), 3429-38 (2007)
32. F. Nagaoka, P. Zhao, Wang, N. Harel, R.P.Kennan, S. Ogawa, S-G Kim, “Increases in oxygen consumption without cerebral blood volume change during visual stimulation under hypotension condition”, J. Cereb Blood Flow Metab, 26(8), 1043- 51 (2006)
33. G. Liu, S. Ogawa “EPI image reconstruction with correction of distortion and signal losses” Journal of Magnetic Resonance Imaging; 24: 683-689 (2006)
34. M. Kamba, Y.W. Sung, S. Ogawa, “A dynamic system model-based technique for functional MRI data analysis.”, Neuroimage. 22(1), 179-87 (2004).
35. S. Ogawa, T-M. Lee, R. Stepnoski, W. Chen, Xi-H. Zhu, and K. Ugurbil, "An approach to probe some neural systems interaction by functional MRI at neural time scale down to milliseconds"**,** Proc. Natl. Acad. Sci.(USA), 97, 11026-11031 (2000)
36. S-G Kim, E. Rostrup, H. B. W. Larsson, S. Ogawa and O. B. Paulson, "Determination of Relative CMRO2 from CBF and BOLD Changes: Significant In crease of Oxygen Consumption Rate During Visual Stimulation", Magnetic Resonance in Medicine 41, 1152-1161 (1999)
37. W. Chen, T. Kato, X. Zhu, S. Ogawa, D. Tank and K. Ugurbil, "Human primary visuaal cortex and lateral geniculate nucleus activation during visual imagery", NewroReport 9, 3669-3674 (1998)
38. X-H Zhu, S-G. Kim, P. Anderson, S. Ogawa, K. Ugurbil and W. Chen, "Simultaneous oxygenation and perfusion imaging study of functional activity in primary visual cortex at different visual stimulation frequency: quantitative correlation between

BOLD and CBF changes.", Magnetic Resonance in Medicine 40, 703-711 (1998)
39. T. Kato, P. Erhard, Y. Takayama, J. Strupp, T. H. Le, S. Ogawa and K. Ugurbil, "Human hippocampal long term sustained response during word memory processing", NeuroReport, 9, 1041-1047 (1998)
40. W. Chen, T. Kato, XH. Zhu, J. Strupp, S. Ogawa and K. Ugurbil, "Mapping of lateral geniculate nucleus activation during visual stimulation in human brain using fMRI", Magn Reson Med, 39(1), 89-96 (1998)
41. R. S. Menon, S. Ogawa, K. Ugurbil, "Ocular Dominance Columns In Human V1 Demonstrated by Functional Magnetic Resonance Imaging", J. Neurophysiology, 77 2780-2787 (1997)
42. P. Mitra, S. Ogawa, X. Hu and K. Ugurbil, "The Nature of Spatiotemporal Changes in Cerebral Hemodynamics as Manifested in Functional Magnetic Resonance Imaging", Magnetic Resonance in Medicine, 37, 511-518 (1997)
43. S. Ogawa, P.P. Mitra, X. HU, and K. Ugurbil "Spatio-temporal patterns revealed in denoised fMRI data" in "Recent Advances in MEG and Functional MRI", edited by I. Hashimoto, Y. C. Okada and S. Ogawa, EEG and Clinical Neurophysiology Suppl. 47, 1996, Elsever, Amsterdam, (1996)
44. R. S. Menon, S. Ogawa, X. Hu, J. Strupp, P. Anderson, and K. Ugurbil, "BOLD Based Functional MRI at 4 Tesla Includes a Capillary Bed Contribution: Echo-Planar Imaging Correlates with Previous Optical Imaging Using Intrinsic Signals", Magnet Resonance in Medicine 33, 453-459 (1995).
45. J. Ellerman, M. Garwood, K. Hendrich, R. Hinke, X. Hu, S-G Kim, R. Menon, H. Merkle, S. Ogawa, K. Ugurbil, "Functional Imaging of the Brain by Nuclear Magnetic Resonance", NMR in Physiology and Biomedicine, Edit by R. J. Gillies (1994).
46. 39. S-G. Kim, J. Ashe, A. P. Georgopoulos, H. Merkle, J. M. Ellermann, R. S. Menon, S. Ogawa and K. Ugurbil, "Functional Imaging of Human Motor Cortex at High Magnetic Field", J. of Neurophysiology, 69 (1), 297-302 (1993)
47. R. S. Menon, S. Ogawa, D. W. Tank and K. Ugurbil, "4 Telsa Gradient Recalled Echo Characteristics of Photic Stimulation-Induced Signal Changes in the Human Primary Visual Cortex", Magnetic Resonance in Medicine, 30, 380-386, (1993).
48. S. Ogawa, R. S. Menon, D. W. Tank, S-G. Kim, H. Merkle, J. M. Ellermann and K. Ugurbil, "Functional Brain Mapping by Blood Oxygenation Level-Dependent Contrast Magnetic Resonance Imaging: A Comparison of Signal Characteristics with a Biophysical Model", Biophysical Journal, 64 (3), March 1993.
49. S. Ogawa, T. M. Lee and B. Barrere, "The Sensitivity of Magnetic Resonance Image Signals of a Rat Brain to Changes in the Cerebral Venous Blood Oxygenation", Magnetic Resonance in Medicine, 29, 205-210, 1993.
50. K. Ugurbil, M. Garwood, J. Ellermann, K. Hendrich, R. Hinke, X. Hu, S-G. Kim, R. Menon, H. Merkle, S. Ogawa and R. Salmi, "Imaging at High Magnetic Fields: Initial Experiences at 4 T", Magnetic Resonance Quarterly, 9 (4), pp. 259-277, 1993.
51. K. Ugurbil, S. Ogawa, R. Menon, S-G. Kim, X. Hu, R. Hinke, J. Ellermann, K. Hendrich, H. Merkle, P. Anderson, G. Andriani and J. Strupp, "Mapping Human Brain Activity Non-Invasively by Nuclear Magnetic Resonance", New Horizons in Neuropsychology, 24-25, November 1993.

52. W. Denk, R. M. Keolian, S. Ogawa and L. W. Jelinski, "Oscillatory Flow in the Cochlea Visualized by Novel Magnetic Resonance Imaging Technique", Proc. Natl. Acad. Sci. (USA), 90, 1595 - 1598 (1993).
53. S. Ogawa, D. W. Tank, R. Menon, J. M. Ellermann, S.-G. Kim, H. Merkle and K. Ugurbil, "Intrinsic Signal Changes Accompanying Sensory Stimulation: Functional Brain Mapping With Magnetic Resonance Imaging" Proc. Natl. Acad. Sci. (USA), 89, 5951-5955 (1992).
54. M. Blamiere, S. Ogawa, K. Ugurbil, D. Rothman, G. McCarthy, J. M. Ellerman, F. Hyder, Z. Rattner and R. G. Shulman, "Dynamic Mapping of Human Visual Cortex by High Speed Magnetic Resonance Imaging", Proc. Natl. Acad. Sci. (USA), 89, 11069-11073 (1992).
55. R. Menon, S. Ogawa, S-G. Kim, J. M. Ellerman, H. Merkle, D. W. Tank and K. Ugurbil, "Functional Brain Mapping Using Magnetic Resonance Imaging", Investigative Radiology, 27, s47-s53 (1992).
56. S. Ogawa, T. M. Lee, A. R. Kay and D. W. Tank, "Brain Magnetic Resonance Imaging with Contrast Dependent on Blood Oxygenation", Proc. Natl. Acad. Sci. (USA), 87, 9868-9872 (1990).
57. S. Ogawa and T. M. Lee, "Magnetic Resonance Imaging of Blood Vessels at High Fields", Magn. Reson. Med.,16, 9-18 (1990).
58. S. Ogawa, T. M. Lee, A. S. Nayak and P. Glynn, "Oxygenation Sensitive Contrast in Magnetic Resonance Image of Rodent Brain at High Magnetic Fields", Magn. Reson. Med. 14, 68-78 (1990).
59. P. Glynn, T. M. Lee and S. Ogawa, "The Level of Phosphoethanolamine and Phosphocholine in Intact Neuroblastoma Cells: Effects of Cell Differentiation and of Exogeneous Ethanolamine and Choline", Proc. New York Acad. Sci.(USA), (1987).
60. S. Ogawa, T. M. Lee and P. Glynn, "Energy Metabolism in Rat Brain in Vivo Studied by P31 Nuclear Magnetic Resonance: Changes During Postnatal Development", Arch. Biochem. Biophys., 248, 43-52 (1986).
61. D. L. Rousseau, S. L. Tan, M. R. Ondrias, S. Ogawa and R. W. Noble, "Absence of Cooperative Energy at the Heme in Liganded Hemoglobin", Biochemistry, 23, 2857- 2865 (1984).
62. S. Ogawa and T. M. Lee, "The Relation between the Internal Phosphorylation Potential and the Proton Motive Force in Mitochondria During ATP Synthesis and Hydrolysis", J. Biol. Chem., 259, 10004-10011 (1984).
63. S. Ogawa and T. M. Lee, "Proton Stoichiometry of Adenosine 5'-Triphosphate Synthesis in Rat Liver Mitochondria Studied by Phosphorous-31 Nuclear Magnetic Resonance", Biochemistry, 21, 4467-4473 (1982).
64. K. Misawa, T. M. Lee and S. Ogawa, "A Study on the Exchange Rate of Magnesium with ATP", Biochem. Biophys. Acta, 718, 227-229 (1982).
65. S. Ogawa, C. C. Boens and T. M. Lee, "A P31 Nuclear Magnetic Resonance Study of the pH Gradient and the Inorganic Phosphate Distribution Across the Membrane in Intact Rat Liver Mitochondria", Arch. Biochem. Biophys., 210, 740-747 (1981).
66. S. Ogawa, C. Shen and C. L. Castillo "A P31-NMR Study of the Cross Membrane pH Gradient Induced by ATP Hydrolysis in Mitochondria", Biochem. Biophys. Acta, 590, 159-169 (1980).

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68. S. Cohen, S. Ogawa and R. G. Shulman "13C NMR Studies of Gluconeogenesis in Rat Liver Cells: Utilization of Labeled Glycerol by Cells From Euthyroid and Hyperthyroid Rats", Proc. Natl. Acad. Sci. (USA), 76, 1603-1607 (1979).
69. S. M. Cohen, S. Ogawa, H. Rottenberg, P. Glynn, T. Yamane, T. R. Brown and R. G. Shulman, "P31 Nuclear Magnetic Resonance Studies of Isolated Rat Liver Cells", Nature, 273, 544-556 (1978).
70. S. Ogawa, H. Rottenberg, T. R. Brown, R. G. Shulman, C. L. Castillo and P. Glynn, "High-Resolution 31P Nuclear Magnetic Resonance Study of Rat Liver Mitochondria", Proc. Natl. Acad. Sci. (USA), 75, 1176-1800 (1978).
71. P. Eisenberger, R. G. Shulman, B. M. Kincaid, G. S. Brown and S. Ogawa, "Extended X-ray Absorption Fine Structure Determination of Iron Nitrogen Distances in Hemoglobin", Nature, 274, 30-34 (1978).
72. S. Ogawa, R. G. Shulman, P. Glynn, T. Yamane and G. Navon, "On the measurement of pH in Escherichia coli by 31P Nuclear Magnetic Resonance Studies of Bioenergetics in E. Coli", Biochem. Biophys. Acta, 502, 45-50 (1978).
73. J. V. Kilmartin, N. L. Anderson and S. Ogawa, "Response of the Bohr Group Salt Bridges to Litation of the T State of Haemoglobin Kansas", J. Mol. Biol., 123 71-87 (1978).
74. C. L. Castillo, S. Ogawa and J. M. Salhany, "Equilibrium and Kinetic Measurements of Carbon Monoxide Binding to Hemoglobin Kansas in the Presence of Inositol Hexaphosphate", Arch. Biochem. Biophys., 185, 504-510 (1978).
75. T. R. Brown and S. Ogawa, "31P Nuclear Magnetic Resonance Kinetic Measurements on Adenylate Kinase", Proc. Natl. Acad. Sci. (USA), 74, 3627-3631 (1977)
76. G. Nevon, S. Ogawa, R. G. Shulman and T. Yamane, "High Resolution 31P Nuclear Magnetic Resonance Studies of Metabolism in Aerobic Escherichia Coli Cells", Proc. Natl. Acad. Sci. (USA), 74 888-891 (1977).
77. G. Nevon, S. Ogawa, R. G. Shulman and T. Yamane, "31P Nuclear Magnetic Resonance Studies of Ehelich Ascites Tumor Cells", Proc. Natl. Acad. Sci. (USA), 74, 87-91 (1977)
78. P. Eisenberger, Shulman RG, Brown GS, Ogawa S. “Structure functional relations in hemoglobin as determined by x-ray absorption spectroscopy”, Proc Natl Acad Sci USA 73, 491-5 (1976)
79. JM Salhany, Castillo CL, Ogawa S, “Carbon Monoxide Bindi ng properties of Hemoglobin M Iwate” Biochemistry 15, 5344-5349 (1976)
80. J. M. Salhany, S. Ogawa and R.G. Shulman, "Correlation Between Quaternary Structure and Ligand Dissociation Kinetics for Fully Liganded Hemoglobin" Biochemistry, 14, 2180-2190 (1975)
81. J. M. Salhany, T. Yamane, and R. G. Shulman, S. Ogawa "High resolution 31P nuclear magnetic resonance studies of intact yeast cells", Proc. Natl. Acad. Sci. (USA), 72, 4966-70 (1975)

82. J. M. Salhany, S. Ogawa, and R. G. Shulman, "Spectral-Kinetic Heterogeneity in Reaction of Nitrosyl Hemoglobin", Proc. Natl. Acad. Sci. (USA), 71, 3359-3362 (1974)
83. A Mayer, Ogawa S, Shulman RG, Yamane T, Cavaleiro JAS, Gonsalves AR, Kenner GW, Smith KM, "Assignments of the Paramagnetically Shifted Heme Methyl Nuclear Magnetic Peaks of Cyanometmyoglobin by Selective Deuteration"J Mol Biol 86, 749- 756 (1974)
84. S. Ogawa, D. J. Patel and S. R. Simon,"Proton Magnetic Resonance Study of the Switch between The Two Quaternary Structures in High Affinity Hemoglobin", Biochemistry, 13, 2001-2006 (1974)
85. R.G. Shulman, Ogawa S, Mayer A, Castillo CL, "High resolution proton NMR studies of low affinity hemoglobin", Ann NY Acad Sci 222, 9-20 (1973)
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