Curriculam Vitae of Professor Gaurisankar Sa

Basic Information:

Full Name: Professor Gaurisankar Sa, PhD, FNASc, FNASg, FIMSA, FAScT

Designation: National Academy of Science (India) Platinum Jubilee Senior Professor of Molecular Medicine
Former Chairman, Division of Molecular Medicine
Former Acting Director, Bose Institute
Executive Chairman, Centre for Translational Animal Research
Controller of Examination
Bose Institute, Kolkata, India

Date of Birth: 24th July, 1960

Complete Postal Address: Division of Molecular Medicine, Bose Institute,
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About:

Professor Gaurisankar Sa, Fellows of *National Academy of Science, India, Nangyong Academy of Science, Singapore, West Bengal Academy of Science & Technology*, received his Doctoral degrees in Biochemistry from University of Calcutta, in 1989. Then he joined Virginia Tech, USA as visiting faculty. Thereafter he moved to Cleveland Clinic, USA as an Exchange Technologists to work on cell signaling. In 1994 he joined Bose Institute, India where he is now working as NASI Platinum Jubilee Senior Professor of Molecular Medicine. He is also a visiting professor of The Cleveland Clinic, USA. Prof. Sa is the Editor-in–Chief of *International J Immunology*, Sectional Editor of *Frontiers in Immunology, Scientific Reports, Frontiers in Oncology, PNAS, India*, Editor of *J Cancer Research & Molecular Medicine, Austin J. Clinical Immunology, Head & Face Medicine* and Editorial board member of no of Scientific Journals like *Int. J. Cancer Res., J Pharmacology & Toxicology, Advances in Modern Oncology Research* etc. Research work of Prof. Sa is focused in the area of cancer biology and tumor immunology and understanding its molecular mechanisms. His work basically aimed at development of safe and non-toxic anti-cancer drug and development of next-generation immunotherapy of cancer. His recent work also aims at understanding the mechanisms of immune-evasion of cancer so that immunotherapy can be reinforce into cancer patients. His findings are highly recognized by various National and International Scientific Communities as is evident from his more than 140 publications in high-impact journals, receiving various National/International awards, and granting number of patents.

Field of expertise:

Research & Development:

Development of Immunotherapy for:

- Cancer
- Diabetics
- Transplantation rejection
- Autoimmunity

Development of DNA vaccine *[Adeno-associated virus serotype-5 (AAV5) vector]*

- Anti-check point inhibitor (PD1 and CTLA4)
- T-regulatory cells
- Corona virus α & δ+ variants

Development of Drugs for:

- Cancer
- Immunotherapy

Genomic & Proteomics:

- Cancer
- Immunology

Teaching:

More than twenty-five years teaching experience at master degree level in Biochemistry, Cell Biology, Cell Signaling, Immunology, Cancer Biology, Molecular Biology, Interactomics.

Education:

Year	Degree	Institution and University
1981	B.Sc. (Major: Chemistry)	University of Calcutta
1983	M.Sc. (Biochemistry)	University of Calcutta
1990	Ph.D.	University of Calcutta
1992-1994	Post Doc	Cleveland Clinic, USA

Positions:

Year	Position	Institution/University
2020-present	NASI Platinum Jubilee Senior Professor	Bose Institute
2012-2020	Professor, Senior Grade & Chairman of Molecular Medicine	Bose Institute
2007-2011	Professor	Bose Institute
2002-2006	Associate Professor	Bose Institute
2001-2002	Reader	Bose Institute
1998-2000	Senior Lecturer	Bose Institute
1995-1997	Lecturer	Bose Institute
1999-2000, 2002-2003, 2005, 2007, 2011-2012	Visiting Faculty	Cleveland Clinic, USA
1992	Visiting Faculty	Virginia Tech, USA

Administrative Positions:

Year	Position	Institution and University
2020	Acting Director	Bose Institute, Kolkata
2018-2020	Chairman	Division of Molecular Medicine, Bose Institute

2012-2020	Executive Chairman	Centre for Translational Animal Research, Bose Institute
2011-2020	Controller of Examination	Bose Institute
2005-2010	Secretary	Indian Society of Translational Research
2018-2021	Secretary	Society of Biological Chemists, India
2021-Present	Vice-President	Society of Biological Chemists, India
2014-2020	President	OFFER

Honors & Awards:

S. No.	Name of Awarding Agency	Year
1	*Established Investigator Award,* American Heart Association,	1993
2	*Established Investigator Award,* American Heart Association	1994
3	*Young Scientist Award,* Department of Science & Technology, GOI	1996
4	*Elected Member* of Molecular Immunological Forum	2012
5	*Fellow*, West Bengal Academy of Science & Technology (*FNAScT*)	2014
6	*Fellow*, National Academy of Science, Allahabad (*FNASc*)	2015
7	*Elected Member*, Federation of Immunological Society of Asia & Oceania	2015
8	*Fellow*, Nangyong Academy of Science, Singapore (FNASg)	2018
9	*P.B. Sen Memorial Oration Award*, Indian Physiological Society	2015
10	*D.P. Burma Memorial Oration Award*, Society of Biological Chemist (India)	2016
11	*Elected Member,* Guha Research Conference	2018
12	*Senior Scientist Oration Award*, Indian Immunological Society	2019
13	*Life Member,* Indian Science Congress	1994
14	*Life Member,* Society of Biological Chemists (India)	1991
15	*Life Member,* Indian Immunological Society	1993

Achievements:

- Obtained several National and International Awards for his contribution in Science and humanities.
- Member of various National and International Scientific societies and expert member of Scientific bodied.
- Editor-in–Chief: *International J Immunology*
- Sectional Editor: *Frontier in Immunology Scientific Reports, Frontier in Oncology, Proc. Nat. Acad. Sc., India, Head & Face Medicine;*

- Associate Editor: *Austin J. Clinical Immunology, J Cancer Research & Molecular Medicine*
- Editorial Board Member: *Int. J. Cancer Res., J Pharmacology & Toxicology, Asian J Biochemistry, Asian J Cell Biology, J Biological Science*
- Ad-hoc Reviewer of scientific journals like *Journal Immunology, Cancer Research, J. Scientific Reports, Biological Chemistry, Antioxidant & Redox Signaling, Human Immunology, Future Oncology, Toxicology Letter, Tumor Biology, Expert Opinions, Neuroscience Lett. BMC Journals, PLoS Journals etc.*

Ph.D. Thesis Supervised:

32 Doctoral students supervised

Post-Doctoral student/Project Scientist Supervised:

21 Post-doctoral students supervised

List of Publications: (Total number of Publications: 139)

Research Article in Peer-reviewed Journals: 110

Review Articles: 29

112 Research Article in Peer-reviewed Journals

h-Index: 42 *i10-Index: 86* *Average Impact factor: 5.9*

1. Bose S, Panda AK, Chakraborty D, Pati S, Chakraborty S, Kajal K, Roy D, Maji RK, Paul S, Sarkar I, Pal M, Ghosh Z, Sarkar DK & Sa G. miR-325-3p targets tumor-associated Treg cells to rejuvenate anti-tumor immune response. (*Under review*).
2. Dhar S, Sarkar T, Bose S, Pati S, Chakraborty D, Roy D, Panda AK, Guin A, Mukherjee S, Sarkar DK and Sa G. FOXP3 promotes CD36-mediated metabolic adaptations of Treg cells in tumor-microenvironment. (*Under review*).
3. Mukherjee S, Basak U, Chakraborty S, Pati S, Dutta A, Dutta S, Roy D, Banerjee S, Ray A, Sa G, and Das T. Breast cancer stem cells generate immune-suppressive T regulatory cells by secreting TGF▪ to evade immune-elimination. *Discover oncology* (in press)
4. Chakraborty S, Mukherjee S, Basak U, Pati S, Dutta A, Dutta S, Dhar S, Sarkar T, Guin A, Sa G, and Das T. Immune evasion by cancer stem cells ensures tumor initiation and failure of immunotherapy. *Exploration of Immunology*, (In press)
5. Pati S, Mukherjee S, Guin A, Roy D, Bose S, Dutta S, Saha S, Datta P, Chakraborty J, Sarkar D and Sa G. Tumor-associated $CD19^{+}CD39^{-}$ B-regulatory cell deregulates class-switch recombination to suppress antibody response. Cancer Immunology Research, doi: org/10.1158.2326-6066.CIR-21-1073, 2022.
6. Dhar S, Sarkar T, and Sa G. Neoangiogenesis and immune-regulation: Two armor of VEGF in the tumor microenvironment. J Breast Cancer Research, 2022, 2: 28-39.
7. Sarkar T, Dhar S, Chakraborty D, Pati S, Bose S, Panda AK, Basak U, Chakraborty S, Mukherjee S, Guin A, Jana K, Sarkar DK & Sa G. FOXP3/HAT1 axis controls Treg infiltration in tumor-microenvironment by inducing CCR4 expression in breast cancer Key words: Treg cells, tumor-microenvironment, CCR4, FOXP3, HAT1, tumor-infiltration. Frontiers in Immunology, 2022, doi: 10.3389/fimmu.2022.740588
8. Roy D, Paul S, Pati S and Sa G. The adroitness of andrographolide as a natural weapon against colorectal cancer", Frontiers in Pharmacology, 2021, doi: 10.3389/fphar.2021.731492.

9. Sarkar T, Dhar S & Sa G. Tumor-infiltrating T-regulatory cells adapt to altered metabolism to escape tumor-immune surveillance. Current Research in Immunology, 2021, 2: 132-141. https://doi.org/10.1016 /j.crimmu.2021.08.002
10. Paul S & Sa G. Curcumin as an adjuvant to cancer immunotherapy. Frontiers in Oncology, 16 August 2021 | https://doi.org/10.3389/fonc.2021.675923
11. Roy D, Bose S, Pati S, Guin A, Banerjee K, Saha S, Singhal AK, Chakraborty J, Sarkar DK & Sa G. GFI1/HDAC1-axis differentially regulates immunosuppressive CD73 in tumor-associated FOXP3+Th17 and inflammation-linked classical Th17 cells. Eur J Immunol. 2021 Feb 8. doi: 10.1002/eji.202048892
12. Kajal K, Bose S, Panda AK, Chakraborty D, Chakraborty S, Saha S, & Sa G. T-regulatory cell-shed VEGFA induces neo-angiogenesis in tumor micro-environment. Cancer Immunol Immunother, Jan 4. 2021, doi: 10.1007/s00262-020-02808-0.
13. Dhar S, Bose, S & Sa G. Immunometabolomics: The metabolic landscape of immune cells in tumor microenvironment. Tumor Microenvironment, 2021; 1: 72-79. doi: 10.4103/tme.tme_2_20,2021
14. D Roy, S Bose, S Dutta, & G Sa, The paradigm of T cells in shaping tumor microenvironment. Trends in Oncology 2 (2), 2020.
15. T Sarkar & G Sa. Infiltrating Treg cells suppress anti-tumor immunity in tumor microenvironment. Arch Immuno Immunother. 1: 1-11, 2020
16. Pati S, Chowdhury A, Mukherjee S, Guin A, Mukherjee S, Sa G. Regulatory lymphocytes: The dice that resolves the tumor endgame. Applied Cancer Research 40:7, 1-9, 2020, doi.org/10.1186/s41241-020-00091-0.
17. Guha D, Saha T, Bose S, Chakraborty S, Khan P, Adhikary A, Das T, & Sa G. Integrin-EGFR interaction regulates anoikis resistance in colon cancer cells. Apoptosis, 24: 958-971, 2019.
18. Sengupta P, Bhattacharya A, Sa G, Das T, & Chatterjee S. Truncated G-quadruplex isomers cross-talk with the transcription factors to maintain homeostatic equilibria in c-MYC transcription. Biochemistry, 58: 1975-1991, 2019.
19. Sarkar I, Pati S, Dutta A, Basak U, & Sa G. T-memory cells against cancer: Remembering the enemy. Cellular Immunology, 338: 27-31, 2019
20. Kajal K, Panda Ak, Bhat J, Chakraborty D, Bose S, Bhattacharjee P, Sarkar T, Chatterjee S, Kar SK, & Sa G. Andrographolide binds to ATP-binding pocket of VEGFR2 to impede VEGFA-mediated tumor-angiogenesis. Scientific Reports, 9: 4073, 2019.
21. Chakraborty D, Pati S, Bose S, Dhar S, Dutta S & Sa G. Cancer immunotherapy: present scenarios and the future of immunotherapy. The Nucleus 62:143–154, 2019.
22. Chakraborty S & Sa G. CD8+ T-Regulatory cells: mechanisms of differentiation and function. J. Immunol. Science, 2: 2-8, 2018.
23. Chakraborty S, Bhattacharya P, Panda AK, Kajal K & Sa, G. Clonal deletion of anti-tumorogenic IFNγhiFOXP3-CD8+ Treg cells confine tumor immunosurvillance. Immunology Cell Biology. doi: 10.1111/imcb.12166. 2018
24. Chakraborty S, Panda AK, Bose S, Roy D, Kajal K, Guha D & Sa G. Transcriptional regulation of FOXP3 requires integrated activation of both promoter and CNS regions in tumor-induced CD8+Treg cells. Scientific Reports 7: 1628, 2017
25. Saha T & Sa G. Constraint-driven docking: a logistic docking approach for deriving protein-protein complex structure. Protocol Exchange, doi:10.1038/protex.2017.011, 2017
26. Panda, AK, Chakraborty, D, Sarkar, I, Khan, T & Sa, G. New insights into therapeutic activity and anticancer properties of curcumin. J. Experimental Pharmacology, 9, 31-45, 2017

27. Abir K. Panda AK, Bose S, Sarkar T, Roy D, Chakraborty D, Chakraborty, S, Sarkar I & Sa G. Cancer-immune therapy: restoration of immune response in cancer by immune cell modulation. The Nucleus, 60: 93-109 2017

28. Saha T, Guha D, Manna A, Panda AK, Bhat J, Chatterjee S, & Sa G. G-actin guides p53 nuclear transport: potential contribution of monomeric actin in altered localization of mutant p53. Scientific Reports 6, 32626; doi: 10.1038/srep32626, 2016.

29. Ray P, Guha D, Chakraborty J, Banerjee S, Adhikary A, Chakraborty S, Das T & Sa G. Crocetin exploits p53-induced death domain (PIDD) and FAS-associated death domain (FADD) proteins to induce apoptosis in colorectal cancer. Scientific Reports 6, 32979; doi: 10.1038/srep32979, 2016.

30. Bose, S, Panda AK, Mukherjee S & Sa G. Curcumin and tumor immune-editing: Resurrecting the immune system. Cell Division, 12;10:6. doi: 10.1186/s13008-015-0012-z. eCollection, 2015.

31. Saha T, Kar RK & Sa G. Structural and Sequential context of p53: A review of experimental and theoretical evidence. Progress Biophy. Mol. Biol. 117: 250-263, 2015.

32. Sulphur alters NFκB-p300 cross-talk in favour of p53-p300 to induce apoptosis in non-small cell lung carcinoma. Saha S, Bhattacharjee P, Guha D, Kajal K, Khan P, Chakraborty S, Mukherjee S, Paul S, Manchanda R, Khurana A, Nayak D, Chakrabarty R, Sa G, Das T. Int. J. Oncol. 47: 573-582, 2015.

33. Saha S, Mukherjee S, Majumder M, Manna A, Khan P, Adhikary A, Kajal K, Jana D, Sa G, Mukherjee S, Sarkar DN and Das T. Mithramycin A sensitizes therapy-resistant breast cancer stem cells towards genotoxic drug doxorubicin. Translational Res. 165: 558-577, 2015.

34. Panda AK, Bose S, Banerjee S, Chakraborty S, Kajal K & Sa G. Intratumoral immune landscape: Immunogenicity to tolerogenicity Austin J Clinical Immunol. 2, 1-10, 2015

35. Hossain DM, Panda AK, Chakrabarty S, Bhattacharjee P, Kajal K, Mohanty S, Sarkar I, Sarkar DK, Kar SK, Sa G. MEK inhibition prevents tumor-shed TGFβ-induced T-regulatory cell augmentation in tumor milieu. Immunology 144: 561-573, 2014.

36. Chakraborty S, Das K, Saha S, Mazumdar M, Manna A, Chakraborty S, Mukherjee S, Khan P, Adhikary A, Mohanty S, Chattopadhyay S, Sa G and Das T. Nuclear matrix protein SMAR1 represses c-Fos-mediated HPV18 E6 transcription through alteration of chromatin histone de-acetylation. J Biol Chem. 289: 29074-29085, 2014.

37. Adhikary A, Chakraborty S, Mazumdar M, Ghosh S, Mukherjee S, Manna A, Mohanty S, Nakka KK, Joshi S, De A, Chattopadhyay S, Sa G and Das T. Inhibition of Epithelial to Mesenchymal transition by E-cadherin up-regulation via repression of Slug transcription and inhibition of E-cadherin degradation: Dual role of SMAR1 in breast cancer cells. J Biol Chem. 289: 25431-44, 2014.

38. Chakraborty S, Adhikary A, Mazumdar M, Mukherjee S, Bhattacharjee P, Guha D, Choudhuri T, Chattopadhyay S, Sa G and Das T. Capsaicin-induced activation of p53-SMAR1 auto-regulatory loop down-regulates VEGF in non-small cell lung cancer to restrain angiogenesis. PLoS ONE 9:e99743. doi: 10.1371/journal.pone.0099743, 2014.

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41. Saha S, Bhattacharjee P, Mukherjee S, Mazumdar M, Chakraborty S, Khurana A, Nayak D, Manchanda R, Chakrabarty R, Das T, Sa G. Contribution of the ROS-p53feedback loop in thuja-induced apoptosis of mammary epithelial carcinoma cells. Oncol Rep. 31:1589-98, 2014.
42. Jana D, Sarkar DK, Ganguly S, Saha S, Sa G, Manna AK, Banerjee A, Mandal S. (2014) Role of Cyclo-oxygenase 2 (COX-2) in Prognosis of Breast Cancer. Indian J Surg Oncol. 5: 59-65.
43. Mukherjee S, Ghosh S, Choudhury S, Adhikary A, Manna K, Dey S, Sa G, Das T, Chattopadhyay S. Pomegranate reverses methotrexate-induced oxidative stress and apoptosis in hepatocytes by modulating Nrf2-NF‑B pathways. J Nutr Biochem 24:2040-50, doi: 10.1016/ j.jnutbio.2013.07.005, 2013.
44. Mazumdar M, Adhikary A, Chakraborty S, Mukherjee S, Manna A, Mohanty S, Ray P, Dutta A, Saha S, Chattopadhyay S, Banerjee S, Chakraborty J, Ray AK, Sa G, Das T. Targeting RET to induce medullary thyroid cancer cell apoptosis: An antagonistic interplay between PI3K/Akt/Bad pathway and death receptor-independent p38-MAPK/caspase-8 pathway. Apoptosis 18:589-604, doi: 10.1007/s10495-013-0803-0, 2013.
45. Saha S, Hossain DM, Mukherjee S, Mohanty S, Mazumdar M, Mukherjee S, Ghosh UK, Nayek C, Raveendar C, Khurana A, Chakrabarty R, Sa G, Das T. Calcarea carbonica induces apoptosis in cancer cells in p53-dependent manner via an immuno-modulatory circuit. BMC Complement Altern Med. 13:230, 2013.
46. Saha B, Adhikary A, Ray P, Saha S, Chakraborty S, Mohanty S, Das K, Mukherjee S, Mazumdar M, Lahiry L, Hossain Dewan Md S, Sa G and Das T. Restoration of tumor suppressor p53 by differentially regulating pro- and anti-p53 networks in HPV-18-infected cervical cancer cells. Oncogene 31:173-86, 2012
47. Saha S, Adhikary A, Bhattacharyya P, Das T, Sa G. Death by Design: Where Curcumin Sensitizes Drug-resistant Tumours. Anticancer Res 32:2567-84, 2012.
48. Ghosh S, Adhikary A, Chakraborty S, Nandi P, Mohanty S, Chakraborty S, Bhattacharjee P, Mukherjee S, Putatunda S, Chakraborty S, Chakraborty A, Sa G, Das T and Sen PC. Nifetepimine, a dihydropyrimidone, ensures CD4+ T cell survival in tumor microenvironment by maneuvering Sarco(endo)plasmic reticulum Ca2+ATPase (SERCA). J. Biol. Chem. 287:32881-96, 2012.
49. Hossain DMS, Mohanty S, Ray P, Das T, & Sa G. Tumor gangliosides and T cells: A deadly encounter. Frontiers in Biosciences 4: 502-519, 2012.
50. Hossain DMS, Bhattacharyya S, Das T, & Sa G. Curcumin: The multi-targeted therapy for cancer regression. Frontiers in Biosciences 4: 335-355, 2012.
51. Mohanty S, Adhikary A, Chakrabarty S, Sa G & Das T. Operation 'p53 Hunt' to combat cancer: Theaflavins in action. Frontiers in Biosciences 4: 300-320, 2012.
52. Sen GS, Mohanty S, Hossain DM, Bhattacharyya S, Banerjee S, Chakraborty J, Saha S, Ray P, Bhattacharjee P, Mandal D, Bhattacharya A, Chattopadhyay S, Das T, Sa G. Curcumin enhances the efficacy of chemotherapy by tailoring p65NFκB-p300 cross-talk in favor of p53-p300 in breast cancer. J. Biol. Chem. 286: 42232-42247, 2011.
53. Chakraborty J, Banerjee S, Ray P, Hossain DMS, Bhattacharyya S, Adhikary A, Chattopadhyay S, Das T & Sa G. Gain of cellular adaptation due to prolong p53 impairment leads to functional switch-over from p53 to p73 during DNA damage in acute myeloid leukemia cells. J. Biol. Chem. 285: 33104-33112, 2010.
54. Bhattacharyya S, Hossain D Md. S, Mohanty S, Sen GS, Chattopadhyay S, Banerjee S, Chakraborty J, Das K, Sarkar D, Das T & Sa G. Curcumin reverses T cell-mediated adaptive immune dysfunctions in tumor-bearing host. Cell. Mol. Immunol. 7: 306-315, 2010

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60. Lahiry L, Saha B, Chakraborty J, Bhattacharyya S, Chattopadhyay S, Choudhuri T, Mandal D, Bhattacharyya A, Sa G & Das T. Contribution of p53-mediated transcription-dependent pathway in mammary epithelial carcinoma cell apoptosis by theaflavins. Apoptosis 13: 771-781, 2008.

61. Das T*, Sa G*, Paszkiewicz-Kozik E, Hilston C, Molto L, Rayman P, Biswas K, Kudo D, Bukowski RM, Finke JH & Tannenbaum C. Renal Cell Carcinoma Tumors Induce T Cell Apoptosis Through Receptor-Dependent and Receptor-Independent Pathways. J. Immunol. 180: 4687-4696, 2008. [*Das T & Sa G both contributed equally]

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63. Sa G & Das T. Anti-cancer effects of curcumin: cycle of life and death. Cell Div. 3:14, 2008.

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65. Mandal D, Bhattacharyya S, Lahiry L, Chattopadhyay S, Sa G & Das T. Black tea-induced decrease in IL-10 and TGF-• of tumor cells promotes Th1/Tc1 response in tumor-bearer. Nutrition Cancer 58: 213-221, 2007.

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newly developed copper chelate through host protective cytokine mediated apoptosis. Clinical Cancer Research 12: 4339-4349, 2006

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