

SANCHAITA LALA, Ph.D.

Senior Researcher in Nanobiotechnology and Nanomedicine |
Experienced Educator in Biological Sciences

Assistant Professor and Head,
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SEX : Female.

RESEARCH INTEREST : Nanobiotechnology, Nanomedicine, Drug delivery

EXPERIENCE

Assistant Professor and Head, Department of Botany,
Sarsuna College (University of Calcutta)

4/HB/A Ho-Chi-Minh Sarani, Sarsuna Upanagari, Kolkata-700 061, West Bengal, India.

- November 2006 – present
- Teaching biology to undergraduate classes.
- 2016-2018: Completed a Minor Research Project worth INR 140,000 awarded by the University Grants Commission, India as Principal Investigator. Title of Project “Effect of nanoparticles on the secondary metabolite content of some Indian medicinal plants”: In this project copper based nanoparticles were studied as elicitors of secondary metabolites in the medicinal herb *Bacopa monnieri*.
- 2008-2012: Completed a research project as Principal Investigator worth INR 5.175 million awarded by the Department of Biotechnology, Government of India, in collaboration with Indian Institute of Chemical Biology, Kolkata. Title of project: “Active targeting of nanoparticles grafted with ligands to cells of the reticuloendothelial system by receptor mediated endocytosis and their application against macrophage-associated diseases.” In this project mannose-grafted poly-lactide-co-glycolide nanoparticles were engineered for targeting

macrophages and applied against animal models of macrophage-associated infectious disease, viz. visceral leishmaniasis.

✚ **Post-doctoral Research Associate (DBT)**

Centre for Surface Science, Department of Chemistry,

Jadavpur University,

188, Raja S.C. Mullick Road, Kolkata-700 032, West Bengal, India.

- July-November, 2006
- Supervisor: Prof. Subhash C. Bhattacharya
- Title of Project: "Designing and testing of an effective oil-in-water microemulsion drug delivery system for *in vivo* application against experimental leishmaniasis: a comparison with poly-lactide nanoparticles."

✚ **Post-doctoral Research Associate (CSIR),**

CSIR- Indian Institute of Chemical Biology,

4, Raja S. C. Mullick Road, Jadavpur, Kolkata - 700 032, West Bengal, India.

- February 2000 – February 2006
- Supervisor: Dr. Mukul K. Basu
- Title of project: "Vesicular drug delivery systems: liposomes, niosomes, microspheres and nanocapsules in macrophage-associated diseases."
- Project involved the study of the efficacy and toxicity of different drug delivery systems *in vivo* in animal models of visceral leishmaniasis.

✚ **Research Fellow (UGC)**

Reproductive Biology Research Section,

Cellular and Molecular Physiology Division,

CSIR-Indian Institute of Chemical Biology,

4, Raja S. C. Mullick Road, Jadavpur, Kolkata - 700 032, West Bengal, India.

- August 1994 – February 2000 :
- Supervisor: Dr. Smritinath Chakraborty
- Title of Ph.D. thesis: "Evaluation of the antifertility potential of phaseolinone and asperlinin male rats and related studies."
- Major work involved isolation and purification of two antiflagellate epoxides, phaseolinone and asperlin, from culture filtrates of the fungus *Macrophomina phaseolina* and evaluation of their ability to reduce functional fertility in male rats.
- Work encompassed pharmacological studies based on reproductive physiology, histopathology biochemistry, endocrinology and toxicology in *in vivo* animal systems, apart from fungal culture.

ACADEMIC QUALIFICATIONS

DEGREE/ EXAMINATION	YEAR	INSTITUTION/ BOARD	PERFORMANCE
Post-graduate Diploma in Bioinformatics	2004	Bioinformatics Institute of India	Grade A
Ph.D. in Life Science and Biotechnology	2001	Indian Institute of Chemical Biology (Jadavpur University), Kolkata, India	
Master of Science in Botany	1992	University of Calcutta, India	First Class
Bachelor of Science with Botany (Honours), Chemistry, Zoology	1990	Presidency College, University of Calcutta, India.	First Class

AWARDS AND HONOURS

- Awarded Certificates for a Top Cited and Top Downloaded Article of 2021-2022 from the journal IET Nanobiotechnology , John Wiley and Sons, for the article “Nanoparticles as elicitors and harvesters of economically important secondary metabolites in higher plants: A Review”

MEMBERSHIP OF SCIENTIFIC SOCIETIES:

- Life Member : Indian Society for Surface Science and Technology.

REVIEWER OF JOURNALS

Journal of Drug Targeting (Taylor and Francis), International Journal of Pharmaceutics (Elsevier), European Journal of Pharmaceutical Sciences (Elsevier), IET Nanobiotechnology (Wiley), Plant Growth Regulation (Springer).

WORKSHOPS ATTENDED

1. September 2-22,2024: Participant in Two week online workshop on Material Characterization and Data Analysis, organized by SIAS Research Center, Kerala, India
2. August 12, 2024: Participant in Workshop for faculties on Biofertilizers and Biopesticides, organized by Department of Botany and Internal Quality Assurance Cell, Scottish Church College, Kolkata., India.
3. August 5-12, 2024: Participant in One week online workshop pn Molecular Dynamics Simulation Organized by SIAS Research Center, Kerala, India
4. October 30,2023: Participant in online workshop on “Innovative Strategies for Drug Design Using Artificial Intelligence & Machine Learning” conducted by 3Bigs, as a part ofSymBiot'23 by the Department of Biotechnology, Manipal Institute of Technology, Manipal, Karnataka, India.
5. July 10-19,2023 : Participant in 8-day Online Workshop on Molecular Docking, organized by SIAS Research Forum, Kerala, India
6. April 26-May 1,2023: Participant in 6-days hands-on Training on Elemental Analysis (online) organized by SIAS Research Forum in collaboration with Department of Physics, PSMO College, Tirurangadi, Kerala, India.
7. April 26-29,2023: Joint Convenor of Hands on Training and Workshop on Basic Molecular Biology Techniques, organized by Sarsuna College, Kolkata in collaboration with Microbiologists' Society of India.
8. March 4-6,2020: Participant at B.Sc. Practical Syllabus on Plant Geography, Ecology, Evolution, Economic Botany and Genetics organized by Probir Chatterjee Research Foundation in collaboration with Centre for Advanced Studies, Department of Botany, University of Calcutta,, India.
9. March 13,2019: Participant as panel discussant in International Consultative Workshop on “Disruptive Translational Research in Nano-Biotechnology: Advancing Sustainable Food Systems and Human Health Solutions” organised by The Energy and Resource Institute, Gurugram, India and Deakin University, Australia, partnered by Department of Biotechnology, Govt. of India, New Delhi,India.
10. December 21-24, 2015: Oral Presentation as Convener and Resource Person entitled “Cultivation of Oyster Mushroom-Substrate Preparation, Spawning and Crop Management” as Convenor and Resource Person of U.G.C.

sponsored National Workshop entitled “Cultivation of Edible Mushrooms: Techniques and Agri-business Prospects”, Sarsuna College, Kolkata, India

11. December 26-27, 2013: Participant in Workshop entitled “Chromatography-the Catapult for Unravelling the Facts of Nature”, Department of Botany (Centre for Advanced Study), University of Calcutta, India.
12. January 3-4, 2012: Participant in 1st International Workshop on Nanoparticles and their Application in Medicine (NAM-2012), IIT Kharagpur, West Bengal, India.
13. December 18-24, 2011: Participant at 1st National Workshop for College Teachers on Application of Flow Cytometry, Cell Sorting and Imaging in Biological Research, Centre for Research in Nanoscience and Nanotechnology, University of Calcutta, India.
14. December 28-30, 2006: Participant at International Workshop on MEMS and Micro/Nano Systems Technology for Bio-Implants and Bio Applications, IIT Kharagpur, Kolkata Campus, India.
15. November 18-20, 2003: Participant at Workshop on Application of Bioinformatic Tools in Genomics and Proteomics, Indian Institute of Chemical Biology, Kolkata, India.

SEMINARS/SYMPOSIA ATTENDED

1. May 12-14, 2023: Invited lecture entitled “Nanoparticles as elicitors of secondary metabolites in higher plants” and chairing a session at International Hybrid Conference on Nanostructured Materials and Polymers(ICNP-2023), organized by Mahatma Gandhi University, Kottayam, Kerala, Indian collaboration with Gdansk University of Technology, Poland, Wroclaw University of Technology, Poland and University of Johannesburg, South Africa and University of Lorraine, France.
2. October 4-6, 2018: Oral Presentation entitled “Enhancement of secondary metabolism in *Bacopamonnieri* (Linn.) Wettst. plants treated with copper nanoparticles *in vivo*” at the 2nd International Conference on Nano Science & Engineering Applications (ICONSEA 2018) (Under TEQIP-III) organized by Centre for Nano Science and Technology, Institute of Science and Technology, Jawaharlal Nehru Technological University, Hyderabad, Telangana, India.
3. March 18-19, 2017: Participant in national seminar and workshop on “Scientific Devices, Technology Applications and Community Linkage” organised by TEQIP and Centre of Excellence, University of Calcutta, India.

4. November 25-26, 2016: Oral Presentation entitled “Scientific e-Resources in Bengali” at national seminar entitled “Bengali Language and Literature-Technological Potentials” organized by Department of Bengali, Sarsuna College in Collaboration with School of language and Linguistics, Jadavpur University, Kolkata, India.
5. July 25, 2012: Invited Lecture entitled “Active targeting of nanoparticles grafted with ligands to cells of the reticuloendothelial system by receptor mediated endocytosis and their application against macrophage-associated diseases.” at national seminar on “Trends in Surface Science and Related Areas” organised by Indian Society for Surface Science in association with Department of Chemistry, Scottish Church College, Kolkata, India.
6. December 8-10, 2011: Poster Presentation, entitled “Pentamidine isethionate loaded mannosylated poly-lactide-co-glycolide nanoparticles for effective management of visceral leishmaniasis.” at 2nd International Conference on Advanced Nanomaterials and Nanotechnology (ICANN-2011), IIT Guwahati, Assam, India.
7. March 21-23, 2011: Oral Presentation entitled “Construction and application of mannose-grafted poly-DL-lactide-co-glycolide nanoparticles for active targeting of macrophages.” at World Congress on Biotechnology, 2011, Hyderabad, India.
8. November 18-20, 2004: Poster Presentation entitled “Targeted delivery of arjunglucoside I using surface hydrophilic and hydrophobic nanocarriers to combat experimental leishmaniasis” at the International Conference on Soft Matter, Jadavpur University, Kolkata, India.
9. January 16-18, 2003: Poster Presentation entitled “Harmine: Evaluation of its antileishmanial properties in various vesicular delivery systems” at the 6th International Symposium on Biochemical Roles of Eukaryotic Cell Surface Molecules, Indian Institute of Chemical Biology, Kolkata, India
10. November 6-9, 2000: Poster Presentation entitled “Evaluation of the antifertility potential of the antflagellate agent asperlin in male rats.” at the International Congress on Fertilization, Embryo Development and Implantation, National Institute of Immunology, New Delhi, India.
11. May 24-26, 1997: Oral Presentation entitled “Evaluation of the antifertility potential of the antflagellate agent phaseolinone in male rats.” at the Indian Council of Medical Research Young Scientists' Symposium on Reproductive Health Issues, Guwahati, Assam, India.

PUBLICATIONS

- *Peer Reviewed Journals*

1. **Lala S.** (2021) Nanoparticles as elicitors and harvesters of economically important secondary metabolites in higher plants: A Review. *IET Nanobiotechnology* 15(1):28-57. (Published 19 February, 2021) <https://doi.org/10.1049/nbt2.12005> (Print ISSN:1751-8741, eISSN:1751-875X) (Impact Factor: 2.050)
2. **Lala S.** (2020) Enhancement of secondary metabolites in *Bacopa monnieri* (L.) Pennell plants treated with copper-based nanoparticles *in vivo*. *IET Nanobiotechnology*. 14(1):78-85. (Epub 23 October, 2019, Published 16 January, 2020) <https://doi.org/10.1049/iet-nbt.2019.0124> (Print ISSN:1751-8741, eISSN:1751-875X) (I.F.: 1.847)
3. Maity A., Hazra A., Palit P., Mondal S., **Lala S.**, Mondal N.B. (2013) The cytotoxic effects of diketopiperazines against *Leishmania donovani* promastigotes and amastigotes. *Medicinal Chemistry Research* 22(7):3452-3458. <https://doi.org/10.1007/s00044-012-0355-9> (I.F.1.402)
4. Bhowal S.K, **Lala S.**, Hazra A, Paira P., Banerjee S., Mondal N.B., Chakraborty S.(2008) Synthesis and assessment of fertility-regulating potential of 2-(2"-chloroacetamidobenzyl)-3-(3'-indolyl) quinoline in adult rats as a male contraceptive agent. *Contraception*. 77(3): 214-222. <https://doi.org/10.1016/j.contraception.2007.09.014> (I.F. 2.32)
5. **Lala S.**, Gupta S., Sahu N.P., Mandal D., Mondal N.B., Moulik S.P., Basu M.K.(2006) Critical evaluation of the therapeutic potential of basic acid entrapped in oil-in-water microemulsions and poly-lactide nanoparticles against experimental leishmaniasis. *Journal of Drug Targeting* 14(4):171-179. <https://doi.org/10.1080/10611860600649765>. (I.F.1.699)
6. Gupta S., **Lala S.**, Sanyal S.K., Dutta S., Basu M.K., Moulik S.P.(2005) Designing and testing of an effective oil-in-water microemulsion drug delivery system for *in vivo* application. *Drug Delivery*. 12(5): 267-273. <https://doi.org/10.1080/10717540500176373> (I.F.1.067)
7. Tyagi R., **Lala S.**, Verma A.K., Nandy A.K., Mahato S.B., Maitra A.N., Basu M.K.(2005) Targeted delivery of arjunglucoside I using surface hydrophilic and hydrophobic nanocarriers to combat experimental leishmaniasis. *Journal of Drug Targeting*. 13(3): 161-171. <https://doi.org/10.1080/10611860500046732> (I.F.1.569)

8. Basu M.K. and **Lala S.** (2004) Macrophage specific drug delivery in experimental leishmaniasis. (Review) *Current Molecular Medicine*. 4(6):681-689.<https://doi.org/10.2174/1566524043360186> (I.F. 4.94)
 9. **Lala S.**, Pramanick S, Mukhopadhyay S., Bandyopadhyay S., Basu M.K. (2004). Harmine: Evaluation of its antileishmanial properties in various delivery systems. *Journal of Drug Targeting*. 12(3): 165-175.<https://doi.org/10.1080/10611860410001712696> (I.F.1.907)
 10. **Lala S.**, Nandy A.K., Mahato S.B., Basu M.K. (2003) Delivery *in vivo* of 14-deoxy-11-oxoandrographolide, an antileishmanial agent, by different drug carriers. *Indian Journal of Biochemistry and Biophysics*. 40(3):169-174. (I.F.0.252)
 11. Chakraborty S. and **Lala S.** (1998) Assessment of the antifertility effect of phaseolinone, an antileishmanial agent, in male rats. *Contraception*. 58(3):183-191. (I.F.1.615)
- *Chapters in Edited Books*
1. **Lala S.** (2024). Nanoparticles as Elicitors and Harvesters of Economically Important Secondary Metabolites in Plants. In: Méryllon, J.M., Ramawat, K.G. (Eds.) *Plant Specialized Metabolites*. Reference Series in Phytochemistry. Springer, Cham. https://doi.org/10.1007/978-3-031-30037-0_45-1 (Published 02 February, 2024) (Online ISBN 978-3-031-30037-0; Print ISBN 978-3-031-30037-0)
 2. Basu M.K. and **Lala S.** (2006) Nanoparticulate Drug Delivery to the Reticuloendothelial System and to Associated Disorders. In: *Nanoparticulates as Drug Carriers*. Ed. Torchilin V.P. Imperial College Press, London pp. 463-480. (ISBN 1-86094-630-5)