

# UNIVERSITY OF CALCUTTA

## FACULTY ACADEMIC PROFILE/CV

1. **Full name of the faculty member:** Anirban Siddhanta
2. **Designation:** Professor
3. **Specialisation:** Biochemistry/Cell Biology
4. **Passport size photograph:**



5. **Contact information:**  
University College of Science, Department of Biochemistry, 6<sup>th</sup> Floor, 35 Ballygunge Circular Road, Kolkata 700019 Phone: 03324615445  
Email: [asiddhanto@yahoo.com](mailto:asiddhanto@yahoo.com), [asbioc@caluniv.ac.in](mailto:asbioc@caluniv.ac.in)

6. **Academic qualifications:**  
*Please mention here the degrees (graduation onward):*

College/ university from which the degree was obtained	Abbreviation of the degree
University of Calcutta	B.Sc.(Chemistry Honours)
University of Calcutta	M.Sc. (Biochemistry)
Jadavpur University	Ph.D.(Science)

7. **Positions held/holding:**
  1. Reader: July 2005-July 2008
  2. Associate Professor: July 2008-April 2015
  3. Professor: April 2015-till date

8. **Research interests:**

Area A:

Symbiotic Nitrogen Fixation (SNF):

**The aim of our laboratory is to dissect:**

1. The function of leghemoglobin, essential for SNF by legume-rhizobia interaction using biochemical and molecular cell biology studies
2. The role of leghemoglobin interacting protein partner(s) expressed during late stage of nodulation by using biochemical and Agrobacterium mediated hairy root knock-down approaches

Area B:

Phosphoinositides, i.e. inositol phospholipids and their kinases play major role during cell motility, cell morphology, intracellular trafficking and gene expression as a constituent of biomembranes and as important signaling molecules.

**The main focus of the laboratory is to elucidate:**

1. Role of cell cycle phases and SUMOylation in the subnuclear distribution of a phosphoinositide kinase (PI4P5 kinase) using biochemical and microscopic approaches.
2. The function of gamma-tubulin during genotoxic stress in mammalian cells

Area C:

The broad objective is to elucidate the roles of phosphotyrosine signaling, TOR (target of rapamycin) and related pathways in Leishmania-macrophage interaction

9. **Research guidance:**

Number of researchers awarded ~~M.Phil/~~ Ph.D. degrees: 8 awarded

Number of researchers pursuing ~~M.Phil/~~ Ph.D.: 6 registered researchers

Registered research scholars:

As PI: Aniruddho Das, M.Sc. (Botany); Sudeshna Saha, M.Sc. (Botany); Oindrila Roy, M.Sc. (Zoology); Priyam Biswas, M.Sc. (Medical Biotechnology); Azimuddin Ashrafi, M.Sc. (Botany)

As Joint PI: Soham Bose, M. Sc. (Microbiology) (Joint PI: Dr. Uma Siddhanta, St. Xavier's College)

**Projects:**

**Current project:**

**SERB-DST (2024-2027):** "Regulation of the Subcellular Localization of Leghemoglobin during Symbiotic Nitrogen Fixation in *Lotus japonicus*"

**Completed projects:**

**SERB-DST (2019-2022):** "Functional Regulation of Leghemoglobin During Symbiotic Nitrogen Fixation"

**SERB DST (Central): (2012-2015)** "Biochemical Study of The Relationship Between Phosphatidylinositol Signaling In Root Cells of Leguminous Plants With or Without Rhizobial Infection"  
**CRNN, CU (2009-10)** "Determination of leishmanicidal potential of metal nanoparticles and their conjugates"

**DST (Central) (2010-2013)** "Inositol Phospholipid Signaling In Apoptotic Death of Insulin Producing Pancreatic Beta Cells during Diabetes"

**DBT (Central) (2009-2012)** "Elucidation of Molecular Mechanism for the Subcellular Distribution of Phosphoinositide Kinases Regulated by Different Patho-Physiological Conditions"

**UPE/UGC (2007-2012)** Investigating Molecular Principles of Species Interaction in Rhizosphere: Biochemical and Metagenomic Approaches (As a Co-Principal Investigator)

**WB-DBT (2015-2019):** "Elucidation of the Role of Differentially Phosphorylated Dok-3 (Downstream of Kinase 3) in the Biogenesis of Phagolysosome in Leishmaniadonovani Infected Macrophages" PI: Dr. Uma Siddhanta, Department of Biotechnology, St. Xavier's College, Kolkata; Co-PI: Dr. Anirban Siddhanta

10. **Select list of publications:**

A. As independent investigator:

**a) Journals:**

1. Tyrosine Phosphorylation of Downstream of Kinase 3 (Dok-3) Plays Crucial Role in *Leishmania donovani*

- Infection by Regulating Inhibitory Proteins, SH-PTP-1 and SHIP-1 in Macrophages. Bose, Soham and **Siddhanta, Anirban** and Siddhanta, Uma (2023); SSRN: <http://dx.doi.org/10.2139/ssrn.4360310>
2. Nodulin 16 of *Lotus japonicus* (Nlj16) regulates the recruitment of Leghemoglobin (LegH) to 3 the infected nodule cell membrane during symbiotic nitrogen fixation. Amit Ghosh \*, Aniruddho Das \*, Md Azimuddin Ashrafi \*, Sudeshna Saha , Firoz Molla , Maitrayee DasGupta and **Anirban Siddhanta** (\* Equal contribution (Alphabetical order). bioRxiv (Cold Spring Harbor Laboratory); <https://doi.org/10.1101/2022.07.21.500945>, 2022
  3. FRB domain of human TOR protein induces compromised proliferation and mitochondrial dysfunction in *Leishmania donovani* promastigotes. Chakraborty S, Mukherjee S, Biswas P, Ghosh A, **Siddhanta A** (2022) Parasitol Int. 2022 Aug;89:102591. doi: 10.1016/j.parint.2022.102591, Epub 2022 Apr 25. PMID: 35472440.
  4. Prevalence of antibiotic-resistant pathogenic bacteria from canal bank soils in and around Kolkata, India. Lopamudra Roy, Souvik Roy, Uma Siddhanta & **Anirban Siddhanta** (2021) International Journal of Environmental Studies, DOI: 10.1080/00207233.2021.1966249
  5. Oxygen sequestration by Leghemoglobin is positively regulated via its interaction with another late nodulin, Nlj16 of *Lotus japonicus*. Amit Ghosh, Kaushik Bhar and **Anirban Siddhanta** (2019) Journal of Plant Biochemistry and Biotechnology e-Pub: 11<sup>th</sup> March, 2019 (<https://doi.org/10.1007/s13562-019-00494-3>)
  6. Para-Phenylenediamine Induces Apoptotic Death of Melanoma Cells and Reduces Melanoma Tumour Growth in Mice Debajit Bhowmick, Kaushik Bhar, Sanjaya K. Mallick, Subhadip Das, Nabanita Chatterjee, Tuhin Subhra Sarkar, Rajarshi Chakrabarti, Krishna Das Saha and **Anirban Siddhanta** (2016) Biochemistry Research International, Volume 2016, 14 pages, Article ID 3137010
  7. mRNA and Protein Levels of Rat Pancreas Specific Protein Disulphide Isomerase are Downregulated during Hyperglycemia. Gupta R, Bhar K, Sen N, Bhowmick D, Mukhopadhyay S, Panda K and **Siddhanta A** (2016) (Accepted on 27th January 2015) Indian Journal of Experimental Biology 54 (2), 100-107
  8. Phosphatidylinositol 4-phosphate 5-kinase 1 $\alpha$  modulates ribosomal RNA gene silencing through its interaction with histone H3 lysine 9 trimethylation and heterochromatin protein HP1- $\alpha$ . Rajarshi Chakrabarti, Sulagna Sanyal, Amit Ghosh, Kaushik Bhar, Chandrima Das and **Anirban Siddhanta** (2015) J. Biol. Chem. 290(34):20893-903; e-Pub: 7th July 2015
  9. Phosphorylation of Leghemoglobin at S45 is Most Effective to Disrupt the Molecular Environment of Its Oxygen Binding Pocket. Kaushik Bhar, Atanu Maity, Amit Ghosh, Tanusree Das, Shubhra Ghosh Dastidar, **Anirban Siddhanta** (2015) Protein J. Apr; 34(2):158-167
  10. Novel Arsenic Nanoparticles Are More Effective and Less Toxic than As(III) to Inhibit Extracellular and Intracellular Proliferation of *Leishmania donovani*. Sudipta Chakraborty, Kaushik Bhar, Sandip Saha, Rajarshi Chakrabarti, Anjali Pal, and **Anirban Siddhanta** (2014) Journal of Parasitology Research; Volume 2014, Article ID 187640
  11. Nuclear pool of phosphatidylinositol 4 phosphate 5 kinase 1 $\alpha$  is modified by polySUMO-2 during apoptosis. Rajarshi Chakrabarti, Debajit Bhowmick, Varsha Bhargava, Kaushik Bhar, **Anirban Siddhanta** (2013) Biochem Biophys Res Commun.; 439(2):209-214
  12. Ultrafast Spectroscopic Study on Caffeine Mediated Dissociation of Mutagenic Ethidium from Synthetic DNA and Various Cell Nuclei. Soma Banerjee, Debajit Bhowmik, Pramod Kumar Verma, Rajib Kumar Mitra,

II. As postdoctoral researcher:

1. Radulescu A, **Siddhanta A** and Shields D (2007) Molecular Biology of Cell, 18(1):94-105
  2. Freyberg Z., **Siddhanta A**, Shields D (2003) Trends Cell Biol. 13:540-546
  3. **Anirban Siddhanta** et al. (2003) J. Biol. Chem. 278, No. 3, 1957–1965
  4. D.A. Sweeney, **A. Siddhanta** and D. Shields (2002) J. Biol. Chem. 277, 3030-3039
  5. Z. Freyberg, D. Sweeney, **A. Siddhanta**, S. Bourgoin, M. Froman and D. Shields (2001) Molecular Biology of Cell 12, 943-955
  6. **A. Siddhanta** et al (2000) J. Biol. Chem. 275:12023-12031
  7. **A. Siddhanta** and D. Shields (1998) J. Biol. Chem. 273, 17995-17998
  8. W.L.W. Ling, **A. Siddhanta** and Dennis Shields (1998) Methods: A Companion to “Methods in Enzymology” 16, 141-149
  9. Ye-Guang Chen, **A. Siddhanta**, Cary D. Austin, Scott M. Hammond, Tsung-Chang Sung, Michael A. Frohman, Andrew J. Morris and Dennis Shields (1997) J. Cell Biology 138, 495-504
- b) Books/book chapters:**
1. Bigyan Kosh: An encyclopedia of Science and Technology, 2010, Pages 147-205 Published by: Sishu Kishore Academy, I & B Dept., WB Govt.
- c) Conference/seminar volumes:**
1. International Symposium, “Teaching, Research and Exploration in Biochemistry: 50 years of Journey” 2006, held at Dept. of Biochemistry, CU
  2. SBC (I) 79th Annual Meeting held at Indian Institute of Science, Bangalore from December 13-15, 2010, Poster entitled “ Phosphoinositide Signaling During Melanosome Biogenesis”
  3. SBC (I) 79th Annual Meeting held at Indian Institute of Science, Bangalore from December 13-15, 2010, Poster entitled “Affinity isolation of pitp-nlj16 and its interacting proteins encoded by late nodule genes during plant-microbe interaction in Lotus japonicus”
  4. XXXV All India Cell Biology Conference held at NISER, Bhubaneswar from Dec 16-18 2011, Poster entitled “Serine Phosphorylation of a Late Nodulin Protein Abrogates Its Novel Interaction With Leghemoglobin from Lotus japonicus”
  5. 3rd Annual Meeting of Proteomics Society (India), Saha Institute of Nuclear Physics (SINP), Kolkata
  6. International Conference on "Perspectives of Cell Signaling and Molecular Medicine", held at Bose Institute, Kolkata from January 10-12, 2012 Poster entitled “Nuclear localization of phosphoinositide 4 phosphate 5 kinase (PIP5K) is mediated by SUMOylation during apoptosis”
  7. 81st Annual meeting of the Society of Biological Chemists (I) held at Kolkata from November 8-11, 2012, Poster Entitled “Proteomics of differentially expressed proteins during diabetes”
  8. 81st Annual meeting of the Society of Biological Chemists (I) held at Kolkata from November 8-11, 2012, Poster Entitled “Oxygen binding by Leghemoglobin, a late nodulin is modulated by phosphorylation”

9. 81st Annual meeting of the Society of Biological Chemists (I) held at Kolkata from November 8-11, 2012 Poster entitled “Nuclear Phosphoinositide 4-Phosphate 5-Kinase (PIP5K) is sumoylated during apoptosis”
9. 81st Annual meeting of the Society of Biological Chemists (I) held at Kolkata from November 8-11, 2012 Poster entitled “para-Phenylenediamine (p-PD) mediates apoptosis of human melanoma cells: The role of JNK activation and ROS”
10. VI International Conference of Legume Genetics and Genomics held at Hyderabad from October 2-7, 2012 Poster entitled “Oxygen binding by Leghemoglobin, a late nodulin is modulated by phosphorylation and interaction with another late nodulin”
11. Recent Trends in Plant and Microbial Research ‘PLAMISYMP-2013’ to be held at North Bengal University from March 22-23, 2013 Oral presentation entitled “Oxygen binding by leghemoglobin, a late nodulin, from Lotus japonicus is modulated by phosphorylation”
12. International Symposium-Trends in Plant Science Research to be held on 15th and 16th of February 2014; Poster presentation entitled “Subcellular localization of interacting proteins in the symbiotic nodule of Lotus japonicus”
13. International Conference and Workshop 7th APOCB Congress and ASCB Workshops held on 24th-27th Feb, 2014 at National University Singapore: Poster presentation entitled “Nuclear Phosphatidylinositol 4 Phosphate 5kinase1 $\alpha$  Is Modified by polysumo during Apoptosis”
14. Serine Phosphorylation of Leghemoglobin perturbs its oxygen binding efficacy: A Mechanistic Insight Conference on Informatics & Integrative Biology (CIIB-2014), December 17-19, 2014, Bose Institute, Kolkata
15. Reversible SUMOylation regulates nucleo-cytoplasmic transport of phosphatidylinositol-4- phosphate 5 kinase 1 $\alpha$  2nd International Meet on Advanced Studies on Cell Signaling Network (CeSiN 2014) December 13-15, 2014, IICB, Kolkata
16. Subcellular localization of interacting proteins in the symbiotic nodule of Lotus japonicus IPLS Conference 2015, January 31, 2015, CU Rowing Club
17. SUMOylation at K490 of Phosphatidylinositol-4-phosphate 5-Kinase 1 Modulates G2/M Transition and its Association with Spindle Poles. 3rd International Meet on Advanced Studies on Cell Signaling Network 2016 (CeSiN-2016), 18-20th December, 2016, IICB, Kolkata
18. Role of Dok-3, an adapter protein, inCSF-1signaling in macrophages. International Congress of Cell Biology 2018: The Dynamic Cell: Molecules and Networks to Form and Function; A Joint meeting of ISCB, APOCB and IFCB.CSIR-Centre for Cellular & Molecular Biology, Hyderabad, India, Jan 27<sup>th</sup> to 31<sup>st</sup>, 2018
19. Nodulin16 of Lotus japonicas is crucial for the recruitment of Leghemoglobin to the membrane in infected nodule cells during symbiotic nitrogen fixation. ‘When Science Meets Life’ A Symposium of the Society of Biological Chemists (I), Kolkata Chapter on 10.04.2022
20. Nodulin16 of Lotus japonicas is crucial for the recruitment of Leghemoglobin to the membrane in infected nodule cells during symbiotic nitrogen fixation. ‘Frontiers in Plant Science Research’ A National Symposium, organized by Archana Sharma Foundation of Calcutta in Collaboration with Dept. of Botany on 10.06.2022
21. 92nd Annual meeting of the Society of Biological Chemists (I) held at Goa from December 18-20, 2023 Poster entitled “Etoposide induced interaction of  $\gamma$ -Tubulin with nucleolar phosphoprotein NPM/B23 and p53Ser15 p in the nucleus of HEK 293 cells”

22. 2<sup>nd</sup> international conference on 'Physiology to Pathology: Finding the Therapeutic Roadmap' Amity University, Kolkata; Date: 7-9th March, 2024. Name of Poster: Membrane Galactolipid shows enhanced expression in root nodules of *Lotus japonicus* during symbiotic nitrogen fixation.

## 12. Membership of Learned Societies:

Life Member: Society for Biological Chemists, India Indian Society for Cell Biology

Yearly: ASBMB

## 13. Patents:

Sl No.	Patent Title	Name of Applicant(s)	Patent No.	Award Date	Agency/Country	Status
1	Mouthwash/oral care formulatuion involving a non-invasive antimutagenic agent	S. N. Bose National Centre for Basic Sciences	969/KOL/2011	----	Indian Patent	Pending
2	Tartrate functionalized La.67Sr.33MnO3 Nanoparticles, its Manner of Manufacture and Biomedical probe	S.N.Bose National Centre For Basic Sciences	979/KOL/2011	-----	Indian Patent	Pending

## 14. Invited lectures delivered:

S.No.	Title of Lecture/Academic Session	Title of conference /Seminar etc	Organised by	Whether International/ National
1	Co-Chair of Session Chemical Biology–II November 11, 2012	81st Annual General Meeting of SBC(I), 2012	SBC(I)	National
2.	Course Coordinator National workshop on Imaging	March 20-22, 2013	DBT-CU-IPLS, University of Calcutta	National
3.	Co-Chair of Session on Biomedical Sciences (Part2)	IPLS Conference-2014 January 10-12, 2014	DBT-CU-IPLS University of Calcutta	National
4.	Co-Chair of Session On Biomedical Sciences	IPLS Conference 2015, January 31, 2015	DBT-CU-IPLS University Of Calcutta	National

5.	Invited Lecturer & Hands-on demonstrator	National Workshop On Fluorescence Microscopy	University Science Instrumentation Centre & Department of Microbiology, The University of Burdwan, 1 <sup>st</sup> September, 2015	National
6	Invited Lecturer "Visualization of Cell"	100 years lecture series in the Department of Biochemistry, Asutosh College, Kolkata on 4 <sup>th</sup> February, 2016	Department of Biochemistry, Asutosh College, Kolkata	National
7.	Invited Lecturer "Visualization of Cell: The basic unit of life"	150 years lecture series in the Department of Biochemistry, Vidyasagar College, Kolkata on May, 2016	Department of Biochemistry, Vidyasagar College, Kolkata	National
8.	Invited Lecturer "Visualization of Cell: The basic unit of life"	Ph.D. Course work (Resource person) September 2016	Department of Biochemistry, West Bengal State University	National
9.	Invited Lecturer Power of 'Sumo'-A Post-Translational Modification Lecture Delivered on January 02, 2017	Refresher Course in Life Sciences (thrust area: Challenges and Options in Life Science Research in the developing World today, Dec.23-Jan.13, 2017	Human Resource Development Centre/Academic Staff College, University of Calcutta	National

10.	Co-Chair of Session1	CAS-Phase II sponsored One day Symposium on “Emerging Trends in Biology” March 17, 2017	CAS-Phase II sponsored One day Symposium, Department of Biochemistry, University of Calcutta	National
11	Invited Lecturer Centrosome & its Significance	Short Term Course On Modern Biology In the Department of Zoology University of Calcutta October, 2018	Department of Zoology, University of Calcutta and Human Resource Development Centre/Academic Staff College, University of Calcutta	National
12	Invited Lecturer Methodology And its applications for undergraduate Course in Zoology Honours Under CBCS system	Workshop on Methodology And its applications for undergraduate Course in Zoology Honours Under CBCS system January 19, 2019	Dept. of Zoology, Hooghly Mohsin College and Dept of Higher Education, Govt of West Bengal	National
13	Invited Lecturer History of Cell Cycle: ‘Circle of Life’	IDC in Life Sciences	UGC-HRDC, University of Calcutta Department of Botany, University of Calcutta January 04-17, 2020	National
14	Invited Lecturer Early Days of Metabolic Biochemistry	Webinar on Journey from Biomolecules to Covaxin	Department of Biochemistry, Asutosh College 2 <sup>nd</sup> November 2020	National



15	Invited Lecturer History of Cell Cycle: 'Circle of Life'	Refresher Course in Life Sciences (Interdisciplinary)	UGC–Human Resource Development Centre, University of North Bengal 03.03.2021 to 16.03.2021	National
16	Invited Lecturer Visualizing a Cell Tools and Techniques	Inter/Multidiscip linary Refresher Course in Life Sciences Jan 05-20, 2022	UGC Human Resource Development Centre (HRDC) And Department of Physiology University of Calcutta January 08, 2022	National
17	Chair of a session: Looking beyond academia: Opportunities and challenges	National level workshop on entrepreneurship and career options in Industrial R & D sectors February 02, 2024	Department of Biochemistry, University of Calcutta Supported by: DBT-Builder program, University of Calcutta	National

### 15. Awards:

Junior and Senior Research Fellowship from CSIR upon qualified National Eligibility Test (NET), 1987  
 Research Assistantship from UNDP at Indian Institute of Chemical Biology 1993-1994  
 Belfer Fellow: 1996-2002 Albert Einstein College of Medicine, Bronx, New York-10461

### 16. Other notable activities:

#### Administrative Positions:

Chairperson UGBOS in Biochemistry, University of Calcutta, (2012-till date); Member of UGBOS in Biochemistry (2008-2012)

Member of UGBOS in Environmental Sciences (2008-tilldate)

Member of Ph.D. RAC, Department of Biochemistry, University of Calcutta (September 2015-till date)

HOD Department of Biochemistry, University of Calcutta 18<sup>th</sup> January 2021 17<sup>th</sup> January, 2023

HOD (Interim) Department of Biochemistry, University of Calcutta (4<sup>th</sup> July-8<sup>th</sup> August, 2012; 10<sup>th</sup> February-27<sup>th</sup> April, 2014)

*Asiddhanta*

*Signature of the faculty member*

*Date: 03.07.2024*