

# Curriculum Vitae



**Chiranjit Ghosh, Ph.D.**

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## Assistant Professor

Department of Biotechnology

Manipal Institute of Technology,

DOB: Jan 10, 1988

Manipal Academy of Higher Education (Manipal University)



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## Academic Journey:

Degree / Designation	Board / University	Year of passing	Subject
Bachelor of Science	University of Calcutta	2009	Chemistry
Master of Science	West Bengal State University, India	2011	Chemistry (Spl in physical chemistry)
Ph.D.	S. N. Bose National Centre for Basic Sciences, India (Registered to University of Calcutta)	2012-2018	Chemistry
Postdoctoral Research Fellow	University of Waterloo, Canada	Apr, 2018- Jan, 2020 (1 yr 10 month)	Analytical Chemistry
Postdoctoral Research Fellow	Harvard Medical School & Mass General Brigham, Harvard University, USA	Feb. 2020- Dec 2022 (2yr 11 month)	Analytical Chemistry

## **Research Area:**

Analytical Chemistry, Mass Spectrometry, Clinical Chemistry, Material Chemistry, Sample Preparation, Medical Diagnosis, Infectious Diseases

## **Research at University of Waterloo, Canada**

During my first postdoc in Pawliszyn's group, my research works mainly focused on the development of micro-sorbent devices exploiting solid phase micro-extraction (SPME) and needle trap (NT) technology for real-time analysis of volatile organic compounds (VOCs) from breath for evaluation of human health and a variety of disease states.

## **Research at Harvard, USA:**

I worked at the Koo lab (dept of infectious diseases) on the animal model to identify novel volatile biomarkers of specific fungal and bacterial infections and examine the dynamics of these metabolites with antibiotic or antifungal therapy

## **Academic Achievement:**

- Qualified Graduate Aptitude Test in Engineering (**GATE**), **2013**
- Received “**University Grant Commission-Basic Scientific Research Fellowship in Science and for Meritorious Students**” **2011-2012**
- Qualified in all India based “**BOSE TEST**”, **2012** examination for pursuing PhD programme organized by S. N. Bose National Centre for Basic Sciences under the Department of Science and Technology, Govt. of India.
- Selected for PhD programme in S. N. Bose National Centre for Basic Sciences, 2012
- Selected for PhD programme in Department of Chemistry, Jadavpur University, 2011

## **Teaching Experience:**

- Guest Lecturer in Physical Chemistry (June 2011-July 2012): Asutosh College, University of Calcutta

## **Editorial Position:**

- **Topic Editor** (2020-present)

'Separations' international scientific journal, MDPI publishing group, Basel, Switzerland

[https://www.mdpi.com/journal/separations/topic\\_editors](https://www.mdpi.com/journal/separations/topic_editors)

Potential reviewer for scientific journals like *Analytica Chimica Acta* (Elsevier), *Sensors* (MDPI), *Metabolites* (MDPI), *Journal of Breath Research* (IOP) etc.

### Research Awards & Honors:

SL. No.	Award/Prize Name	Conference/Organizer	Year	Place
1.	<b>Young Investigator Award</b>	European Society for Endocrinology	2019	Lyon, France
2.	<b>Best Oral Paper Presentation</b>	International Diabetes Summit-2017	2017	Pune, India
3.	<b>Best Paper Award</b>	National Annual Conference of Hypertension Society of India	2017	Kolkata, India
4.	<b>SIGMA-ALDRICH Excellent Poster Award</b>	International Conference of the Korean Society for Molecular and Cellular Biology	2016	South Korea
5.	<b>IFCC-TFYS Young Scientists Award</b>	International Federation of Clinical Chemistry	2016	Mangalore, India
6.	<b>Student Travel Award</b>	14 <sup>th</sup> Asia Specific Federation for Clinical Biochemistry and Laboratory Medicine Congress	2016	Taiwan
7.	<b>DR. C. SITA DEVI AWARD</b>	Association of Clinical Biochemists of India	2015	Chandigarh, India
8.	<b>2<sup>nd</sup> Best Prize for Oral Presentation</b>	9 <sup>th</sup> Annual Conference of RSSDI Maharashtra Chapter	2015	Pune, India
9.	<b>One of the Best Six Research Papers Award</b>	4 <sup>th</sup> Annual Conference of the Integrated Diabetes & Endocrine Academy	2015	Kolkata, India
10.	<b>Best Innovation Research Idea Award</b>	Research Society for the Study of Diabetes in India	2014	Bangalore, India
11.	<b>One of the Best Poster Prize</b>	41 <sup>st</sup> Annual Conference of the	2014	Jodhpur

		Association of Clinical Biochemists of India		AIIMS, India
12.	<b>Best Poster Presentation</b>	Satyendra Nath Bose National Centre for Basic Sciences	2013	Kolkata, India

### Travel Grants and Awards:

- **Young Scientist Travel Grant** (Letter No. ITS/3239/ 2015-2016) from Department of Science & Technology, Govt. of India for presenting my research work in International Conference (**IABR SUMMIT 2015, Austria**)
- **Young Scientist International Travel Grant Award** from Korean Society for Molecular and Cellular Biology, **South Korea** (ICKSMCB-2016)
- **International Student Travel Award** by 14<sup>th</sup> Asia-Pacific Federation for Clinical Chemistry and Laboratory Medicine Congress, **Taiwan**
- **International Travel Grant** by The 5th Seoul International Congress of Endocrinology and Metabolism 2017, **South Korea** (**SICEM 2017**)
- **International Travel Grant** by Korean Diabetes Association, **South Korea, 2017** (**ICDM-2017**)

### Patents:

SL. No.	Title of the invention	File No.	Inventors	Status	Country
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1	“Dioxo vanadium (V) complex as carbonic anhydrase inhibitor”	<b>Granted on</b> <b>19/06/2020</b> Patent No. 338829 Application No. 201631038296	<b>1. Chiranjit Ghosh</b> 2. Manik Pradhan 3. Debashis Patra 4. Tapas Ghosh	<b>Granted</b>	India (2016)
2	“A System for monitoring hemodialysis efficacy of a subject”	<b>Granted on</b> <b>16/05/2023</b> Patent No. 431879 <b>File No.</b> <b>201731042502</b>	<b>1. Chiranjit Ghosh</b> <b>2. Santanu Mandal</b> 3. Manik Pradhan	<b>Granted</b>	India (2017)
4	“System and kit for monitoring blood glucose profile based on breath analysis”	<b>Granted</b> <b>On 26/05/2023</b> Patent No. 432954 <b>File No.</b> <b>201631003758</b> Published on: 04/03/2016	<b>1. Chiranjit Ghosh</b> 2. Manik Pradhan	<b>Granted</b>	India (2016)
3	“Mixed use binder for solid phase microextraction coatings”	US Patent Application (provisional) <b>16/704426</b>	<b>1. Chiranjit Ghosh</b> 2. Varoon Singh 3. Jonathan Grandy 4. Janusz Pawliszyn	Filed from Canada	USA (2020)

## Peer-Reviewed Journal Publications

	<b>Title</b>	<b>Authors</b>	<b>Journals</b> (Page/Vol/Yr)	<b>Publishers</b>
1	“Simultaneous determination of exhaled breath vapor and exhaled breath aerosol using filter-incorporated needle-trap devices: A comparison of gas-phase and droplet-bound components”	S.Zeinali, <b>C. Ghosh</b> and J. Pawliszyn.	<i>Analytica Chimica Acta</i> , 1203:339671, <b>2022</b>	Elsevier
2	“A family of amphiphilic dioxidovanadium (V) hydrazone complexes as potent carbonic anhydrase inhibitors along with anti-diabetic and cytotoxic activities”	<b>C. Ghosh</b> , D. Patra, N. Bala, I. Majumder, N. Sepay, P. Mukhopadhyay, S. Das, R. Kundu, M. Drew, A. León, T. Ghosh, M. Pradhan	<i>BioMetals</i> 35(3):499-517, <b>2022</b>	Springer
3	“Breath-Based Diagnosis of Infectious Diseases: A Review of the Current Landscape”	<b>C. Ghosh</b> , A. Leon, S. Koshy, O. Aloum, Y. Al-Jabawi, N. Ismail, Z. Weiss and S. Koo	<i>Clinics in Laboratory Medicine</i> 185, 41, <b>2021</b>	Elsevier
4	“Development and validation of a headspace needle-trap method for rapid quantitative estimation of butylated hydroxytoluene from cosmetics by hand-portable GC-MS”	<b>C. Ghosh</b> , V. Singh, J. Grandy and J. Pawliszyn	<i>RSC Advances</i> 6671, 10, <b>2020</b>	Royal Society of Chemistry
5	“Recent advances in breath analysis to track human health by new enrichment technologies”	<b>C. Ghosh</b> , V. Singh, J. Grandy and J. Pawliszyn	<i>Journal of Separation Sciences</i> 226, 43, <b>2019</b>	John Wiley & Sons, Ltd
6	“Isotope-specific breath analysis to track the end-stage renal disease during hemodialysis”	S. Mandal, P. Mukhopadhyay, <b>C. Ghosh</b> , M. Pal, G. D. Banik, T. Chatterjee, S. Ghosh and M. Pradhan	<i>Journal of Breath Research</i> 12:036019, <b>2018</b>	Institute of Physics (IOP)
7	“Isotopic evidences of the preferential coordination between <sup>12</sup> CO <sub>2</sub> and urease enzyme”	S. Maithani, A. Maity, M. Pal, S. Bhattacharya, G. D. Banik, <b>C. Ghosh</b> , S. Chaudhuri and M. Pradhan	<i>Chemical Physics</i> 21, 520, <b>2019</b>	North-Holland
8	“New strategy for in-vitro determination of carbonic anhydrase activity from analysis of oxygen-18 isotopes of CO <sub>2</sub> ”	<b>C. Ghosh</b> , S. Mandal, M. Pal and M. Pradhan	<i>Analytical Chemistry</i> 1384, 90, <b>2018</b>	American Chemical Society

9	“Non-invasive diagnosis of type 2 diabetes in <i>Helicobacter pylori</i> infected patients using isotope-specific infrared absorption measurements”	S. Som, G. Banik, A. Maity, C. Ghosh, S. Chaudhuri and M. Pradhan.	<b>Isotopes in environmental and health studies</b> , 54, 435-445, <b>2018</b>	Taylor & Francis
10	<sup>13</sup> C-isotope abundance in natural nutrients: a new formulated test meal for non-invasive diagnosis of type 2 diabetes”	C. Ghosh, S. Mandal, M. Pal, P. Mukhopadhyay, S. Ghosh and M. Pradhan	<i>Journal of Breath Research</i> 026005, 11, <b>2017</b>	Institute of Physics (IOP)
11	“Targeting erythrocyte carbonic anhydrase and <sup>18</sup> O-isotope of breath CO <sub>2</sub> for sorting out type 1 and type 2 diabetes”	C. Ghosh, S. Mandal, G. D Banik, A. Maity, P. Mukhopadhyay, S. Ghosh and M. Pradhan	<i>Scientific Reports</i> 1-8, 6, <b>2016</b>	Nature Publishing Groups (NPG)
12	“Moisture induced isotopic carbon dioxide trapping from ambient air”	S. Das, C. Ghosh and S. Jana.	<i>Journal of Materials Chemistry A</i> , 7632-7640, 4, <b>2016</b>	Royal Society of Chemistry (RSC)
13	“Insulin sensitivity index (ISI <sub>0, 120</sub> ) potentially linked to carbon isotopes of breath CO <sub>2</sub> for pre-diabetes and type 2 diabetes”	C. Ghosh, P. Mukhopadhyay, S. Ghosh and M. Pradhan	<i>Scientific Reports</i> 1-9, 5, <b>2015</b>	Nature Publishing Groups (NPG)
14	“Oxygen-18 isotope of breath CO <sub>2</sub> linking to erythrocytes carbonic anhydrase activity: a biomarker for pre-diabetes and type 2 diabetes”	C. Ghosh, G. D. Banik, A. Maity, S. Som, A. Chakraborty, C. Selvan, S. Ghosh, S. Chowdhury and M. Pradhan	<i>Scientific Reports</i> 5, 8137, <b>2015</b>	Nature Publishing Groups (NPG)
15	“Halloysite nanotubes capturing isotope selective atmospheric CO <sub>2</sub> ”	S. Jana, S. Das, C. Ghosh, A. Maity and M. Pradhan	<i>Scientific Reports</i> , 1-8, 5, <b>2015</b>	Nature Publishing Groups (NPG)
16	“Mechanisms linking metabolism of <i>Helicobacter pylori</i> to <sup>18</sup> O and <sup>13</sup> C-isotopes of human breath CO <sub>2</sub> ”	S. Som, A. De, G. D. Banik, A. Maity, C. Ghosh, M. Pal, S. B Daschakraborty, S. Chaudhuri, S. Jana and M. Pradhan	<i>Scientific Reports</i> 1-5, 9, <b>2015</b>	Nature Publishing Groups (NPG)
17	“Non-invasive <sup>13</sup> C-glucose breath test using residual gas analyzer-mass spectrometry: a novel tool for screening individuals with pre-diabetes and type 2 diabetes”	C. Ghosh, A. Maity, G. D. Banik, S. Som, A. Chakraborty, C. Selvan, S. Ghosh, B. Ghosh, S. Chowdhury and M. Pradhan	<i>Journal of Breath Research</i> 036001, 8, <b>2014</b>	Institute of Physics (IOP)
18	“Residual gas analyzer-mass spectrometry for	A. Maity, G. D. Banik, C. Ghosh, S. Som, S.	<i>Journal of Breath Research</i>	Institute of Physics

	human breath analysis: a new tool for the non-invasive diagnosis of Helicobacter pylori infection”	Chaudhuri, S. B Daschakraborty, S. Ghosh, B. Ghosh, A. K. Raychaudhuri and M. Pradhan	016005, 8, 2014	(IOP)
19	"Oxygen-18 stable isotope of exhaled breath CO <sub>2</sub> as a non-invasive marker of Helicobacter pylori infection"	A. Maity, S. Som, C. Ghosh S. Som, A. Chakraborty, C. Selvan, S. Ghosh, S. Chowdhury, M. Pradhan	<b>Journal of Analytical Atomic Spectrometry</b> , 2251, 29, 2014	Royal Society of Chemistry (RSC)
20	“Excretion kinetics of <sup>13</sup> C-urea breath test: influences of endogenous CO <sub>2</sub> production and dose recovery on the diagnostic accuracy of Helicobacter pylori infection”	S. Som, A. Maity, G. Banik, C. Ghosh, S. Chaudhuri, S. B. Daschakraborty, S. Ghosh and M. Pradhan.	<b>Analytical and Bioanalytical Chemistry</b> , 5405, 406, 2014	Springer
21	“Diagnosis of small intestinal bacterial overgrowth in irritable bowel syndrome patients using high-precision stable <sup>13</sup> CO <sub>2</sub> / <sup>12</sup> CO <sub>2</sub> isotope ratios in exhaled breath”	G. Banik, A. Maity, S.Som, C. Ghosh, S. Daschakraborty, S. Chaudhuri, S. Ghosh and M. Pradhan.	<b>Journal of Analytical Atomic Spectrometry</b> , 29, 1918, 29, 2014	Royal Society of Chemistry (RSC)

### Preprint Publication:

1. V.Singh, C. Ghosh, A. Kaur and J. Pawliszyn. Polyvinylidene Difluoride: A Universal Binder for Preparation of Solid Phase Microextraction Devices. *ChemRxiv* DOI: 10.26434/chemrxiv.12959885.v1

### Conference Proceedings:

1. C. Ghosh and M.Pradhan. 21st European Congress of Endocrinology, France. Endocrine Abstracts (2019) 63 OC2.3 | DOI: 10.1530/endoabs.63.OC2.3. ISSN 1470-3947 (print) | ISSN 1479-6848 (online)
2. C. Ghosh, P. Mukhopadhyaya, S. Ghosh and M. Pradhan. Abstracts of 43rd National Conference of Association of Clinical Biochemists of India (ACBICON 2016). *Ind J Clin Biochem* 31, 1–129 (2016). <https://doi.org/10.1007/s12291-016-0628-z>
3. M. Pradhan, G. D. Banik, A. Maity, C. Ghosh and S. Som. BRNS National Laser Symposium Kiran, *Helicobacter* 2 2 2013
4. C. Ghosh, S. Chowdhury, S. Ghosh and M. Pradhan. *Indian J Clin Biochem.* 2014 Dec; 29(Suppl 1): 1–152. Published online 2015 Jan 6. doi: 10.1007/s12291-014-0471-z



5. **C. Ghosh**, P. Mukhopadhyay, S. Ghosh and M. Pradhan. *Ind J Clin Biochem* (2015) 30 (Suppl 1):S1–S131 DOI 10.1007/s12291-015-0537-6.
6. **C. Ghosh**, S. Ghosh, S. Chowdhury and M. Pradhan. *Int J Diabetes Dev Ctries* (December 2015) 35 (Suppl 4):S535–S611, DOI 10.1007/s13410-016-0469-6

### **Scientific Meetings Presented:**

1. **Invited Speaker** presentation in dept. seminar of chemistry in "**Indian Institute of Technology, Palakkad**", **India**, 2022
2. **Lecture series** presentation in dept. seminar of chemistry at "**Indian Institute of Technology, Goa**", **India**, 2022
3. **Invited Speaker presentation** in dept. seminar of chemistry in "**Indian Institute of Technology, Goa**", **India**, 2022
4. **Oral Paper presentation** at the annual conference of "**American Society for Mass Spectrometry**" Conference, **Atlanta, USA**, 2019
5. Nominated and presented for "**Young Investigator Award**" in the annual conference of the European Society for Endocrinology, **Lyon, France**, 2019
6. **Oral Paper Presentation** in 5th Seoul International Congress of Endocrinology and Metabolism 2017, **South Korea**.
7. **Oral Paper Presentation** in International Diabetes Summit-2017, **Pune India**, 2017
8. **Poster Paper Presentation** in the "International Congress of Diabetes and Metabolism", **South Korea**, 2017
9. **Oral Paper Presentation** in the "National Annual Conference of Hypertension Society of India", **Kolkata, India**, 2017
10. Nominated and presented for "**Sun Pharma Science Scholar Awards-2017**", **New Delhi, India**, 2017
11. **Poster Paper Presentation** in the "7th World Congress of Diabetes-DiabetesIndia 2017", **New Delhi**, 2017
12. **Oral Paper Presentation** in the "14th Asia Specific Federation for Clinical Biochemistry and Laboratory Medicine Congress", **Taipei, Taiwan**, 2016
13. **Poster Paper Presentation** in the "International Conference of the Korean Society for Molecular and Cellular Biology", **Seoul, South Korea**, 2016
14. Nominated and presented for the "**IFCC-TFYS Young Scientists Award**" in the annual conference of "Association of Clinical Biochemists of India", **Mangalore, India**, 2016
15. **Poster Paper Presentation** in the "44th Annual Conference of Research Society for the Study of Diabetes in India", **Lucknow, India**, 2016
16. **Oral Paper Presentation** in the "71st Annual Conference of the Association of Physicians of India", **Hyderabad**, 2016
17. **Oral Paper Presentation** in the institutional conference of "**S. N. Bose National Centre for Basic Science**", **Kolkata, India**, 2016

18. **Oral Paper Presentation** in the annual conference of Vivekananda Institute of Medical Sciences, Kolkata, India, 2016
19. **Poster Paper Presentation** in "Optics Within Life Sciences Conference", TIFR Mumbai, India, 2016
20. Nominated and presented for the "**SITA DEVI AWARD**" in the "42nd annual conference of Association of Clinical Biochemists of India", Chandigarh, India, 2015
21. **Poster Paper Presentation** in the "International Association of Breath Research Summit", Vienna, Austria, 2015
22. **Short Paper Award** Session presentation (oral) in the annual conference of "Integrated Diabetes & Endocrine Academy", Kolkata, India, 2015
23. **Poster Paper Presentation** in the "6th World Congress of Diabetes-DiabetesIndia", Chennai, 2015
24. **Oral Paper Presentation** in the 9th annual conference of "RSSDI Maharashtra Chapter", Pune, India, 2015
25. **Poster Paper Presentation** in "Recent Trends and Perspective in Chemistry-2015" conference, Sikkim, India, 2015
26. Oral Paper Presentation in "**New Idea session**" in the 29th Annual Scientific Conference of Vivekananda Institute of Medical Science, Kolkata, 2015
27. **Poster Paper Presentation** in the 41st annual conference of the Association of Clinical Biochemists of India, Jodhpur AIIMS, India, 2014
28. **Poster Paper Presentation** in the annual conference of Research Society for the Study of Diabetes in India", Lucknow, India, 2016
29. Nominated and presented at the "**Innovation Award Category**" of research ideas in the "Conclave of Research Society for the Study of Diabetes," Bangalore, India, 2014
30. **Poster Paper Presentation** in "S. N. National Centre for Basic Science", Lucknow, India, 2016
31. **Oral Paper Presentation** in the 3rd Annual Conference of the Integrated Diabetes & Endocrine Academy, Kolkata, India, 2014