

Curriculum Vitae

Sanghamitra Bandyopadhyay, Ph. D.

Senior Principal Scientist

**CSIR-Indian Institute of Toxicology Research (IITR), Lucknow,
India**



Area of Specialization: Neurobiology; focusing on neurotoxicology and neuro-degeneration.

Teaching: Coordinating AcSIR-teaching course of “Research Methodology” at CSIR- IITR

Ph. D. students (completed): Degree awarded-8

Currently registered PhD students: 6

Editorial Board member: Current Aging Science; Toxicological Sciences

Extramural grants as independent PI: (Detail list below)

Ongoing: 4; CRG-SERB (PI), SUPRA-SERB (Co-PI), DBT (PI) and ICMR (PI).

Completed: 5; SERB-3 (PI), DBT-1 (PI) and ICMR-1 (PI)

Honor: One amongst the 75 Indian Women selected from STEAM (Science, Technology, Engineering, Arts and Mathematics), honored by the Office of the Principal Scientific Adviser, Govt. of India and The British High Commission.

Ongoing

1. SERB (PI)-CRF: Hippocampal E2, neuronal dysfunctions and sexual dimorphism in adult rats: Effects of chronic arsenic exposure; Sanctioned Rs 47,08,240, March-2021-2024.

2. SERB-SUPRA (Co-PI): Anti-gerogenic Therapy to Augment Lifespan and Health span by Bioactive Peptides from Rasayana Herbs: Generation of PaC for the First-in-class Ayurveda-based Peptides; Sanctioned Rs 15,93,000, August 2020-2023.

3. DBT (PI): 70 Lakhs; Study on the Intergenerational Effect of Maternal Vitamin D3 Deficiency on Cognition and Hippocampal Neurons in Rats; Sanctioned Rs 68,35,024, August 2021-2024.

4. ICMR (PI): Hippocampal E2, cognition loss and sexual dimorphism in adult rats: A comparative study on chronic Bisphenol S, F and A exposures; Sanctioned Rs 60,00,000, January 2022-2025.

Completed

5. SERB (PI): To study the role of Gpr40 and PPAR γ signaling induced by Docosahexaenoic Acid in alleviating heavy-metal(s) mediated astrocyte damage in the developing brain- Rs 30,67,000, June 2017-2020.

6. SERB (PI): Mechanism of white matter damage by a mixture of As, Cd and Pb: Investigating the role of glutamate metabolism during CNS development; Rs 48,48,000, May 2014- 2017

7. DBT (PI): 60 lakhs; Mechanism underlying white matter damage by metals during brain

development: Role of glia-neuron interaction-Rs 64,00,000, June 2014-November 2017

8. DST (PI): 20 Lakhs; Characterisation of pathogenic mechanism of action of metal mixture on neurodevelopment-2009-2012

9. ICMR (PI): 40 Lakhs; Characterisation of the protective role of omega3 fatty acid against neurodevelopmental damage in metal mixture exposed rat model-2009-1012

10. Empower (PI; CSIR-competitive grant): 50 lakhs Unraveling New Pathobiological Mechanism of Developmental Brain Damage by Environmental Toxicants-2010-2013.

Patent: “**Model of Alzheimer’s disease**”, European patent granted; **No. 0036NF2013-EP**

- **Brief CV:** I have obtained Ph. D. from Calcutta University, India in 2001. I pursued my post- doc. at the Department of Psychiatry, Harvard University, Boston, USA in the field of neurodegeneration. Returning to India, I joined as Scientist (Independent Investigator, Govt. of India) at CSIR-Indian Institute of Toxicology Research, Lucknow in 2007. Currently I hold the position of a Principal Scientist at the CSIR-Indian Institute of Toxicology Research, Lucknow. My major research interests are Neurobiology, with special emphasis on Neurodegeneration and Developmental neurotoxicology. Basic mechanisms in Alzheimer’s disease are major research pursuits of mine. Additionally, determination/characterization of cellular pathogenic mechanism of action in developmental neurotoxicity and their neurobehavioral consequences are my interests. Animal and cell culture-based studies are performed in my laboratory, identifying histopathological and mechanism-based work.

Publications

1. Arsenic Induces GSK3 β -Dependent p-Tau, Neuronal Apoptosis, and Cognitive Impairment via an Interdependent Hippocampal ER α and IL-1/IL-1R1 Mechanism in Female Rats. Keerti Gupta, Jitendra Vishwakarma, Asmita Garg, Rukmani Pandey, Veena Jain, Raksha Gupta, Uttara Das, Somendu Roy and Sanghamitra Bandyopadhyay . Toxicol Sci. 2022 Oct 27;190(1):79-98. doi: 10.1093/toxsci/kfac087. Impact factor: 4.849

2. Role of Neuron and Glia in Alzheimer's Disease and Associated Vascular Dysfunction. BandyopadhyayS. Front Aging Neurosci.2021Jun15;13:653334. doi: 10.3389/fnagi.2021.653334. eCollection 2021. Impact factor: 4.504

3. Hypothyroidism Induces Interleukin-1-Dependent Autophagy Mechanism as a Key Mediator of Hippocampal Neuronal Apoptosis and Cognitive Decline in Postnatal Rats. Juhi Mishra, Jitendra Vishwakarma, Rafat Malik, Keerti Gupta, Rukmani Pandey, Shailendra Kumar Maurya, Asmita Garg, Manoj Shukla, Naibedya Chattopadhyay & Sanghamitra Bandyopadhyay. Mol Neurobiol 2020 Oct 26. doi: 10.1007/s12035-020-02178-9. Impact factor: 4.260

4. Estrogen deficiency induces memory loss via altered hippocampal HB-EGF and autophagy; Rukmani Pandey, Pallavi Shukla¹, B. Anjum, Himanshu Pawankumar Gupta, Subhashis Pal⁵, Nidhi Arjaria⁶, Keerti Gupta¹, Naibedya Chattopadhyay, *Rohit A. Sinha and *Sanghamitra Bandyopadhyay. *Journal of Endocrinology*; 2020 Jan 1;244(1):53-70. doi: 10.1530/JOE-19-0197. Impact factor: 4.381
5. Rosiglitazone up-regulates glial fibrillary acidic protein via HB-EGF secreted from astrocytes and neurons through PPAR γ pathway and reduces apoptosis in high-fat diet-fed mice. Kushwaha R, Mishra J, Gupta AP, Gupta K, Vishwakarma J, Chattopadhyay N, Gayen JR, Kamthan M, Bandyopadhyay S. *J Neurochem*. 2018 Oct 12. doi: 10.1111/jnc.14610. Impact factor: 4.609
6. Kumar H, Chattopadhyay S, Das N, Shree S, Patel D, Mohapatra J, Gurjar A, Kushwaha S, Singh AK, Dubey S, Lata K, Kushwaha R, Mohammed R, Dastidar KG, Yadav N, Vishwakarma AL, Gayen JR, Bandyopadhyay S, Chatterjee A, Jain MR, Tripathi AK, Trivedi AK, Chattopadhyay N, Ramachandran R, Sanyal S. Leprosy drug clofazimine activates peroxisome proliferator-activated receptor- γ and synergizes with imatinib to inhibit chronic myeloid leukemia cells. *Haematologica* 105:971-986, 2020. Imp. Factor: 7.116
7. Arsenic attenuates Heparin-binding EGF-like growth factor/EGFR signalling that promotes matrix-metalloprotease-9-dependent astrocyte damage in the developing rat brain; Rajesh Kushwaha, Juhi Mishra, Sachin Tripathi, Waseem Raza, Kapil Mandrah^{1,5}, Somendu Kumar Roy and *Sanghamitra Bandyopadhyay; *Toxicol. Sci.*; 2018 Apr 1;162(2):406-428. Imp. Factor: 4.081
8. Arsenic induces hippocampal neuronal apoptosis and cognitive impairments via an up-regulated BMP2/Smad-dependent reduced BDNF/TrkB signalling in rats; Rukmani Pandey, Vipin Rai, Juhi Mishra, Kapil Mandrah, Somendu Kumar Roy and *Sanghamitra Bandyopadhyay; *Toxicol. Sci.* 2017 Sep 1;159(1):137-158. doi: 10.1093/toxsci/kfx124. . Imp. Factor: 4.081
9. Docosahexaenoic acid up-regulates both PI3K/AKT-dependent FABP7-PPAR γ interaction and MKP3 that enhance GFAP in developing rat brain astrocytes; Tripathi S, Kushwaha R, Mishra J, Gupta MK, Kumar H, Sanyal S, Singh D, Sanyal S, Sahasrabuddhe AA, Kamthan M, Mudiam MK, *Bandyopadhyay S.; *J Neurochem*. 2017 Jan;140(1):96-113. doi: 10.1111/jnc.13879. Imp. Factor: 4.609.
9. Chronic cerebral hypoperfusion-induced impairment of A β clearance requires HB-EGF-dependent sequential activation of HIF1 α and MMP9; Ashok A, Rai NK, Raza W, Pandey R, *Bandyopadhyay S.; *Neurobiol Dis*. 2016 Jul 16;95:179-193. Imp. Factor: 5.227.
10. Arsenic, Cadmium, and Lead Like Troglitazone Trigger PPAR γ -Dependent Poly (ADP-Ribose) Polymerase Expression and Subsequent Apoptosis in Rat Brain Astrocytes. Kushwaha R, Mishra J, Tripathi S, Khare P, *Bandyopadhyay S. *Mol Neurobiol*. 2017 Mar 10. doi: 10.1007/s12035-017-0469-7. Imp. Factor: 5.076.
11. As, Cd and Pb-mixture induces synergistic A β pathology via amyloidogenic APP processing in developing rats: Role of oxidative stress, IL-1 and APP 5'UTR; Anushruti Ashok, Nagendra Kumar Rai, Sachin Tripathi and *Sanghamitra Bandyopadhyay. *Toxicol Sci*. 2015

Jan;143(1):64-80. doi: 10.1093/toxsci/kfu208. Imp. Factor: 4.081

12. Cypermethrin stimulates GSK3 β -dependent A β and p-tau proteins and cognitive-loss in young rats: Reduced HB-EGF signaling and downstream neuroinflammation as critical regulators; SK Maurya, J Mishra, S. Abbas, *S Bandyopadhyay. *Mol Neurobiol.* 2016 Mar; 53(2):968-82. Imp. Factor: 5.076.

13. Similarities in lindane induced alterations in protein expression profiling in different brain regions with neurodegenerative diseases. Mudawal A, Singh A, Yadav S, Mishra M, Singh PK, Chandravanshi LP, Mishra J, Khanna, K, Bandyopadhyay S, Parmar D. *Proteomics.* 2015 Nov;15(22):3875-82. Factor: 4.2.

14. Rai A, Tripathi S, Kushwaha R, Singh P, Srivastava P, Sanyal S, *Bandyopadhyay S. CDK5-induced p-PPAR γ (Ser 112) downregulates GFAP via PPREs in developing rat brain: effect of metal mixture and troglitazone in astrocytes.. *Cell Death Dis.* 2014 Jan 30;5:e1033. Imp. Factor: 5.638.

15. Bandyopadhyay S and Rogers JT. Alzheimer's disease therapeutics targeted to the control of amyloid precursor protein translation: maintenance of brain iron homeostasis. *Biochem Pharmacol.* 2014 Apr 15;88(4):486-94. doi: Imp. Factor: 4.235.

16. Rai NK, Ashok A, Rai A, Tripathi S, Nagar GK, Mitra K, *Bandyopadhyay S. Exposure to As, Cd and Pb-mixture impairs myelin and axon development in rat brain, optic nerve and retina. *Toxicol Appl Pharmacol.* 2013 Dec 1;273(2):242-58. Imp. Factor: 3.616.

17. S. Abbas, K. Khan, MP Khan, GK Nagar, D Tewari, SK Maurya, J Dubey, NG Ansari, *S Bandyopadhyay and N Chattopadhyay, Developmental exposure to As, Cd and Pb- mixture diminishes skeletal growth and causes osteopenia at maturity via osteoblast and chondrocyte malfunctioning in female rats. *Toxicol Sci.* 2013 Jul;134(1):207-20. Imp. Factor: 4.081

18. Bandyopadhyay S, Cahill C, Balleidier A, Huang C, Lahiri DK, Huang X, Rogers JT. Novel 5' untranslated region directed blockers of iron-regulatory protein-1 dependent amyloid precursor protein translation: implications for down syndrome and Alzheimer's disease. *PLoS One.* 2013 Jul 31;8(7):e65978. Imp. Factor: 2.766.

19. SK Maurya, A Rai, N Rai, S Deshpande, R Jain, MKR Mudiam, YS Prabhakar and *S Bandyopadhyay. Cypermethrin Induces Astrocyte Apoptosis by the Disruption of the Autocrine/Paracrine Mode of Epidermal Growth Factor Receptor Signaling. *Toxicological Sciences*, 125(2), 473–487 (2012). Imp. Factor: 4.081

20. MKR Mudiam, R Jain, SK Maurya, HA Khan, S Bandyopadhyay, RC Murthy; Low density solvent based dispersive liquid–liquid microextraction with gas chromatography– electron capture detection for the determination of cypermethrin in tissues and blood of cypermethrin treated rats; *Journal of Chromatography B*, 895– 896 (2012) 65– 70. Imp. Factor: 2.441

21. *Sanghamitra Bandyopadhyay, Xudong Huang, Debomoy K. Lahiri and *Jack T. Rogers Novel drug targets based on metallobiology of Alzheimer's Disease. *Expert Opinion on therapeutic targets*, 2010 Nov;14(11):1177-97. *corresponding authors. Imp. Factor: 4.598

22. Asit Rai, Shailendra Kr Maurya, Priyanka Khare, Abhinav Srivastava and Sanghamitra Bandyopadhyay. Characterization of Developmental neurotoxicity of As, Cd and Pb mixture: Synergistic Action of Metal Mixture in Glial and Neuronal Function. *Toxicological Sciences* Dec;118(2):586-601. 2010. Imp. Factor: 4.081
23. Sanghamitra Bandyopadhyay, Jacob Tfelt-Hansen and Naibedyia Chattopadhyay. Diverse roles of extracellular calcium-sensing receptor in the central nervous system. *Journal of Neuroscience Research*, Aug 1;88(10):2073-82, 2010. Imp. Factor: 2.662
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25. Sanghamitra Bandyopadhyay, Jose R. Romero and Naibedyia Chattopadhyay. Kaempferol and Quercetin Stimulate Granulocyte-macrophage colony-stimulating factor Secretion in Human Prostate Cancer Cells. *Molecular and Cellular Endocrinology*. 2008, 11;287(1-2):57-64. Imp. Factor: 3.563.
26. Naibedyia Chattopadhyay, Araceli Espinosa-Jeffrey, Jacob Tfelt-Hansen, Shozo Yano, Sanghamitra Bandyopadhyay, Edward M. Brown, Jean de Vellis. Calcium Receptor Expression and Function in Oligodendrocyte Commitment and Lineage Progression: Potential Impact on Reduced MBP in CaR-null Mice. *Journal of Neuroscience Research* 2008, 1;86(10):2159-67. Imp. Factor: 2.662
27. Sinha RA, Pathak A, Mohan V, Bandyopadhyay S, Rastogi L, Godbole MM. Maternal thyroid hormone: a strong repressor of neuronal nitric oxide synthase (nNOS) in rat embryonic neocortex. *Endocrinology*. 2008 Sep;149(9):4396-401. Imp. Factor: 3.961. 25
28. *S. Bandyopadhyay, L. E. Goldstein, D. K. Lahiri and *J. T. Rogers: Role of the APP non-amyloidogenic signaling pathway and targeting alpha-secretase as an alternative drug target for treatment of Alzheimer's disease. *Current Medicinal Chemistry* 14, 17 (2007).
*Corresponding authors. Imp. Factor: 3.519
29. S. Bandyopadhyay, X Huang, H H Cho, N Greig, M Youdeem, JT Rogers: Iron Chelation and Translation Repression via an Iron-responsive Element in the Alzheimer's Amyloid Precursor Protein Transcript. *Journal of Neural Transmission*. (Suppl 71-0/450, 2007). Imp. Factor: 2.776.
30. S. Bandyopadhyay, KH Jeong, JT Hansen, PM Vassilev, EM Brown, N. Chattopadhyay: Calcium-sensing receptor stimulates secretion of an interferon-gamma-induced monokine (CXCL10) and monocyte chemoattractant protein-3 in immortalized GnRH neurons. *Journal of Neuroscience Research* 85:882-895 (2007). Imp. Factor: 2.662
31. S. Bandyopadhyay, J Ni, A Ruggiero, K Walshe, M Rogers, N Chattopadhyay, M Glicksman, JT Rogers: A High-Throughput drug Screen targeted to the Alzheimer's amyloid

precursor protein mRNA 5'Untranslated region. *Journal of Biomolecular Screening* 11(5):469-80 (2006). (One of the 50 most frequently read articles, as in web site: <http://jbx.sagepub.com/reports/mfr1.dtl>). Imp. Factor: 2.49.

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33. S. Bandyopadhyay, JM Lion, R Manyavarri, S Huang, D Riccupero, S Kamel, J Romero, N. Chattopadhyay. Apigenin Potently Inhibits Osteoclastogenesis and Osteoclast Function by Acting at Multiple Levels in Bone cells. *Biochemical Pharmacology* 72(2):184- 97 (2006). Imp. Factor: 4.235.

34. S Tucker , M Ahl , HH Cho, S. Bandyopadhyay, GD Cuny , AI Bush , LE Goldstein, D Westaway, X Huang, Rogers JT. RNA therapeutics directed to the non coding regions of APP mRNA, in vivo anti-amyloid efficacy of paroxetine, erythromycin, and N-acetyl cysteine. *Curr Alzheimer Res.* 3(3):221-7 (2006). Impact factor: 3.289.

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39. S. Banik, S. Bandyopadhyay, S. Ganguly, D. Dan Effect of microwave irradiated *Methanosarcina barkeri* DSM-804 on biomethanation; *Bioresource Technology* 97(6):819- 23 (2006). Impact factor: 7.589

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41. S. Banik, S. Bandyopadhyay, S. Ganguly and S. Dan: Bioeffects of Microwave-A Brief Review. *Bioresource Technology*, 87, 155-159 (2003). Impact factor: 7.539

42. S. Bandyopadhyay, S Ghosh, S Chaudhuri and D. K. Bhattacharyya, Production of - Linolenic acid by *Rhizopus nigricans* SSSD - 8', *Journal of Oleo Science (Japan)*, vol. 50 (no.8), p. 641-647 (2001). Impact factor: 1.106
43. S. Bandyopadhyay, D.K.Bhattacharyya, K.Bandyopadhyay and S.Ghosh, Characterization of a Novel Lipase from the Soil isolate - *Burkholderia cepacia* SS- 16, *Journal of Japan Oil Chemists' Society*, vol.49 (no.2), p. 137-142 (2000). Impact factor: 1.106
44. S Chaudhuri, S. Ghosh and D. K. Bhattacharyya and S. Bandyopadhyay, Effect of Mustard Meal on the Production of Arachidonic Acid by *Mortierella elongata* SC – 208, *Journal of American Oil Chemists' Society*, vol.75, p.1053-1055 (1998). Impact factor: 1.541
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