

## **DR. ANIRUDDHA BANERJI**

### **Designation: Associate Professor**

Post Graduate Department of Biotechnology,  
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30, Mother Teresa Sarani, Kolkata-700016.

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### **Qualifications**

- B. Sc (Zoology Hons.), (1st class 1<sup>st</sup>) in 1998 from Presidency College, University of Calcutta.
- M. Sc. (Zoology), (1<sup>st</sup> class 1<sup>st</sup>, Gold Medallist) in 2000 from University of Calcutta.
- Ph. D. (Life Sciences) awarded in 2007 by Jadavpur University. Research pursued at Chittaranjan National Cancer Institute, Kolkata.
- Qualified NET (CSIR-JRF), (2000)

### **Areas of Interest**

Primary area of research interest: Cancer Biology

- Study of cell surface receptors and their roles in tumour biology.
- Study of cellular signalling pathways which are dysregulated to promote tumour metastasis.
- Study of matrix metalloproteinases (MMPs) and their roles in tumour metastasis.
- Study of anti-tumorigenic and anti-invasive effects of natural compounds.

Additional areas of research and academic interest include Wildlife Biology, Evolutionary Biology, Animal Behaviour and Ecology, Genetics and Genetic Analysis, Comparative Anatomy, Environmental Biology

## Honours and Awards

- Aparajita Memorial Medal, awarded by Presidency College, Kolkata for 1<sup>st</sup> place in B. Sc Zoology (Hons.), 1998.
- A.K. Bhowmick Memorial Medal, awarded by The Zoological Society, Kolkata for 1<sup>st</sup> place in B. Sc Zoology (Hons.) 1998, University of Calcutta.
- Medal from Calcutta University, for 1<sup>st</sup> place in M. Sc Zoology 2000, University of Calcutta.
- Adjudged Best Young Scientist in Molecular Biology and Genetics, at National Seminar on Dimensions in Zoological Research in Human Welfare, organized by Dept. of Zoology, University of Calcutta and The Zoological Society, Kolkata in collaboration with Zoological Survey of India, 2007.
- Award for Best Oral Presentation, at Symposium on Recent Trends in Cancer Research & Treatment, organized by Chittaranjan National Cancer Institute (Golden Jubilee Celebration), 2007.
- Included in India Cancer Researcher Database (ICRD), supported by the Department of Biotechnology, Government of India, 2011 onwards.
- Elected as Member of the Executive Committee, Zoological Society, Kolkata, 2015–2019.
- Elected as Member of the Sectional Committee of the Section of New Biology, Indian Science Congress, 2019-2020 and 2020-21.

## List of Publications

### Journals

- 1) **A. Banerji**. Membrane type matrix metalloproteinases – importance in tumour biology. *Science and Culture* (2004) vol. 70 pp. 105-107. (UGC-Approved Journal)
- 2) A. Mitra, J. Chakrabarti, **A. Banerji**, A. Chatterjee. Binding of  $\alpha 2$  monoclonal antibody to human cervical tumor cell (SiHa) surface  $\alpha 2\beta 1$  integrin modulates MMP-2 activity. *Gynecologic Oncology* (2004) vol. 94(1) pp. 33-39. (UGC-Approved Journal)

- 3) **A. Banerji**, J. Chakrabarti, A. Mitra, A. Chatterjee. Effect of curcumin on gelatinase A (MMP-2) activity in B16F10 melanoma cells. *Cancer Letters* (2004) vol. 211(2) pp. 235-242. (UGC-Approved Journal)
- 4) **A. Banerji**, J. Chakrabarti, A. Mitra, A. Chatterjee. Cell membrane-associated MT1-MMP-dependant activation of pro-MMP-2 in A375 melanoma cells. *Journal of Environmental Pathology, Toxicology and Oncology* (2005) vol. 24(1) pp. 3-17. (UGC-Approved Journal)
- 5) A. Mitra, J. Chakrabarti, **A. Banerji**, S. Das, A. Chatterjee. Culture of human cervical cancer cells, SiHa in the presence of fibronectin activates MMP-2. *Journal of Cancer Research and Clinical Oncology* (2006) vol. 132(8) pp. 505-513. (UGC-Approved Journal)
- 6) A. Mitra, J. Chakrabarti, **A. Banerji**, A. Chatterjee. Cell membrane-associated MT1-MMP dependent activation of MMP-2 in SiHa (human cervical cancer) cells. *Journal of Environmental Pathology, Toxicology and Oncology* (2006) vol. 25(4) pp. 655-666. (UGC-Approved Journal)
- 7) J. Chakrabarti, A. Mitra, **A. Banerji**, A. Chatterjee. Culture of human fibrosarcoma HT-1080 cells in presence of fibronectin activates MMP-2. *Journal of Environmental Pathology, Toxicology and Oncology* (2006) vol. 25(4) pp. 667-677. (UGC-Approved Journal)
- 8) A. Mitra, J. Chakrabarti, **A. Banerji**, A. Chatterjee, B.R. Das. Curcumin, a potential inhibitor of MMP-2 in human laryngeal squamous carcinoma cells HEP2. *Journal of Environmental Pathology, Toxicology and Oncology* (2006) vol. 25(4) pp. 679-690. (UGC-Approved Journal)
- 9) S. Das, **A. Banerji**, E. Frei, A. Chatterjee. Rapid expression and activation of MMP-2 and MMP-9 upon exposure of human breast cancer cells (MCF-7) to fibronectin in serum free medium. *Life Sciences* (2008) vol. 82(9-10) pp. 467-476. (UGC-Approved Journal)
- 10) **A. Banerji**, S. Das, A. Chatterjee. Culture of human A375 melanoma cells in the presence of fibronectin causes expression of MMP-9 and activation of MMP-2 in culture supernatants. *Journal of Environmental Pathology, Toxicology and Oncology* (2008) vol. 27(2) pp. 135-145. (UGC-Approved Journal)
- 11) S. Moulik, T. Sen, A. Dutta, **A. Banerji**, C. Ghosh, S. Das, A. Chatterjee. Phosphatidylinositol 3-Kinase and NF- $\kappa$ B Involved in Epidermal Growth Factor-Induced Matrix Metalloproteinase-9 Expression. *Journal of Cancer Molecules* (2008) vol. 4(2) pp. 55-60. (UGC-Approved Journal)

- 12) T. Sen, S. Moulik, A. Dutta, P.R. Choudhury, **A. Banerji**, S. Das, M. Roy, A. Chatterjee. Multifunctional effect of epigallocatechin-3-gallate (EGCG) in downregulation of gelatinase-A (MMP-2) in human breast cancer cell line MCF-7. *Life Sciences* (2009) vol. 84(7-8) pp. 194-204. (UGC-Approved Journal)
- 13) A. Dutta, T. Sen, **A. Banerji**, S. Das, A. Chatterjee. Studies on Multifunctional Effect of All-Trans Retinoic Acid (ATRA) on Matrix Metalloproteinase-2 (MMP-2) and Its Regulatory Molecules in Human Breast Cancer Cells (MCF-7). *Journal of Oncology* (2009) vol. 2009 Article ID 627840, 13 pages. (UGC-Approved Journal)
- 14) G. Maity, S. Fahreen, **A. Banerji**, P. Roy Choudhury, T. Sen, A. Dutta, A. Chatterjee. Fibronectin-integrin mediated signaling in human cervical cancer cells (SiHa). *Molecular and Cellular Biochemistry* (2010) vol. 336(1-2) pp. 65-74. (UGC-Approved Journal)
- 15) **A. Banerji**. The gelatinases and their role in tumour invasion. *International Journal of Biology, Pharmacy and Allied Sciences* (2012) vol. 1(7) pp. 1003-1011. (UGC-Approved Journal)
- 16) S. Das, I. Guha, A. Chatterjee, **A. Banerji**. Anti-cancer Potential of All-trans Retinoic Acid (ATRA): A Review. *Proceedings of the Zoological Society* (2013) vol. 66(1) pp. 1-7. (UGC-Approved Journal)
- 17) **A. Banerji**, A. Majumder, A. Chatterjee. Stem Cells and Cancer: the Cancer Stem Cell (CSC) Model. *Journal of Tumor* (2015) vol. 3(3) pp. 349-355. (UGC-Approved Journal)
- 18) **A. Banerji**, A. Majumder. All-Trans Retinoic Acid Downregulates Epidermal Growth Factor Receptor Mediated Regulation of Matrix Metalloproteinase-2 in B16F10 Murine Melanoma Cells. *Annual Research & Review in Biology* (2016) vol. 10(5) pp. 1-8. (UGC-Approved Journal)
- 19) A. Majumder, **A. Banerji**. Epidermal Growth Factor Receptor Regulates Matrix Metalloproteinase-2 Activity in MDA-MB-231 Human Breast Cancer Cells. *British Biotechnology Journal* (2016) vol. 16(1) pp. 1-9. (UGC-Approved Journal)
- 20) **A. Banerji**. Man and his ancestors – the legacy and fate of Neanderthal Man. *Current Science* (2018) vol. 114(7) pp. 1394-1396. (UGC-Approved Journal)

- 21) A. Majumder, S. Ray, **A. Banerji**. Epidermal growth factor receptor-mediated regulation of matrix metalloproteinase-2 and matrix metalloproteinase-9 in MCF-7 breast cancer cells. *Molecular and Cellular Biochemistry* (2019) vol. 452(1-2) pp. 111–121. (UGC-Approved Journal)
- 22) I. Chakraborty, A. Roy, **A. Banerji**. Therapeutic Potential of Phosphatidylinositol 3' Kinase (PI3K) Inhibitors in Cervical Cancer. *Science and Culture* (2021) vol. 87(1-2) pp. 57-61. (UGC-Approved Journal)
- 23) A. Roy, I. Chakraborty, **A. Banerji**. Natural Compounds as Potential Regulators of the Phosphatidylinositol 3' Kinase (PI3K) Pathway in Breast Cancer. *South Asian Journal of Experimental Biology* (2021) vol. 11(5) pp. 524-538. (UGC-Approved Journal)
- 24) P. Ghoshal, **A. Banerji**. Looking at COVID-19 Pandemic Through the Lens of Epidemiological Transition Theory. *Science and Culture* (2023) vol. 89(1-2) pp. 27-32. (UGC-Approved Journal)
- 25) S. Sen, A. Biswas, **A. Banerji**. Analysis of Avian Diversity at Chintamani Kar Bird Sanctuary: An Urban Forest Perspective. *Uttar Pradesh Journal of Zoology* (2023) vol. 44(12) pp. 7-15. (UGC-Approved Journal)

### **Book Chapters**

- 1) A. Mitra, J. Chakrabarti, **A. Banerji**, S. Das, A. Chatterjee. Tumor Cell Surface Integrins and Metallomatrix Proteinases (MMPs) Cross-talk : A Potential Area for Developing Anti-Metastatic Drugs. *Current Trends in Pharmacology*, Ed. A. Ray, K. Gulati, Pub: I.K. International Publishing House Pvt. Ltd., New Delhi (2007) pp. 437-441. ISBN: 81-88237-77-9.
- 2) S. Das, **A. Banerji**, E. Frei, A. Chatterjee. Culture of human breast cancer cells (MCF-7) in presence of fibronectin in serum free medium activates MMP-2 and MMP-9. *Proceedings of the 4th International Conference on Tumor Microenvironment: progression, therapy and prevention*, Ed. I.P. Witz, Pub: Medimond International Proceedings, Bologna, Italy (2007) pp. 117-127. ISBN: 978-88-7587-346-2.

- 3) **A. Banerji**, J. Chakrabarti, A. Mitra, A. Chatterjee. Cell Surface Activation of MMP-2. *Zoological Research in Human Welfare*, Ed. Ramakrishna, R.N. Chatterjee, Pub: Zoological Survey of India, Kolkata, (2008) pp. 235-244. ISBN: 978-81-8171-201-1.
- 4) **A. Banerji**. Endocrine Disrupting Compounds (EDCs): The Risks for Aquatic Fauna. *Current Strategies in Biotechnology and Bioresource Technology Vol. 2*, Ed. A. Alam, Pub: Book Publisher International (2020) pp.149-155. Print ISBN: 978-93-89816-88-4, eBook ISBN: 978-93-89816-89-1.
- 5) **A. Banerji**, K.K. Ganguly, A. Chatterjee. All-trans Retinoic Acid (ATRA), a Potential Inhibitor of Matrix Metalloproteinase-2 (MMP-2) and Tumour Invasion in Melanomas. *Current Strategies in Biotechnology and Bioresource Technology Vol. 2*, Ed. A. Alam, Pub: Book Publisher International (2020) pp.156-168. Print ISBN: 978-93-89816-88-4, eBook ISBN: 978-93-89816-89-1.
- 6) **A. Banerji**, P. Ghoshal. Agricultural Production and Climate Change: The Scope for Innovation in the Post-COVID 19 Scenario. *Current Strategies in Biotechnology and Bioresource Technology Vol. 2*, Ed. A. Alam, Pub: Book Publisher International (2020) pp.169-176. Print ISBN: 978-93-89816-88-4, eBook ISBN: 978-93-89816-89-1.
- 7) A. Majumder, S. Ray, **A. Banerji**. Phosphatidylinositol 3' Kinase (PI3K), A Crucial Regulator of Epidermal Growth Factor Receptor (EGFR) Modulated MMP-2, MMP-9 and MT1-MMP Expression in Breast Cancer Cells. *Recent Progress in Microbiology and Biotechnology Vol. 2*, Ed. E.A. Makky, Pub: Book Publisher International (2020) pp. 165-174. Print ISBN: 978-93-90206-62-9, eBook ISBN: 978-93-90206-59-9.
- 8) P. Ghoshal, **A. Banerji**. Studies on Some Issues Specific to Demography during COVID-19 Pandemic. *Issues and Development in Health Research Vol. 3*, Ed. D.C. Sharma, Pub: Book Publisher International (2021) pp. 1-9. Print ISBN: 978-93-91595-14-2, eBook ISBN: 978-93-91595-16-6.
- 9) A. Roy, I. Chakraborty, **A. Banerji**. Determination of Phytochemicals as Potential Inhibitors of Matrix Metalloproteinases (MMPs) with Special Reference to Breast Cancer. *Issues and Development in Health Research Vol. 5* (2021), Ed. W.M. Oo, Pub: Book Publisher International (2021) pp. 73-81. Print ISBN: 978-93-91882-30-3, eBook ISBN: 978-93-91882-32-7.

10) P. Ghoshal, **A. Banerji**. Agriculture in COVID-19 Pandemic: The Indian Perspective. *New Innovations in Economics, Business and Management Vol. 8*, Ed. M.D. Guillamon, Pub: Book Publisher International (2022) pp. 77-86; Print ISBN: 978-93-5547-510-7, eBook ISBN: 978-93-5547-518-3.

11) P. Ghoshal, **A. Banerji**. Forest Cover and Its Management: A Study in Indian Perspective. *Novel Perspectives of Geography, Environment and Earth Sciences Vol. 9*, Ed. H.L. Shrestha, Pub: Book Publisher International (2023) pp. 28-43; Print ISBN: 978-81-19491-52-0, eBook ISBN: 978-81-19491-53-7.

12) A. Roy, **A. Banerji**. Endogenous Regulators of Matrix Metalloproteinase Expression and Activity in Breast Cancers. *Novel Research Aspects in Medicine and Medical Science Vol. 5*, Ed. R.W. Sawadago, Pub: Book Publisher International (2023) pp. 37-49; Print ISBN: 978-81-19761-32-6, eBook ISBN: 978-81-19761-68-5.

13) I. Chakraborty, **A. Banerji**. Signalling Cascades in Melanoma: Understanding the Potential of Phytochemicals as Inhibitors. *Research Perspectives of Microbiology and Biotechnology Vol. 1*, Ed. E. Magiorkinis, Pub: Book Publisher International (2024) pp. 19-31; Print ISBN: 978-81-971580-1-8, eBook ISBN: 978-81-971580-3-2.

### Other Publications

1) **A. Banerji**, P. Ghoshal. Climate Change and Agriculture: Implications on Sustainable Development. *Goethals News* (2011) vol. XIV (1-2).

2) **A. Banerji**. Could Dinosaurs Walk the Earth Again? *Pebbles* (2014) vol. 6, pp.10-11.

3) **A. Banerji**. The Collagenases: Key Molecules In Tissue Remodelling. *Aviskaar: A Xaverian Journal of Research* (2017) vol. IX pp. 13-20

4) **A. Banerji**. Habitat Conservation – The Necessity of Awareness. *MAGIS – Xaverian Journal of Education* (2021) vol. X pp. 18-23.

### **Invited talks/ Papers Presented at Conferences/ Seminars**

- 1) Presented paper “Modulation of gelatinase A/ matrix metalloproteinase-2 activity by curcumin” at *Annual Meeting of Immunology Study Group, West Bengal*, organized at Chittaranjan National Cancer Institute, Kolkata, Jan 16<sup>th</sup>, 2004.
- 2) Presented paper “Effect of curcumin on MMP-2 activity in B16F10 cells” at the *Scientific Seminar for the selection of Sudev Bhushan Ghosh Young Scientist Award (2005-06)*, organized by The Zoological Society, Kolkata, July 21<sup>st</sup>, 2006.
- 3) Presented paper “The role of cell surface integrins (fibronectin receptor) in regulation of expression and activity of matrix metalloproteinases (MMPs)” at *International Conference on Frontier Researches in Integrative Physiology* organized by Dept. of Physiology, University of Calcutta, Jan 8<sup>th</sup>–10<sup>th</sup>, 2007.
- 4) Presented paper “Integrin–Matrix Metalloproteinases (MMPs) Cross Talk” at *26<sup>th</sup> Annual Convention of Indian Association for Cancer Research and International Symposium on Translational Research in Cancer* organized by Institute of Life Sciences, Bhubaneshwar and Imgenex India Pvt. Ltd., Bhubaneshwar, Jan 17<sup>th</sup>–19<sup>th</sup>, 2007.
- 5) Presented paper “Cell membrane associated activation of MMP-2 and its role in tumour biology” at *National Seminar on Dimensions in Zoological Research in Human Welfare* organized by Dept. of Zoology, University of Calcutta and The Zoological Society, Kolkata in collaboration with Zoological Survey of India, Mar 23<sup>rd</sup>–25<sup>th</sup>, 2007.
- 6) Presented paper “Effect of curcumin on MMP-2 activity in B16F10 murine melanoma and HEP2 human laryngeal cancer cells” at *Symposium on Recent Trends in Cancer Research & Treatment*, organized by Chittaranjan National Cancer Institute Golden Jubilee celebration, Nov 1<sup>st</sup>–3<sup>rd</sup>, 2007.
- 7) Presented paper “Climate Change and Agriculture: Implications on Food Security” at *1<sup>st</sup> St. Xavier’s Global Earth Summit* organized by Dept. of Environmental Studies, St. Xavier’s College (Autonomous), Kolkata, Mar 11<sup>th</sup>–12<sup>th</sup>, 2011.



8) Presented paper “Anti-tumorigenic Potential of Curcumin and ATRA” at D.S.T. (Govt. of India) sponsored *Sir J.C. Bose Memorial National Symposium on Modern Trends in Animal Science Research and Challenges of the Day*, organized by Presidency University, Kolkata, Mar 23<sup>rd</sup>–25<sup>th</sup>, 2011.

9) Presented paper “Role of  $\alpha 5\beta 1$  integrin (fibronectin receptor) in modulation of MMP-9 and MMP-2 activity in A375 melanoma cells” at 99<sup>th</sup> *Indian Science Congress (Section: New Biology)* organized by The Indian Science Congress Association at Bhubaneswar, Jan 3<sup>rd</sup>–7<sup>th</sup>, 2012.

10) Delivered invited lecture “Role of cell surface receptors in modulation of MMP activity in human cancer cells” at 102<sup>nd</sup> *Indian Science Congress (Section: New Biology)* organized by The Indian Science Congress Association at Mumbai, Jan 3<sup>rd</sup>–7<sup>th</sup>, 2015.

11) Delivered invited lecture “Effect of All-Trans Retinoic Acid (ATRA) on Receptor Mediated Modulation of Matrix Metalloproteinase-2 (MMP-2) in Murine Melanoma Cells” at 106<sup>th</sup> *Indian Science Congress (Section: New Biology)* organized by The Indian Science Congress Association at Jalandhar, Punjab, Jan 3<sup>rd</sup>–7<sup>th</sup>, 2019.

12) Delivered invited lecture “Epidermal Growth Factor Receptor (EGFR): A Potent Regulator of Matrix Metalloproteinases (MMPs) and Tumour Invasion in Breast Cancer” at 107<sup>th</sup> *Indian Science Congress (Section: New Biology)* organized by The Indian Science Congress Association at Bengaluru, Karnataka, Jan 3<sup>rd</sup>–7<sup>th</sup>, 2020.

13) Delivered invited lecture “Improving Cancer Therapeutics: The Potential of Curcumin and ATRA” at *International Conference on Chemistry for Human Development (ICCHD-2020)* organized by Professor Asima Chatterjee Foundation, Kolkata, University of Calcutta and Heritage Institute of Technology at Kolkata, Jan 9<sup>th</sup>-11<sup>th</sup>, 2020.

#### **Posters Presented at Conferences/ Seminars (by Research Scholars/ Summer Trainees)**

1) A. Majumder, A. Chatterjee, **A. Banerji**. “Effect of ATRA on EGFR mediated MMP regulation in B16F10 murine melanoma cells” at 102<sup>nd</sup> *Indian Science Congress (Section: New Biology)*, organized by The Indian Science Congress Association at Mumbai, Jan 2015.

- 2) A. Agarwal, R. Shrivastav, M. Sarkar, A. Majumder, **A. Banerji**. “Matrix Metalloproteinases (MMPs) and their Roles in Breast Cancer” at *6<sup>th</sup> International Conference on Stem Cells and Cancer: Proliferation, Differentiation & Apoptosis*, Pune, Oct 2015.
- 3) A. Majumder, A. Chatterjee, **A. Banerji**. “EGFR Mediated Regulation Of MMP-2 Expression And Activity In Human Breast Cancer” at *Current Innovation in Biotechnology for Human Welfare*, organized by Guru Nanak Institute Of Pharmaceutical Science & Technology, Kolkata, Nov 2015.
- 4) A. Majumder, A. Chatterjee, **A. Banerji**. “Regulation of MMP-2 expression by EGFR in human breast cancer cells” at *103<sup>rd</sup> Indian Science Congress (Section: New Biology)*, organized by The Indian Science Congress Association at Mysuru, Jan 2016.
- 5) A. Majumder, S. Ray, **A. Banerji**. “EGFR mediated regulation of MMP-2 and MMP-9 in human breast cancer” at *36<sup>th</sup> Annual Conference of Indian Association for Cancer Research*, Thrissur, Feb 2017.
- 6) S. Ghosh, M. Ghosh, A. Majumder, **A. Banerji**. “Effect of All-Trans Retinoic Acid (ATRA) on Integrin  $\alpha 5\beta 1$  Mediated Modulation of Matrix Metalloproteinase-2 (MMP-2) in Murine Melanomas” at *Frontiers in Modern Biology 2018*, organized by Indian Institute of Science Education and Research (IISER)-Kolkata, Jan 2018.
- 7) A. Majumder, **A. Banerji**. “EGFR mediated regulation of MMP-2 and MMP-9 expression and activity in MDA-MB-453 human breast cancer cells” at *An Interdisciplinary Approach to Biological Sciences*, organized by Indian Association for the Cultivation of Science, Kolkata, Feb 2018.
- 8) A. Majumder, S. Ray, **A. Banerji**. “Targeting epidermal growth factor receptor (EGFR)-EGF interactions in breast cancer” at *INTZOOCON 2018*, organized by Dept. of Zoology, University of Calcutta, Feb 2018.
- 9) P. Bandyopadhyay, A. Banerjee, S. Sen, A. Majumder, **A. Banerji**. “Focal Adhesion Kinase (FAK): A Possible Therapeutic Target For Breast Cancer” at *Frontiers in Biotechnology, Chapter IV* organized by Dept. of Biotechnology, St. Xavier’s College (Autonomous), Kolkata, Nov 2019. **Awarded 2<sup>nd</sup> prize for poster presentation.**

- 10) S. Sen, A. Biswas, **A. Banerji**. “Analysis of Avian Diversity: An Urban Forest Perspective” at *International Symposium on Environment and Climate Crises* organized by Dept. of Environmental Studies, St. Xavier’s College (Autonomous), Kolkata, **The Blue Patch and The Biome**, Dec 2019.
- 11) A. Roy, **A. Banerji**. “Regulation of Focal Adhesion Kinase and Phosphatidylinositol 3’Kinase Pathways in Breast Cancer: The Role of Natural Products” at *41st Annual International Conference of Indian Association for Cancer Research (IACR-2022)* organized by Amity University, Noida, March 2022.
- 12) A. Roy, **A. Banerji**. “Phytochemicals as potential Matrix Metalloproteinase (MMP) inhibitors in breast cancers” at *International Conference (Online) on Biomolecules to Biome*, organized by Dept. of Life Sciences, Presidency University, Kolkata, Aug 2022.
- 13) I. Chakraborty, **A. Banerji**. “All-trans retinoic acid (ATRA) as an inhibitor of cell signalling in melanomas” at *International Conference (Online) on Biomolecules to Biome*, organized by Dept. of Life Sciences, Presidency University, Kolkata, Aug 2022.
- 14) A. Roy, **A. Banerji**. “Targeting EGFR-Mediated MMP-2 and MMP-9 Expression in Metastatic Breast Cancer Cells by Curcumin and ATRA” at *42nd Annual Conference of Indian Association for Cancer Research (IACR-2023)* (International Conference) organized by Advanced Centre for Treatment, Research and Education in Cancer, Mumbai, Jan 2023.
- 15) I. Chakraborty, **A. Banerji**. “All-trans Retinoic Acid (ATRA) as an Inhibitor of Integrin  $\alpha 5\beta 1$  Mediated Signalling in the Murine Melanoma Cell Line B16F10” at *42nd Annual Conference of Indian Association for Cancer Research (IACR-2023)* (International Conference) organized by Advanced Centre for Treatment, Research and Education in Cancer, Mumbai, Jan 2023.
- 16) A. Roy, **A. Banerji**. “Curcumin and All-trans Retinoic Acid (ATRA) As Inhibitors of Matrix Metalloproteinase Expression and Activity in Breast Cancer Cells” at *Bio Colloq: One Day Conference on Inter-Disciplinary Biological Sciences*, organized by Ramakrishna Mission Vivekananda Centenary College (Autonomous), Rahara & Academy of Biodiversity Conservation, Jan 2024. **Awarded 1<sup>st</sup> prize for poster presentation.**

17) I. Chakraborty, **A. Banerji**. “Potential of All-trans Retinoic Acid (ATRA) For Inhibiting Cellular Signalling Pathways in Melanoma Cells” at *Bio Colloq: One Day Conference on Inter-Disciplinary Biological Sciences*, organized by Ramakrishna Mission Vivekananda Centenary College (Autonomous), Rahara & Academy of Biodiversity Conservation, Jan 2024.

18) A. Roy, **A. Banerji**. “Synergistic Treatment with Curcumin and All-trans Retinoic Acid: Effects on Matrix Metalloproteinases (MMPs) in Metastatic Breast Cancer Cells” at *8<sup>th</sup> World Cancer Congress-2024*, organized at JNU Convention Centre, New Delhi, March 2024. (Oral Presentation)

19) I. Chakraborty, **A. Banerji**. “The Role of All-trans Retinoic Acid (ATRA) as a Potential Inhibitor of Signalling Pathways in Cervical Cancers” at *8<sup>th</sup> World Cancer Congress-2024*, organized at JNU Convention Centre, New Delhi, March 2024.

#### **Seminars/ Conferences Attended**

1) Seminar on Fluorescence Microscopy, organized at Chittaranjan National Cancer Institute, Kolkata, Nov 7<sup>th</sup>, 2003.

2) International Symposium on Complex Diseases: Approaches to Gene Identification and Therapeutic Management (HGM 2008 Satellite Symposium at Kolkata), organized at Saha Institute of Nuclear Physics, Kolkata, Sept 25<sup>th</sup>–26<sup>th</sup>, 2008.

3) National Seminar on Modern Biology in Health and Disease, organized by Dept. of Biophysics, Molecular Biology and Bioinformatics, University of Calcutta, Nov 20<sup>th</sup>, 2008.

4) National Conference on Future of Food Biotechnology in India, organized by National Institute of Technology, Durgapur, Jan 8<sup>th</sup>–9<sup>th</sup>, 2009.

5) National Conference on Environmental Issues and Food Security in India: Let’s voice together towards a sustainable future, organized by Foundation for Science & Environment, Kolkata, Aug 10<sup>th</sup>, 2014.

6) National Seminar on Current Innovation in Biotechnology for Human Welfare, organized by Guru Nanak Institute of Pharmaceutical Science and Technology, Nov 7<sup>th</sup>, 2015.

- 7) National Level Young Scientists' Meet–2016, organized by The Zoological Society, Kolkata and Dept. Of Zoology, University of Calcutta, Feb 5<sup>th</sup>– 6<sup>th</sup>, 2016.
- 8) Sparsha, an interactive forum for the Educators of today and tomorrow, organized by The Zoological Society, Kolkata and Ramakrishna Mission Vivekananda Centenary College, Rahara, Jan 13<sup>th</sup>, 2019.
- 9) International Symposium on Environment and Climate Crises organized by Dept. of Environmental Studies, St. Xavier's College (Autonomous), Kolkata, **The Blue Patch and The Biome**, Dec 20<sup>th</sup> 2019.

### **Workshops Attended**

- 1) Participated in “National Workshop on HPLC & Its Applications”, organized by Chittaranjan National Cancer Institute, Kolkata, Sept 20<sup>th</sup> – 22<sup>nd</sup>, 2003.
- 2) Participated in “Workshop on Advanced Methods In Field Biology And Statistical Application In Life Science Research”, organized by The Zoological Society, Kolkata and Dept. of Zoology, University of Calcutta, Oct 10<sup>th</sup>–21<sup>st</sup>, 2014.
- 3) Participated in Workshop (Online) in “Drug Discovery Technology”, organized by BDG Life Sciences (OPC) Pvt. Ltd., June 26<sup>th</sup> – 30<sup>th</sup>, 2021.
- 4) Participated in Workshop (Online) in “Molecular Modeling: Simulations, Docking & Homology Modeling”, organized by BDG Life Sciences (OPC) Pvt. Ltd., July 2<sup>nd</sup> – 11<sup>th</sup>, 2021.
- 5) Participated in Workshop (Online) on “Molecular Docking: Study to predict interaction energy between molecules”, organized by BDG Life Sciences (OPC) Pvt. Ltd., July 26<sup>th</sup> – 31<sup>st</sup>, 2021.
- 6) Participated in One Week National Level Online Faculty Development Program on “Digital Pedagogy: ICT & AI assisted teaching in-line with OBE and NEP”, organized by St. James College of Nursing and St. James College of Pharmaceutical Sciences, Chalakudy in association with The Kerala State Higher Education Council, May 29<sup>th</sup> – June 5<sup>th</sup>, 2024.

7) Participated in Faculty Development Program/ Training Program (Online) on “R Programming For Budding Data Analysts” organized by Research Foundation of India & RFI-CARE, June 9<sup>th</sup> – 18<sup>th</sup>, 2024.

### **As Resource Person**

1) Co-chaired session on Environmental Biotechnology & Microbiology at National Conference on Environmental Issues and Food Security in India: Let’s voice together towards a sustainable future organized by Foundation for Science & Environment, Kolkata, Aug 10<sup>th</sup>, 2014.

2) Delivered a lecture on “Animal Handling” for Educational Multimedia Research Centre (An University Grants Commission Project), St. Xavier’s College (Autonomous), Kolkata in 2014.

3) Delivered a series of lectures on Developmental Biology and Animal Physiology at Research Career Counselling and Preparatory Camp for Research Eligibility Tests, organized by The Zoological Society, Kolkata at the Dept. of Zoology, University of Calcutta, Oct–Dec 2014.

4) Delivered a lecture (as resource person) on “Conservation and Environmental Awareness” in Foundation Course “A Multi Disciplinary View of Education” organized by Department of Education, St. Xavier’s College (Autonomous), Kolkata on March 11, 2020.

5) Invited reviewer for several international journals.

### **Orientation/ Refresher/ Short Term Courses Attended**

1) Participated in the UGC-sponsored Orientation Programme (OP-84), organized at Academic Staff College, University of Calcutta, July 5<sup>th</sup>–31<sup>st</sup>, 2010.

2) Participated in the UGC-sponsored Refresher Course in Life Sciences, organized at Dept. of Physiology, University of Calcutta, Nov 21<sup>st</sup>–Dec 12<sup>th</sup>, 2011.

3) Participated in the UGC-sponsored Refresher Course in Life Sciences, organized at Dept. of Physiology, University of Calcutta, Mar 27<sup>th</sup>–Apr 20<sup>th</sup>, 2015.

4) Participated in the UGC-sponsored Short Term Course on “Workshop on MOOCs & E-Learning: Issues, Prospects, Problems”, organized by HRDC, Jadavpur University, Jan 15<sup>th</sup>-21<sup>st</sup>, 2019.

5) Participated in the UGC-sponsored Short Term Course on “Language and Linguistics”, organized by HRDC, Jadavpur University, Feb 19<sup>th</sup>-25<sup>th</sup>, 2020.

### **Research Projects**

1) Project Title: **Anti-cancer potential of ATRA in a murine melanoma model.**

Role: Principal Investigator

Granting Agency: University Grants Commission (UGC) Major Research Project

Period of Sanction: 2010–2013.

2) Project Title: **Epidermal Growth Factor Receptor (EGFR) A Potential Regulator Of Matrix Metalloproteinases (MMP)**

Role: Principal Investigator

Granting Agency: Govt. of West Bengal, Department of Science and Technology

Period of Sanction: 2014-2017.

### **Research Supervision (for Ph. D)**

#### **Ph.D Awarded**



#### **Dr. Aheli Majumder**

Awarded Ph.D from University of Calcutta, Department of Zoology, 2022.

Title of Thesis: Regulation Of Matrix Metalloproteinase (MMP) Expression And Activity In Breast Cancer Cells By Epidermal Growth Factor Receptor (EGFR)

## Current Research Scholars



### **Mr. Anirban Roy**

Registered for Ph.D under Dept. of Biotechnology, St. Xavier's College (Autonomous), Kolkata.

Area of Research: Cancer Biology



### **Ms. Indira Chakraborty**

Registered for Ph.D under Dept. of Biotechnology, St. Xavier's College (Autonomous), Kolkata.

Area of Research: Cancer Biology

## Administrative Duties Performed

- 1) Head of the Department of Biotechnology, St. Xavier's College (Autonomous), Kolkata from July 2018 – December 2020.
- 2) Secretary, Ethical Committee for Animal Research, St. Xavier's College (Autonomous), Kolkata till 2023.
- 3) Member of Stage & Ground Committee/ Reception Committee/ Security Committee for organization of Convocation & Valedictory, St. Xavier's College (Autonomous), Kolkata till 2020.
- 4) Member, Remedial and Tutorial Care Committee, St. Xavier's College (Autonomous), Kolkata.



## **Membership of Scientific Societies**

- 1) Life Member, Indian Science Congress Association
- 2) Life Member, Zoological Society, Kolkata
- 3) Life Member, Indian Association for Cancer Research
- 4) Member, Indian Statistical Institute.