

Curriculum Vitae

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RESEARCH EXPERIENCE & AREA OF RESEARCH

1. Inspire Faculty (Assistant Professor) in Dept. of Biophysics, Mol. Bio. & Bioinformatics, University of Calcutta, Kolkata, India since 13.10.2014.
 2. Post-Doctoral Fellow at Frontier Institute for Biomolecular Engineering Research (FIBER), Konan University, Kobe, Japan since July 2013 to September 2014.
 3. Post-Doctoral Fellow at IACS-Kolkata, Jadavpur, Kolkata, WB, India November 2012 to June 2013
 4. Post-Doctoral Fellow at IISER-Kolkata, Mohanpur, WB, India from Feb 2012 to October 2012
 5. Ph.D. in Biochemistry from Department of Biochemistry & Biophysics, University of Kalyani, India in July 2012, Research period: September 2006 to Jan 2012
- Studying the physico-chemical interaction of ligands with different DNA structural forms like G-quadruplex DNA, i-motif DNA in cellular mimicking condition.
 - Application of high pressure on the folding unfolding of different biomolecules. Different nucleic acid structures such as helical, quadruplex, i-motif and triplex has been monitored under high pressure through high pressure UV-visible and fluorescence spectroscopy, circular dichroism (CD), ITC and molecular modeling studies.

- DNA quadruplex small molecule interaction, selectivity, inhibition of telomerase and other specific gene products in cancer cells through biophysical and molecular biological studies like spectrophotometric, fluorimetric titrations, FRET, CD, TRAP assay, gene expression through RT-PCR, cell survival, cell cycle arrest, apoptosis, analysis of apoptotic pathways.
- Interaction of acridine derivatives with different forms of duplex DNA through molecular modelling studies. Also to study the interaction of acridine derivatives with DNA biophysically by spectroscopy, viscometry, DNA melting, fluorimetric titration.
- Interaction of some acridine derivatives with biologically important biomolecules like topoisomerase I by molecular docking, simulation studies.
- Anti-cancer property of some acridine derivatives on human cancerous cell in vitro by using different protocols like cell viability assay and cyto-toxicity assay, fluorescence microscopy, western blot analysis, FACS, DNA gel electrophoresis, comet assay, ELISA and RT PCR etc.
- Induced carcinogenesis in-vivo (mice tumor regression) and its amelioration by different derivatives.
- Protein small molecule and DNA small molecule interactions through various molecular modeling and simulation techniques.

List of publications:

1. Snehasish Bhattacharjee, Sandipan Chakraborty, Pradeep Kumar Sengupta,* Sudipta Bhowmik,* Exploring the Interactions of the Dietary Plant Flavonoids Fisetin and Naringenin with G-quadruplex and Duplex DNA, showing Contrasting Binding Behavior: Spectroscopic and Molecular Modeling Approaches, *J. Phys. Chem. B*, 120, 2016, 8942-8952. Impact Factor: 3.2
2. Shuntaro Takahashi, Sudipta Bhowmik, Naoki Sugimoto,* Volumetric analysis of formation of the complex of G-quadruplex DNA with hemin using high pressure, *J. Inorg. Biochem*, 2016, <http://dx.doi.org/10.1016/j.jinorgbio.2016.08.011> Impact Factor: 3.22
3. S. Bhowmik, R.N. Das, B. Parasar, J. Dash*, pH dependent multifunctional and multiply-configurable logic gate systems based on small molecule G-quadruplex DNA recognition, *Chem. Commun.*, 49, 2013, 1817-1819. Impact Factor: 6.378
4. Y. P. Kumar, S. Bhowmik, R. N. Das, I. Bessi, S. Paladhi, R. Ghosh, H. Schwalbe, J. Dash*, A fluorescent guanosine dinucleoside as a selective switch-on sensor for c-myc G-quadruplex DNA with Potent Anticancer Activities, *Chem. A Eur. J.*, 19, 2013, 11502-11506. Impact factor: 5.831
5. G.C. Midya, S. Paladhi, S. Bhowmik, S. Saha, J. Dash*, Design and synthesis of a ON-OFF "Click" fluorophore that execute logic operation and detect heavy and transition metal ions in water and living cell, *Org. Biomol. Chem.*, 11, 2013, 3057-3063. Impact Factor: 3.568

6. A. Chauhan, S. Paladhi, M. Debnath, S. Mandal, R. Nath Das, S. Bhowmik, J. Dash, A small molecule peptidomimetic that binds to *c-kit1* G-quadruplex and exhibits antiproliferative properties in A375 cancer cells, *Bioorg. Med. Chem.*, 2014 Online published 9th June 2014. DOI: 10.1016/j.bmc.2014.05.060. Impact Factor: 3.151
7. R. Ghosh*, S. Bhowmik, D. Guha. 9-Phenyl acridine exhibits antitumour activity by inducing apoptosis in A375 cells, *Mol. Cell. Biochem.*, 361, 2012, 55-66. Impact Factor: 2.329
8. R. Ghosh*, S. Bhowmik, A. Bagchi, D. Das, S. Ghosh. Chemotherapeutic potential of 9-phenyl acridine: biophysical studies on its binding to DNA, *Eur. Biophys. J.*, 39, 2010, 1243–1249. Impact Factor: 2.274
9. R. Ghosh*, D. Guha, S. Bhowmik, S Karmakar, Antioxidant enzymes and the mechanism of the bystander effect induced by ultraviolet C irradiation of A375 human melanoma cells, *Mutat. Res.*, 757, 2013, 83-90. Impact Factor: 2.220
10. R. Ghosh*, D. Guha, S. Bhowmik. UV Released Factors Induce Antioxidant Defense in A375 Cells. *Photochem. Photobiol.*, 88, 2012, 3, 708-716. Impact Factor: 2.287
11. R. Ghosh*, D. Guha, S. Bhowmik, S Karmakar. Some UV-bystander effects are mediated through induction of antioxidant defense in mammalian cells. *Indian J. Biochem. Biophys.* 2012, 49, 371-378. Impact Factor: 1.026
12. D. Guha, S. Bhowmik, R. Ghosh*. Influence of Ultraviolet C bystander effect on inflammatory response on A375 cell on subsequent exposure to ultraviolet C or hydrogen peroxide. *Indian J. Biochem. Biophys.*, 51, 2014, 552-558. Impact Factor: 1.026
13. S. Bhowmik, A. Bagchi, R. Ghosh*. Molecular modelling studies of some 9-arylacridines to elucidate their possible roles in topoisomerase I inhibition, *Int. J. Integrative Biol.*, 2, 2008, 8-14.
14. R. Ghosh*, D. Guha, S. Bhowmik. Possible role of 2, 2'-(Diazinodimethylidene) di-(ophenylene) dibenzoate, a novel hydrazine as an anti-HIV agent, *J. Biophys. Struct. Biol.*, 2, 2010, 42-46.
15. Y. P. Kumar, S. Bhowmik, R. N. Das, I. Bessi, S. Paladhi, R. Ghosh, H. Schwalbe, J. Dash*, Inside Cover: A Fluorescent Guanosine Dinucleoside as a Selective Switch-On Sensor for c-myc G-Quadruplex DNA with Potent Anticancer Activities, *Chem. Eur. J.*, 19, 2013, 11458. Impact Factor: 5.831

* - Corresponding Author

Opportunities in the lab: Motivated students having knowledge about biophysical techniques, spectroscopy and physical chemistry are encouraged to apply for research positions.