

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A&B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Biological Sciences Colloquium

Title: Interfering with Interference: targeting the RNAi pathway: Opportunities and Challenges.

Speaker: Prof. Souvik Maiti, CSIR-IGIB

Date: February 12, 2018

Time: 3:45 PM

Venue: S N Bose Hall

Abstract: MicroRNAs (miRNAs) play crucial roles in regulating gene expression in many cellular context. Deregulation of miRNAs has been implicated in a number of disease conditions and thus, methods that can modulate mature miRNA levels in cells can have immense therapeutic potential. We describe a simple in vitro screening method using a DNA based molecular beacon which overcomes the limitations associated with earlier screens. With this proof of concept study we illustrate the utility of a scalable molecular beacon based screening strategy for miRNA inhibitors. We have identified potent molecules against several oncogenic microRNA as a candidate anticancer agent. Results of such studies will comprehensively be discussed during the presentation.

References:

- 1) Enhanced and synergistic downregulation of oncogenic miRNAs by self-assembled branched DNA. Nahar S, Kayak AK, Ghosh A, Subudhi U, Maiti S. *Nanoscale*. 2017 Dec 21;10(1):195-202.
- 2) Systematic Evaluation of Biophysical and Functional Characteristics of Selenomethylene-Locked Nucleic Acid-Mediated Inhibition of miR-21. Nahar S, Singh A, Morihiko K, Moai Y, Kodama T, Obika S, Maiti S. *Biochemistry*. 2016 Dec 20;55(50):7023-7032.
- 3) Potent inhibition of miR-27a by neomycin⁺ bisbenzimidazole conjugates. Nahar S, Ranjan N, Ray A, Arya, DV. Maiti S. *Chem. Sci.*, 2015,6, 5837-5846.
- 4) Selective inhibition of miR-21 by phage display screened peptide. Bose D, Nahar S, Rai MK, Ray A, Chakraborty K, Maiti S. *Nucleic Acids Res.* 2015, 43, 4342-52.
- 5) Nonconventional chemical inhibitors of microRNA: therapeutic scope. Jayaraj GG,

Nahar S, Maiti S. *Chem Commun.* 2015, 51(5):820-31.

6) Anti-cancer therapeutic potential of quinazoline based small molecules via global upregulation of miRNAs. Nahar S, Bose D, Kumar Panja S, Saha S, Maiti S. *Chem Commun.* 2014, 50(35):4639-42.

7) A Molecular-Beacon-Based Screen for Small Molecule Inhibitors of miRNA Maturation. Bose D, Jayaraj GG, Kumar S, Maiti S. *ACS Chem Biol.* 2013, 17, 930-938.

8) The tuberculosis drug streptomycin as a potential cancer therapeutic: inhibition of miR-21 function by directly targeting its precursor. Bose D, Jayaraj G, Suryawanshi H, Agarwala P, Pore SK, Banerjee R, Maiti S. *Angew Chem Int Ed Engl.* 2012, 51, 1019-23.

9) Antagomirzymes: oligonucleotide enzymes that specifically silence microRNA function. Jadhav VM, Scaria V, Maiti S. *Angew Chem Int Ed Engl.* 2009; 48, 2557-60.

All are cordially invited to attend the Colloquium.