

DEPARTMENT OF BIOTECHNOLOGY
MINISTRY OF SCIENCE AND TECHNOLOGY
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**CALL FOR CONCEPT PAPER ON DEVELOPMENT OF RNAi
TECHNOLOGY FOR APPLICATION IN AGRICULTURE AND MEDICINE**

The process of RNA interference has emerged as a major paradigm in modern biology and the 2006 Medicine Nobel to the discoverers of the phenomenon, indeed vouch for it. The recent discovery of an increasing number of large and small non-coding RNAs, viz. siRNA, miRNA, piRNA etc have been shown to play essential roles in the four Eukaryote kingdoms (protists, fungi, plants, animals), with the surprising exception of the budding yeast, *Saccharomyces cerevisiae*. These regulatory RNAs are involved in a variety of phenomena that are essential for genome stability, development, and adaptive responses to biotic and abiotic stresses.

Our understanding of RNAi is still limited and there are many more questions, which promise to keep researchers captivated for many years to come. For example, one of the foremost tasks is to catalogue the vast regulatory RNA genes that exist in the cell of various species, especially plants. Understanding the processes of biogenesis and functions of the micro RNAs (say) will lead to the developmental controls of various organisms, and aberrations of such processes will result in diseases of all sorts. Unravelling of such mechanisms will pave pathways for not only great science but also invaluable technologies in terms of diagnosis and prevention of diseases. Similarly one can consider the case of viruses. These are looked at as lethal agents that destroy either agriculture production or harm the well being of animal. However, they can be harnessed for desired goals as they encode the molecules that can suppress the RNAi effects. Using these suppressors, one dissects the various biochemical steps of RNAi, builds the VIGS vectors for fast-track uses in functional genomics in an expensive manner, and also ventures for molecular farming to any unlimited degree. Besides, basic research, RNAi has also spawned an active community of translational researchers who aim to develop novel RNA-based therapeutics for medical and agricultural biotechnology. One can thus enumerate innumerable possibilities for structuring RNAi related science and biotechnologies.

Although the literature is overwhelmingly flooded with RNAi-research reports, we at India are still at the stage of infancy. The basic research relating to machineries of siRNA- and miRNA-biogenesis and function are pursued in some Indian labs but there is lot more scope to advance in such fronts. The possibilities of applications of hairpin constructs to improve nutritional, medicinal aspects of plants have caught up with some Indian labs. Many labs are exploring for suitable siRNAs along with their delivery mechanisms to combat various diseases. Thus waves of optimism to be at par with international RNAi-research are visible everywhere. Hence it is high time to take stock of the various activities and focus those for better research and their applications. DBT wishes to consolidate such activities and invite the participants to submit the concept proposal which they would like to be discussed in the brainstorming session on 'Development of RNAi Technology and its Application in Agriculture and Medicine' to be held sometime by the end of March, 2007. The concept papers including a brief biodata stating experience and expertise in the area, may be submitted positively by **15th February, 2007** by post to Dr R. R. Sinha, Adviser, Department of Biotechnology, Block-2, 6th Floor, CGO Complex, Lodhi Road, New Delhi 110 003 and also by email (rrsinha.dbt@nic.in, r2sinha@gmail.com) mentioning 'Concept on RNAi' in the subject area.