

**DEPARTMENT OF BIOTECHNOLOGY  
MINISTRY OF SCIENCE AND TECHNOLOGY  
Block-2, CGO Complex, Lodhi Road, New Delhi 110 003**

**CALL FOR CONCEPT PAPER ON DEVELOPMENT OF RNAi TECHNOLOGY FOR  
APPLICATION IN AGRICULTURE AND MEDICINE**

RNA interference (RNAi) has emerged as third major leap in modern molecular biology after cloning and monoclonal antibody. The power of RNAi is enormous in basic biology and clinical practice that claimed Nobel prize in Medicine and Physiology in 2006 and number one technology award in 2002. An increasing number of small non-coding RNAs viz. siRNA, rasiRNA, TasiRNA, miRNA, piRNA, etc. commonly referred as 'micromanagers of gene expression' have been shown to play essential roles in many life forms encompassing protozoa to mammals. These regulatory RNAs are involved in a variety of phenomena including epigenetic regulation, genome control and stability, development, metabolic engineering, innate immunity and adaptive responses to biotic and abiotic stresses.

The real breakthrough of mechanistic understanding came via an introduction of DNA fragment, aberrant double stranded RNA for silencing gene in animals. Since then, the components of RNAi machinery have been identified at a startling rate although the picture is still not complete. Our understanding of RNAi is still limited and there are many more questions, which promise to keep researchers captivated for many years to come. RNAi is more than a just protective response to exogenous genetic materials. A wide range of endogenous regulatory RNAs control all major biological functions. However, the foremost tasks are to catalogue them functionally in many species, especially plants. The biogenesis and functions of small regulatory RNAs will understand the diverse functions in development and physiology. RNAi works as an effective experimental tool for any gene function, but also revolutionarizes our ability to perform large scale screening for novel drugs and their *in vitro* validation in a single step. RNAi guides heterochromatin formation, transposon silencing and other foreign DNA (viruses and other microbes) integrated in genome. Besides, basic research, RNAi has also spawned an active community of translational researchers who aim to develop RNA-based therapeutics for medical and agricultural biotechnology. The RNA based therapies and transgenic plants are running towards the clinics and farmhouse. One can do miracles by exploiting the power of this magic technology in agriculture and modern medicine.

Several milestones related to machineries of siRNA- and miRNA-biogenesis and function are contributed by few Indian labs as a pioneer finding since its discovery in animals but its application in crop improvement and medicine is at the stage of infancy. Many labs are exploring for suitability of siRNAs delivery, dosage selection, design of siRNA and anti-microRNAs to combat various diseases. Thus waves of optimisms 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, guide such activities in the nation and invite the participants to submit the concept proposal which they would like to be considered under '**Development of RNAi Technology and its Application in Agriculture and Medicine**'. The concept paper (15 copies) including a brief bio-data, stating experience and expertise in the area, list of publications of last 3 years, expected cost of the project in given duration (maximum length of document should not be more than 5–7 pages) may be submitted positively by **15 February 2008** 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 e-mail (advert.sinha@gmail.com) mentioning 'Concept on RNAi 2008' in the subject area.