



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

**CALL FOR PRE-PROPOSAL ON NANOBIO TECHNOLOGY/NANOPARTICLE MEDIATED DRUG/BIOMOLECULE DELIVERY AND THEIR TOXICOLOGICAL STUDIES: IN PUBLIC, PRIVATE AND PUBLIC-PRIVATE PARTNERSHIPS TOWARDS DEVELOPMENT OF INDUSTRIAL PRODUCTS; STUDY OF THEIR BASIC MECHANISM OF ACTION AND CONDUCT TOXICOLOGICAL STUDIES**

Nanotechnology deals with manipulation of materials, devices or systems at nanometer scale and have wide applications in drug delivery. Nanometer sizes help biodegradable nanoparticles enter into smaller capillaries/tissues leading to efficient drug delivery at the target sites over a period of a day or even weeks. Increase of shelf life, bioavailability and half life of the drug inside body by encapsulating them in nanoparticulate form are the frontier areas of drug delivery research.

Novel functions can be induced in the nanoparticle by engineering the shape, size or composition of nanoparticle. The most important nanoscale systems explored currently are liposomes; micelles; emulsions; polymer, metal, magnetic and oxide nanoparticles, dendrimers and nanocomposites etc. It is learnt that nanoscale materials below 100 nm scale show reduced toxicity towards mammalian host and increased toxicity towards infectious organisms. However more numbers of studies are required about the interaction of different types of nanoscale system with varieties of animal cells and tissues in order to understand their pharmacological action, immunogenicity, and more importantly, toxicity associated with it.

Although humans have been exposed to airborne nanosized particles (<100 nm) throughout their evolutionary stages, such exposure has increased dramatically over the last century due to anthropogenic activities. The rapidly developing field of nanotechnology is likely to become yet another source through inhalation, ingestion, skin uptake, and injection of engineered nanomaterials. Information about safety and potential hazards is thus urgently needed. Biokinetic, epidemiological and toxicological studies with novel and engineered nanoparticles are the realms of the field of nanotoxicology, as for example, engineered nanomaterials can have many different shapes (e.g., spheres, fibers, single and multi-wall tubes, rings and planes). DBT encourages researchers to undertake toxicological studies with the market available nanoparticles/nanoscale systems as well as novel ones widely used for drug and bimolecular delivery. Therefore, mechanism of action and toxicological studies of all the developed nanoparticles from the proposed subject should be studied thoroughly and carefully before patent application is filed by the concerned investigator.

Fifteen copies of your concept papers (not more than 10 pages) which should include title of the concept, its preliminary proof, major objectives/milestones, expected deliverables/outcomes along with proof of having expertise in form of publications in high impact factor journals, lowest amount of the budget which you need, projects in hand and association with industry may be submitted positively by **15th March** 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: [advert.sinha@gmail.com](mailto:advert.sinha@gmail.com) mentioning '**NANOBIO TECHNOLOGY/NANOPARTICLE BASED DRUG DELIVERY**' in the subject area.