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Nanobiotech market forecast

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It would take India some more time to arrive on the nanobiotech map.

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-E analyst, technical insights, healthcare, Frost & Sullivan

The nanobiotech market is as nascent in India as it is anywhere else in the world. At present, it's very early to talk about a market figure, specifically for biotechnology, because indigenous products in biotechnology are yet to emerge from the subcontinent.

The Indian government has allocated a budget of Rs 1,000 crore per annum for nanotechnology, which is much less than the global funding for nanotechnology. Given that the revolution has just begun in India, it could take as long as a decade before India is able to announce a sizable market in nanotechnology and possibly longer before it talks about the contribution of biotechnology to India's GDP.

As of 2006 roughly 40 products were released in the nanomedicine space and most of these so called â€œbiotechnologyâ€? derived products were in fact modifications of gene delivery systems conventionally employed in biotechnology, barring a few products that focused on application of nanoparticles. In essence, the global funding has been around $3 billion for nanotechnology. However projections on a 28 percent growth rate and the industry touching a $1 trillion market in 2010 must be taken with a pinch of salt. While the innovation potential in nanotechnology is much higher in areas outside the life sciences, the life science industry itself needs to face a host of critical issues in the form of social, ethical, regulatory and economic concerns. Hence from the perspective of biotechnology, the operation of the critical mass in determining the total global output would dictate the long term potential of biotechnology to contribute to the magical and optimistic $1 trillion projection. In other words, as far as biotechnology is concerned, the commercialization potential of biotechnology would be inversely proportional to its ability to address and resolve the critical mass of ethical, social and regulatory issues which

currently are major limiting factors against biotechnology achieving its full innovation potential.
The unfortunate aspect of biotechnology is that it cannot be compared with the pharmaceutical market which is mature and largely a cash cow. With the recession affecting the world and limited liquidity in the market and eagerness to invest is low and biotechnology research from a commercial point of view may not be doing well. Members in the healthcare space have claimed that their industry is recession proof as under grave economic conditions among all costs, the highest costs would be that of healthcare,which would essentially increase the demand for medicines. The focus thus in the current times would be to involve technologies in medical science that would have a quick lead time as opposed to being stocked as work in progress for a long time. Unlike other industries, investors and venture capitalists of biotech sector would need to wait anywhere between three and six years to see returns. Given the grim scenario and the high substitution threats faced by biotechnology, the market for biotechnology products may be lower than expected but may not be bad enough to shut down operations because at the end of the day it addresses serious medical needs which apparently are a driving force for the healthcare industry globally.

Legal and policy initiatives needed to fuel nanotech growth in India

- A comprehensive new law on nanotechnology is not needed but some amendments in the relevant legislations are required.
- No need for a separate regulatory authority but an expert committee must be constituted comprising members from relevant departments and ministries. The committee should make short term recommendations in light of growing application and commercialization of the technology.
- Precautionary principle has already been adopted in environmental regulation, and should be extended to nanotechnology regulation, considering the uncertainties.
- Manufacturers, especially of those products that have a direct contact/ implications for humans, should have limited liability. These products should be identified and listed. Insurance could be a suitable option for covering such liability.
- Regulatory framework should take into account the phase of Nanotechnology development and the regulatory intervention should be as per the stage of development and knowledge of risks.
- All evidence based data should be admissible irrespective of the country of study, while designing the regulatory framework for Nanotechnology
- The Indian patents Act needs to define a clear definition and classification of nano particles and nanotechnology.
- These are the recommendations presented at a national conference on â€œNanotechnology and Regulatory Issuesâ€? organized by TERI on the first week of January 2009, in Kolkata. The aim of the conference was to map the national and international regulatory developments with reference to EHS aspects (Environmental, Health and Social). This included a discussion on risks emanating from nanotechnology, the nature, scope and design of regulatory instruments, explore the dimensions of the current law and regulatory instruments in place and provide for a gap analysis, analyze the role and value of technology assessment, and explore other cross cutting issues like IPR regimes, institutional role and capacity, and ethical issues.

Nano research activities in India

- Development of micro devices for minimally invasive surgery and surfactant nanoparticles for curing respiratory diseases by the Department of Chemistry, IIT Mumbai.
- Dabur has launched Nanoxel-a drug delivery system for the anticancer drug Paclitaxel.
- A typhoid detection kit developed by DRDE Gwalior using a nanosensor developed at the Indian Institute of Science (IISc), Bangalore.
- The Department of Chemistry, University of Delhi has developed nanoparticles to encapsulate steroidal drugs for delivery to the eye--an invention that has been transferred for commercialization to Panacea Biotec, Chandigarh.
- Bhaskar Center for Innovation and Scientific Research, Chennai, is developing an antimicrobial spray using silver nanoparticles and herbal extracts.
- The Central Scientific Instruments Organization is developing a nanotech-based kit for tuberculosis.
- Center for Nanobioscience Agharkar Research Institute, Pune is working on several interesting problems such as use of super paramagnetic nanoparticles for the treatment of cancer by hyperthermia; Development of nanotechnology based methods for the rapid diagnosis of diseases; Nanomaterials for the delivery of biopesticides; Studies on Ayurvedic bhasma preparations which are known to contain nanoparticles of metals, etc.