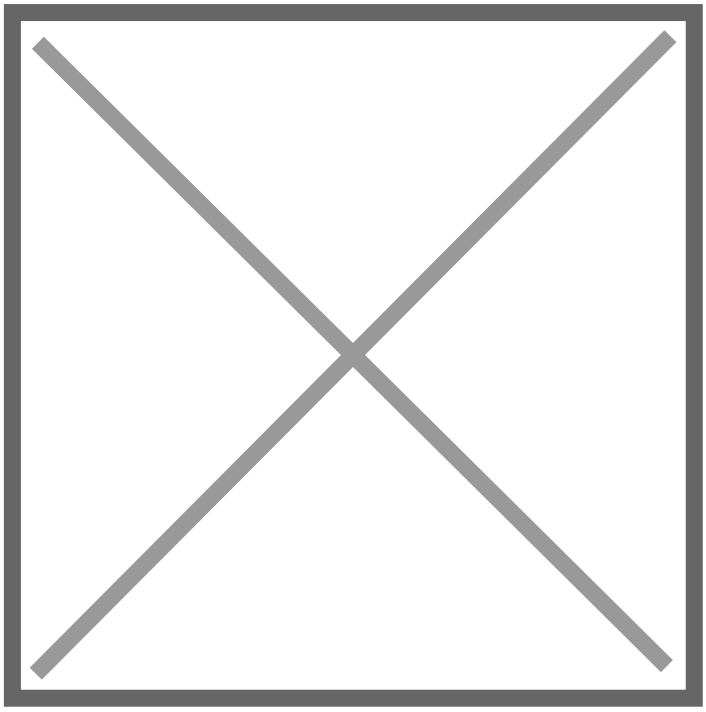
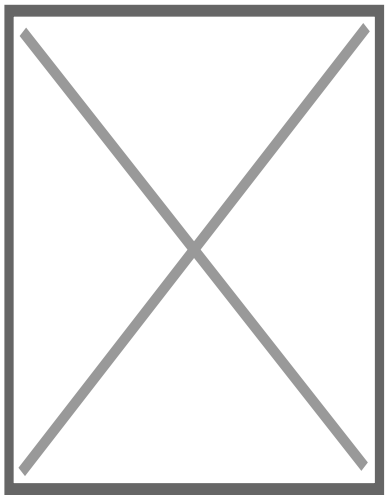


Hot Technologies and Technological Challenges in Life Sciences Industry

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-R R Dalvi, vice president, Fermentation Business and Projects, RPG Life Sciences

The biggest challenge for the pharmaceutical industry is and will remain to be the discovery of new chemical entities (NCEs). As the pipelines of most of the big innovator companies are drying up, many of the potential blockbuster molecules have failed either in clinical trials or at the market place.

Innovator companies are now looking desperately at small research companies and using financial muscle to buy out their discoveries. But we are still far-off from solving the problems of critical illnesses affecting the human race. Unfortunately the focus has shifted from the critical illnesses to the lifestyle-related problems and diseases probably because of the market potential and also its impact in the class having the ability to pay.

In India, the situation is even more dismal as the NCE research has taken a back seat in most of the big pharma companies. The major reason is that there is no great success story which can become a driving force for all the business leaders. Recession also has taken its toll particularly on those companies that have lot of exposure abroad or have over leveraged their assets, this has limited their ability to take risk. Government research laboratories are active in this area but the industry is not working with them to take the concepts to commercialization.

In search of NCEs, the focus has shifted to biotechnology, monoclonal antibodies (MAbs) have provided answer to some of the problems. Some of these MAb-based drugs have become blockbusters and the work in this area is going on at a feverish pitch. Among Indian companies, Biocon definitely has a head start and they have initiated research efforts in this area. We may see some successful culmination of the efforts when the product sees the light of the day. Other than Biocon, there are not many players in this area as it requires lot of investment and commitment from the management. The major concern of biotech companies that are in the generic space is the legal frame work under discussion in the US. Convincing the authorities that their product is equivalent to the innovator product requires some effort.

The other major challenge is the development of vaccines for some of the important diseases like AIDS, cancer etc. Though some advances are made in this area, we are far from the situation where we can claim to have conquered these diseases. The development of diagnostic tools for certain diseases is also a major challenge, particularly for those diseases which need to be controlled at an early stage for the complete recovery of the patient. In India, lot of startup companies are active in this area but no big successes are seen.

The other area of work is the stem cell research, which is more specific to the patient. There is a lot of work going on in hospitals where the medical specialists are working on developing specific cures for individual patients using the stem cells, this work is going on in many centers in India. However, by the very nature of the cure, it will be specific to the individual

patient. The challenge would be how to roll it out on to a bigger scale and make it viable for patients.

Nanotechnology has been talked about as a delivery mechanism in many cases and offers a tremendous potential. It will help to deliver the drug to the cell where it is required and at the same time limit its side effects as it will be a targeted delivery. This is of high importance particularly for diseases like cancer where we need to focus on unwanted cell mass without affecting the normal cells and there is a need to distinguish between the two cells, lot of work is going on in this area and some successes are seen. Nanotechnology has also found lot of potential uses in diagnostics. In India, government is supporting lot of research work and in the coming years there is expected to be tremendous development in this field.

After a decade, one can expect that the biotechnology coupled with nanotechnology can give solutions to many problems in diagnostics, vaccines and drug delivery.