

## Jai Ho Biotech!

10 March 2009 | News



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When the first human genetic map was unveiled in the year 2000, the global collaborative project cost approximately \$3 billion. Two years ago, when the full genome of the iconic scientist, James Watson was published in full, the project cost just a tenth or around \$300 million. Now there are companies in California offering to provide an individual's gene map for just about \$1,000. And the latest issue of Technology Review, from MIT, has predicted that the individual genome map could soon be available for as little as \$100.

This is the progress biotechnology is making with the adoption of some cutting edge technological tools. Many of these developments are possible mainly due to advances on computer software, electronic instrumentation, imaging, and host of other enabling technologies. So this 6th Anniversary Special Issue of BioSpectrum has attempted to highlight some of these enabling technologies without which biotech would not be what it is today.

In fact sequencing technologies have enabled the mapping of human genome and understanding of molecular mechanisms of life much better. Gene sequencer as a technology has remained central to modern molecular research. PCR emerged as the most revolutionary technique that accelerated biotech research allowing detection of genetic mutations as well as analyzing degraded DNA, among other things. Similarly DNA microarray is a prime technology for the analysis of performance of gene expression. Chromatography and mass spectrometry are the most preferred techniques for routine bio analysis and are commonly used in pharmacokinetic studies.

With the development and maturing of other technologies like the flow cytometry and LIMS, biotechnology is beingharnessed much better now. And biotechnology is moving into the next horizon of managing the life in general and life sciences industry in particular. It promises hope for treatment of Alzheimer's; promises stem cells therapies; new ways of managing life style diseases like obesity and insulin; gene therapy using purified preparations of a gene or a fraction of a gene to treat diseases; and new therapies for neurodegenerative disorders like the neuron replacement therapy. Certainly the expectations run high on the healthcare arena. While new therapies are being discovered, the use of biotechnology as an alternative to

conventional fuel cells etc. is on. Genetic testing is a new way of diagnosis. In another five years time genome analysis of an individual would be available for lesser than Rs 1,000 and as common as mobile phone technology.

The Technology Review's 10 Emerging Technologies list also has other interesting developments in areas such as clean energy, health care, computing and communications. The promising ones include some medical technologies such as paper-based medical tests, biological machines and \$100 genome analysis chip. These developments are good news to the sector.

Are there any other major technological developments that will guide the progress in biotechnology?

BioSpectrum has put together a list of 12 developments that would make a difference to the life sciences industry in general.

The thin line between the pharmaceutical industry and biotech segment is now narrowing further. The developments at Pfizer, Roche, etc. are an indication to this effect. And the industry has the opportunity to embrace the challenges posed by the current financial downturn and transform its way of conducting business and research. Operational excellence as a strategy is the mantra.

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