BioSpectrum the business of Bio & Health Sciences

Tool Makers

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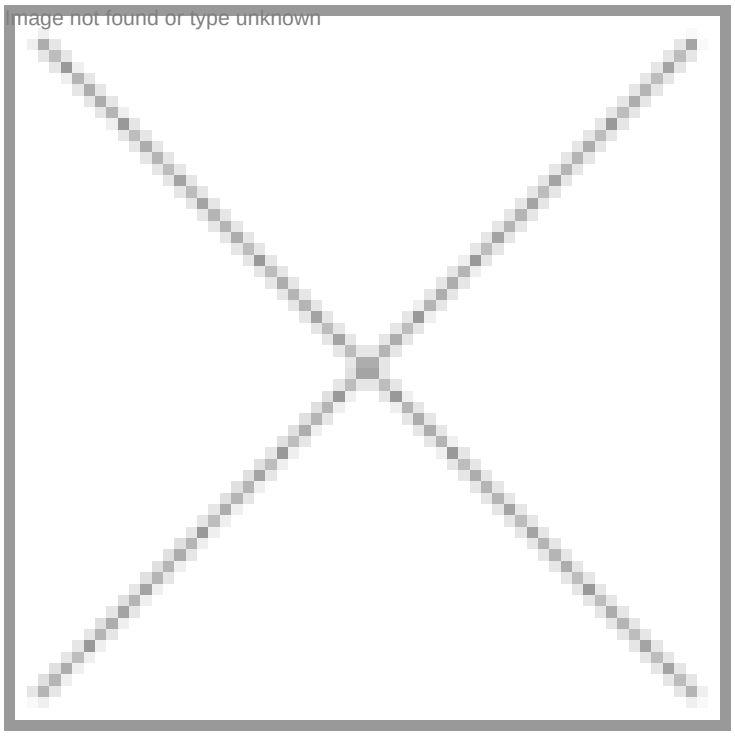
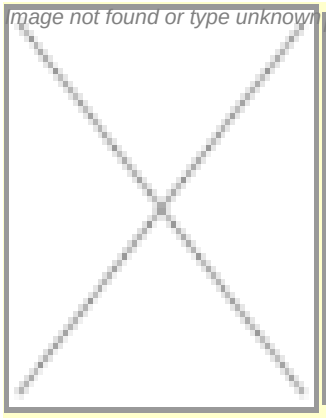
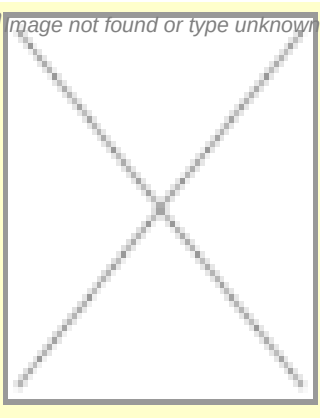


Tool Makers

A practical course curriculum will help students take up challenging jobs successfully.





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Training in biotechnology is a buzzword these days. Every academic institution would like to plunge into opening up doors for biotechnology training in India. Very often we face questions like: What will be the course curriculum? What kind of job prospects are in store for biotechnologists? And so on and so forth.

We have started believing that learning is the fundamental requirement for earning. To put it more emphatically, higher the quality of learning, higher will be the earnings. The IT boom has successfully confirmed the hypothesis. In these circumstances, the awareness about biotechnology training and research, development and industry, social impacts and solutions is very very low. Biotechnology is the interdisciplinary approach towards learning life sciences along with physics, chemistry, computer science, maths and statistics. The crucial part is to convert this scientific knowledge into a viable technological base.

Scope of biotechnology

What is this technology we are referring to? Where is it required? Biotechnology is a very specialized segment of the life sciences industry. The pace of growth of this industry has definitely been accelerated in the 21st century. The growth of biotechnology in sectors, which touch the human requirements on food, health care and environment. This is so very self-explanatory that these three segments of life are the most vital areas of human civilization in the globe at this point of time. It would be rather difficult at this stage to define the scope of this subject in a confined sense.

Innovation, value addition, validation, formulation and application - individually or cumulatively define the scope of biotechnology in the vital areas of medicine, agriculture and environment management. Having these as base line statements, we can definitely predict how the course curriculum and its successful implementation can put the man and machine in place to further the most challenging subject of 21st century. Essentially the course curriculum will train a meritorious and interested student, preferably with research acumen in the fundamental sciences with further application in biotechnology. The student would be then trained with practical aspects of modern biotechnology namely plant and animal tissue culture, fermentation and genetic engineering. Sounds good.

However, there is a word of caution here: This collage of information from various disciplines of science should culminate into a strong knowledge based meaning biotechnology. To make these work rigorous hands on training in the fundamental techniques is absolutely essential at the graduation level. This exercise is a definite upgradation of the otherwise compartmentalized and repetitive science education at college level. Usually higher education till graduation does not encourage creativity in the present circumstances. Biotechnology definitely would prosper with creativity as one of the main anchors. Independent project handling at the last year of graduation definitely helps the students to be more organized in designing the experiments, logically interpret them and find out what was the most worthwhile activity in the whole series of experiments termed as projects. The students with these ideas would definitely contribute as tool makers in industries harboring new technologies related to Genomics.

The Genomic industry can be categorized into five groups:

- Tool makers: Companies which supply the necessary equipments for gene discovery.
- Gene cataloguers: Companies which use these tools to build databases and sell them eventually.
- Target screening: Companies that use these tools to perform target screening.
- Companies using data bases and developing potential drug compounds as well are known as functional genomics companies.
- Companies involved in data mining, genotyping, DNA sequencing are using bioinformatics to a large extent.

All these developments are signals that the existing major pharmaceutical companies would soon evolve as part pharma, part biotech companies and this forms a biggest chunk of job opportunities for biotechnology-trained graduates, post-graduates and researchers in that order. It is true that the industry would require one PhD and ten bench workers. Hope we can make deliberate effort to maintain this ratio.

Farm sector

The agriculture sector all said and done needs to metamorphosized into a more scientific and knowledge based industry than a weather dependent, unskilled livelihood. Working with Vidya Pratishthan in rural background has made us realize the need to create awareness amongst relevant target population, actual successful implementation of modern biotechnology at grassroot levels (farmer) and strengthening research based for future needs of agriculture is of utmost importance for a stable and progressive Indian economy. Trained manpower in biotechnology can change this scenario positively.

There are other areas of environment management where user-friendly biotechnology can be put to test. It would be wrong to assume that only molecular level studies mean biotechnology. Any positive modification in biological sample further exploited for betterment of human life in any aspect can be deduced as the real meaning of biotechnology at least in the Indian context. India has a unique advantage in its large and diversified genetic resource to lead the world in biotechnology. Trained manpower is required in patent regime as well. This would mean a very interesting scope with a combination of science and law.

Talent pool

In this era of biogenerics, contract manufacturing, contract research, clinical trials, diagnostics, bioinformatics and agri biotech skilled manpower in these niche areas of biotechnology would have tremendous demand. The potential of growth would depend on pace of innovative mind and the caliber of the manpower entering into this field. Other crucial success factors like infrastructure, patent regime, collaborations with research and development, finances and regulatory support, if fall in chain, India would be undoubtedly at the top in the near future.

By Dr Arun Adsool and Dr Sushama Chaphalkar