

## Field of biotechnology is ever expanding and evolving

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**Dr Kalpana Joshi shares her thoughts with BioSpectrum on current biotech education and the academia-industry gap**



Dr Kalpana Joshi is Professor and Head of the Department of Biotechnology at Sinhgad College of Engineering (SCOE). The institute is affiliated to Savitribai Phule Pune University (SPPU) and recognised by All India Council for Technical Education (AICTE), New Delhi. Recently, SCOE has received NAAC "A" Grade. BTech Biotechnology course run by the department is first AICTE approved course in SPPU.

Dr Joshi completed her doctorate in molecular biology from National Chemical Laboratory. She headed in-vitro biology group at Pharma R and D, besides giving consultancy to pharma companies like Glenmark, Matrix, Hyderabad and Orchids, Chennai. The SCOE department has a team of faculty with expertise in fermentation engineering, biochemical engineering, pharma biotechnology, biochemistry, analytical chemistry and microbiology. Faculty is active in fetching grants for research, patents and publications.

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### **Do you think biotech schools are teaching what industry needs?**

Field of biotechnology is ever expanding and evolving. Pharma companies have diversified into production and business of biotherapeutics, vaccines and immunologicals, and molecular diagnostics. Industries such as agri-biotech, dairy biotech, food biotech are coming up and have specific requirement of skilled manpower. I feel giving hard core fundamental knowledge of the subjects and skill development are essential to meet industry requirement.

### **Specific requirements of industry when it comes to biotech education?**

Industry requires experienced and trained manpower. There is no time for training in companies. I remember my former boss used to tell me 'Kalpana this is not university for training. Take someone who would work from the next day.' Biotech schools need to develop necessary laboratory skills and strong basics.

**Where is the gap according to you?**

As a manager in drug discovery R&D of top pharma company, I used to interview candidates from renowned biotech schools in India. Major observation was students lacked practical skills and basic knowledge of fundamental subjects like microbiology, immunology, molecular biology, biochemistry etc. We at SCOE decided to focus on developing strong knowledge and skills in three pillars of biotechnology namely microbiology, biochemistry, and molecular biology with blend of engineering fundamentals like mass transfer, heat transfer, unit operations, plant design and process development. We have created excellent facilities so that students get to handle top brand equipment like PCR, HPLC, Lyophiliser, fermenters, microfiltrations and develop practical skills in molecular biology, animal tissue culture and data analysis softwares. Gap is at many places. I can give examples. Students use graph papers to plot graphs. We need to train them to use Excel to analyse data and plot graphs using softwares like Prism and SPSS normally used by industries

**What do you do to bridge the skill gap if it exists?**

At Sinhgad Institutes, we have state-of-the-art laboratories where students are trained for developing practical skills in microbiology, enzymology, molecular biology, fermentations and reaction engineering. We also teach them computation and statistics. Students work on projects and develop skills in at least one technique such as PCR, HPLC or cell culture. They are trained to be analytical, logical and develop problem solving capacity. Students are encouraged to do industry internships and projects in collaboration with companies and national laboratories.

**What has been the investment in student training?**

We have invested in infrastructure, facilities, equipment and faculty. Faculty members are PhD/ MTechs from renowned institutes like NCL, IITs, ICTs with industry exposure. If faculty does not know what is happening in the industry then it is difficult to percolate it to students. We ensure that faculty gets exposure to industry and maintain interactions with industry experts