

## Academia and industry should work more closely

04 September 2007 | News

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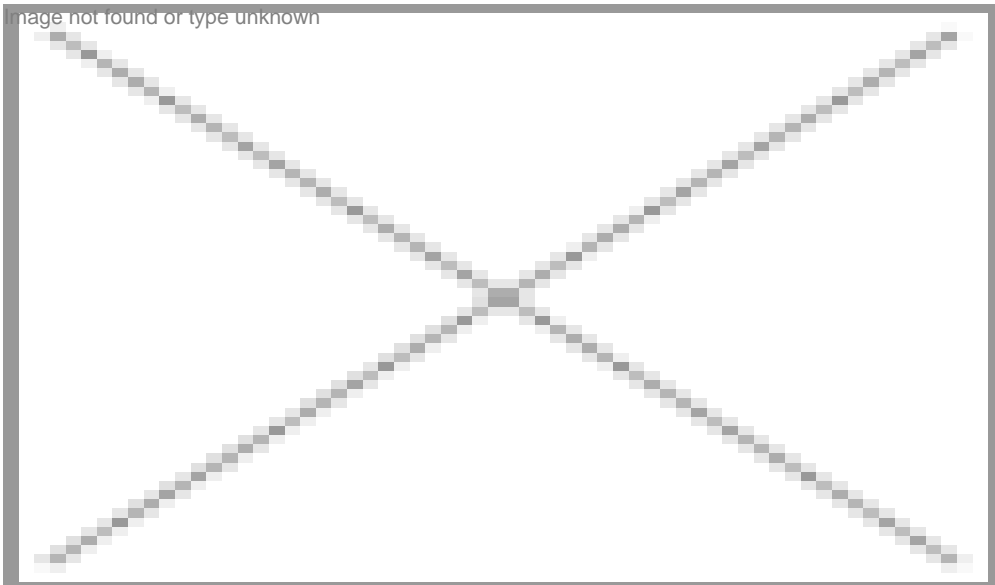


### Academia and industry should work more closely

*The BioSpectrum CEOs Summit 2007 in Bangalore discussed ways to bridge the existing gap between the industry and academia.*

The third BioSpectrum CEOs Summit kicked off with its Bangalore leg on August 17, 2007 at The Grand Ashok, Bangalore. Addressing a gathering of industry leaders and representatives from the academia, Narayanan Suresh, Editor, BioSpectrum, who moderated a discussion on bridging the industry-academia gap, said there are about 300 institutions in the country offering biotechnology courses and these institutions have been churning out as many as 30,000 students every year for the last few years, but as per the BioSpectrum-ABLE survey, the industry today employs about 20,000-25,000 personnel in the technical and scientific categories. "This set us thinking as to what could be the reason for this kind of mismatch and this is something which we wanted to explore. Hence we thought apart from the industry people, the other stakeholders (academia) of the industry should be equally present here at this forum and we should give them an opportunity to interact with the industry captains who keep complaining about talent crunch in the industry. This platform should help come up with solutions which will ensure smooth flow of talent from the academia to the industry," Narayanan Suresh stated.

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Pointing out to a recent report in New York Times that India is introducing very contemporary issues in school and college curriculum including latest political trends, Narayanan Suresh said, "We would like to explore if the same has been happening in biotech institutions. Are the students being taught what's current in the industry?"

The discussion panel comprised Dr Vijay Chandru, chairman, Strand Life Sciences, Dr Jagadish Mittur, director, Monsanto Research Centre, Prof. HN Nagendra of the Visvesvaraya Institute of Technology (VIT), Dr Geeta Bali of the Bangalore University, and Dr PS Rao of the Dayanand Sagar Institutions.

Describing himself as an "intellectual poacher", Dr Vijay Chandru said he was trained in electrical engineering and computer science and "somehow found my way into the life sciences." When asked about the challenges he faced while recruiting people, he said, "The primary challenge in terms of recruitment has been essentially the challenge of finding highly skilled computer scientists. It is very difficult as essentially we are competing with the Googles and Yahoos (IT majors) of the world. We need to find out the underlying interests potential candidates have in the life sciences and then rope them in. Purely trying to attract them with big salaries would be very hard."

Mooting the concept of tele-education in the country, he said the government should think of implementing PG diplomas in specialized courses, take steps to enhance the quality of education and also introduce refresher courses.

Dr Jagadish Mittur agreed it was not easy to find competent computational biologists. "Here we are competing with the Intels, IBMs, Wipros and Infosys and also pharmaceutical companies. It is easier to attract them into a pharmaceutical company as opposed to an agricultural company because agriculture seems to be somewhat more controversial than a pharmaceutical company...people never ask questions when it comes to taking a drug but people will have questions when they have a choice of food. So it is that much more difficult to attract people of high caliber into an agri company. Nevertheless Monsanto has been very successful in research. Here in Bangalore, we are about 60 people in the area of biotechnology and we also house an IT group of about 40 people and I know the IT leads in an agri company like ours face a lot of challenges to keep them going. My passion is to really interact with the academicians and students to build a sense of passion towards agriculture because India is an agricultural country. If we do not solve problems we have in agriculture, I don't think India will progress to the extent that the government and the leaders are trying to dream of," Mittur said.

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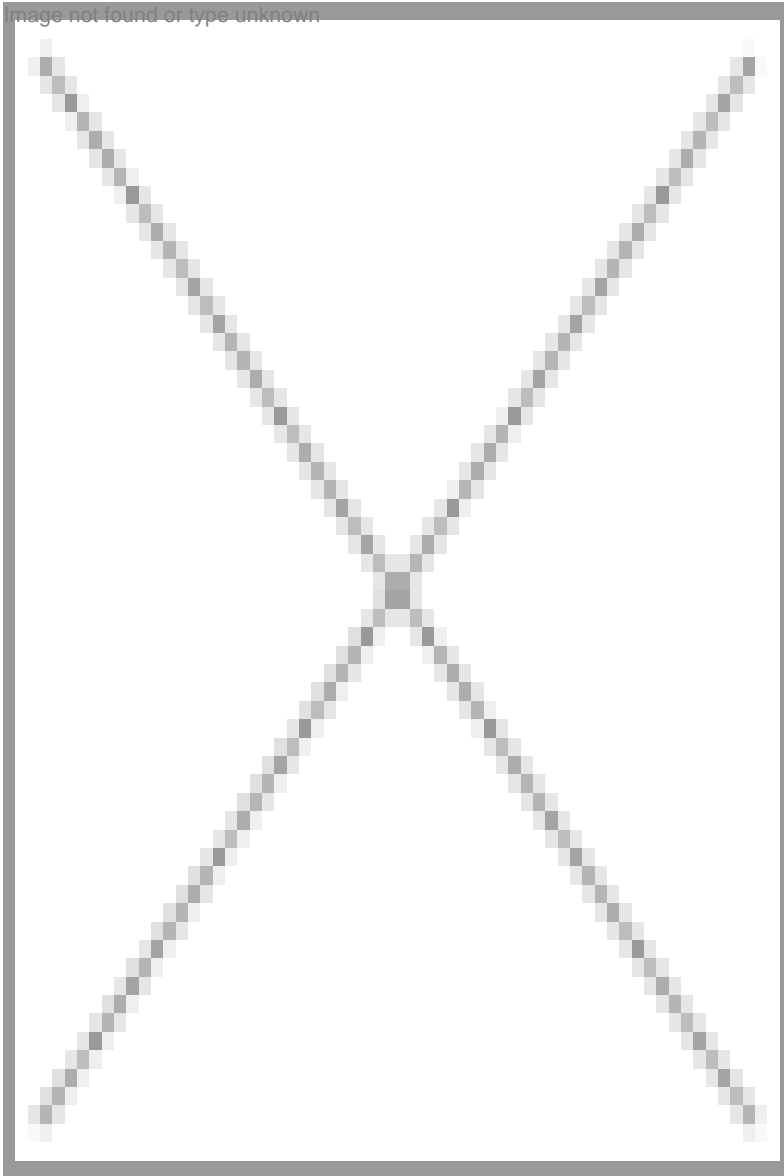
"Although Monsanto is a life sciences company, it is only one-third of the strength that is actually life sciences oriented. We need other people to support the industry and that includes finance people, lawyers, patent scientists, and HR experts. Getting a degree in life sciences these days is not really enough or is not the end of the road. There are many lateral ways of growing a career in life sciences, but what is important is to develop a passion towards the field that you are in like for instance agbiotech or a passion for developing drugs or vaccines for the community or for animals or finding new sources of energy. If we don't have that ingrown, heartfelt passion, it is very difficult to survive," he opined.

Dr Geeta Bali of the Department of Microbiology, Bangalore University, said, "There is total agreement that the students who come out of academic institutions should match the needs of the industry. The disagreement only comes in judging the quality of the students."

She said about 10-15 percent of the talented students, whom the industry would really love to have, are the ones who do not wish to join the industry. They go aboard for higher studies or join premier institutes to do their PhDs and in the process we lose them. Is there any way to attract them? Educational programs should be integrated in such a way so as to facilitate awarding PhDs to students while they are working and this will definitely attract the best of the students to the industry, she felt.

Stating that the Bangalore University had taken steps to introduce subjects like nanobiotechnology, medical biotechnology and IPR issues and bioethics in the syllabus over the last few years, Dr Geeta Bali said the syllabus had to be modified every year as there were more and more students coming from diverse backgrounds.

Dr PS Rao felt there was an urgent need to tailor the current biotech syllabus to suit the needs of the industry. "These days biotech graduates are not qualified enough to effectively take up job responsibilities in the industry as they lack practical skills. Therefore we need to have experimental protocols and take steps to restructure and upgrade the syllabus," he said. Lamenting over the dearth of quality faculty in biotech institutions, he said other factors such as lack of infrastructure and improper basic education had only added to the worsening education scenario. "I would highly recommend refresher courses for the faculty. The quality of education is totally unresponsive to the biotech industry," he pointed out. He felt that the Bangalore University, which had taken out the project work from the syllabus, had to reintroduce it in the curriculum.



Stressing on the dire need for establishing biotech finishing schools in the country, Dr Rao said students require at least a six-month hands-on training program and six months internship in the industry before they can think of shaping up their career in biotechnology.

Sharing similar views, Prof. Nagendra of VIT said the first and foremost important thing was to ensure that educational institutions produced quality biotech engineers who would be competent in the industry. He felt BE (biotech) graduates have an edge over the conventional BSc/MSc students as they come from a mathematical background and possess better analytical skills. "These days the industry people need to interview several candidates before they can find the right one.

They need to support and identify talent pool through capacity building exercises. Biotech institutions should cease to become mere degree churning organizations and public funding initiatives is the need of the hour to nurture talent," he emphasized.

There were several other suggestions from the industry as well academia.

Naveen Kulkarni, CEO of Polyclone Bioservices pointed out that the major concern is not how current the syllabus is, but hands-on training. It is a very simple thing that academic institutions have to do...we study something but we don't do that in the practice and this is much more prevalent in India. "About 10 years back, I went to Australia for my PG, I had to take one UG subject and genetics was the subject. In theory I scored well, but when it came to practicals, I just could not even gas the drosophila and the experiment continued for a week until we saw the difference in the eye color and so on. I lost it in my first lab. That was a major issue," explained Kulkarni. Genetics being a basic subject, we do not have relevant practicals in our education. Rather than talking about nanotechnology and whatever else that's coming in current trends, the industry should focus on simple things, i.e., what you read is what you do. Together the learning comes in. I think we are missing that point.

Prof. C Kameswara Rao, executive secretary, Foundation for Biotechnology Awareness and Education (FBAE), said, "The top courses in universities are never there to provide for the industry. Biotechnology probably is the first one. The industry does not require students with a very high academic background. It requires people who have competence in thinking, planning a product, a few great managers and the rest of the employees are worker bees. It requires a biotechnologist, a biochemist and so many other people put together. The industry captains have nowhere made it clear the kind of candidates they require and the qualifications they looking for. Let the industry come up with a white paper stating their requirements. We can modify a part of the curriculum to meet these requirements. Unless there is a serious dialogue between the industry and universities, we cannot improve the situation of talent crunch in the industry.

Sudhir Kant, President, Millipore India, said, "The quality of teachers should be increased so that knowledge can be imparted effectively. But how many people really want to get into teaching these days? We are allowing too many biotech colleges to come up...quantity is increasing, but quality is lacking."

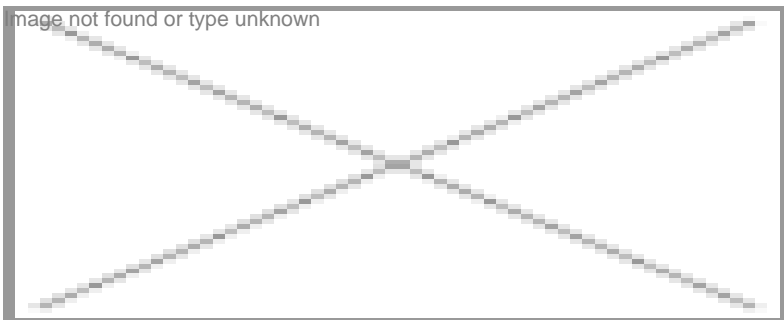
Raghu MR, director, Best Biotek Research Labs, said: "We focus on practical hands-on oriented programs. What we have seen in the last five years is that the industry doesn't really expect very high-end things from the students. They want a very strong practical foundation and we are focusing on only that.

## **Two major highlights of the discussion**

1. Relevance of the curriculum
2. Current needs of the industry

What are the things academia must do to ensure smooth flow of talent to the industry?

Dr Jagadish Mittur, director, Monsanto Research Center: It is one versus team. Do we want one person who can handle everything as opposed to a team of lets say 10 individuals? Each one of these 10 will have extreme amount of in-depth knowledge in many of the subjects. I don't think one person can give us what we want. We look for a team of experts. It is good to have people who have had a little bit of exposure to other aspects of technology. They can bring in lateral thinking. We look for someone with a fundamental grounding. Fundamental aspects of the technology. We want someone who is able to communicate well what she/he knows. This is extremely important. It is very difficult for us to hire one person over the other. If this person has the capabilities, confidence will ooze out of the person. And we will not take much time in trying to scrutinize that person. Another thing is that this person has to have a long-term goal. We come across all kinds of students. They really have no idea as to what they want to become in life. I would rather listen to a student who has a long-term vision and who wants to contribute to solve the problems facing the country. And we do get people like that. That's what we would want.



How do we meaningfully employ students?

Dr Vijay Chandru, chairman, Strand Life Sciences: I am trying to understand the crisis better. I should not talk from the perspective of Strand Life Sciences. I don't think it generalizes well. If someone is trained both in theory and practice, you would actually get a much better product and we can go into several aspects of what the industry requires. And this is a challenge because we clearly need to modernize places like the IISc. I was appalled that there was no good microarray facility there. When we had to get scientists who understood these experimental techniques, we had to get scientists who were post doctoral people abroad and they have been our application scientists. There is no doubt it is very critical to have scientists with hands-on experience.

Geeta Bali, Bangalore University: Ultimately it is practical training which will help the industry. What are the needs of the industry? We are yet to analyze this as the industry is diverse in nature. Can we tailor a program which is offered for 2 years and cut down to practically 8 months with the semester scheme. Within 8 months, can we train students and see to it that they are good in each of the subjects...it is difficult. The industry demands are growing at an enormous rate and practical training is lacking in most institutions as they have to deal with a large number of students and it is an expensive affair. I feel a closer interaction is required where BioSpectrum could help identify the industries and tell us what they requires in terms of theoretical and practical knowledge in students. We can try to incorporate the same as much as possible in the syllabus. It is impossible to train students in every branch of biotechnology. So let us at least focus on industries which are likely to recruit our students. We can improve the syllabus. We are always open for suggestions and we require inputs from the industry as to what can be incorporated in the syllabus.

Dr PS Rao, Dayanand Sagar Institutions: The bottomline is to have a strong interaction between academia and industry. We need to know what the industry needs. Practical skills are lacking in biotech graduates passing out in huge numbers these days.

Namratha Jagtap