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RESEARCH ARTICLE

BIOINCUBATORS AS BIO-PORT SOLUTIONS

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Abstract

In spite of tremendous effort and expertise being invested into Biotech R&D, the world still awaits the so-called “Biotech-boom”. Countries like India and China, famous for their cheap and skilled labour, have also been unsuccessful to give birth to the desired entrepreneurial talent. The retarded growth of Biotech-spectrum and need for assistance of budding entrepreneurs, gave birth to the bioincubators. Bioincubators are business incubators, meant for start-up companies in biosciences department, and aims towards their development. This study aims to reveal the awareness, potentials and perception of bioincubators amongst respondents from academia and industry expertise, from an Indian perspective.

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Introduction

In today's scenario Biotechnology and allied health care industry is indeed experiencing a retarded growth owing to the hindrance experienced in research and development sector. Considering a developing country like India, expenditure in Biotech research is certainly not on the primary agenda of the government. Most often researchers do stumble in and around discoveries which can either be patented or can be made available commercially with the intention of production scaling. Even private funding in regard of venture capital is a not-so-frequent event when compared with the likes of the counterparts of USA and other European countries. It is in accordance with the fact that investment in biotech research does not always fetch subsequent returns. Leaving aside the funding point of view another bigger hindrance faced by biotech research is the lack of adequate environment and associations. The Indian Bioincubators face various hurdles out of which the most significant is Biotech incubation being a very time consuming approach, more funding-centric, specialized management being very crucial and Bioincubators requiring special mentors for incubates.

Mode of market research: The market research was conducted in the form of survey that involved getting questionnaire filled by respondents. Differing on the value of each question and based on the value attached to it by the respondent, we have hereby come to the conclusions. The respondents to the survey included both academia as well as corporate representatives.

Awareness on Bioincubators

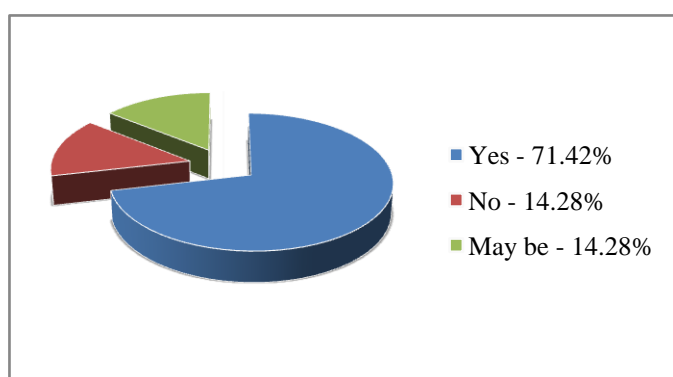
Newspaper dominates over others like magazines and research journal as far as creation of awareness is concerned. The frequent symposium, seminar, conferences and initiatives by BIRAC (Biotechnology Industry Research Assistance Council) are what that can be accounted for as a reason to it. 100% of the respondents feel that Bioincubators can promote the concept of bio-business more into the conserved allies of a nation no matter how resistant to change is it. In spite of the best efforts from Department of Biotechnology, BIRAC and other Organisations trying to promote bioincubators, it can be seen that they have experienced a retarded growth which also contributes to India still awaiting the Biotech-boom.

Potentials and Opportunities of Bioincubators

- Bioincubator and Bio-entrepreneurship:

The function of a bioincubator is to provide the appropriate resources as well as services to convert their novel business plans into reality. This can often come around as a handy approach as far as promoting bio-entrepreneurship is concerned. In India the wide variety of educated population often leaves a huge impact that this would bring a deep impact on the economical pool of the country. Unfortunately, the same has not taken place. With the promotion of bioincubators, the country can afford to dream that they will get to experience the rise in Bio-entrepreneurship.

Figure 1: Can Bioincubators lead to a promotion of Bio-entrepreneurship?



- *Bioincubator and Commercialisation*

Biotechnology is often regarded as a knowledge-centric domain in the field of business and for a bioentrepreneur it is the rate of commercialisation from lab to market that determines the revenue of his enterprise. This commercialisation is normally brought about in two major ways which include technology transfer process and the other is exploitation of the intellectual property rights. On an average, 73.33% of the respondents feel that the number of patents filed every year from India will increase with the IP services that are provided by the Bioincubators. The IP services also include guidance regarding Patent filing, IP policy and IP management. On the other hand 86.67% of the respondents feel that the concept of 'Bioincubators' are a just and a proactive step taken to facilitate Biotech R & D and commercialization, while 80% of the respondents feel that Bioincubators will see acceleration in the Product development by means of easier Research and Development and higher rates of commercialisation only if

Bioincubator is taken more seriously and precariously by the regulatory authorities.

- *Bioincubators and Drug Pipelines*

Pharmaceutical products often come with a very specific and timid product life cycle and re-launching the product by re-engineering is often not possible. Thus companies find no other option but to rely on the continuous innovation that would yield them a significant drug pipelines. 86.67% of the respondents feel that Bioincubators can help the pharmaceutical players build a formidable drug pipeline to help them remain functional in the market. Now on a more practical note, not all pharmaceutical players can afford to maintain a huge pool in their pipeline due to the cost factor and thus it has given rise to the biggest problem in the pharmaceutical market which is drying pipelines. 53.33% of the respondents feel that Bioincubators can come along as a useful resource when it comes to aiding the drying drug pipelines.

- *Bioincubators and development in Biotechnology*

Despite all the faceted-development touching many sectors under the biotech umbrella, 80% of the respondents feel that development of bioincubators will finally lead to an allover development in the Biotech as an entire domain. This development might just be the one that all the biotechnologists in the world have been awaiting for because this will also give rise to Bio-port solutions as an individual domain. Thus 86.67% respondents do truly feel that the development of this "Bio-port" solution can indeed be a huge leap towards Bio-development or development of biotechnology.

Success Story:

- One of the biggest success stories of Bioincubators is Sid Martin Biotechnology Bioincubator that helped grow some of the leading Biotechnology based companies that manufacture products ranging from antibodies, antibody reagents to diagnostic kits at competitive prices sheltering scientific inventions all over the world.

This 4000 square feet incubator was found in the year 1990 by Florida Legislature and was funded by the University of Florida, the United States Department of Agriculture and the Florida Legislature. Sid Martin Biotechnology Bioincubator aimed at providing enough help and support to a bio-based start-up company in terms of transportation of raw materials and finished products, R& D activities, undisturbed

power supply, Clean water for industrial purpose, well equipped laboratory, Conference rooms, guest rooms, Internet and telecom facilities at affordable charges such that the startup can successfully grow into a business giant.

A good number of Biotechnology based companies have graduated from here, noteworthy among them are Applied Genetic Technologies Corp. (AGTC), EnCor Biotechnology Inc., BioMed-Immunotech Inc., Cygene Labs, Florida BioDatabase Profile, EcoArray, Inc. Luminex etc.

- EnCor Biotechnology Inc. is among those few Biotech companies that have successfully generated profit steadily, since 2004. Dr. Gerry Shaw found the company in the year 1999 under the shelter of Sid Martin Biotechnology Bioincubator. He initially took a lab space in the incubator after which Dr. Shaw started large scale production of monoclonal and polyclonal antibodies and supplied them to companies like Abcam, Abnova, Cell Signaling Technology, Covance, Invitrogen, Millipore, Thermo Fisher, Santa Cruz and many others. Excellent Laboratory facilities enhanced research and development due to which EnCor discovered more novel and unique antibodies. Demand for antibodies increased and so did their supply. Sid Martin Biotechnology Bioincubator helped EnCor grow from the very beginning, step by step, converting Dr. Shaw's dreams into reality. Finally, EnCor 'graduated' from the Incubator in the year 2006 and set up their ware house in Gainesville.

A hindered growth of Bio-link

Amidst all the bright shades of successes, there are darker shades of failures in the spectrum of bioincubators. One that can be described is the co-incubation model adopted by Bio-Link in January 2003. Under its hat lies the achievement to have bagged 6 NDAs and 14 written proprietary informations, along with it here are a few it's severe hindrances:

- Most of the entrepreneurs that founded the Bio-Link portfolio companies came directly from academia and for most of them; this was their first business experience. As such, they were very focused on their invention and lacked the business culture of "openness and sharing" which is the basic essential for co-incubation. This refers mainly to the early stage product developing companies (75% of the Bio-Link portfolio companies) and not to the service-

providing companies. In those cases where the managers of a certain portfolio company had already worked for a biotech or pharmaceutical company, they were much more open to the co-incubation process. A unjustified fear for their IP also prevented some of the companies considering a co-incubation and collaboration with another young company

- Companies ready for co-incubation needs to be at least 2 to 3 years old. This age will also result in internal clarification and understanding of the needs for co-incubation in terms of the benefits that the company can obtain with such potential collaborations.
- Co-incubation requires dedicated funding since collaboration between scientific or technology developing groups means travel, use of material, use of legal services to set the terms of the collaboration, considerations related to sharing IP etc. The Bio-Link project did not take these expenses into consideration. Budget to support co-incubation between portfolio companies did not exist, so any co-incubation was financed by the portfolio companies themselves. This limitation enabled only more established, advanced companies to take part in the co-incubation process while the young companies which may have needed co-incubation were unable to afford it.

The Global and Indian Scenario

According to Dr. Ravi Dhar (BIRAC) in ISBA meeting, March, 2012, the following is the condition of bioincubators in India.

Northern India	10
Southern India	27
Eastern India	5
Western India	8
TOTAL	50

On the contrary, there are approximately 1100 Incubators available abroad where USA has 12% of the operating functionally, France has 4% and German has 52% operating functionally. On comparing the case of India, The Bioincubators in India provide the following benefits:

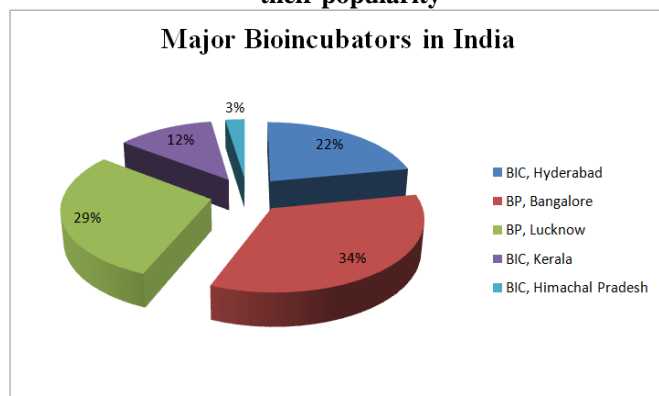
- Creating a localised cluster of industry and academia
- Enhances an entrepreneurial culture
- Accelerates commercialisation
- Spreads the localised economies
- Encourages the small fragments of the society like women

The issues that Indian Bioincubators face are as follows:

- Absence of adequate venture capital
- Long-term-sustainability is indeed an issue
- The business models in India are not incubator-friendly

Though India sees an approx. 50-85% government participation in venture funding but the duration being approximately 2-5 years and the ownership being joint venture at the time of funding which later slips out as the host becoming the proprietor in due course of time, this brings a dark cloud over the bioincubator's climate in India.

Figure 2: Major Bioincubators in India based on their popularity



A clear Majority of the respondents strongly believe that bioincubators will help entrepreneurs in developing their start-ups. Though there are certain respondents who feel that it may or may not help entrepreneurs in their start-ups, there were none who felt that bioincubators would be of no help to the entrepreneurs. 53.33% of the respondents believe that the bioincubators in India are not enough as per the world standards.

Conclusion

More often than not inventions and innovations are preceded by a problem or a necessity. The successor to this problem is the evolution of bioincubators. Bioincubators are designed keeping in mind the services and the also the infrastructure that can often translate an entrepreneurial venture into SMEs. Management and finance are the two key ingredients that incubates need from bioincubators and besides providing just that and other support, bioincubators also provide the ideal platform to an incubate to interact with other incubates and entrepreneurs of the same sector in the form of conferences. By means of

infrastructure, a researcher enjoys access to more sophisticated techniques besides enjoying office areas and other lab requirements which may be covered in the package. It is indeed important that start-ups are guided by the incubators in a way which not just provide them ideal growth conditions, but also leads towards the desired results within desired span of time. Indeed the bioincubators in India suffer a staggered growth due to the absence of proper environment of incubation and innovation. 86.67% of the respondents believe that bioincubators can essentially derive a boost from increased interaction between academia and industry. Amidst all the grey, 53.33% of our respondents will surely rely on bioincubators to do justice to their innovation.

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Appendix

The questionnaire used for the survey is as follows:

1. Which age group do you belong to?

☐ <20 years

☐ 20-30 years

☐ 30-50 years

☐ >50 years

2. Do you know what Bioincubators are?

☐ Yes

☐ No

3. From where have you heard about Bioincubators?

☐ Newspaper

☐ Magazines

☐ Research

☐ Other sources

If you have selected "other sources", please specify:

4. Just like an incubator provides a culture with optimum conditions for development and growth, do you think

Bioincubators provide an entrepreneur with all the necessary conditions for development?

☐ Yes

☐ No

☐ May be

5. Do you think Bioincubators will help entrepreneurs in developing their start-ups?

☐ Yes

☐ No

☐ May be

6. Which of the following incubators have you heard of? (Can tick more than 1 option)

☐ Biotech Park Lucknow

☐ BIC Kerala

☐ BIC Hyderabad

☐ Biotechnology Park Bangalore

☐ BIC Himachal Pradesh

Which one do you think is the best? Please specify:

7. Do you think that the Bioincubators in India are at par with those in the technologically developed countries?

☐ Yes

☐ No

☐ May be

8. Do you think that Government support in bio-entrepreneurship is enough in India?

☐ Yes

☐ No

☐ May be

9. In a situation where World Bank has to say that 32.7% of Indian people fall below poverty line, do you think it is worth investing money in developing such Bioincubators?

☐ Yes

☐ No

☐ May be

10. Do you think Bioincubators will be successful enough to promote Biotechnology and Bio-business in the nation?

☐ Yes

☐ No

☐ May be

11. Do you think Bioincubators will encourage young researchers to become entrepreneurs rather than becoming just another employee of a company?

☐ Yes

☐ No

☐ May be

12. Do you think the present incubators are well-equipped to meet the needs of the Bio-entrepreneurs?

☐ Yes

☐ No

☐ May be

13. Do you think the Bioincubators are expensive enough for entrepreneurs who are just about to start their business?

☐ Yes

☐ No

☐ May be

14. Do you think the total number of patents filed every year from India will increase with the IP services provided by the Bioincubators which includes guidance regarding Patent filling, IP policy, IP management etc.?

☐ Yes

☐ No

☐ May be

15. Do you think that the close interaction of the Incubators with the academia would be beneficial for both and would provide a boost to innovative technologies?

☐ Yes

☐ No

☐ May be

16. Do you think India has enough Bioincubators to support the academia?

☐ Yes

☐ No

☐ May be

17. To promote the Bio-Port solutions, do you think that there should be more interactions between the academia and Bioincubators?

☐ Yes

☐ No

☐ May be

18. Do you think Bioincubators as Bio-port solutions can emerge as a big leap towards development of Biotechnology?

☐ Yes

☐ No

☐ May be

19. Do you think the concept of 'Bioincubators' are a just and a proactive step taken to facilitate Biotechnology R & D and commercialization?

☐ Yes

☐ No

☐ May be

20. Do you think that Bioincubators can successfully bring about commercialization from lab to market in the near future?

☐ Yes

☐ No

☐ May be

21. Do you think that the Bioincubators can lead to a rise of new drugs in the drug pipeline?

☐ Yes

☐ No

☐ May be

22. Do you think that bioincubators can emerge as a solution for drying pipelines?

☐ Yes

☐ No

☐ May be

23. Do you think Bioincubators can act as a potential one stop solution for technologists?

☐ Yes

☐ No

☐ May be

24. Do think that if Bioincubators bring about more transparency in their terms and conditions, it will facilitate all round development?

☐ Yes

☐ No

☐ May be

25. Do you think,Bioincubators have experienced a retarded growth due to lack of awareness?

☐ Yes

☐ No

☐ May be

26. If you had a novel idea, would you rely on a Bio-incubator for further development?

☐ Yes

☐ No

☐ May be