ABSTRACT BOOK

Inauguration of India Regional Branch Office, AFOB

May 28, 2016

ONE-DAY WORKSHOP ON- 'BIOTECHNOLOGY EDUCATION, BIO-ENTREPRENEURSHIP & BIOBUSINESS IN INDIA-2020'

India Regional Branch Office, Asian Federation of Biotechnology,

Department of Biotechnology, Indian Institute of Technology
Kharagpur, India-721302.

PROGRAM SCHEDULE

Inaugural program

- Opening the office of India Regional Branch Office (RBO), Asian Federation of Biotechnology (AFOB)
- Saraswati Vandana
- Lighting of lamp
- Welcome address by the Head of the Department, Biotechnology
- Address by Professor Virendra S. Bisaria, President, India RBO
- Address by Professor Satyahari Dey, Vice President, India RBO
- Address by Dean (POS&R)
- Address by Director , 11T Kharagpur
- Vote of thanks. Professor Tapas K. Maiti, Secretary, India RBO

Technical session

The One-day workshop on the theme-'BIOTECHNOLOGY EDUCATION, BIO-ENTREPRENEURSHIP & BIO-BUSINESS IN INDIA-2020'
Technical session-10:45 am-12:45 pm

Speakers-

- Professor Virendra S. Bisaria(Prospective unique curriculum for biotechnology courses in IITs).
- Dr. Subhranshu Sanyal, IIM Calcutta (Presenting a business plan).
- Dr. Parthasarathi Bhattacharya, Tierra Seedscience (Plant biotechnology: converting ideas to wealth).
- Dr. Goutam Bhattacharyya, K & S Partners (Patents, designs & know-how-creating new jobs for bio-researchers).

Panel discussion

Asian Federation of Biotechnology (AFOB) & Registered (Central) Office

Asian Federation of Biotechnology (AFOB) is a non-profit organization established in 2008. Its incorporation was agreed upon by the delegates from Asian countries during the IBS 2008 conference, Oct. 12-17 held in Dalian, China.Preparative meetings for the formation of AFOB had been held four times prior to its official establishment (April 27th, Songdo Technopark, Incheon, Korea, KSBB 2007 National Spring Meeting; November 5th and 7th, Taipei International Convention Center, Taipei, Taiwan, APBioChEC 2007 Meeting; April 18th, Jeonju City, Korea, KSBB 2008 (National Spring Meeting). The delegates from participating Asian countries discussed on the launching of AFOB during the meetings.The International Federation bears the name Asian Federation of Biotechnology, abbreviated to “AFOB”, hereafter referred to as ‘The Federation’.

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Divisions

Agricultural and Food Biotechnology

Applied Microbiology

Biopharmaceutical and Medical Biotechnology

Biocatalysis and Protein Engineering

Bioprocess and Bioseparation Engineering

Bioenergy and Biorefinery

Environmental Biotechnology

Marine Biotechnology

Nanobiotechnology, Biosensors and Biochips

Systems and Synthetic Biotechnology

Tissue Engineering and Biomaterials

Bioeconomy and Biobusiness

India Regional Branch Office (India RBO), AFOB and its address

INDIA REGIONAL BRANCH OFFICE, ASIAN FEDERATION OF BIOTECHNOLOGY (AFOB) is a non-profit organization established in 2015. Its incorporation was approved by the delegates from Asian countries during the 8th Executive Board Meeting (16 November 2015) held during Asian Congress on Biotechnology 2015, November 15-19, 2015 in Malaysia.

The International Federation bears the name Asian Federation of Biotechnology, abbreviated to "AFOB", registered office of the headquarter is located in Incheon, Republic of Korea. The INDIA REGIONAL BRANCH OFFICE, hereafter referred to as 'India RBO' will undertake activities in consultation/collaboration with headquarter and other RBOs .

AIMS AND OBJECTS OF India RBO, AFOB

India RBO, AFOB is a non-profit association. The general objectives of the India RBO are the same as that of AFOB, and are indicated below:

To promote co-operation, on scientific grounds, between the scientists from academia and industry in Asian region, and beyond, especially in collaboration with European Federation of Biotechnology (EFB), for the general advancement of biotechnology as an interdisciplinary field of research and as a means of bringing the scientific development to industrial level.

To promote the safe, sustainable and beneficial use of natural resources / biodiversity through the application of science, engineering and technology.

To improve public perceptions and education, to facilitate exchange of people and ideas, and to stimulate innovation and technology transfer with the common goal of advancing biotechnology in Asia and in the rest of the world.

To expand the network of regional scientists and organizations to enhance mobility and to facilitate exchange of skills and ideas among Asian nations.

To promote industry-institute partnership in supporting bio-entrepreneurship/ biobusiness and ushering in bio-prosperity through bioeconomy.

India RBO address
Department of Biotechnology, Indian Institute of Technology
Kharagpur, India-721302.

INDIA RBO EXECUTIVE MEMBERS

President

Dr. Virendra S Bisaria is a Professor at Department of Biochemical Engineering and Biotechnology, Indian Institute of Technology (IIT) Delhi. Professor Bisaria's research interests include Lignocellulose Bioconversion for Biofuels and Bioproducts, Bioinoculants, and Plant Cell Technology. Professor Bisaria is an Editor of Journal of Bioscience and Bioengineering, and is a Vice President of Asian Federation of Biotechnology (AFOB).

Vice President

Dr. Satyahari Dey is a Professor in Department of Biotechnology, IIT Kharagpur. Professor Dey's R&D are in plant/microbial biotechnology concerning Bio-prospecting genes/molecules, Molecular profiling, Prebiotics; pro-/psychobiotics nutraceuticals bioproducts (important contributions- sandalwood (cyclosaplin), Growtek bioreactor, prebiotics (Thelebolan). Professor Dey is Managing Director, STEP IIT Kharagpur; Deputy Secretary General, and Chair, Bioeconomy & Biobusiness, AFOB.

Secretary

Dr. Tapas Kumar Maiti is a Professor in Department of Biotechnology, IIT Kharagpur. Professor Maiti's R&D interest spans isolation and characterization of anticancer and immunomodulatory biomolecules and tissue engineering matrices from natural sources. Currently, the focus of the laboratory is fabrication of in vivo-like organ models on microfluidic chips to study physiological phenomenon like vasculogenesis, autophagy and disease models.

Steering Committee Member

Dr. Parthasarathi Bhattacharya, (M.Tech., Ph.D. -Biotechnology, IIT Kharagpur), Founder Director, Tierra Seed Science Pvt. Ltd. with two decades of R&D experience (Agricultural Biotechnology), built/managed corporate R&D, PPP projects, commercialized products/processes (Transgenics/Regulatory Assessment, Molecular/Mutation breeding). Received UNESCO Young Scientist Award (1992), Technology Day Award (NRDC, 2002); authored patents/copyrights, and 30 research papers He is in Governing Body, TIETS, IIT, Kharagpur.

Steering Committee Member

Mr. Shyam Shankar Das (M.Tech. Biotechnology and Engineering 1995) is Vice-President in Transgene Biotech Limited, Hyderabad. His prior assignments were in Dr. Reddy's Research Foundation; Themis Medicare, Sartorius India, Krebs Bio-chem and Praxair India. The expertise ranges from technology development, scale up and commercialization of different biologicals (immune-suppressant, anti-cholesterol, vitamin, and nutraceutical molecules), including participation in Overseas Technology Transfer.

Steering Committee Member

Dr. Goutam Ghosh (PhD, IIT Delhi) is Senior Vice President, Vaccines & Biological research at Panacea Biotec Limited, and leading the development of a number of potential products including India's first dengue and pneumococcal conjugate vaccines. Dr. Ghosh, a former World Bank Fellow, was instrumental in commercializing a few early stage innovations.

Steering Committee Member

Dr. Raghavendra P Gaikaiwari (PhD- NCL, Pune) is the Founder Chairman and Managing Director of M/s Hi Tech Bio Laboratories (proprietory firm in 1994). The Company turned in to a public limited one (M/s Hi Tech BioSciences India Ltd) in 2007. The major activities are manufacturing and marketing of-
-Bulk probiotics (human &farm animals)
-Synerbac formulation for waste water
-High value nutraceuticals and essential oil
-Novel delivery for probiotics.

Steering Committee Member

Dr. Debabrata Das (PhD, IIT Delhi; PDF, Utah) is a Professor in Department of Biotechnology, IIT Kharagpur. He was MNRE Chair Professor. He published 2 books; 128 papers; 22 chapters (books) and in editorial board of 3 Journals and Editor-in-Chief of American Journal of Biomass and Bioenergy. He received IAHE Akira Mitsue and BRSI Malaviya Memorial Awards for biohydrogen research.

Steering Committee Member

Dr. Amit K Das is a Professor in Department of Biotechnology, IIT Kharagpur. His research on M. tuberculosis searching new lead molecules to combat XDR/MDR tuberculosis. Prof. Das is a structural biologist having R&D focus on fatty acid biosynthesis. His team solved the structures of two important enzymes, namely FabG4 and HadAB complex, involved in mycolic acid synthesis.

Steering Committee Member

Dr. Sudip K. Ghosh, Professor & Head, Department of Biotechnology, Indian Institute of Technology Kharagpur, completed his Ph.D from Bose Institute, Kolkata and Post doctoral research from Harvard University School of Public Health. He has research interests in the area of Cell and Molecular biology of Protozoan parasite Entamoeba histolytica and E. invadens, Plant Molecular Biology and Drug Delivery.

Steering Committee Member

Dr. Anindya Sundar Ghosh (Ph. D. Bose Institute, Kolkata; PDF, ND, USA) is an Associate Professor in Department of Biotechnology, IIT Kharagpur. His major Research areas are in -a) Molecular Microbiology; b) Bacterial cell surface proteins; c) Biofilm and Antimicrobial chemotherapy; having achieved 51 Publications (International Journal & conference).

Steering Committee Member

Dr. Dipendra K Mitra is a Professor in All India Institute of Medical Sciences, New Delhi and is currently heading, Department of Transplant Immunology & Immunogenetics. He is an MD, Ph.D, trained in Stanford University Medical School. His area of research interest is transplant and immune deficiency patients. He serves as a member of several task force committees of DBT and ICMR.

Steering Committee Member

Dr. Rahul Roy is an Assistant Professor of Chemical Engineering at the Indian Institute of Science, Bangalore. His lab leads an interdisciplinary research program that aims to innovate and engineer novel technologies to help understand and manage infectious diseases using single molecule detection, quantitative genomics and high-resolution imaging.

Auditors

Dr. Ananta Kumar Ghosh (M.Sc., Ph.D. Calcutta University; PDF- USC, Harvard, Stanford, USA) is a Professor in Department of Biotechnology, IIT Kharagpur. Prof. Ghosh's research interests are in molecular biology, recombinant protein production, antimicrobial peptides, silk proteins as biomaterials and hybridoma technology.

ABSTRACTS

Presenting a business plan

Dr. Subhrangshu Sanyal
CEO
Indian Institute of Management Calcutta Innovation Park

The success rate of startups globally is around 10%. The entrepreneurs need to do a hard validation of their idea right upfront so that if it fails, it should fail early and cheap.

In view of the risk of failure, it is essential to write a proper business plan to convince the investors or even your business partners. In most of the cases it is the dedicated journey of one mind in an organization who actually has the energy to conceive the full idea of the business, and therefore can write a perfect plan.

A complete business plan is essential for a startup. The success of raising money is dependent on success of answering investors' questions. It is essential therefore to have a complete sense and its projection on items like business description, capital spending, cash flow forecast, profit and loss forecast, marketing plan, sales revenue forecast, personnel plan etc.

Individual aspects will differ depending on the nature of the business-retail, wholesale, manufacturing, project development etc. it will also change depending upon the domain area. Should consider a bio-business then it is essential to have a prior idea about the similar business in the same domain. If one is considering international transactions then it is prudent to forecast rise and fall in exchange rates in currencies while writing the plan. Many a time the lender/ investor may themselves a business owner and surely will judge your ability in projecting your plan. Bio-businesses have higher than average risks and you need to extra careful and critical in writing the plan.

Prospective unique curriculum for biotechnology courses in IITs: Biotechnology Education in IITs for Biobusiness

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Academic spin-offs are one way in which employability of university graduates is reflected. There is a growing realization that the close alignment between scientific research and innovation will lead to commercialization of the resultant research. Thus, the IITs and other R&D institutions, which are regarded as inventive knowledge sources can contribute substantially to the commercializable R&D output. Moreover, the IITs and other academic institutions are becoming increasingly entrepreneurial as evidenced by sustained rise in patenting, licensing and creation of spin-off companies. This has been possible through creation of Technology Business Incubators which help in creating successful ventures from innovative technology ideas and through Technology Transfer offices which facilitate the technology transfer through licensing.Ever since the pioneering start-up venture of Genentech, there has been continuous rise in biotechnology ventures; many of them were driven by passion to address some of the challenging issues facing mankind to provide solutions to a host of issues encompassing human health, environment and energy. The existence of various support programs, particularly by the Government agencies (such as Department of Biotechnology), provides opportunities to the entrepreneurs with ideas to realize their dreams.The lecture will givean overview of issues related to education, innovation, technology transfer and biotechnology entrepreneurship with some examples.

References

1. *Innovation and Entrepreneurship, Peter F. Drucker, HarperCollins, New York, 1986.*
2. *A knowledge-based typology of university spin-offs in the context of regional economic development, HaraldBatheltet. al., Technovation, 519, 30, 2010.*
3. *Human Capital and Successful Academic Spin-Off, Bettina Müller, ZEW (Centre for European Economic Research), ftp://ftp.zew.de/pub/zew-docs/dp/dp06081.pdf*

Plant biotechnology & new agriculture: converting ideas to wealth

Dr.Parthasarathi Bhattacharya
Director
Tierra Seed Science Pvt. Ltd.
Hyderabad

Following the Industrial Revolution and Computer Revolution, the third technological revolution that is being predicted to have a major global impact is "BiOmics" Revolution, comprising – Genomics – Proteomics – Metabolomics &Phenomics generated Big data analysis using modern bio informatics tools. Besides, helping new drug discovery, personalized medicines etc. it will bring vast change in agriculture through development of better food, fibre and fuel. The strategies for crop improvement are changing fast from conventional plant breeding to breeding by design, gene transfer to genome editing to PACE, mutation breeding to TILLING Technology etc.

Food and agribusiness form a $5 trillion global industry that is only getting bigger and bigger every day. If current trends continue, by 2050, caloric demand will increase by 70 percent, and crop demand for human consump¬tion and animal feed will increase by at least 100 percent. Meeting this demand won't be easy, for example, 40 percent of water demand in 2030 is unlikely to be met, and more than 20 percent of arable land is already degraded.

In India, agriculture is a $370 billion sector, but there is still little application of technology to improve productivity which can effectively lift millions out of poverty. While, in recent past, overall inflation has been taken under control, food inflation however, is growing at 7%, indicating a mismatch of supply and demand. Last year, India imported corn after 16 years, and at the same time it has turned from an exporter to an importer of soya. However, for a smartagrientrepreneur, the inflation challenge throws an additional opportunity. In modern India, with the rise in per capita income, the propensity for consumption is also going up. Technologies addressing ever increasing stress challenges like pest, disease, drought tolerance by enhancing water, fertilizer and pesticide use efficiency without affecting productivity are in high demand. The forecasting and other decision support tools are

also becoming popular among all the agriculture stake holders.

Protected agriculture, precision farming, vertical farming, agro biologicals are no new terms.Sensing an opportunity, strategic and financial investors are racing to capture value from techno¬logical innovation and discontinuities in food and agriculture.Large chemical and pharmaceutical companies likeDow Chemical, DuPont - Pioneer, Monsanto, Bayer, BASF and Syngenta have invested heavily in agbiotech—specifically, genetic modification of plants—both in-house and through major collaborations with genomics companies.

Since 2004, global investments in the food-and-agribusiness sector have grown three-fold, to more than $100 billion in 2013, according to a McKinsey analysis. Food-and-agribusiness companies on average have demonstrated higher total returns to shareholders than many other sectors.

It is now an open opportunity for those with entrepreneurial mind to identify the big challenges and innovate viable solutions before others.

Patents, designs & know-how: creating new jobs for bio-researchers

Dr. Goutam Bhattacharyya
K&S Partners, Hyderabad

"The presentation is intended to give an insight to the patentability criteria in India with special emphasis to the inventions in the area of biotechnology and chemistry. Some of the important provisions of Indian Patents Act 1970 with respect to inventions in the field of biotechnology and chemical are exemplified for better understanding and interpretation of the law. Also disclosed in the presentation are practice pointers for researchers to design experiments to generate data which would be helpful in overcoming any patentability issues under the Law. Finally, a few inventions along with title, which were granted patent by the Indian Patent Office, to give an idea regarding kind of subject matter that can be patented in India".

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