



GOVERNMENT OF GUJARAT

Innovation, the basis of technology, is the 'incentive' for change & improvement.
Those who initiate change will have a better opportunity to manage the change that is inevitable...

Annual Report 2009-10 ►►

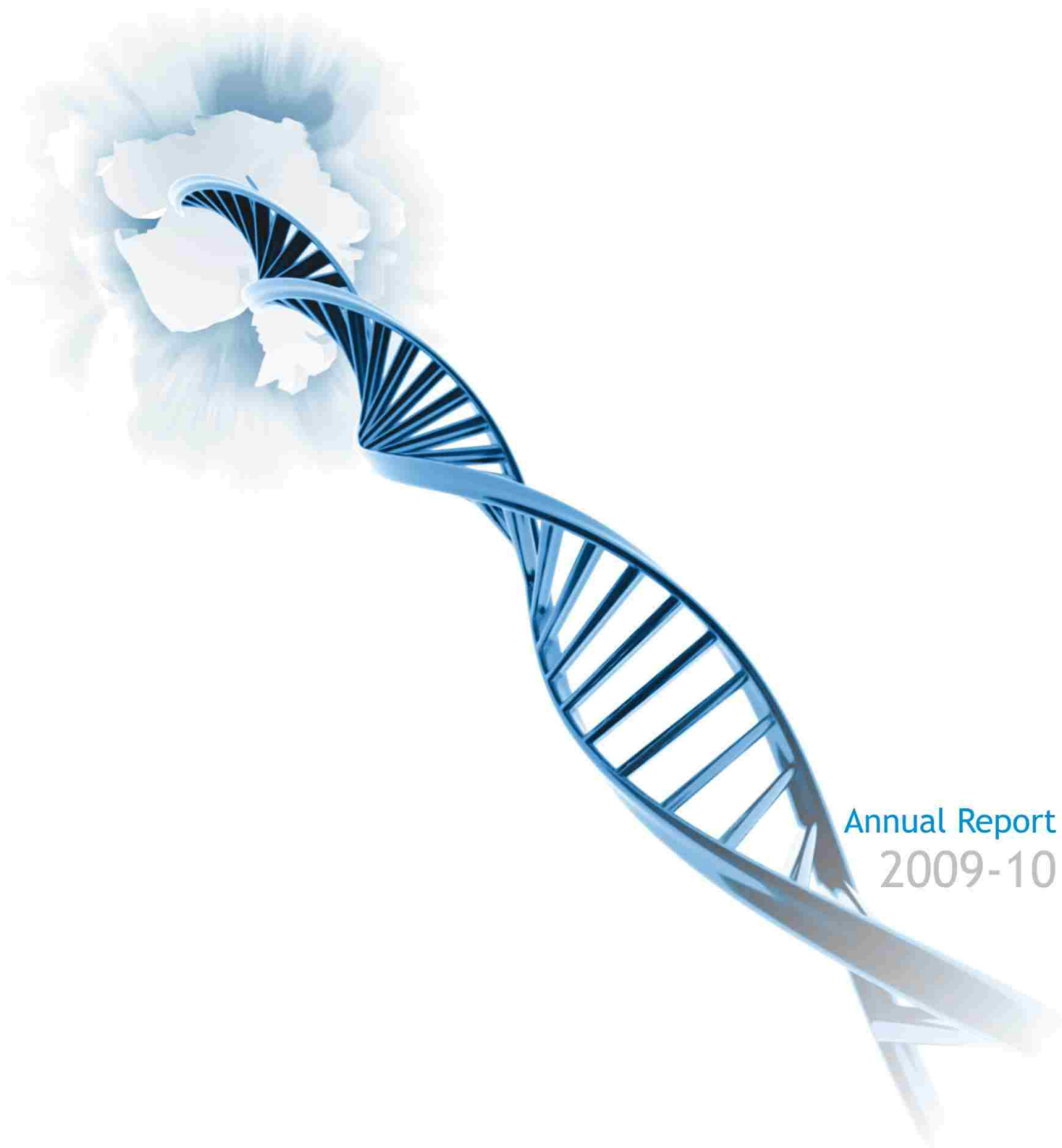
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GUJARAT STATE BIOTECHNOLOGY MISSION
Department of Science & Technology
Government of Gujarat



GOVERNMENT OF GUJARAT

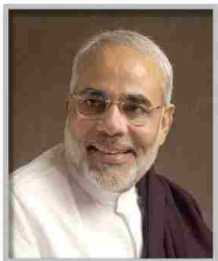


Annual Report
2009-10

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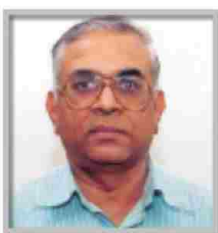


GUJARAT STATE BIOTECHNOLOGY MISSION



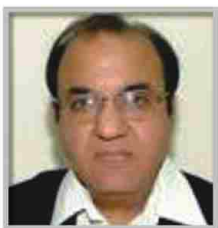
Shri. Narendra Modi

H'ble Chief Minister of Gujarat State &
Chairman of Gujarat Council of Biotechnology



Shri D. Rajagopalan, I.A.S.

Chief Secretary, Government of Gujarat &
Chairman of Governing Body



Shri. A. K. Jyoti, I.A.S.

Chief Secretary, Government of Gujarat &
Chairman of Governing Body



Shri. Raj Kumar, I.A.S.

Secretary, Department of Science & Technology, GoG &
Chairman of Executive Committee



Shri. Ravi Saxena, I.A.S.

Principal Secretary, Department of Science & Technology, GoG &
Chairman of Executive Committee



Shri. Akshay Kumar Saxena, I.F.S.

Mission Director, Gujarat State Biotechnology Mission,
Department of Science & Technology, GoG

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Shri Ravi S. Saxena, I.A.S.

Additional Chief Secretary, Department of Science & Technology
Government of Gujarat

Message of Secretary

Department of Science & Technology

Government of Gujarat has taken concerted efforts to encourage biotechnology development in the state. Apart from establishing GSBTM, as state nodal agency for biotechnology, conceptualization of overall framework, specific strategies, focused action and programs, have been the salient features of state's endeavor in this sector.

Since its formation in 2004-05, GSBTM, has been coordinating and facilitating the biotechnology development activities in the state. It has been addressing the key issues of policy, infrastructure, research, human resource development, entrepreneurship, business and coordination. State government through, GSBTM, has undertaken various initiatives to provide an enabling environment for growth of Biotechnology, high end application based research, value addition of existing skilled manpower and push the growth of biotech business and industries.

The high level of investment interest by biotechnology industries attracting investment, new entrepreneurs, new companies, diversification into biotechnology, are the reflections of steps into right directions.

With every passing year, GSBTM has been consolidating the efforts of previous years. The annual report of GSBTM for the year 2009-10, provides a brief account of the activities undertaken during the year. The report is also a reflection of last six years of GSBTM's endeavors, achievement and commitment towards this knowledge based sector.

It is a pleasure to be a part of such team spirit and scientific efforts. I hope that GSBTM will keep on working with the same spirit, commitment and enthusiasm.

I wish GSBTM team all the best in their future efforts and goals.

Shri Ravi S. Saxena, I.A.S.

Additional Chief Secretary,
Department of Science & Technology,
Government of Gujarat

FOREWORD

GSBTM as state nodal agency for Biotechnology has been undertaking efforts to strengthen the platform for enabling the growth of biotechnology in the state.

Running into its sixth year of existence, GSBTM is carefully treading the path by playing both the role of facilitator and catalyst. While higher priority is being accorded to consolidate the ongoing programs, newer concepts with present need and future relevance, are also being developed. In conformity with the goals and strategy developed, the focus is more on encouragement, stakeholder participation, and coordination than of implementation.

During the current year, definite actions were taken in the areas of policy planning biotech business infrastructure, research infrastructure, human resource development, promoting biotech entrepreneurship, biotech business, information dissemination and awareness development.

Finalizing the implementation modalities of Biotech incubator, starting the operations of Biodiversity gene bank, DNA fingerprinting and genomics, CoE in clinical excellence, Bio-informatics Virtual institute, Action for establishing Genetic diagnostic centre, program for facilitating industry –Academia interaction, were the key activities.

Offering various scientific services from the GSBTM operated centre to industries, was a milestone and matter of confidence for GSBTM. Skill development program in stem cell area in the state, Industrial training in biotechnology, entrepreneurship in sea weed cultivation, were the new activities undertaken. Developing web based portals for BT jobs, BT news, Bio-suppliers, Research funding, were new e-facilitation initiatives. During the year, the project of DNA banking and institute of wildlife Genomics, developed by GSBTM for state Forest department, has been approved for implementation. Biotechnology industrial training centre, State level GM testing facilities, Biotech incubator facilities in university, were the other key projects developed by GSBTM for consideration of state government and further action.

Supporting Biotech seminar, workshops, guidance for dissertations, information dissemination, were other regular activities. Documentation included publication of Skill gap analysis in HRD in Biotech sector in Gujarat, Analytical report on genetic disorders in the state and status report on global stem cell research. Active marketing, networking, facilitation has been reflected in increasing investment interest by biotechnology players, new biotech entrepreneurs, diversification in biotechnology sector, being observed in the state.

Critical constraints, though reduced yet exist and impede the desired achievement. The unflinching support of department of Science & technology and all stakeholders of state strengthens the spirit and resolve of GSBTM, to strive and deliver.

I extend my heartiest gratitude to entire team of GSBTM who, even in the face impoverished facilities, resources and returns, have displayed highest level of commitment. GSBTM also extends its gratitude to all biotechnology stakeholders of Gujarat, who have been responding positively to this organization.

GSBTM looks forward to join and walk together as the state aims and endeavors for – "A brighter bio-future

Shri A. K. Saxena, I.F.S.
Mission Director,
GSBTM

About GSBTM

The science of Biotechnology is emerging as potential tool for development and technology of hope for the society. The state Government of Gujarat, in its resolve and continued efforts for socio-economic upliftment of society, has identified Biotechnology as single most potential tool of development. To facilitate overall development of Biotechnology, state has constituted Gujarat State Biotechnology Mission [GSBTM].

Organizational Structure

GSBTM was established for coordination of Biotechnology program and activities, under the aegis of Department of Science & Technology. Gujarat State Biotechnology Mission, is an autonomous body. The Governing Body of GSBTM is headed by Chief Secretary, Gujarat State, and includes representatives of DBT, GoI, and Secretaries of key departments, industry representatives and academicians. Executive Committee of GSBTM is headed by Secretary, Department of Science & technology and includes industry representatives, technical experts and representatives of interfacing departments. State government has also appointed technical experts as Principal Advisor and Advisor. The state also has a Gujarat Council of Biotechnology, chaired by the Hon'ble Chief Minister himself, he being the Minister for Science and Technology as well, and consists of technical experts from various sections of biotechnology and representing the academia and industry evenly.

The mission started its functioning from April 2004, with the appointment of three sector specialists followed by the appointment of Mission Director. Gujarat State Biotechnology Mission (GSBTM) was registered as society under Society Registration Act, in 2004. The Memorandum of Association (MOA) of GSBTM incorporates the scope, duties, responsibilities and functioning of GSBTM.

Mandate of the Mission

GSBTM, headed by a Mission Director, supported by sector specialists and administrative staff has following mandate:

- ✦ To promote, support and facilitate the overall development of Biotechnology in the state.
- ✦ To provide institutional, legal, financial and policy support.
- ✦ To facilitate networking among stakeholders at Regional, National and International level.
- ✦ To facilitate the infrastructure development and R & D activities.
- ✦ To create scientific awareness, sensitization, socio-ethical acceptance and adoption to the potentials and application of biotechnology.

Approach and Strategy

In the first year of its operations, GSBTM took a stalk of the the status of Biotechnology at globally and at the National Level. GSBTM conducted sectoral brainstorming sessions with leading academicians and industrialists in biotechnology, in the State and India over. Based on these discussions, GSBTM arrived at a clear status report of biotechnology in the State, and the strengths and gaps in terms of policy planning, infrastructure, research, human resource development, biotech industries, business and other related issues. Accordingly GSBTM formulated a roadmap for the purpose of further progress in the various sectors of biotechnology. As state nodal agency, GSBTM focused on providing support and facilitation of biotech academia and industry. GSBTM initiated various programs and schemes for strengthening biotechnology research, human resource development, research infra structure, and industrial initiative funding.

GSBTM developed the Biotechnology Policy for the State, to facilitate the stakeholders of biotechnology.

1. 0 Events of the Year

1.1 Vibrant Gujarat 2009-10: Investor Summit

Efforts were continuously made for encouraging Biotech business in Gujarat. It included coordination with Biotech/Bio-Pharma companies. Coordination and networking was done, with two key companies, Alexandria Real Estate and Biocon, of which latter has been allotted the land near Sanand while issue is under discussion with Biocon. Efforts were undertaken to facilitate the biotech projects which were committed during Vibrant Gujarat: Global Investment Summits. Efforts have been taken to encourage new biotech investment projects, by existing companies as well as by new companies, both through expansion and diversification.

The number of biotechnology industries in Gujarat has increased from 45 in 2004 to nearly 100 in 2009. There has been strong convergence and diversification by companies from other sectors in Biotechnology. Existing Biotechnology industries have undertaken expansion worth 250-300 crores in Gujarat, confirming the favorable business conditions which state offers. New Investment in Biotechnology sector in Gujarat has also been increasing. While investment since last ten years has been to the tune of approx. Rs. 300-350 crore, 2007 saw an investment commitment of around 1550 crores by 19 projects and investment of around 2500 crores has been committed by 28 projects in 2009. Of this, investment of 655 crores has been completed with employment generation of around 1000 people. 33 projects are under implementation. Both in terms of number of companies and turn over, Gujarat features amongst first five states in the country.

Sr. No.	Company	Title of project/Project Description	Status
1	Anil Biochem Ltd	Various types of enzymes, Microbes, Probiotics, Gluconates & products manufactured from dextrose through the fermentation route & other bio products	
2	Cadila Healthcare Ltd - Zydus Group	Vacasin Manufacharing (Bacterial & Viral)	Civil Construction started, Equipment ordering started, Layout has been frozen for VTC, QC & T/T Plants, HVAC Layout frozen
3	NANOBIOSYM Inc.	High end Biotech Research	
4	Intas Biopharmaceuticals Ltd.	Large Scale Manufacturing Facility for Recombinant Mammalian Platform Products-Mono Clonal Antibodies	
5	Greendiam Exim Pvt. Ltd	Sheet & Tabular Film, Bages & Rigid Products	
6	Savani Biotech Pvt. Ltd	Cutting Edge Biotech Research & applied Biotech Platform	
7	Troikaa Phar maceuticals Ltd.	Biotechnology facility, Pharmaceuticals formulations, Anti Cancer/Hormones/Steroids	In Progress
8	Vaishnavi Biotech Pvt Ltd	Organice fertilizers/Manures, Bio-Fertilizers & Control Agents, Cattle feed, Poultry feed, Bulk drug/Nutraceutical product	Large Scale
9	RPG Life Sciences Ltd	Biotech API, Life saving anti-cancer & immunosuppressant bulk drugs.	
10 A	Cadila Pharmaceuticals Ltd & Karnavati Engineering Ltd (Project: 1)	Multi Vaccine Manufacturing Facility	
10 B	Cadila Pharmaceuticals Ltd & Karnavati Engineering Ltd (Project: 2)	Biotechnology Facility	
10 C	Cadila Pharmaceuticals Ltd & Karnavati Engineering Ltd (Project:3)	CPL shall set up the Food & Agro based Industry	

Sr. No.	Company	Title of project/Project Description	Status
12 A	Xcelris Labs Ltd. (Project:1)	Biopharmaceuticals products for Human use - Life saving injectible products	
12 B	Xcelris Labs Ltd. (Project:2)	Contract Research & Services Organization providing: a) Pharmaceutical Products development & analytical services and b) Biotechnology services including genomics, bio-pharmaceutical development	
13	Evolva Biotech Pvt. Ltd	R & D in the areas of Nanotechnology, Bioinformatics, Stem Cells	
14	Piramal Pharmaceutical Development Services Pvt. Ltd.	R & D Services related to Pharmaceutical Development & scale up and clinical manufacturing of Solid dosage Forms	Completed
15	Swati Spentose Pvt Ltd	Biotech Bulk Drugs	80 % Completed
16	Torrent Pharmaceuticals Ltd.	Sterile Finished Formulation Plant for Insulin (Novo Nordisk)	
17	Biomix Network Ltd.	Neutraceutical/Pharma Immune Booster Formulations	
18	Sun Pharmaceuticas Industries Ltd.	Biotechnology R & D	Completed
19	Thamna Health & Education Trust	Installation of Biogas Based Power Generation Co-generation, Vegetable & Fruits Freeze & Dry	
20	Laxai Avanti Life Sciences Ltd - Avanti Group Company (Project: A)	Contract R & D, (Drug R & D and clinical Support Services)	
21	Avanti Feeds - Renamed as Avanti Thai Aquaz Feeds Pvt. Ltd.(Project:B)	Prawn feed manufacturing	
22	Hester Biosciences Ltd.	Research & Development centre for animal Disease Surveillance	
23	Chiron Behring Vaccines Pvt Ltd.		
24	Unimark Remedies Ltd.	Biotechnology Products, Biocatalysis	
25	Concord Biotech Ltd	Expansion of the existing facility	Expects completion by end of next month (June)
26	Chembond Enzyme Company Ltd.	Industrial Enzymes	
27	Agriland Biotech Ltd (Project:1)	Seaweed-Biofertilizers	
28	Agriland Biotech Ltd (Project:2)	Biofertilizer-Glomus Fasciculatum, a Vesicular Arbuscular Mycorrhizae	

1.2 Children Science Congress 2009-10

The 17th National Children's Science Congress 2009 was held in Science City in Ahmedabad during 27-31st December, 2009. National Children's Science Congress was initiated by the National Council of Science and Technology Communication (NCSTC) which functions under the Department of Science and Technology of the Government of India. National Children Science Congress is a prestigious national academic event and provides a platform for building scientific temperament amongst young students of science. The NCSC promotes young students to indulge into internal brainstorming of significant societal problem, their causes and their scientific solutions.

National Science Congress was held in Gujarat for the first time since its inception in 1993. The event saw a convergence of around 800 young scientists from across the country and 50,000 students from the state. During the program, eminent scientists across the country were invited to the event for interactions with the students and teachers were given orientation programs. The event included technical sessions, science exhibition, poster presentations and theme presentations by premier institutions. Gujarat Council of Science

City and Swaminarayan Gurukul Vidya Pratisthan were the hoisting organizations for the event. Science City hoisted the science exhibition and Swaminarayan Gurukul Vidya Pratisthan hoisted the seminars, poster presentation and such other activities.

Professor Yash Pal (president of NCSTC network), N K Sehgal (former advisor of NCSTC), Janki Ranjan (Jamia Millia Islamia University) and Saroj Ghosh (the creator of science museums at Gujarat Science City and Kokata Science City) were among the eminent scientists who interacted with the students at the event.

Various prestigious science institutions like The Physical Research Laboratory (Ahmedabad), Institute of Plasma Research (Gandhinagar), Indian Space Research Organisation (Ahmedabad), GEER foundation Gandhinagar, Indian Meteorological Department (Gujarat), Vigyan Prasad (Department of Science and Technology of the Government of India), Education and Awareness Department of the Indian Air Force, National Institute of Occupational Health (Ahmedabad), Bhaskaracharya Institute of Space Applications and Geo-Informatics (Gujarat), National Innovation Foundation (Ahmedabad), Gujarat Cancer Research Institute (GCRI, Ahmedabad), NICEF etc. participated in the event.

Gujarat State Biotechnology Mission being the nodal agency for promotion of biotechnology in the state and as a wing of department of science and technology also participated in the event. The main focus was to create awareness of biotechnology amongst young and budding scientists of the nation. The entire exhibition of GSBTM was prepared keeping the school children in mind. Two stalls were exhibited by this office, amongst which, one was dedicated for biotechnology activities like virtual labs (e.g. electrophoresis, PCR, Microarray, DNA isolation etc.), Biotechnology click and learn (e.g. creation of transgenic crops, DNA replication, cell structure etc.) and Biotechnology educative games (e.g. recombination, cellular organelles, inheritance experience etc.). Another stall was dedicated for the educative cartoon posters for communicating the basic concepts of biotechnology, its history, various technologies, tools in biotechnology, application of biotechnology etc. The stall also included exhibits of award winning cartoons made by students of the state on various themes like recent developments in biotechnology, during state level competitions. Apart from the poster some interesting videos of biotechnology like timelines, heroes, BT cotton, vaccines, etc were also played at the stall. To make the visit to the biotechnology stall memorable, takeaways like scale containing history of DNA, household methods for isolation of DNA, Book specially prepared for the school children on Understanding Biotechnology etc., were distributed among the school children. More than 10,000 school children from all over the state and around 1000 students from the nation and SARK countries took advantage of the exhibition.



2.0 Rural Development Initiative

Governments India over have been taking up several training and employment generation initiatives in rural areas. One such program has been seaweed cultivation. Several hundred women affected by tsunami depend on wild seaweed collection just to earn their daily bread. The coastal community could be rehabilitated from wild seaweed collection to scientific farming of seaweed with a possibility of generation of at least Rs.10,000/- per month for a family. Economics of seaweed cultivation, on bamboo rafts has been worked out and approved by State Bank of India.

Seaweed is a term comprising of macroscopic, multicellular, benthic marine algae. The term includes some members of the red, brown and green algae. Seaweed has found applications in food, medicine, fertilizer, industry etc. Seaweeds grow in alkaline water of the seas and can efficiently convert carbon dioxide into oxygen in presence of sunlight and the minerals of the sea. Some Korean research has found that seaweeds can covert 155 microgram CO₂/sq.mt./second. Seaweeds are extensively used as food by coastal people, particularly in East Asia, e.g. Japan, China, Korea, Taiwan, Thailand, and Vietnam, but also in Indonesia, Belize, Peru, the Canadian Maritimes, Scandinavia, Ireland, Wales, Philippines, and Scotland, among other places. Apart from food and medicinal use, seaweeds have recently found their use in BIOFUEL production, which is also called the clean fuel. Research is going on to device newer methods to make biofuel production cost effective. Seaweed is easily cultivated in seawater, by the local fish farmers, with very less of technical training. GSBTM joined hands with Fisheries Commissionerate and CarraSeaveg Pvt. Ltd. to put up a demonstration project of seaweed cultivation. Although Gujarat Fisheries Commissionerate does not have a mariculture policy as of date, it modified its functioning to support the program. Funding support was lent by GSBTM, whereas the Fisheries Commissionerate charged up its entire regional office network to execute this program. With the assistance of the regional offices of the Commissionerate existing in all the coastal districts, it was made possible to form the Self Help Groups (SHG) of 25 of the local fishermen, for the execution of the project. CarraSeaveg Pvt. Ltd. assisted the program by supplying resource persons and complete technical support.

OPERATIONAL PHASING OF THE CULTIVATION PROGRAM

Phase I

A five day training program was conducted at 3 selected sites, by the Resource People of GSBTM in collaboration with the local fisheries agency, as appointed by the Fisheries Commissionerate. The training sites were as follows:

1. Simer, Junagadh – 50 Fish farmers
2. Miani, Porbandar – 25 Fish farmers
3. Arambada – 25 Fish farmers

The training material was developed and printed by the appointed fisheries agencies at all the 3 sites, in consultation with the resource person (RP). The agency and the RP together selected the fishermen for the 5 day training program. Rs.100/day wages were paid to all the 100 fish farmers for 5 days, at all the 3 sites. Post the training program, the agency and RP selected 6 fish farmers at each site for the Phase II commercial training program.

Phase II

First 2 of the 6 fish farmers selected at 2 sites joined the commercial training program, and attended the rafts for next 40 days. Rs. 100/day wage was paid to the 2 fish farmers for 40 days.

At the end of 40 days, the second set of 2 fish farmers were entrusted to attend the rafts for next 45 days. The second and the first set of farmers were then taught to take seed from the existing rafts and inoculate newer rafts. In the second cycle a fresher set of 2 fish farmers got training for 45 days and wages. At the end of 90 days, the third set of 2 fish farmers were entrusted the job of attending the rafts for next 45 days, and also taught to take seed from the existing rafts and inoculate newer rafts. In the third cycle the 3rd set of 2 fish farmers got training for 45 days and wages.

BENEFICIARIES

At the end of 3 cycles, which ended on 15th May, 2010, there were 6 fish farmers, well trained in seaweed cultivation, at two sites, leading to 12 trained fish farmers on the coast of Gujarat. At the 3rd site i.e. Aramada, Okha, the rafts were misplaced due to water currents, and were non-recoverable.

OUTCOME

3 growth cycles for the planted material was completed. The planted material of 40kg at two sites i.e. Simer,

Jafrabad and Miyani, Porbandar, has reached a size of 2 Tons. The initial planting material at third site, i.e. Arambada, Okha, was provided by a local seaweed cultivator, and hence, is not in possession of the Fisheries office, post the initial training program.

The coastal weather undergoes a change with the onset of Akha tij, and hence the 2 tons of produce is being preserved at Simer site, it being a cleaner site, for use in future training and cultivation programs.

3.0 Surveys and Reports of the year

3.1 A Strategic Analysis of the G_A_Ps between the Academia perception and the Industry Needs of the Biotechnology Sector in the state of Gujarat

Technology has been accepted as one of the leading tools of socio-economic upliftment, and Biotechnology, with its infinite applications touching the lives of common man from health, food, environment, clothes, life-style, etc is certainly amongst the most impressive tools. However, the success of this tool shall depend upon its adoption by masses and hence, a function of the markets and the market driven forces. An important enabling force for any market definitely is the industry-ready talent pool available and the industry-ready innovations. The source of both is academia, whose focus is seldom oriented towards the industry, thus, leading to an Industry – Academia divide.

This office had undertaken a study with an aim to study the Gaps or the Industry-Academia divide, for the Biotech Sector in one of the leading, industrialized state in the western province of India - Gujarat. The study involved designing questionnaires for the Gujarat Biotech Industry Partners as well as the Gujarat Biotech Academia Partners and taking structured responses from all of them. Hence, the study did not aim at surveying a small sample of the population and then extrapolating the findings to the population but was rather, censal in nature – taking feedback from all of the partners.

The findings have been categorized into three perspectives – the very basis for the three chapters – the Human Resource Perspective, the (Research and) Technology Perspective as well as the Curriculum Perspective. Recommendations have been meticulously drawn from the study, classified as General ones as against those pertaining to specific enabling groups like the Education Department, the Academic Quality Evaluation Body, the Curriculum Developers and of course, the Nodal Agency for Biotechnology in the state – the GSBTM.

Thus, the study, though not free from limitations, is certainly a step forward to understand the strategic gaps between the Biotech Industry and the Academia and bring out recommendations for strategic interventions possible, at various strata. The report would shortly be presented to the Hon'ble Chief Minister (also the Minister of Science & Technology) of the state of Gujarat.

3.2 Stem Cell Therapy - Generation Next In Regenerative Medicine

Medical researchers believe that stem cell therapy has the potential to dramatically change the treatment of human diseases. Use of stem cells from bone marrow to treat leukemia is a time tested method of stem cell therapy. In future, medical researchers anticipate being able to use technologies derived from stem cell research to treat a wider variety of diseases including cancer, Parkinson's disease, spinal cord injuries, Amyotrophic lateral sclerosis, multiple sclerosis, and muscle damage, amongst a number of other impairments and conditions. The present Report focuses on STEM CELL THERAPY - GENERATION NEXT IN REGENERATIVE MEDICINE.

The report is a compilation and analysis of stem cell technologies. It is a compilation of more than 2100 ongoing trials in the area of stem cell, worldwide, the institutes participating in the trials and their country wide distribution. The report is with a searchable, interactive CD, giving details of all the trials. It gives detailed survey cum analysis on global status of the stem cell research, market trends and business potentials of stem cell technologies in improving future horizons of human healthcare, Stem cell therapies available, or under development. Detailed analysis of the country wise clinical trials, with reference to diseases addressed, phase wise, has also been done for the better understanding of the analysis. This report will be a ready reference to researchers, entrepreneurs, companies and doctors and those who want to venture in this field.

3.3 Market Report on Monoclonal Antibody

The worldwide market for therapeutic and diagnostic uses of monoclonal antibodies is expected to reach \$26 million (€21.2 million) by 2010, owing to the ability of antibodies to exhibit a specified targeted attack on disease-causing cells or compounds. This is a Market report on the business opportunities in the field of Monoclonal Antibodies.

The report gives an illustrated business Plan for production of monoclonal antibodies. It includes, properties & characteristics, uses & application, market survey, current status of monoclonal antibodies as the therapeutics, FDA approved monoclonal antibody products, technologies in the area of monoclonal antibodies, patents for the monoclonal antibodies, MAb-Based Therapeutics to be launched shortly, companies in large scale antibody production, suppliers of monoclonal antibodies, flowchart of the manufacturing process, method for production, characterization & purification, QA-QC aspects, method for

storage, environmental pollution concerns, steps from test tube to New Drug Application, flow chart for approval of monoclonal antibodies, approval process for new drugs, OUHSC IACUC Policy on monoclonal antibody production in the Mouse – Ascites, principle of Plant Lay out and Plant Location Factor.

Preparation of Market Survey cum Detailed Techno Economic Feasibility Report on Monoclonal Antibody will be of use and interest to budding entrepreneurs who want to venture in to this field. The report has been prepared by compiling the information available on public domain.

3.4 Understanding Biotechnology

Bio-Technology is a research intensive field and covers under its umbrella a wide range of subjects like Genetics, Biochemistry, Microbiology, Immunology, Virology, Chemistry and Engineering. Biotech as a tool has been used in various fields of biology like Healthcare and Medicine, Agriculture and Animal Husbandry, Environmental biology and Ecology, Cell Biology, Statistics, etc. There is a great scope in this field as the demand for biotechnologist is growing in India as well as abroad. Biotechnology needs young passionate minds to appreciate the sector and contribute to it directly or indirectly-in any capacity and role- as academicians, researchers or entrepreneurs. Young minds in their formative period, need to be made aware of the outreach of this tool of science and its pros and cons. Such awareness generation needs structured approach and hence GSBTM developed the booklet titled "Understanding Biotechnology".

The Booklet was prepared by compiling basics of biotechnology, applications, tools and techniques, timelines of achievements in biotechnology, Indian scientists at work, Biotechnology in India, Gujarat and World, products of Biotechnology and careers in Biotechnology. This booklet aims at providing overview of the biotechnology sector to young students and laymen.

3.5 Tissue Culture Compendium of Gujarat

Gujarat is an Agriculture intensive state of the country, and 15% of its GDP is fetched out of agriculture. Biotechnology has provided tools to increase this agricultural produce and TISSUE CULTURE is a powerful technique for mass production in many crops, and is also a useful method to produce healthy plants. It has also become an important tool in the nursery industry.

Tissue Culture Compendium is an attempt to compile comprehensive information of the 21 tissue culture companies in Gujarat with detailed analysis of plant tissue culture sector of Gujarat. These companies are spread over 11 cities of the State.

The compendium provides detailed information of facility area, laboratory design, turnover of the company, employee number and qualification and production. Gujarat based tissue culture companies produce tissue cultured plant of various plant species covering vegetable crops, horticulture crops, medicinal plants and floriculture crops.

Production Profile : Tissue Culture Plants in Gujarat

1. Banana
2. Sugarcane
3. Date palm
4. Medicinal plants
5. Rose
6. Chrysanthemum
7. Chili
8. Kankoda
9. Parwal
10. Lemon
11. Patchouli
12. Stevia
13. Papaya
14. Anthurium
15. Potato

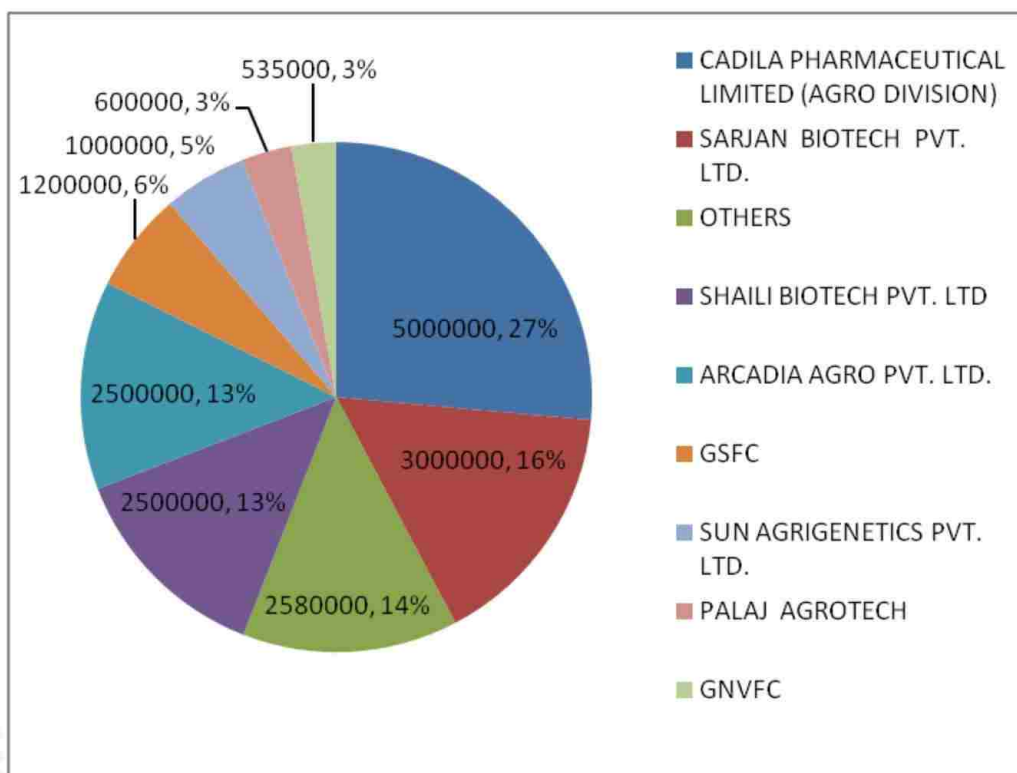


Figure-1 Production of Tissue culture plant in Gujarat

Out of 21 tissue culture companies of Gujarat, 8 major companies are having 86% share i.e. Cadila Pharma (Agro Division), GSFC, GNFC, Shaili Biotech Pvt. Ltd, Sun Agrigenetics, Palaj Agritech, Arcadia Agro Pvt. Ltd. and Sarjan Biotech Pvt. Ltd. and 13 smaller companies have 14% share with reference to production in 2009.

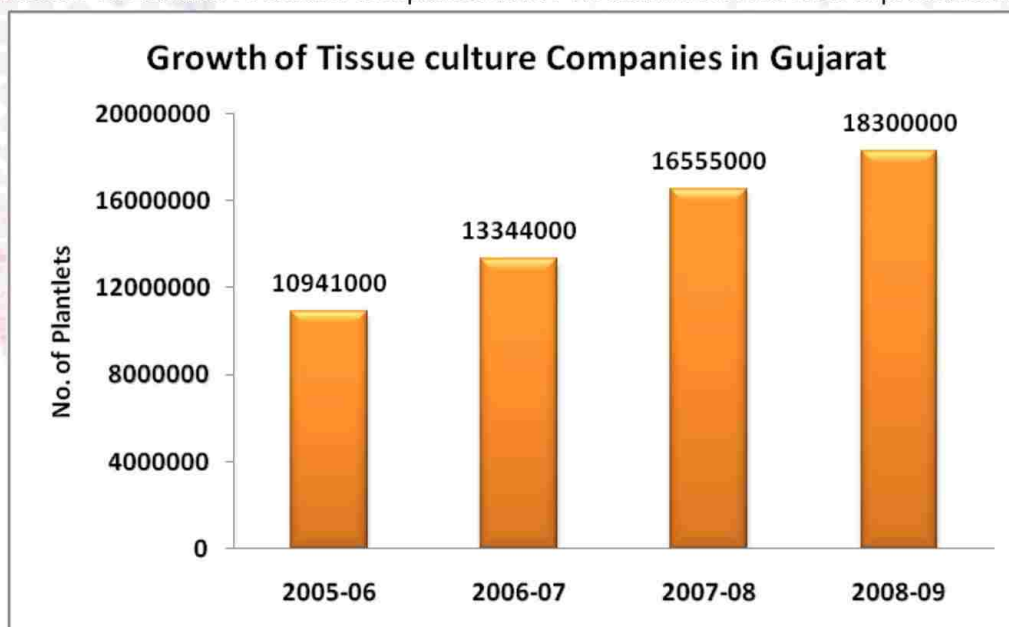
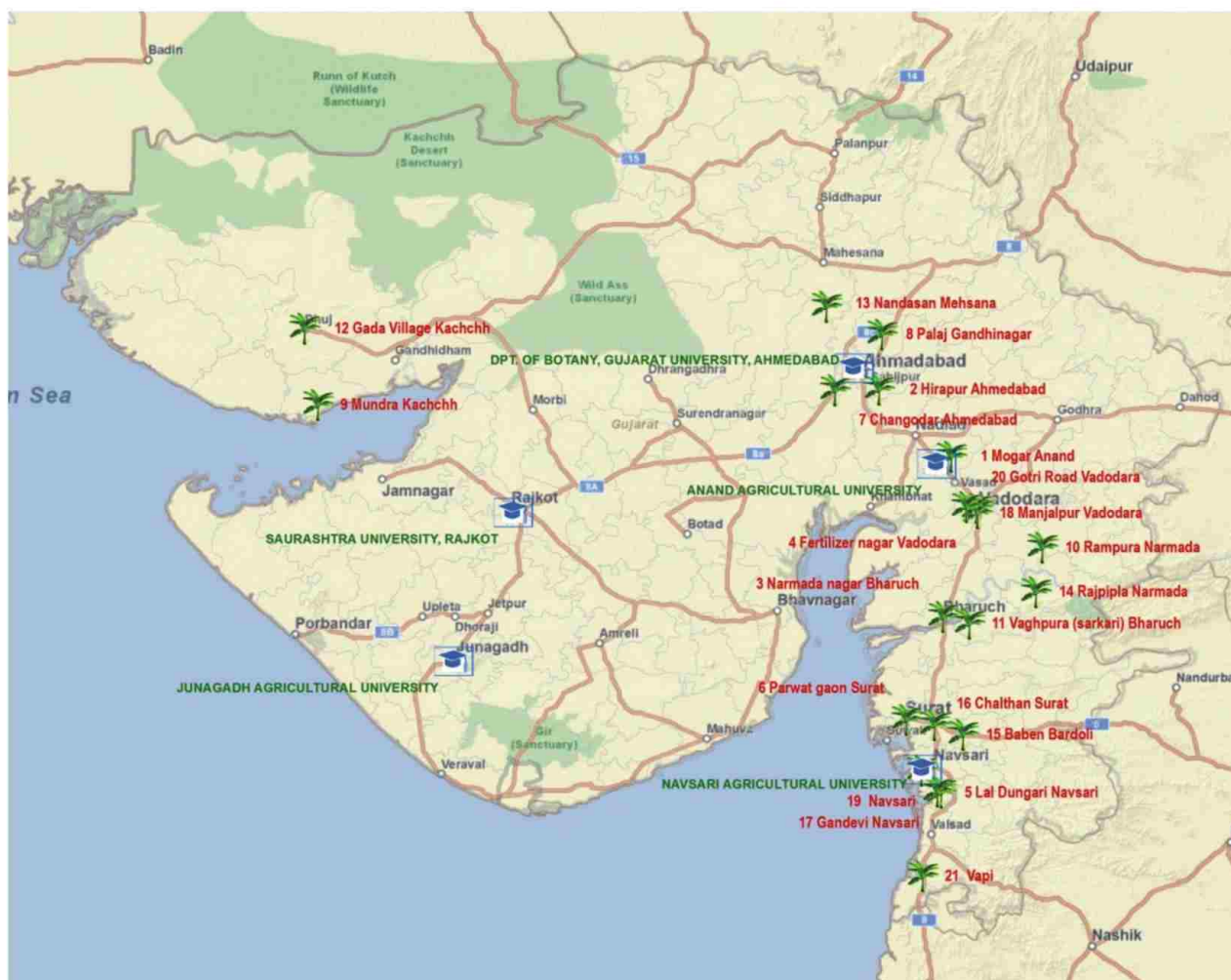



Figure-2. Production of Tissue Culture Plants in Gujarat

Tissue cultured plants produce by different companies is gradually increasing which is graphically represented in figure. As compared to 2005-06 27% growth was observed in 2006-07, 55% growth was observed in 2007-08 and 72% growth was observed in 2008-09. Tissue culture compendium shall be of great help to researchers, entrepreneurs and other plant biotechnology stakeholders.



No.	COMPANY	No.	COMPANY
1	Arcadia Agro Pvt. Ltd., Anand	12	Sarjan Biotech Pvt. Ltd., Bhuj
2	Cadila Pharmaceutical limited (agro division), Ahmedabad	13	Shaili Biotech Pvt. Ltd, Mehsana
3	Gujarat Narmada Valley Fertilizers Company Ltd. (GNFC). Bharuch	14	Shradhdha AgriTech Industries, Narmada
4	Gujarat State Fertilizers and Chemical Limited (GSFC), Vadodara	15	Shree khedut sahakari khand udyog mandali ltd (bardoli sugar), Bardoli
5	Hybritech Tissue Culture and Nursery Private Limited, Navsari	16	Shree chalthan vibhag sahakari khand udyog mandali limited (chalthan sugar), Surat
6	Italiya Biotech Plant Tissue Culture Lab, Surat	17	Shree gandevis vibhag sahakari khand udyog mandali ltd. (gandevis sugar), Navsari
7	Neesa AgriTech Pvt. Ltd., Ahmedabad	18	Shri sai AgriTech Pvt.Ltd., Vadodara
8	Palaj Agrotech, Gandhinagar	19	Sugarcane Tissue Culture Lab, Navsari Agricultural University, Navsari
9	Plant Tissue Culture Laboratory, Mundra, Kachchh	20	Sun AgriGenetics pvt. Ltd., Vadodara
10	Prem Sarita Agribiotech, Narmada	21	Zandu Pharmaceuticals Pvt.Ltd., Vapi
11	Reva Agri Biotech Pvt. Ltd., Bharuch		
 Tissue Culture Company		 University engaged in tissue culture research	

4.0 E-Buzz of GSBTM

The important role of mission shall be to provide relevant, field related information to the stakeholders both in print form as well online. It includes hosting of website, updating, creation of web cell.

4.1 Website

GSBTM had taken up the endeavor to revamp the entire website. The work was outsourced to Silver Touch Technologies through GIL. The earlier website has been replaced by a new website, which has been asthetically designed to accommodate the various spheres of activities that is undertaken by GSBTM. The new website has placed newer tabs and buttons, to include more information which would be of general and specific help to the various stakeholders of biotechnology, thus extending its realm of reach and awareness. The website is designed in the most user friendly manner catering to all needs.

4.2 E-chronicle

It is important to provide a platform and forum for sharing and disseminating biotechnology related information of Gujarat. Such effort has not been undertaken by any of the state. Accordingly, a concept of e-chronicle has been developed, in-house. And first issue of Biotechnology E-chronicle, was launched on 15 Aug. 2005. The chronicle covers the industry, research, academic strengths of Gujarat. It has various features like Industry of the month, research institute of the month, entrepreneurs of the month, spotlight, Cartoon corner, techno-views, Bio-business etc.

4.3 Research and Development Support Portal

GSBTM, being the state nodal agency for biotechnology has the mandate of overall facilitation, in the field of biotechnology. Biotech being a knowledge based sector has Researchers and Research Programs at the very roots of its growth. Govt. of India has been supporting research in biotech in a big way through many research schemes. These schemes are announced and withdrawn intermittently, and hence, many instances have happened when a desiring and deserving researcher of Gujarat due to lack of information/awareness, has missed the opportunity to submit a worthy proposal to the central Government. To bridge this gap of transmittance of this information to the Gujarat academia, GSBTM created the Research and Development Support Portal. GSBTM felt it important to bring this information to the notice of the entire research fraternity of the state.

The portal when initiated had only the list of national government agencies that fund research. With advent of further needs, International Funding agencies were also included to the list. India has seen events when international funding agencies have heavily funded research in India, it having an astronomical diversity in its population gene pool and similarly in its climatic zones. Hence, international funding agencies could not have been left out from the notice of the research crowd of Gujarat.

Since GBTM is never satisfied with its efforts to disseminate relevant information to stakeholders, it is increasing the number of features of this portal, including current research news and information of its like. In the pursuit of the same, GSBTM has initiated an endeavor to constantly send email updates about newer schemes of Govt. of India to the academia database of GSBTM. The academia is free to make a telephonic request to GSBTM to include them in the database for receiving the email alerts. All the features of the portal are not currently available, since it is under making. However, GSBTM intends to complete the task in a two month's time period for the public to access it.

The R&D Support portal is a humble beginning, and would be enhancing its scope of information dissemination with more time to go. It endeavors to place information at one place to enable stakeholder to have fair idea about the options, choices and opportunities.

4.4 Bio-Gadget Guide portal: One-stop kiosk for Bio-instrumentation

The development of biotechnology characterized by development of Biotech units & industry as a whole, increased financial support from varied sources inclusive of Government sources, etc. unfailingly lead to the consequence of increased business to the manufacturers of Bio-Instruments and Bio-Suppliers operating in the state of Gujarat [collectively referred to as BioSuppliers, as per the convention]. Hence, it has been contemplated for a while by this office that if the BioSuppliers can be brought on a common platform, it could be a step forward for the Biotech fraternity of the state.

Moreover, this office had been witnessing cases wherein Industrial Units or Academic organizations coming up with Biotech labs or its expansion, needed information regarding Biotech Equipments and the

BioSuppliers. This office, catering to this effect; and true to the philosophy of 'Swant Sukhaay'; has got a portal developed that can act as a Single-window kiosk for the said information.

Some of the salient features of the Portal may be enumerated as follows:

- ✎ The portal has been developed by students undertaking 'Short-term/Summer Training' in this office under the guidance, supervision and conceptualization of this office.
- ✎ The portal has been prepared in a manner that it can be updated as per the need be or an increase in the number of biosuppliers in the State.
- ✎ The portal currently includes contact details of about 250 BioSuppliers spread over four zones of Gujarat viz. North, Central, Saurashtra and South Gujarat.
- ✎ The portal currently includes various equipments in the categories: Analytical, Microbiological, Microscopy, Molecular Biology & Immunological, Separation, Spectrophotometry and Sterilization.

The portal was dedicated to the fraternity by the Mission Director, GSBTM in a session of networking with BioSuppliers on 11th February, 2010.

4.5 Biotech Job Portal

Growth of biotechnology companies in the state, over a period of five years, has reached to 116 in number than that of 40 in 2004. Also the number of students graduating and post-graduating from Gujarat in the field has also increased significantly. However, both these stakeholders of biotechnology do not have an interface for interactions and GSBTM being the facilitating agency for biotechnology in the state, felt the need to address the issue. Hence in the interest of biotechnology growth, GSBTM has developed Biotech Job portal. Biotech Job Portal - is a common platform and web enabled portal for Biotech employment seekers (researchers, students, and academia) and employment providers (BT industry, institute, and department). It allows both the stakeholders to submit their needs and requirements and both can search the portal for, selection or application and further action for match making. Job portal has facilitated job finding for more than twenty stakeholders and helped in employing around five.

BT JOB PORTAL

Are you a Recruiter? [Click here to log in](#)

Already a registered job seeker? Log in to see your job matches.

Username Password **LOGIN**

[Forgot Password](#)

[Home](#) [About GSBTM](#) [My Account](#) [Search Job](#) [Contact Us](#)

Job Seeker? REGISTER FREE to see instant job matches

Registered user? [Click Here To Login](#)

Username *

Create Password *

Confirm Password *

Name *

Email ID *

Type the code shown below *

5789 **CONTINUE**

WELCOME TO BIOTECHNOLOGY JOB PORTAL
GUJARAT STATE BIOTECHNOLOGY MISSION

WE WILL SHOW YOU THE WAY TO SUCCESS!

[Job Seeker Registration »](#)

[Recruiter Registration »](#)

Are you a Recruiter? [Click here to Registration](#)

SEARCH JOB

Enter Keywords Location **SEARCH**

Biotechnology: A Growth Engine

- As per the 2006 survey by ABLE-Biospectrum, the forecast of the size of BT industry in India should have been to the tune of \$2 bn by 2004 and \$5bn by 2008.
- BT industry has been growing at an average annual growth rate of 37.42%. In terms of sectors, it is led by Bio-Agri sector showing a growth of 81%, followed by Bio-Pharma (31.88 %) and Bio-Informatics (20%) and Bio-Industries (17.9%) (Source: ABLE-Biospectrum, 2006 survey).

Recent Jobs

8 Unique Resume writing Tips

RESUME

[Click Here for know 8 unique resume writing tips...](#)

@GSBTM

4.6 Database of Bioactive Molecules from Marine Sources and their Artificial Synthesizers

World over the marine biological resources are being studied for their unique features and unique chemical molecules produced by them. Since, the marine bioresources are limited to some countries, the data that is generated is scattered amongst the research institutes of those countries. A complete compilation of all the marine biomolecules is not available on the electronic media. Hence, an elaborate database has been created consisting of the various bioactive molecules that are available from the marine flora and fauna. Apart from the name of the compounds and their marine source, the database consists an enlisting of all the companies, research institutes and University departments, which have artificially synthesizing these molecules. It also includes the clinical trial phases of the molecules, if available. The work is a comprehensive work and currently has a list of approximately 200 compounds. The database would be converted into an interactive portal shortly. The portal is intended to help those researchers in marine biotechnology, who intend to acquire a known molecule of marine origin, for further research and technology development purpose, but cannot manufacture the same at their own facility. Hence, the researcher can approach all the synthesizers of the molecule, and get the needful.

4.7 BT Industry Policy Suite

With the primary focus of making Gujarat the most attractive investment destination of not only in India, but also that of the world, the Government of Gujarat (GoG) has announced a new Industrial Policy. The objectives of the new industrial policy are as under:

- Facilitate investments in the state
- Employment generation and Employability enhancement
- Adherence to high quality standards

The BT Policy of the State is in congruence with the State Industrial Policy, and derives its incentive strength from the same. The Industrial Policy involves a lot of incentives which would require calculations using formulas of finance, which is not always known to the various stakeholders of biotechnology. Hence, GSBTM made an attempt to create a web enabled interactive program & financial incentive calculator. It gives the investor a clear idea about the level of financial benefits available to him under eligible categories. It requires internet access, filling the forms and requisite information on-line and provides the entitlement details.

Policy Calculator is E-module for calculating the policy benefits available under Industrial policy and schemes of Industries Commissionerate, Industries and Mines Department, Government of Gujarat. It is an effort to project to available benefits to the investor for their projects of interest.

POLICY SUITE

Policy Calculator is E-module for calculating the policy benefits available under Industrial policy and schemes of Industries Commissionerate, Industries and Mines Department, Government of Gujarat. It is an effort to project to available benefits to the investor for the project of interest.

LOGIN

Login Status:

User Name

Password

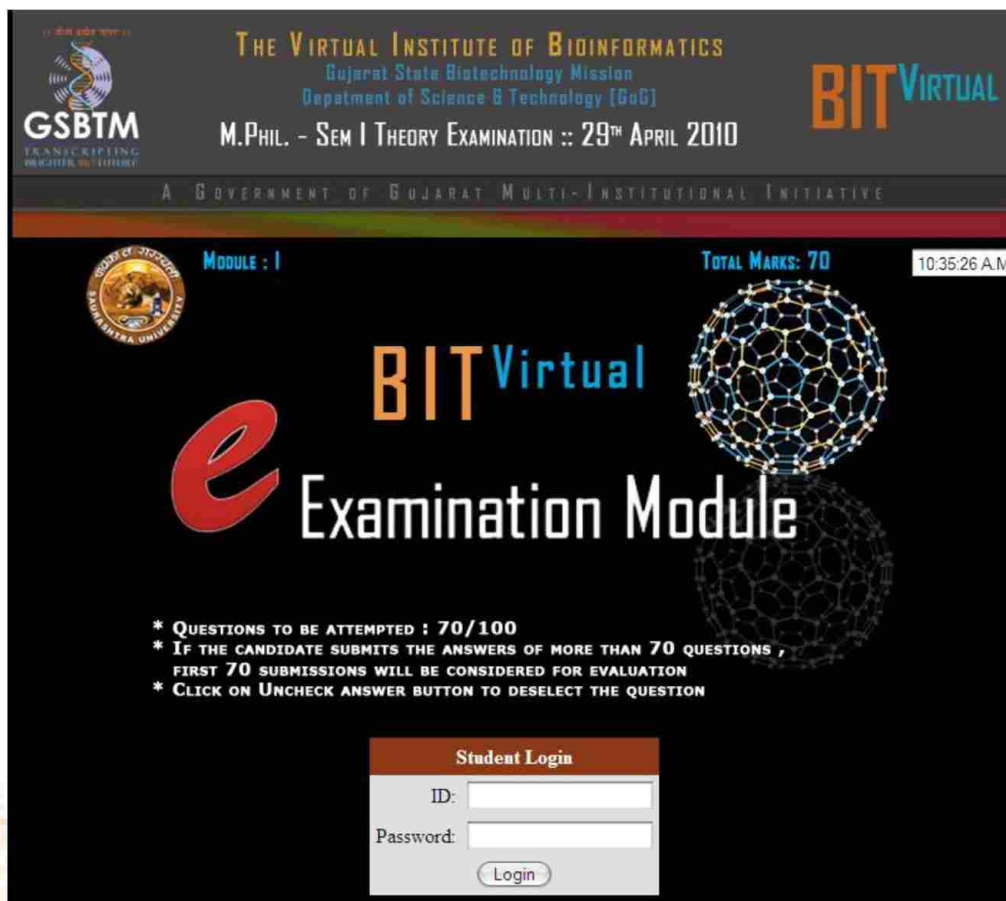
[Login](#) [Forgot your password?](#) | [Register](#)

4.8 E-examination Module

E-examination module has been developed for entrance & semester examinations of the M. Phil students of BITVirtual.

Prime Features of the Module are:

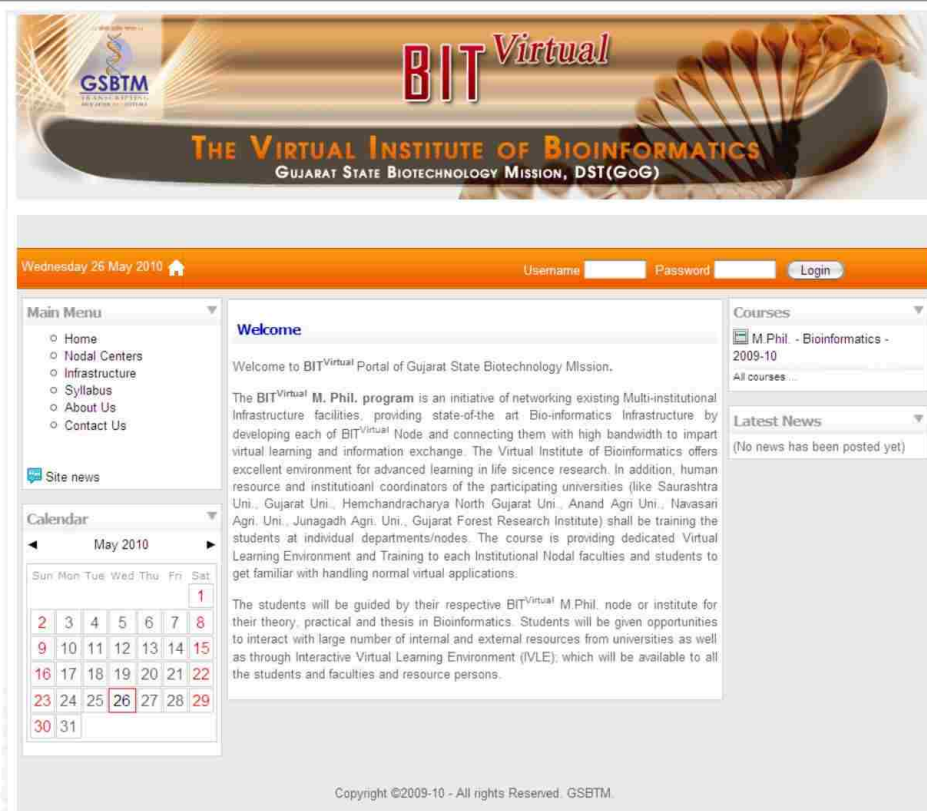
- Entrance test for M. Phil. Bioinformatics
- Theory Examination for M. Phil. Bioinformatics
- Student & Admin login with authentication
- Auto-submission after fixed duration of time
- Objective type examination with uncheck feature
- Auto-generation of results with one click



4.9 BITVirtual Portal - Interactive Virtual Learning Environment (IVLE)

The BITVirtual M. Phil. program is a Multi-Institutional program, providing state-of-the art Bio-informatics Infrastructure to each of the BITVirtual Node and connecting them with high bandwidth to impart virtual learning and information exchange. The Virtual Institute of Bioinformatics offers excellent environment for advanced learning in life science research. Institutional coordinators of the participating universities (Saurashtra Uni., Gujarat Uni., Hemchandracharya North Gujarat Uni., Anand Agri Uni., Navasari Agri. Uni., Junagadh Agri. Uni., Gujarat Forest Research Institute) train the students at individual departments/nodes. The course is providing dedicated Virtual Learning Environment and Training to each Institutional Nodal faculties and students to get familiar with handling normal virtual applications.

Students get opportunities to interact with large number of internal and external resources from universities as well as through Interactive Virtual Learning Environment (IVLE); which is available to all the students and faculties and resource persons.



IVLE on www.bitvirtual.org

Features of IVLE:

- Based on Moodle [Modular Object-Oriented Dynamic Learning Environment] platform also known as a Course Management System, Learning Management System or Virtual Learning Environment (VLE).
- Moodle has many tools and features that enhance a student's and teacher's experience in a course. Listed below are many of the features Moodle offer:
 - Assignments
 - Chats
 - Databases
 - Forums
 - Glossaries
 - Lessons
 - Resources
 - Sharable Content Object Reference Model [SCORM]
 - Surveys
 - Wikis
- Developers can extend Moodle's modular construction by creating plugins for specific new functionality. Moodle's infrastructure supports many types of plugins like:
 - activities
 - resource types
 - question types (multiple choice, true and false, fill in the blank, etc)
 - data field types (for the database activity)
 - graphical themes
 - authentication methods (can require username and password accessibility)
 - enrollment methods
 - content filters

5.0 R&D Institutional & Infrastructural Strengthening in Gujarat

5.1 Marine Biotech Project Proposal Development & Mentoring Program

Gujarat has a vast coastline of 1650 km containing large amount of bioresource. However, the potentials of this bioresource stays largely untapped, because of the lack of research institutes in marine biotechnology in the State. But, the state of Gujarat has also been blessed with a large number of Undergraduate colleges in Biotechnology & allied courses. It is felt that the faculty of these colleges can play an important role in strengthening marine biotechnology research in the state; they being creative and enthusiastic youth of the state. Hence, GSBTM launched Project Proposal Development and Mentoring Program, for the financial year 2009-2010, for strengthening research acumen of the young scientists of the state in the field of marine biotechnology. This program initiated to help initiate small marine research projects in various pockets of the State. The program was a proactive initiative of the state Government to equip the young faculty of the state for advanced research in marine biotechnology.

APPROACH OF THE PROGRAM WAS AS MENTIONED BELOW:

1. The program was declared only for the teachers of Undergraduate Colleges.
2. The teachers were selected based on the state relevance of the project that they submitted.
3. The preliminary screening of the projects was done at GSBTM.
4. Post the screening, the projects were sent to a committee of eminent marine biologists and biotechnologists, for review and comments, followed by presentation to TAC, GSBTM.
5. The candidates selected by the committee would be then sent to any National Laboratory for 5/7 days for hands-on training in marine biotechnology & further refinement of the proposal.
6. The groomed projects would then be sent to DBT, GoI & Industries Commissionerate, GoG for funding.

THE PROJECTS INVITED WERE

1. Within a budget of 10-12 lakhs
2. Projects on Marine Microbiology related to bioprospecting of some pharmaceutically important molecule(s) or very unique & innovative project in marine microbiology
3. Seaweed cultivation for bioremediation in collaboration with an industry and
4. Only three (3) projects were to be selected in one round of the program.

OUTCOME

GSBTM received three projects, of which one was a late submission and another was submitted by a Post Graduate Department and hence was rejected. The projects received were:

1. An assessment bioremediation efficiency in the removal of dissolved organic, inorganic nutrients and heavy metals by the seaweeds through land-based tank system, P.G. Department of Environment Science & Technology, Institute of Science & Technology for Advanced Studies & Research (ISTAR), Vallabh Vidyanagar.
2. Screening, characterization and database construction of pharmaceutically active compounds from marine microbial resources of coastal Gujarat, V.V.P. Engineering College, Rajkot.
3. Marine microbial biodiversity exploration for antimicrobial and anti cancer implication, Department of Life Sciences, Hem. North Gujarat University, Patan.

The project from V.V.P Engineering College was selected through preliminary screening and sent to a committee of Marine Scientists, through email. Dr. Bhavnath Jha, Scientist, CSMCRI, Bhavnagar, took a proactive initiative and helped the applicants modify the project according to the scientific temperament and needs of the state. The proposal has now been taken up for modifications.

5.2 Stem Cell Research mentoring program

GSBTM very strongly feel the need to uplift the status of biotechnology research in the state and feels it as an important role to enable qualitative and quantitative improvement in Biotechnology research. While vast funding opportunities for research funding are available at national level, this is availed minimally. This is leading to a situation, where, quality research proposals are not prepared and a large mass of the academia is deprived of joining the national research mainstream. This is applicable to all the segments of biotechnology including Stem cell research. State government of Gujarat is committed to promote and develop stem cell research in Gujarat with definite strategy and action plan prepared through intensive brain storming session. To address the issue of stem cell research development trainees of the stem cell skill development programs were guided to prepare project proposals which were submitted to GSBTM. These proposals were then reviewed by a mentoring panel comprising of national level experts on stem cell research, their training mentors and GSBTM official the composition of which is as under:

Sr No	Name	Designation
1	A. K. Saxena, IFS , Mission Director, GSBTM	Chairperson
2	Dr Mohan Vani, Scientist , NCCS , Pune	Mentor
3	Dr Rakesh Raval, Scientist, GCRI, Ahmedabad	Mentor
4	Mr Himanshu Patel, Director, Stemcure , Ahmedabad	Mentor
5	Ms Madhvi Joshi, Sector Specialist, GSBTM	Members Secretary

All the projects prepared by young scientists were presented in front of the panel and were mentored by the panel for modifications and improvements. After the due changes the same are being considered for submission for funding to relevant national funding agencies. Following is the list of the projects prepared for "Stem Cell Research Mentoring Program".

Sr.No.	Project Title	Name of Scientist	Designation
1	Effect of Arecoline and Arecoline products on oral fibroblast cells: in-vitro& in-silico approach	Dr.Jayasankar P.Pillai	TUTOR, Department of Oral Dental Pathology and Microbiology, Govt. Dental College and Hospital
2	"A stem cells based preclinical model in Drug Discovery	Dr. Viral Jagdishchandra Patel	Asst. Professor, Department of Pathology, C.U. Shah Medical College and hospital
3	INVESTIGATION OF SAFETY AND EFFICACY OF STEM CELL THERAPY IN POST-MENOPAUSAL OSTEOPOROSIS USING OVARIETOMIZED RAT MODEL	Kakadia nimisha parshottam	Lecturer, Department of pharmacognosy, K.B. institute of pharmaceutical education and Research
4	Study of genetic markers (STRs) and establishing Hematopoietic Stem Cell bank for the Gyps vultures.	DR. SANJAY M. DAVE	Assistant Professor, Department Of Life Sciences, Hemchandracharya North Gujarat University
5	Umbilical cord blood cell derived mesenchymal stem cell infusion in diabetic mice to treat type 1 diabetes	Dr. Divya Chandel & Dr Devendra Zala	Assistant Professor, Zoology Department, Gujarat University
6	A proper cytogenetic control study for the detection of possible chromosomal abnormalities from those cells earmarked for human stem cell therapy programs.	Dr. Meonis A Pithawala	

5.3 Biotechnology Research Encouragement & Strengthening Program

GSBTM conceptualized this program to support the academia of the State to strengthen their research potentials. Through this program GSBTM aimed at encouraging researchers of the State to invite reputed senior scientists of the nation to their college/department, for advisory purpose. These scientists can be invited for consultation, developing new project ideas and to impart training into newer biotechnology techniques.

The economy class airfare (within India), Local Hospitality cost of Rs.500/-/day and an honorarium of Rs.500/-/day is provided by GSBTM for the visiting Scientist. GSBTM believes, that, with help of national biotech academia, Gujarat will be able to broaden its biotech research base.

6.0 Human Resource Development Drive of GSBTM

6.1 Dissertations Supported

GSBTM under Gujarat Genomics Initiative and The Virtual Institute of Bioinformatics has conducted dissertation program under which research problems were assigned to students for the duration of their dissertation work.

Gujarat Genomics Initiative Dissertations: [Under GGI-WGSeq Program - AAU as one of the GGI Node]

1. Arpit B. Patel
Degree : M.Sc. Life science
University : Department of Life science, Hemchandracharya North Gujarat University
Topic : Repeat analysis in the sequence reads generated with Bacillus megaterium genome through 454 sequencing technology
2. Manish Rajgor
Degree : M.Sc. Life science
University : Department of Life science, Hemchandracharya North Gujarat University
Topic : Gene finding using Bioinformatics tools in the contigs Generated from Bacillus megaterium genome through GS-FLX system
3. Rachna D. Trivedi
Degree : M.Sc. Life science
University : Department of Life science, Hemchandracharya North Gujarat University
Topic : Metabolic analysis and phylogenetic classification applying Metagenomic rapid annotation based on subsystem technology on the sequences generated from Bacillus megaterium genome through GS-FLX high throughput sequencer
4. Punam B. Patel
Degree : M.Sc. Life science
University : Department of Life science, Hemchandracharya North Gujarat University
Topic : Functional analysis and taxonomic classification applying bioinformatics tools on the sequences generated from Bacillus megaterium genome through 454 next generation sequencer

The Virtual Institute of Bioinformatics Dissertations

5. Sonali Popatbhai Gujar
Degree : M.Sc. Bioinformatics
University : Sardar Patel University
Topic : Inversion tool to identify inversion in the data generated by SOLID system.
6. Shreyas K. Dhuliya
Degree : B.E. Biotechnology
University : V.V.P College, Saurashtra university
Topic : Docking Studies Of Some Plant Compounds For 2HWC- Human Rhinovirus Coat protein

6.2 Training Regimes of GSBTM

6.2.1 Skill Development in Stem Cell Techniques: Basic Training in cell culturing

Stem Cell Technology is a technology of hope for patients of many incurable disorders including heart diseases, cancer, HIV etc. In view of the healthcare solutions offered by stem cells, and its relevance to state of Gujarat, GSBTM is visualizing to develop a platform to enable research, application and use of stem cell technologies in the state. GSBTM had organized a Brain Storming Session on 25th September, 2008 to identify the thrust areas and priorities in stem cell research for the state. The brain storming session was held under the Chairpersonship of Dr Manju Sharma, Advisor-Biotechnology, GoG, and co-chairmanship of Prof. D. Balasubramanian, Director Research, IVPEI, Hyderabad. One of the important recommendations was to create skilled human resource in stem cell research by organizing training programs.

GSBTM organized "Skill Development in Stem Cell Techniques: Basic Training in cell culturing" in technical collaboration with Stem Cure Pvt. Ltd. in two batches from 21st to 25th September, 2009 and 5th to 9th October, 2009. For the training total 53 application were received from all over the state by researchers, academicians and medical practitioners. From these 53 applicants, 14 participants were selected for the training. Training included practical hands-on training in stem cell handling and theory session related

to the same. Participants were given hands-on training on basic skill development for stem cell research like Cell viability detection, Cell counting, Cell Preparation for plating, Coating of dish / Flask, Final plating of cells and demonstration on Media change, Media preparation, Observation of plates, Sub culturing, Passage of cultured cells, Freezing and Thawing of cells, methods to detect contamination & troubleshooting. The resource persons were: Himansu Patel- Directors Stem Cure Pvt. Ltd., Dr. C. B. Nagari- Dr. Nagori Institute of Infertility, Ahmedabad, Dr. R. M. Rawal, Head, Division of Medicinal Chemistry & Pharmacogenomics, Gujarat Cancer Research Institute, Ahmedabad, Dr. Sonal Panchal- Dr. Nagori Institute of Infertility, Ahmedabad, Akash Bhavsar -Co- Founder & President, Sky Quest Technology Consulting Pvt. Ltd, Ahmedabad, Dr. N.K. Jain- Prof & head Dept of Life Science, Gujarat University. The Key topics covered were , Therapeutic potentials of Adult stem cells, Laboratory Setup, Markers for isolation and characterization of stem cells, Role of stem cells in Gynecology, Role of ultrasound in Stem cell therapy, Technology Transfer: Stem cell perspective, Cryopreservation of stem cell, Molecular basis of cell differentiation.

List of participants

Name of Participants	Designation	University/collage/Institute
Sanajy Dave	Lecturer	Department of life sciences, Hemchandracharya North Gujarat University,PATAN
Bhumika Patel	Lecturer	Department of Biotechnology, V.V.P engineering collage
Dr.Jayshankar Pillai	Lecturer	Govt. Dental Collage and Hospital, Ahemdabad
Nimisha Kakadia	Lecturer	Parul Institute of Pharmacy, Baroda
Dr. Devendra Jhala	Lecturer	Dept. of Zoology, Gujarat University
Dr Divya Chandel	Senior Lecturer	Dept. of Zoology, Gujarat University
Shruti Adani	Lecturer	Department of Biotechnology, V.V.P Engineering collage
Dr. Meonis Aspi Pithawala	Lecturer	C.G.bhakta institute of biotechnology, VNSGU
Navneetkumar Singh	Lecturer	Sardar Patel University
Dr. Viral Patel	Medical doctor & Assi. Professor, Pathology	Pathology, C.U.Shah Medical College, Surendranagar
Dr Rajesh D Dobariya	Medical Doctor, Tutor	PDU Medical College, Rajkot
Urja N. Desai	Junior Research Fellow	Gujarat Cancer & Research Institute (GCRI)
Shah Arpita	Student (M.Sc.Biotechnology)	Department of Biotechnology, Gujarat University
Mehta Jignasha Kantilal	Student (M.Phil. Bioinformatics)	GSBTM,HNGU Nodal Center, Saurashtra University



6.2.2 Industrial Biotech Training Program [IBTP] - 2009

In knowledge sector industries inclusive of Biotechnology, a huge importance is given to the skilled manpower employed and hence, head-hunting has always been one of the prime priorities. Most of the industries also find that the freshers (directly from Academics) are generally too naïve and need some training so as to start contributing towards the growth of the Industry. It has been marked at various forums that the freshly graduating students are often not – employable though trainable. The Industrial Biotech Training Program aimed at imparting on- project training to students freshly graduating as B.E./B.Tech./M.Sc. from various Biotechnology & related Academic programs of Gujarat, in the various biotech industries of Gujarat. Biotechnology Units in Gujarat were requested to express their interest in imparting on-project Industrial training to students selected by GSBTM for a period of 4 months. GSBTM extended nominal financial support to the Industry (towards bearing the charges for chemicals and consumables spent) for the training of each student.

About 15 students, fresh graduates of M. Sc. or B.E. (Biotech) from the Biotechnology and related departments of the universities in Gujarat, were selected, with due recommendation/nominations from the HODs. Each student was paid a nominal stipend per month for the duration of the training and also offered travels & incidentals support.

All candidates under IBTP-2009 completed their training successfully. Encouraged by the response, this office intends to continue this program for the next academic year as well with improvements as learnt from the earlier experiences.

6.2.3 Molecular Biology Training Program

GSBTM considered the requests from the institutions for student training under Gujarat Genomics Initiative and Biodiversity Gene Bank for practical hands-on training in molecular biology techniques, and launched the Molecular Biology Training Program. This training was initiated for personnel with some scientific background, seeking basic and advanced-level molecular biology training.

Following is the list of trainees under Gujarat Genomics initiative and Gujarat Biodiversity Gene Bank.

Sr. No.	Name of the Students	Institute
1	Brahmbhatt Jpan	Pramukh Swami Science & H.D.Patel Arts college
2	Thakkar Bijal	
3	Upadhyay Kaushal	
4	Patel Gopi	
5	Panchal Gunjan	
6	Patel Kinjal	
7	Vipul S. Bambhaniya	B R Doshi School of Biosciences, S P University
8	Priyank M. Shah	
9	Saurabh Pathak	
10	Arpit B. Patel	Hemchandracharya North Gujarat University
11	Manish Rajgor	
12	Rachna D. Trivedi	
13	Poonam B. Patel	ARIBAS, New V.V.Nagar
14	Anand Bhavanji Patel	
15	ChiragAshokbhai Patel	
16	Dhaval K Patel	
17	Hinesh K. Patel	
18	Jimit Harshadbhai Patel	
19	Pratik S Thaker	
20	Purav Naishadh Bhatt	
21	Ronak Rajendrakumar Patel	
22	Saurabh Kumar Singh	
23	Meghavi Atulbhai Patel	
24	DEEP A. PATEL	MSU- BIOCHEM DEPT.



6.3 Student Facilitation

6.3.1 Gujarat Integrated Bio Network [GIBioN]

More than 150 courses are taught in Biotechnology & allied fields in more than 70 Colleges or University Departments at graduate and post graduate level in the State of Gujarat. This large pool of young and aspiring students pursuing studies in life sciences, need to be continuously motivated and inspired for excellence so as to create a world-class highly competitive manpower. Eyeing at these objectives, a humble beginning was done in 2005 in the form of an initial network of all under-graduate colleges teaching Biotechnology & allied subjects in Gujarat, jointly with Microbiology Study Circle, J. & J. College of Science, Nadiad; and has been baptized as Gujarat Integrated Bio Network [GIBioN].

The aim of this Network is to conduct events to induct amongst the students, a sense of healthy competitiveness, and aim for perfection. Hence, this network conducts competitions at various levels of graduate studies and these events are aimed at enthusing the students at evolving the creativity. These events also aim at academic exchange of knowledge amongst ourselves.

Under the aegis of GIBioN, all Under-graduate colleges are facilitated & encouraged to conduct Intra-Collegiate competitions in the various events to be held at the Annual meet of GIBioN viz. Seminar Presentations, Scientific Article writing, Extempore Elocution & Scientific Cartoons [BT toons] and thus, select their College representatives. The winners of the Intra-Collegiate competitions then compete for the State-level title at an Annual Event of State level Inter-Collegiate Competitions.

The State Level event generally, provides an occasion for about 1000 students (including about 150 participants) from around 55 undergraduate colleges of the State to interact with each other. The Annual State-level Inter-Collegiate Competitions were held at Kadi, Kalol, Navsari, and Nadiad for the academic year 2008-09, 2007-08, 2006-07 and 2005-06.

In the year 2009-10 – the 21st State Level Inter-Collegiate Competitions was held on 22nd November 2009, at C. G. Bhakta Institute of Biotechnology, Bardoli.

The different Competitions were:

1. Seminar Presentation Competition for Second Year B. Sc. students [Topic: Interplay of Biomolecules in a Living System]
2. Seminar Presentation Competition for Third Year B. Sc. students [Topic: Stem Cells and its most fascinating application]
3. Scientific Article Writing Competition for Third Year B. Sc. students [Topic: Current Status of Biotechnology in India]
4. Extempore Speech/Elocution for Second or Third Year B. Sc. Students on Current Topics in Biosciences
5. Scientific Cartoon [BTtoon] Competition for Second or ^{No} _{Know} H_1N_1 Third Year B. Sc. Students on the topic:

These competitions were judged by eminent scientists and academicians of the state. The results are summarized as follows:

NAME OF EVENT	TOPIC	PRIZE/ RANK	NAME OF WINNER	NAME OF COLLEGE
S.Y. SEMINAR	<i>Interplay of Biomolecules in a Living System</i>	FIRST	ANITA DADESAGAR	R. G. SHAH COLLEGE, AHMEDABAD
		SECOND	POOJA	CHRIST COLLEGE, RAJKOT
		THIRD	PAMU LAVANYA	DEPT OF BIOSCIENCES, VNSG UNIVERSITY, SURAT
T.Y. SEMINAR	<i>Stem Cells and its most fascinating application</i>	FIRST	RAJESHWARI PAWAR	J AND J COLLEGE OF SCIENCE, NADIAD.
		SECOND	SHREYA MODI	GUJARAT VIDYAPITH, SADARA.
		THIRD	NATHWANI MANALI	M.B. PATEL SCIENCE COLLEGE, ANAND.
T.Y. ARTICLE	<i>Current Status of Biotechnology in India</i>	FIRST	JENNY JOHANSON	NV PATEL COLLEGE OF PURE AND APPLIED SCIENCES, V.V.NAGAR.
		SECOND	JAIN KUNALIKA	CHRIST COLLEGE, RAJKOT
		THIRD	AKANKSHA D. ARORA	R. G. SHAH COLLEGE, AHMEDABAD
SCIEN TOON	No Know H_1N_1	FIRST	HONEY B. PATEL	NARANLALA COLLEGE OF PROFESSIONAL AND APPLIED SCIENCES, NAVSARI.
		SECOND	SHRUTI TEREDESAI	NV PATEL COLLEGE OF PURE AND APPLIED SCIENCES, V.V.NAGAR.
		THIRD	ODEDRA HIREN	CHRIST COLLEGE, RAJKOT.
EXTEMPORE SPEECH	On Current Topics in Biosciences	FIRST	SHARMA SEEMA	DEPT OF BIOSCIENCES VNSG UNIVERSITY, SURAT
		SECOND	MAULIK BADMALIYA	NV PATEL COLLEGE OF PURE AND APPLIED SCIENCES, V.V.NAGAR.
		THIRD	DAMAN AVANI M.	P. S. SCIENCE & H.D. PATEL ARTS COLLEGE, SARV VIDYALAYA, KADI.

The judges were also requested to also act as mentors to the participants and suggest corrective & constructive measures for the candidates to improve their abilities.

6.3.2 Network of Capacity Building Cells in Biotechnology [N-BT-CBC]

CONCEPT

The success in 'Transcripting Brighter Bio Future' from the neo tool-Biotechnology shall need world-class manpower and both the state and the central governments are working towards it. The Gujarat State Biotechnology Mission [GSBTM] is also taking some small but discrete steps towards development of an Institutional Network for Capacity Building in the field of Biotechnology.

It is being envisaged that structured mentoring and provision of an institutional framework of Cells for Capacity Building shall help the budding biotechnologists to aim and hit high; at increasingly competitive examinations for professional careers in the field of Biotechnology.

Hence, GSBTM has built a couple of Capacity Building Cells in Biotechnology at various academic organizations of the state in the initial phase. Proposals were invited for establishing BT-CBCs, especially

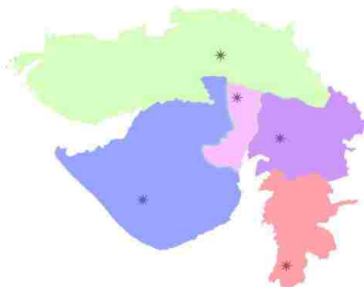
encouraging the under-graduate departments/colleges, they being the students aiming at such National Competitive Examinations & hence, such Colleges/Departments have a higher interest in such activities. The proposals were scrutinized in this office, with an inclusive approach, instead of a reductionist approach. Six Cells were identified as BT-CBCs

GSBTM – CAPACITY BUILDING CELLS are as below:

1. N. V. Patel College of Pure and Applied Sciences, Vallabh Vidyanagar	These five cells shall provide the training envisaged by this office by means of the CRASH WORKSHOP
2. Sheth Motilal Nyalchand Science College, Patan	
3. P. S. Science & H. D. Patel Arts College, Kadi	
4. College of Agriculture, Junagadh Agriculture University	
5. KBS Commerce & NATRAJ Professional Science College, Vapi	
6. Tolani College for Arts & Sciences, Adipur	Has sought excuse from conducting the CRASH WORKSHOP

Each such Capacity Building Cell conducted a structured CRASH WORKSHOP to train the Biotech (to be) Graduates, as per the Guidelines/BLUE-PRINT developed by GSBTM.

A Meeting of all of the CBC-Coordinators was organized in this office on 17th April, 2010 wherein the philosophy of the Program was explained and the comments/suggestions from the Coordinators on the Blue-Print were discussed. An elaborate discussion ensuring development of the Strategy for Crash Workshop was undertaken.



The BT-CBC at Tolani College for Arts & Science, Adipur sought excuse from conducting the Crash Workshop while in spite of lot of efforts of KBS Commerce & Natraj Professional Science College, Vapi; the Crash Workshop could not be arranged in the South Gujarat area.

For Students of colleges in the following Districts	GSBTM – BT-CBC	Contact Details of the Coordinator	Crash Workshop
Kutch, Sabarkantha, Banaskantha, Patan, Mehsana (other than P. S. Science & H. D. Patel Arts College, Kadi)	<u>Sheth Motilal Nyalchand Science College, Patan</u>	Darshan Marjadi GSBTM – BT-CBC Department of Biotechnology, Sheth M. N. Science College, College Campus, Rajmahel Road, Patan – 384 265 Email: darshworld@yahoo.com Tel.: 02766-220812	4 th to 9 th May, 2010
Junagadh, Jamnagar, Amreli, Rajkot, Bhavnagar, Surendranagar, Porbandar	<u>College of Agriculture, Junagadh Agriculture University</u>	Dr. B. A. Golakiya, Professor & Head GSBTM – BT-CBC Dept of Biotechnology, College of Agriculture, Junagadh Agriculture University, Moti Baug, Junagadh - 362 001 Email: bag@jau.in Tel.: 0285-2672080-90-379 Fax: 0285-2670754	3 rd to 8 th May, 2010
Ahmedabad, Gandhinagar	<u>P. S. Science & H. D. Patel Arts College, Kadi</u>	Ms. Minal Trivedi, Head & Lecturer Department of Biotechnology P. S. Science & H. D. Patel Arts College, Sarva Vidyalaya Campus, Opp. Railway Station Kadi – 382 715 Email: minalmihir@gmail.com Tel.: 02764-262634	3 rd to 8 th May, 2010
Kheda, Anand, Dahod, Vadodara, Panchmahal	<u>N. V. Patel College of Pure and Applied Sciences, Vallabh Vidyanagar</u>	Mr. Amit Ballani, GSBTM – BT-CBC Dept. of Biotechnology, Genetics & Bioinformatics, N. V. Patel College of Pure & Applied Sciences, Mota Bazaar, Vallabh Vidyanagar – 388 120 Email: amitballani@gmail.com Tel.: 02692-232473	5 th to 10 th May, 2010

GLIMPSE OF THE TRAINING ENVISAGED THROUGH CRASH WORKSHOPS

The Crash Workshops are an intensive period of training with some of the best available resource persons delivering more than 60 formal lecture sessions, with ample informal sessions, psychological orientation sessions, mock tests, etc. Aspirants undergo an intensive period of learning spanning more than 12 hours a day. There are NO FEES for the CRASH WORKSHOPS, however, to ensure that the enrolled aspirants maintain an attendance of over 90%, a refundable deposit of Rs. 500/= from each aspirant has been envisaged.

The identified cells invited applications from students studying in various colleges falling within their area. The identified cells followed a transparent un-biased mechanism for selection of candidates for the said Workshop. The cells decided to follow either of the following methods:

1. Request nomination of candidates from the Head of Departments/Coordinators/Sr. Faculty of the Biotech or related programmes in the colleges falling within their area OR
2. Arrange for a screening test and select students on the basis of their merit at the screening test.

Students in the final year of graduation of any of the Biotech or allied subjects (like Microbiology, Biochemistry, Genetics, Bioinformatics, Environmental Sciences/technology, Molecular Biology, Human Genetics, etc.) were trained at the CRASH WORKSHOP. A limited number of outstanding cases of non-freshers were entertained by each cell. Each cell were expected to train at least 60 candidates, in total. Out of the total candidates, at least 30 students belonged to other colleges, with a good representation from ALL of the other colleges in the nearby area. The Cells have started sending information about candidates clearing various entrance examinations.

6.3.3 Industry Academia Collaboration Cell iAC2

Today is an era of knowledge based industries, and along with gaining knowledge there also is a need of joining the strengths to become mega powers. Universities and industry, which for long have been operating in separate domains, are rapidly inching closer to each other to create synergies. The intersecting needs and mutually interdependent relationship requires identifying means of further strengthening academia-industry partnerships. Considering this need and being the nodal agency for overall development of Biotechnology in the state GSBTM has established Industry Academia Collaboration Cell- iAC². Out of many activities visualized one of the key features is to organize lecture of eminent biotechnologists from industries in various academic departments.

In continuation of the same Industry and Academic interactive lectures were organized by Genetic Diagnostic center, Gujarat University on 3rd march, 2010 at University campus. Around 150 students of post graduate degree and 15 faculties of the university took advantage of the lecture series.

1. A lecture by Dr. M. Krishnaiah, Ex. Vice President, Zydus Cadila, Ahmedabad. Director, Spectrum Business Solution. Mr Krishnaiah both as a ex-employee of the very renowned pharma and biotech company and entrepreneur gave vision to the student about spirit of entrepreneurship in the area of Biotechnology.
2. Dr. Maheswari. K, Sr. Vice President, Intas Pharmaceuticals, Ahmedabad. Dr Maheshwari being the alumni of the University gave detailed insight onto the skill expectation and need of the industry for employing manpower in the various divisions and scopes of the same.



6.3.4 Seminar Support

During the year GSBTM provided financial support for the various seminars.

Workshop in Immunology was organized by **M. S. University of Baroda**, on 27th November, 2009 and 28th November, 2009. Purpose of seminar to inculcate interest in the field of immunology. The key **Speakers** were Dr. K.B.Sainis, Mumbai, Dr. Krishna Hajela, Indore, Prof. Sita Naik, Prof., Rasheedunnisa Begum, Vadodara, Prof. Nibhriti Das, New Delhi, Prof. Shobhana Sharma, Mumbai, Prof. G. Subrahmanyam, Mumbai, Dr. V. Singh, Bhopal, Dr. S. Chiplunkar, Prof. Dipendra Kumar Mitra, Additional Professor, AIIMS, New Delhi, Prof. Santosh Kar, Research scientist, New Delhi, Dr. Rajpal Singh Kashyap, Senior Scientist, CIMS, Nagpur, Prof. G. Naresh Kumar, Professor, Department of Biotechnology, Vadodara, Prof. D.N.Rao, Professor, AIIMS, New Delhi.



- A workshop on **Genetics in clinical Practice** was organized by **Foundation for Research in Genetics & Endocrinology [FRIGE]**, Ahmedabad on 20th December, 2009. Purpose of seminar was to focus on Human Genetics and its clinical application. The key speakers were Dr. Prochi Madon, Mumbai, Dr. Koumaudi Godbole, Pune, (Dr. Prakash Gambhir, Pune), Dr. Frenny Sheth, Dr. Jayesh Sheth, Dr. Harshal Shah, Dr. Sanjeev Mehta, Dr. Ashwin Patel of Ahmedabad. The topics focused included -Role of Cytogenetics in Obstetric and gynec practice Genetic Counseling to the family with unknown genetic disorders, Genetic Study in dysmorphic children Role of Molecular Cytogenetics and CGH array in children with multiple congenital anomalies, diagnosis of lysosomal storage disorder, its treatment, Neurogenetic assessment in pediatric practice(), Recent and Future for stem cell therapy in genetic disorders.



- Industry - Academia Interactive Lecture** was organized by **Ganpat University, Kherva** on 5th February, 2009. It aimed to establish interaction between Biotech Industry and the Biotech Academia. Dr. Vikash Shirsath, chief scientific officer, M/s Oxygen Health Care; talked on Industry Perspective and areas of possible interactions & collaboration with Universities. Dean Science & Pharma provided overview of facilitation work in the University.
- Nanotechnology: Today & Tomorrow** was organized by **Dir. Institute of Technology, Nirma, Ahmedabad** on 8th January, 2010. Nanotechnology: Seminar's main goal was to sensitize and stimulate the young minds towards the newer openings in the field of Science & Technology. The key speakers were - **Dr Murli Sastry**, **Dr. K. M. Paknikar**, **Dr. Santosh K Kar**, Prof, JNU, New Delhi, **Pro. Sanjeev Kumar Gupta**, **Dr. Satishchandra B Ogale**, Scientist,, Associate Prof, Department of Chemical Engineering, Indian Institute of Science, Bangalore, **Prof. T P Radhakrishnan**, the school of Chemistry at University of Hyderabad, Materials & Computational Chemistry, **Prof. V Ramgopal Rao**, Prof. Electrical Engineering Department Indian Institute of technology Mumbai, This seminar focused on risk assessment, and perceptions with respect to application of nanoscience and nanotechnology in various fields. The topics focused included - new biomimetic strategies for the synthesis of minerals and nanoparticles of nanomaterials, Self- assembly of nanomaterials, Surface-modification strategies for nanoparticles with particular emphasis on bioconjugation, Development of new synthesis process for nanomaterials in solution, Metal- microbe interactions and their applications, Application of nanoscience in medicine, biology, agriculture and environment, Microbial Culture Collections. Micellar processes; Nanoparticle; synthesis; Micellar solubilization; Foams; emulsions and, Physical and Material Chemistry & nanosynthesis, characterization and applications, pulsed laser deposition of metal oxide films, nanocomposites, Hybrid systems. Nanoelectronics, Circuit and System Design Considerations with Emerging CMOS Technologies, etc.



- Pharmacogenomics and Toxicogenomics: New Horizons in Veterinary Pharmacology and Toxicology** was organized by **Collage of Veterinary Sci. and Animal Husbandry, Ananad Agriculture University**, on 5th November to 7th November, 2009. Seminar aimed to promote research in the field of Veterinary Pharmacology and Toxicology. It also provided a common platform for academia and industry to discuss problems related to drug development and drug safety and evolve strategies to incorporate pharmacogenomics and toxicogenomics in drug discovery and food safety.
- The key speakers were: **Dr. G. J. Samathanam**. Director, Convener EC. **Dr. J. K. Malik**, Joint Director, Indian Veterinary Institute. **Dr. A.K. Srivastava**., Haryana. **Dr. Ram Raghubir**, Lucknow, **Dr. S. J. S. flora**, Gwalior, **Dr. A. K. Saxena**, GSBTM, Gandhinagar. **Dr. B. D. Sharma**, Indian Veterinary Institute. **Dr. C. Adithan**, Punducherry, **Dr. N. Kondaiah**, Hyderabad. **Dr. A.H. Ahmad**, Pantnagar. **Dr. Ashok kumar**, Izatnagar- UP, **Dr. R. K. Goyal**, Vadodara, **Dr. B. G. Patel**, V. V. Nagar, **Dr. H. S. Sandhu**, Ludhiana, **Dr. TK Mandel**, Kolkatta, **Dr. J. V. Anjaria**, **Dr. (Mrs.) L. Mathuram**, Chennai, **Dr. S. K. Mishra**, Izatnagar- UP, **Dr. C. Jayachandran**, Patna, **Dr. C. Varshneya**, Palampur, **Dr. (Mrs.) C. C. Barua**, Guwahati (Assam), **Dr. Harish Padh**, Ahmedabad, **Dr. M.R. Marathe**, Vadodara, **Dr. K. S. Reddy**, Tirupati.

- Topics covered included: **Animal** Technology, Pharmacogenomics, Toxicogenomics, Pharmacokinetics, Bio-informatics and Herbal drugs (Ethno-pharmacology)



- To share experiences of successful Biotech entrepreneurs, GSBTM & Vir Narmad South Gujarat University, Surat, organized a seminar titled **Triumphant Biotechnologist & Initiatives of GSBTM** on 7th September, 2009. Dr Prashant Bhatt, Chairman and Managing Director M/s Son Agree Genetics and Shri Sundip Saxena, Managing Director M/s Acton Biotech give talks on 'Business opportunities in Biotechnology [Plant Tissue Culture]' and Setting up Biotech Venture respectively.

7.0 Developing Biotech Business Expanse in Gujarat

Biotechnology is knowledge based economy, driven by research, innovation and entrepreneurship. It needs, state support, in the form, of hand holding, through financial support. The support in the form of financial incentives (proposed in the BT policy & available through other state policy), venture finance (as per the state commitment), Technology facilitation Cell, project preparation, BT Business guidance has been provisioned.

7.1 Gujarat Biotechnology Venture Fund

To promote the development of cutting edge research and technology and its conversion into innovative business opportunity, the state Government has created Gujarat Biotechnology venture fund with proposed corpus of Rs. 50 crores, with GVFL as trustee manager of the Gujarat Biotechnology venture fund. State Government has commitment to contribute Rs 10 crores as initial corpus for the same from the funds available at DST, GoG, for Biotechnology.

Up till, 2008, GVFL had received 8-9 projects with request for venture financing. After due diligence, GVFL has approved following projects.

Sr.No.	Name of company	Amount released (Rs. in lacs)
1.	Celestial Biologicals Limited	Rs. 200.00 lacs
2.	Century pharmaceuticals Limited	Rs. 250.0 lacs
3.	Amrita Therapeutics Private Limited	Rs. 200.0 lacs
4.	Aura herbal Wear Limited	Rs. 240.00 lacs
	Total	Rs. 890.00 lacs

GSBTM has been playing a pro-active role and directing the needy and interested Biotech entrepreneurs to GVFL. It is to be submitted that high degree of interest has been generated in biotech entrepreneurship. Around 12 proposals, seeking financial support to the tune of Rs. 40-50 crores, have been received by GVFL and are under scrutiny. Efforts have been undertaken to increase the corpus size of venture fund. Under Industrial Policy, 2009, during the current financial year, Industries Commissioner has provided Rs. 10.0 crores for Biotech venture funds.

7.2 Gujarat Savli Biotech Park

The State Government is developing a state of art Biotech Park at Savli, Vadodara to promote biotech business and biotech industry. This biotech park is being developed under Public Private Partnership over about 700 acres of land within Savli GIDC industrial estate. The Phase-I inclusive of 90 acre of land has been developed to provide facilities related to international roads, water, electricity, storm water drain, etc by GIDC. While, Phase-II and Phase-III are being developed on Public Private Partnership mode and Public Partner has been selected following International Competitive Bidding procedure. A Joint Venture [JV] company has been formed to act as Special Purpose Vehicle [SPV] with Government participation of 11%. Land amounting to about 123 acres has been transferred to the SPV. The Biotech Park at Savli, Vadodara aims to provide state art infrastructure facilities fundamental to Biotech research, incubation and business.

To date, an investment to the tune of Rs 300 to 400 crore has been committed by various biotech companies in next 3 to 4 years.

This office had conducted Rapid Environment Impact Assessment [REIA], has undertaken Environment Public Hearing and has also availed Environment Clearance from MoEF, GoI. This office in concurrence to the interest shown by biotech units has availed, SEZ Notification from MoCI, GoI for a land of about 25 acres in Phase-I. This office had undertaken marketing of the Phase-I of Savli Biotech Park with interest shown by some of the world leading companies and resulting into about 13 companies have been recommended in Phase-I with 3 have received allotment in the non SEZ area, 4 others in non SEZ and 6 others in SEZ area are at different stages of processing and allotment.

A Biotech Incubation Centre along with Common Facility Centre, and Human Resource Training units; as committed by the state government has already been discussed by a technical committee along with architectural design and has received approval for the state government.

This centre shall provide the much needed biotech facilities for the tenants and shall also act as marketing tool for Phase-II and Phase-III. Hence, a world class biotech incubator and common facilities centre is being envisaged on BOOT basis.

7.3 Marine Biotechnology Park

GSBTM had received an in-principal approval for developing a Marine Biotech Park in Jamnagar, from Government of Gujarat. GSBTM intends to develop the said Park in collaboration with Gujarat Industrial Development Corporation. Over discussions with GIDC it was decided to conduct Feasibility cum Due Diligence Study for the Park, before the Government initiates into such a massive infrastructure Project. Bidding was conducted to select a Consultant to carry out the feasibility study. Mott Mac Donald Pvt. Ltd., Ahmedabad was selected after completing the bidding procedure and recruited for the study.

7.4 Network of Biotech Entrepreneurship Development Cells [N-BT-EDC]

The globe is witnessing a paradigm shift in the economic scenario and the challenge before the nation is to harness the maximum out of the increased business interests in the East. So also, the success of the tool of biotechnology and its consequent socio-economic upliftment of masses would depend upon successful entrepreneurship initiatives that would start in this field. Thus, though the need of entrepreneurial ventures in this knowledge-driven field of 'Biotechnology' (also described as the 'Technology of hope') is more than established; the concern is over the observation that the .

In such situations, structured, strategic & comprehensive efforts are being made by various Government agencies towards developing entrepreneurs in the field of Biotechnology and that the values/tenets of technopreneurship be imbibed in the budding biotechnologists. Gujarat State Biotechnology Mission [GSBTM], having strategized vide the Biotechnology Development Strategy; has also initiated an Entrepreneurship Development Regime over a few years now.

PHILOSOPHY OF THE CONCEPT

Taking cues from previous activities in this respect by this office and the responses had; with an objective to imbibe the tenets of technopreneurship in the young, budding biotechnologists a Network of couple of Entrepreneurship Development Cells in Biotechnology [BT-EDC] in different regions of the state are being developed. Each cell shall act as a regional centre catering to the needs of the fraternity, at large. Each cell may begin as an awareness generation centre, but with a vision of emerging into a 'Biotech Business Incubator' in future.

MODUS OPERANDI

A couple of centres are being identified through-out the state, to develop Entrepreneurship Development Cell in Biotechnology [BT-EDC] with a mandate of creation of awareness through regular lectures, workshops, guest lectures, demonstrations, discussions, forums, exhibitions, open-house, assignments, etc as per the advice of an Advisory Board on the basis of the blue-print developed by GSBTM. This advisory board may include professionals & entrepreneurs of relevance, be chaired by member from this office and operated by a Senior Faculty of the identified Centre acting as the Coordinator of the BT-EDC, who will be undertake the overall supervision, implementation & coordination of BT-EDC.

ROLE OF THE STATE GOVERNMENT

GSBTM aims to support this initiative through limited funding, mentoring – especially through the Advisory Board to be formed for each cell; networking & resource sharing.

ROLE OF THE PARTNERING ORGANIZATION

The Partnering organization shall form a cell – Biotech-Entrepreneurship Development Cell [BT-EDC] that shall act as a Regional centre dedicated for entrepreneurship development activities in the field of biotechnology (as the umbrella science). Each cell would be needed to undertake various activities with discrete but strategic steps with a higher vision. The ambit of activities will include periodic lectures, workshops, guest lectures, demonstrations, discussions, forums, exhibitions, open-house, assignments, etc as per the advice of an Advisory Board. These activities will be gradually taken up depending on the response & interest. Each of these cells should have infrastructure inclusive of Seminar Hall, LCD projector, etc. in the initial phase and Loaded Wet Laboratory, etc. in the next phase.

University Departments or Colleges engaged in teaching of Biotechnology or allied subjects shall partner to form a BT-EDC. The selection of the partner shall depend on the facilities offered, infrastructure existing & offered & experience of similar activities, if undertaken in past.

Expression of Interest from the biotech colleges of Gujarat have been received, and is under processing.

8.0 Representing Gujarat at National Biotech Forums

With an aim to create awareness related to biotechnology related aspects, Sensitize the general public and key players in this sector, the GSBTM has aimed at conducting various programs. Main being, event participation, Participation in International Conferences and Exhibitions, Participation in National Conferences and exhibitions, Conduction of national Exhibition, Conference, Development of Resource , Conduction of Popular lecture series, Conduction of state level seminars, Awareness generation, Dissemination of Information, documentation and preparation of awareness material & literature,.

With an aim to create awareness related to biotechnology related aspects, sensitize the general public and key players in this sector, the GSBTM has aimed at conducting the following programs:

8.1 Bangalore Bio-2009

GSBTM represented Gujarat at Bangalore Bio 2009, an annually organized International event and Asia's largest gathering of Biotechnology Professionals. GSBTM was the co-sponsor of the event, CEO CONCLAVE. CEO Conclave is an exclusive gathering of Biotech community (CEOs, R&D Heads, VCs, FI Heads, Policy Makers. The vision talk by an eminent personality is followed by networking dinner. It is a platform to mingle with the best of the people in the various sections and clusters of biotechnology, from all over the nation and the globe. ACTIVITIES UNDERTAKEN GSBTM being a co-sponsor of this event made a presentation about Gujarat as a land of biotech opportunities, to this august gathering. The talk was presided over by eminent industrialists like, Dr. Kiran Mazumdar Shaw, CMD Biocon Ltd., Mr. Ashok Kumar C Manoli, Principal Secretary for IT&BT and Science & Technology, Govt. of Karnataka, Mr. Srikumar Suryanarayanan, Direct General, ABLE, Mr. N Suresh, Editor, Biospectrum, Mr. K K Narayanan, MD, Metahelix, Dr. Samir K Brahmachari, Director General, CSIR. During this event GSBTM could communicate with around 50,000 biotech professionals, researches, entrepreneurs, discussing about the Biotechnology opportunities in Gujarat. BIO GUJARAT Brochures were also distributed with GSBTM-GOG Brochures and Takeaways during the event, to give the wide coverage.



9.0 New Initiatives

9.1 LeoGEN project

Gujarat possesses rich wildlife. While in situ efforts are under way, the extraneous factors, causing habitat loss, habitat fragmentation, disease, population dynamics, need modern technological interventions. The main consideration are the rare and endangered species like Lion, Wild Ass, keeping the above aspects in consideration, it is visualized to have gene / tissue / DNA bank facilities for endangered species. For addressing the issues of (i) Ensuring conservation at tissue / DNA / genetic level, (ii) Ensuring the availability of wild genetic base, (iii) Augmenting the breeding of wild population, GSBTM has conceptualized the establishment of wildlife DNA / gene / tissue banking facilities. GSBTM has developed the entire concept and project and submitted it to Wildlife wing of Forest department. The concept was approved by High power committee of the state. The same was presented and approved by the state wild life Advisory Board, headed by H'ble chief Minister of Gujarat. Department of Forest & Environment has approved the projects for establishing Centre of DNA banking and Institute of Wildlife genomics at Shakkarbaug, Junagadh, with project cost of Rs.22.67 crores. It has appointed GSBTM as technical consultants for the entire project. GSBTM has also submitted the draft tender document for selection of Project management consultants, equipment and consumables, to above agency for further action. The work is likely to start in the 2010-11.

9.2 BioACorn (Biotechnology Awareness Corner)

Biotechnology popularization and awareness generation is one of the important activities amongst six different pillars of the activities of the Mission. It is important to spread the message and bring awareness in the community about the latest developments in the field of Biotechnology. In the similar line while all the different approaches are being addressed to ensure various other aspects of awareness generation and information dissemination among the stakeholders; school children and community also needs to know the importance of biotechnology in the welfare of humanity. To address the same this office has conceptualized the project BioACorn - Biotechnology Awareness Corner with following objectives:

- o To inculcate & nurture aptitude of biotechnology among the people.
- o To generate scope for activity based learning.
- o To develop kits/teaching aids for their use in school science teaching and to improve the knowledge of school biotechnology education.
- o To provide training and extend facilities for creative work to approachable schools.
- o To educate the community as a whole in the various areas of biotechnology, it's application, tools and technology, carrier opportunities etc.
- o To provide career guidance to the people in the areas of biotechnology.

Department of Science and Technology, Government of Gujarat through Gujarat Council of Science and Technology is already running Community science center in the 19 districts of the state with the motive of popularization and awareness of science as a whole. Project BioACorn initially will take advantage of the networks of these community science centers for spreading the awareness of biotechnology and related tasks. In the similar line GSBTM through GUJCOST is developing C. C. Patel community science center, Vallabh Vidyanagar as a model center and aims to develop the rest of the centers in the parallel fashion by this year.



9.3 Biosafety And Bioethics Online Course

Biosafety of various biotech products and biopharmaceuticals have been point of discussion at various forums. Biosafety issues have been treated as most crucial in the evolution of biotech products. Various sets of guidelines are available for final arrival of the biotech products in the market. However, a training program giving and insight into the complete set of the Indian and international guidelines is not available, to the best of the knowledge of the undersigned. Although guideline implementing and auditing authorities are existing at national and state level, lack of trained and aware manpower has always been felt. However, these authorities have also not taken any major initiative to mass train manpower. The state lacks manpower formally trained in handling different kinds of biosafety issues for the biotechnology products. Hence, a need

is felt for developing human capital in the specific field. For the same a Biosafety & Bioethics Online Course has been conceptualized by the undersigned. The entire course-work as well as the examination would be conducted online. The course would be designed online, using ASP.NET. The examination certificate would also be generated online, automatically. A flow-chart, describing the tentative operation of the course is given below, although changes would be made for effective implementation as and when required and as suggested by the consultant engaged for developing the portal.

BIOSAFETY ONLINE COURSE



INFORMATION ABOUT THE BIOSAFETY ONLINE COURSE

- In this page all information about the course, what are the benefits of the course.

➤ **Course Details**



WHO IS ELIGIBLE TO JOIN & HOW?

- **Admission** **Fee structure** **Examination** **Results**

• **Admission**

- On this tab we put Eligibility criteria & Admission Process
- Admission Process: Student will send C.V., D.D of Rs.2000/- & True copy of all the Certificates (Hard Copy) to us.
- Scrutiny by GSBTM.
- If eligible, we can give login & password to the student through email. NOTE: The password will not be changed by that student.
- Password locked.(Saved in Excel/SQL) .
- Once student logs in, uploading study material for the registered student.

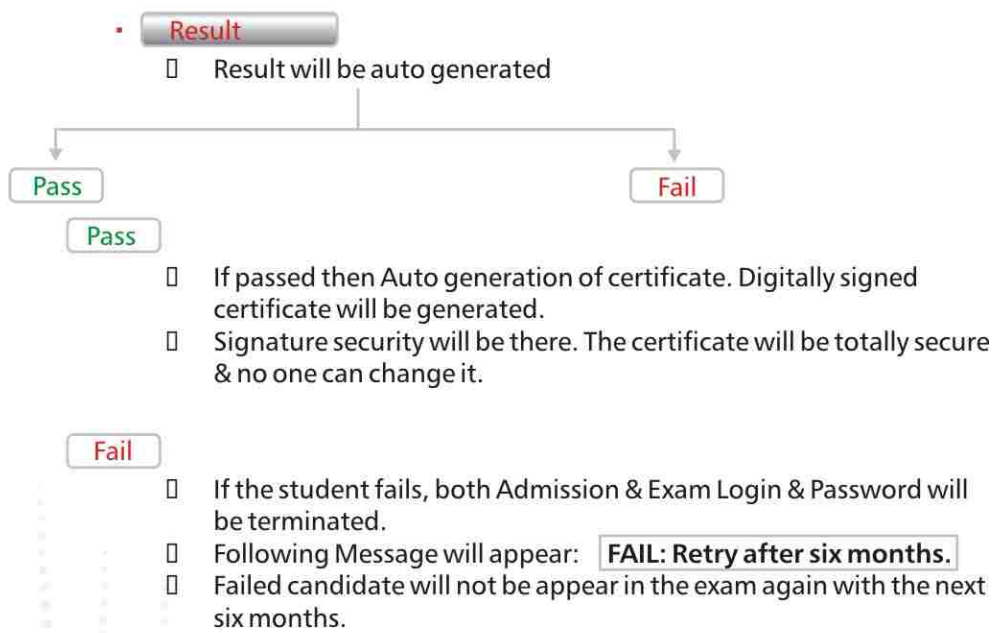
Upload material

• **Fee structure**

- On this tab we put the details of fees of the course.
- Course Material fees + Admission fees = 2000/-
- Exam fees = 800/-
- Total fees = 2800/-

• **Examination**

- On this tab we put the Examination Form with interaction.
- Rs. 800/- exam fees will send through D.D.
- Received by GSBTM.
- Scrutiny by GSBTM.
- Approval
- For exam we will send new login & Password by email & it will also not be changeable & will be saved in Excel/SQL.
- Once student logs in for exam, question paper would be auto-generated.
- Only short questions without option would be included in the question paper.
- Question paper would contain 50 questions of 2 marks each. Total 100 marks
- exam & duration 50 minutes.
- After 50 minutes the question paper will automatically close down.
- **Submit** : If the student finishes the exam before 50 minutes, then student can submit the answer sheet with the help of the submit tab.



The portal and the study material for the portal are under preparation. GSBTM is training one of its techno-administrative assistant through the work of the portal, for future operations and maintenance of the portal and conduction of examinations.

10.0 Upcoming Initiatives

10.1 Developing Biotechnology Incubator in Universities

To encourage application based research, provide facilities for proof of concept stage, hand holding support for technology incubation, facilitate skill developments, in universities, GSBTM has developed the concept of establishing Biotechnology incubators in universities in the state.

The program visualizes separate and dedicated facilities, earmarked for research or technology incubation. The program concept includes, (i) Developing dedicated and separate Biotechnology incubation centre in universities. Interested researchers, student, faculty or entrepreneur can use the facilities for incubating his idea, research or project. (ii) The facility will only support application based research and not basic research. The existing scientific infrastructure will also be utilized on availability basis. (iii) The technical expertise available from the faculty and researchers will also be mobilized to provide technical guidance to the incubatee. The facility will not be used for undertaking regular academic programs, however, dedicated instrumentation based training or special skills development program can be taken.

The program provisions support in terms of equipment / instruments, building infrastructure support or renovation support, administrative and operational cost for five years and requires University commitment to maintain, run and operate the incubator, through its own resources, after the completion of 5 years period. The project component includes Building infrastructure, Equipments, Consumables, Manpower while the activities include, providing different type of laboratory facilities, key equipments, ready to occupy laboratory, for validation, proof of concept scaling up, technical guidance etc.

The concept covers key aspects of nature of support, modalities of operation, institutional mechanism, role and responsibilities of participating organizations, physical and financial phasing. The estimated project cost is Rs.15.0 crores. The project has been submitted to government for consideration, discussion and approval.

10.2 Establishing Biotechnology Industrial training centre at Savli, Vadodra

It is important to impart basic technical skills to students, researchers, faculty in universities by providing strategic and needed interventions. While long term measures needs dedicated approach for policy, institutional, infrastructural and curriculum based interventions, short term measures are required. To address the skill gaps in biotechnology and provide the sector with good manpower, GSBTM has visualized a dedicated Biotechnology industrial training centre which can provide range of practical skills in terms of techniques, instruments, patents, regulations, etc. It will act as finishing school which will generate industry needed skilled manpower. It aims to provide intensive skill development on the aspects that are wanting in university system and which are required for the sector.

The proposed facility will provide (i) value added skill development program in Biotechnology, (ii) provide training on missing gaps of academic curricula in biotechnology, (iii) hands on training on specific key instruments, technologies and processes in Biotechnology.

The project developed covers key aspects of course modules, target groups, subject areas, facilities, shortlisted locations, participating organization, institutional mechanism, modalities of operation, roles & responsibilities, physical & financial phasing, sustainability etc.

The project provisions support in terms of building renovation, instruments and equipment, project based manpower, consumables, administrative and operational cost for five years. The business model provisions revenues generation through the training fees, research projects, services offered, rentals and its plough back in the project.

The concept covers key aspects of nature of support, modalities of operation, institutional mechanism, role and responsibilities of participating organizations, physical and financial phasing. The estimated project cost is Rs.12.0 crores for five years. The expected project outcomes are, Value addition in biotech academia of Gujarat, developing better trained technical and better employable manpower, for biotechnology industries and sector. The project has been submitted to government for consideration, discussion and approval.

10.3 Developing Central GM Testing Facilities in Collaboration with State Agriculture Department / Universities

Gujarat has clear competitive advantage both in production and productivity in various crops. The conventional breeding, have issues of productivity, low resistance etc. Modern biotechnology techniques, like Genetic modification provide an option to overcome this hurdle and have been adopted widely. All over the world work is being done on more than 25-30 crops against nearly 14-15 traits. Gujarat too has successful

experience of Bt Cotton. Around 11 new transgenic crops are under field trials, which includes Brinjal, Cabbage, Cauliflower, Groundnut etc. in various organizations like IARI, ICRIASAT, Mahyco.

GM foods / crops have bio-safety issues (prescribed bio-safety trials) need to pass through strict prescribed regulatory mechanism which permits the release of crop, Hence critical aspect to large scale adoption of GM crop is, bio-safety issues and regulatory mechanisms.

To enable the state to capitalize the advantages offered by application of biotechnology in Agriculture, GSBTM has developed the concept of establishing GM testing facilities in collaboration with Agriculture department and state agri universities. It includes developing network of bio-safety testing facilities for GM crops in Gujarat and facilitating the designing, conduction and monitoring of bio-safety trials of GM crops, in accordance with Bio-safety norms and guidelines of MOEF, GoI.

The project component includes Building infrastructure, Equipments, Consumables, Manpower while the activities include, providing different type of testing facilities, technical guidance, in trial conduction, monitoring, data collection, skill development Bio-safety process and procedures.

The concept covers key aspects of nature of support, modalities of operation, institutional mechanism, role and responsibilities of participating organizations, physical and financial phasing. The estimated project cost is Rs.20.0 crores for main and satellite centers. The project has been submitted to government for consideration, discussion and approval.

11.0 Ongoing Projects

11.1 Marine Bioresource Centre

The Director for Marine Bioresource Centre, Dr. Usha Goswami, Retd. Scientist, NIO, Goa was appointed in July 2009. She joined the centre in August, 2009. The centre started in two lab spaces of 600 sq. ft. each, summing upto approximately 1200 sq. ft. area. The centre had its first Project Implementation and Monitoring Committee (PIMC) Meeting in September, 2009, under the chairmanship of Vice Chancellor, Gujarat Ayurved University. The powers of the Director and the other relevant issues were discussed in the meeting. Post the meeting MBRC commenced with the development of the interiors and instrumentation. Currently the office space and the labs have been completely developed and instrumentation is under process. A blue print of the technical work plan has been made and has been discussed in a special meeting of Technical Advisory Committee of GSBTM, in presence of Principal Secretary, Department of Science and Technology, and has been approved. The same would be discussed in the Research Advisory Committee of MBRC for further refinement of the plan.

11.2 The Virtual Institute of Bioinformatics

The Virtual Institute of Bioinformatics [BITVirtual] is a multi-institutional E-Initiative of the State Government affiliated to Saurashtra University for M. Phil. and Ph. D. Programs in Bioinformatics.

BITVirtual – Nodes & Collaborators

- Gujarat State Biotechnology Mission, Gandhinagar
- BioGene, Gujarat Forest Research Institute, Gandhinagar
- Anand Agriculture University, Anand
- Gujarat University, Ahmedabad
- Hemachandracharya North Gujarat University, Patan
- Saurashtra University, Rajkot
- Navsari Agriculture University, Navsari
- Junagadh Agriculture University, Junagadh
- Gujarat Cancer and Research Institute
- APBioNet & Progeniq, Singapore

BITVirtual - Infrastructure Facilities

- High Performance Computing Cluster - SGI Altix 1300
- Work stations for all research students and faculties
- 1 mpbs broadband connectivity for all the nodes
- Web Conferencing Facility
- Progeniq BioBoost™ Lab 3.0
- Progeniq BioBoost™ Cluster Accelerator Add-on
- BITVirtual – IVLE



Conferences Organized by the BITVirtual network are:





1. National Conference on Contemporary Developments at Biotech - Bioinformatics Interface
 Node: BitVirtual Patan Node
 No. of Speakers: 5
 Poster presentations: 17
 Total participants: 151
 UG Students: 15
 PG students: 70
 Research Students: 30
 UG & PG Teachers: 36






The M. Phil. Program Structure is as follows:

Module – I	Basic Bioinformatics
Module – II	Advanced & Applied Bioinformatics
Module-III	Assignments, Seminars and Problem Based Learning
Module IV	Dry & Wet Lab Practicals
Module V	M. Phil. Thesis







The M. Phil. Program Structure is as follows:








Sr. No.	Name of Student	Research Topic	Research Guide
1	 Joshi Chinmayi Kamleshkumar [One Patent Filed]	<i>Comparative studies of ligands acting on CNS disorders</i>	Dr. Snehal Bagatharia Sector Specialist - Agriculture Biotechnology Coordinator – BIT ^{Virtual} Gujarat State Biotechnology Mission
2	 Joshi Toral Nirabhai	<i>Computational Analysis and related Studies of Thyroiditis</i>	
3	 Mehta Charvi Jayeshbhai	<i>Molecular Docking & QSAR studies for Diabetes mellitus.</i>	
4	 Pandya Chirag Udaykumar	<i>Identification of Potential inhibitors of Wnt signaling for Colorectal Cancer</i>	

Sr. No.	Name of Student		Research Topic	Research Guide
5		Solanki Rinal	<i>Prediction & Determination Of Neural Network Of Protein Through Differentially Expressed EST's & Bioinformatics Tools In Induced Lactation Model Of Buffalo.</i>	Prof. C. G. Joshi Nodal Coordinator- AAU Anand Agricultural University
6		Manglani Puja Satishkumar	<i>Genomics & Proteomics Database of Biomining Organisms & it's applications</i>	Prof. Shailesh Dave Nodal Coordinator- GU Head-Department of Microbiology & Biotechnology, Gujarat University
7		Thakkar Gaurang Nareshbhai	<i>Physiology & Metabolic Database of Biomining Organisms & it's application</i>	
8		Mehta Jignasha Kantilal	<i>Library Creation & QSAR study of Heterocyclic Entities for In-Silico Drug Discovery Implication</i>	
9		Patel Bhoomi Tulshibhai	<i>Protein Modeling studies for Antibacterial Drug Targets</i>	Dr. Rajesh Patel Nodal Coordinator- HNGU Department of Biosciences, Hemchandracharya University
10		Patel Nikunj Kumar Bhikhabhai	<i>Pharmacophore Modeling for Antibacterial Drug Discovery</i>	
11		Bhojani Niles h Nagjibhai	<i>Morphological & genetical study in Castor</i>	
12		Hemani Neha Deepakbhai	<i>Comparative Genomic Study on Fungi</i>	Prof. Rajendrakumar R. Shah Nodal Coordinator- NAU Dean, ABM and Prof. & Head, Dept. of Biotechnology, Navsari Agricultural University
13		Naik Dhruti Niti nbabu	<i>In Silico Analysis On Growth Factor Receptor in Targeted Therapy in Cancer</i>	

Sr. No.	Name of Student		Research Topic	Research Guide
14		Rathod Manojkumar Kantilal	<i>Comparative Genomic study on Mycobacterium Tuberculosis using Bioinformatics Tools and Designing Effective Drug against tuberculosis</i>	Prof. Vrinda. S. Thaker Nodal Coordinator- SU Centre for Plant Biotechnology & Genetic Engineering [CPBGE], Saurashtra University
15		Jhala Vibhuti Maheshbhai	<i>PGRs & Receptors Studies: An Insilco Approach</i>	
16		Sheth Bhavisha Prakashbhai	<i>Computational Modeling of Photosynthetic Efficiency in Plants: Exploring Light to Life</i>	

M. Phil. Program – 2009/10 [Research Students Enrolled]

Sr. No.	Name of Student		Research topic	Research Guide
1		Desai shivangi Maheshkumar	<i>Comparative Analysis of some Mitochondrial Genome</i>	Dr. Snehal Bagatharia Sector Specialist - Agriculture Biotechnology Coordinator – BITVirtual Gujarat State Biotechnology Mission
2		Patel Nilam Manubhai	<i>In Silico Analysis of some Plastid Genomes</i>	
3		Patel Priyankakumari Navinchandra	<i>Cross-Genomic Analysis of some Plasmid Genomes</i>	
4		Vaidya Megha Bhaveshkumar	<i>Functional Annotation of Data Generated by Next Generation Sequencer</i>	Prof C. G. Joshi Nodal Coordinator- AAU Anand Agricultural University
5		Patel Vandanabehn Narendrakumar	<i>Genomic Insights into the Metal Resistance Mechanisms of the Biomining Microorganisms</i>	Prof. Shailesh Dave Nodal Coordinator- GU Head-Department of Microbiology & Biotechnology, Gujarat University
6		Bhanu Pratap singh	<i>Database of Geomicrobiology</i>	

Sr. No.	Name of Student		Research topic	Research Guide
7		Mevada Vishal Arvindlal	<i>Integrated Village Information System - Generation for Micro Farm Planning with Bioinformatics Approach</i>	Dr. Rajesh Patel Nodal Coordinator- HNGU Department of Biosciences, Hemchandracharya University
8		Parekh Brijal Dineshkumar	<i>Bioinformatics Based Abiotic Factor – Database Development with Decision Support System For Improved Crop Production in Village Agro-Ecosystem</i>	
9		Kothari Vishal Vallabhbbhai	<i>Bioinformatics Driven Biotic Factors- Management for Sustainable Agro-Ecosystem Development</i>	
10		Faldu Harikrishna Gopalbhai	<i>Morphological and Molecular Characterization of Sessame</i>	Prof. V. P. Chovatia Nodal Coordinator- JAU Professor & Head, Department of Agricultural Botany, Junagadh Agriculture University
11		Chaudhari Bhaktiben Gajanand	<i>Database of Vegetable Crop Diseases in India</i>	Prof. Rajendrakumar R. Shah Nodal Coordinator- NAU Dean, ABM and Prof. & Head, Dept. of Biotechnology, Navsari Agricultural University
12		Chavada Nikul Kumar	<i>Focus on Insect Resistant BT Cotton through Bioinformatics Tools</i>	
13		Tejas Oza	<i>In Silico Studies on Skin Disorders</i>	Prof. Vrinda. S. Thaker Nodal Coordinator- SU Centre for Plant Biotechnology & Genetic Engineering [CPBGE], Saurashtra University

11.3 Gujarat Genomics Initiative (GGI)

Gujarat Genomics Initiative is a multi-unit, multi-disciplinary, multi-institutional initiative with participating faculty, students, scientists and biotechnology industries. Activity focus is on genomics and molecular biotechnology operations including specialized research laboratories, training activities, infrastructure and equipment for the biotechnology community of Gujarat. This initiative aims to help in creating a top level genomics culture in Gujarat and generating new economic opportunities in the field of high-end biotechnology. It also aims at helping in building-up genomics infrastructure which will enable Gujarat in achieving international competency and standards. This initiative aims to develop the large-scale consortia of academia, institutes and biotechnology industries with a highly diverse network of professionals.

GGI Mandates

1. Molecular Biology Research to address Gujarat specific problems and issues in various biotechnology areas across various biological systems
2. Molecular Biology Services to industry and academia at nominal rate
3. Industry Academia Collaborations for developing better protocols, processes and solutions
4. Intuitional Research Collaborations for capacity building in the area of molecular biology
5. Molecular Biology Training to students, teachers, scientist from industries and academia
6. Extension and Outreach

INFRASTRUCTURE

1. Fully equipped labs
2. Dedicated lab for DNA sequencing
3. Equipments from world class manufacturers for comprehensive molecular biology research
4. Internally optimized protocols, and innovative automations together with stringent quality assurance and quality control



GGI Activities

1. At present GGI is collecting rhizosphere soil from semiarid region and the microbes are isolated and purified for species level identification. Identified species are then submitted to the gene bank. Till date 58 different microbes have been identified and their sequences submitted to the gene bank.
2. Molecular Marker development of Mango is initiated.

GGI: Spectrum of Services

GSBTM has formulated Gujarat Genomics Initiative for the high end genomics research in the state of Gujarat. Visualizing the unavailability of these infrastructure and strengths in most of the academics and research institutes, molecular biology services was also kept as a mandate of GGI. GGI offers the following

services in the field of molecular biology at very nominal rates and high accuracy within a short period of time:

- DNA Sequencing
- Bacterial Identification
- Fungal Identification
- AFLP
- RAPD & ISSR markers
- SNP Detection and Genotyping
- Gene Expression
- DNA Mutagenesis
- DNA Based QC, QA services
- Training
- Research Assignments on turnkey basis
- Need based custom services and turnkey projects

Clients of GGI:

We have offered services to many universities and pharma companies as described below:

1. Companies

- a. **Concord Biotech:-** Bacterial, fungal identification services, mutation detections, DNA based QC/QA services for USFDA filings
- b. **Sandoz Pharma, Mumbai:-** bacterial identification services for clean room air samples
- c. **ACG Associated Capsules:-** Bacterial identification services
- d. **Organica Biotech, Mumbai:** Bacterial identification services

2. Academic Institutions

- a. **Gujarat University:-** Identification and bioinformatics analysis of the research cultures.
- b. **Kadi Sarva Vishwavidhyalay:-** Identification and bioinformatics analysis of the research cultures.
- c. **Bhavnagar University:** Identification and bioinformatics analysis of the research cultures.
- d. **Sardar Patel University (Bioscience Dept):-** Gene Expression studies using RT-PCR.

3. Research Institutions

- a. **Xavier's Research Foundation:** - Identification and bioinformatics analysis of the research cultures.
- b. **Central Horticulture Research institute (C.I.A.H):** Molecular Characterization of Tomato Mutants using RAPD and ISSR markers.
- c. **Ila Devi Cattract Research Institute:** Identification and bioinformatics analysis of the research cultures.

Workshops:

16s rDNA Sequencing workshop was conducted for three days on 24, 25, 26th Feb.2010. Hands on training was given to the individuals in bacterial identification through molecular biology and Bioinformatics techniques.

11.4 Gujarat Biodiversity Gene Bank [BioGene]

The rich heritage of plants, which feeds and sustains humankind, is conserved through seeds, vegetative propagules, tissue culture, embryos, cells, DNA etc. Gujarat Biodiversity Gene Bank plays a vital role in conservation. This bank is primarily intended for the storage of DNA of endangered species and socio-economically important species of Gujarat. Gujarat Biodiversity Gene Bank also conserve Micro organisms. Gujarat Biodiversity Gene Bank is a multi-unit, multi-disciplinary, multi-institutional initiative with participating faculty, students, scientists and biotechnology industries. Activity focus is on Conservation Biotechnology operations including specialized research laboratories, training activities, infrastructure and equipment for the biotechnology community of Gujarat. Gujarat Biodiversity Gene Bank include conservation in terms of Seed banking and DNA Banking.

Objectives of Seed Gene Bank

1. Preservation and characterization of plant genetic resources, mainly species that are related to agriculture and industrial crops and those that are endemic, rare or in danger of extinction.
2. Undertake and promote long term conservation of plant genetic resources employing ex-situ conservation for seeds, in-vitro cultures and cryopreservation techniques and assist in in-situ conservation efforts.
3. Act as the repository of collected material, elite material and endangered material, as also a regional repository of duplication collection as a part of the global system.

4. Monitoring and maintenance of the existing collections, facilitating the organization of regeneration program.
5. Conducting research related to medium and long term conservation of germplasm. Developing and operating a database and information network system on forest genetic resources.
6. Support/assist post graduate education and short/medium term trainings.

Infrastructure

1. Fully equipped labs:
 1. Molecular Biology Laboratory
 2. Cryo-preservation Laboratory
 3. Embryo-Rescue Laboratory
 4. Seed Bank
 5. Bioinformatics and Database Unit
2. Internally optimized protocols, and innovative automations together with stringent quality assurance and quality control



Biogene Activities

1. Plant Collection and Tissue Banking

Till date 443 Plant species are collected from Indroda Nature Park, Gandhinagar. Collection includes 443 accessions representing 106 families, comprising of 134 trees, 95 shrubs, 133 herbs, 52 grasses and 29 climber species. This collection contains eight endangered species (*Stereoculia urens*, *Crataeva nurvala*, *Dolichandrone atrovirens*, *Macaranga peltata*, *Santalum album*, *Vitiveria zizanioides*, *Coccoloba uvifera*, *Cedrela toona*); six vulnerable species (*Commiphora wightii*, *Pandanus fascicularis*, *Dolichandrone falcata*, *Heterophragma adenophyllum*, *Tecomella undulate*, *Dillenia pentagyna*); 45 rare species, 33 least concern species, 102 common and 78 cultivated species. Rests of the 171 species are of wild distribution and their threat is not identified. The total collection of plant diversity represents 30% of Gujarat's Plant Diversity.

Plant Collection from Basan Research Center includes 416 accessions of 416 CPTs representing 20 plant species for DNA banking. These collections contribute to the 20% of the total identified CPTs of Gujarat. GPS data of each plant species is taken to locate the plant on map.

2. Herbarium Collection

Herbarium preparation is being established to correctly refer the collected species from the field collection.

3. Plant DNA Banking and DNA Bar-coding protocols are being established.

4. Microbial Repository- Bank A Bug Program

One of the prime mandates of BioGene is conservation of biodiversity of Gujarat. Microbes being key components of the lives and a magic tool box of potentials; essentially needs no justification for conservation. It is a stepping stone for the conservation of the microbial diversity of Gujarat. BioGene has initiated a program called as Bank a Bug under which it is encouraging deposition of microbes from the Academicians/ researchers/ students of Gujarat in to the microbial

repository of BioGene. The main objectives of this facility are to act as a depository, to supply microbial cultures and to provide related services to the scientists working in research institutions, universities and industries. Its aim is to promote and support the establishment of culture collections and related services, to provide liaison and set up an information network between the collections and their users, to organize workshops and conferences. Microbial repository holds about 300 microbial strains of bacteria and fungi.

For Depositor there are two options available for depositing their cultures:

1. Secured Access: Depositor can deposit the cultures without putting them on public domain. This option is to be taken when strain is having the relevance in IPR or other matters. Such deposition and maintenance of the cultures be charged based.
2. Public Access: Depositor can deposit their cultures in open access and get molecular identification done for their cultures. Also they will share joint authorship in the submissions. Such deposition will be free without involving any financial liabilities on depositor.

BioGene has received culture from many institutes of Gujarat for repository, like:

- 62 Culture are deposited from Prof. Shailesh Dave, Microbiology Dept. Gujarat University.
- 106 cultures are deposited from Prof. Datta Madamwar, BRD School of biosciences, Sardar Patel University.
- Two cultures are deposited from Dr. Amita Shah, Reader, BRD School of biosciences, Sardar patel University.
- Two cultures are deposited by Dr. Trupti Patel, Lecturer, Ashok & Rita Patel Institute of Integrated Study & Research in Biotechnology and Allied Sciences (ARIBAS), Aanand.
- Three cultures are deposited from Dr. Nasreen S. Munshi, Assi. Professor, Nirma University.

11.5 - Shivrath Center Of Excellence In Clinical Research

Clinical trial is at the heart of developing any drug molecule, through any synthesis route. Also Gujarat is developing as a Clinical Research Organization hub, and Asia's largest clinical research organization is housed in Gujarat, i.e. Synchron Pvt. Ltd. Shivrath Center for Excellence is a collaborative endeavor with Synchron, and aims to enhance capability, competency and expertise of the professionals engaged in supervising, conducting and monitoring clinical trials in India and other countries of the world by the way of specialized training programs. Shivrath COE got affiliated to UGC approved Center for Continuing Education of Saurashtra University in June 2009 up to April 2010 for three of its Training Programs i.e., Post Graduate Diploma in Clinical Research (PGDCR), Post Graduate Diploma in Advanced Clinical Research (PGDACR) & Post Graduate Diploma in Clinical Trial Management (PGDCTM).

The admission procedure for the training programs of the centre was initiated from May 2009. The students were screened based on their academic capabilities, their aptitude to carry out research in the concerned field. Further, the students appeared for the written examination for evaluation of their basic general knowledge, grammar and English and were then called for a personal interview. The Full time Post Graduate Diploma in Clinical Research batch (PGDCR) comprised of 17 students and the part time Post Graduate Diploma in Advance Clinical Research batch (PGDACR) and Post Graduate Diploma in Clinical Trial Management (PGDCTM) comprised of total 30 students.

Advisory Committee meeting of Shivrath COE was held on 8th October, 2009 under chairpersonship of Dr. Amish Ghosh (Director, IIR). Twenty four participants of all the three training programs were awarded Convocation Certificates from Mr. A. K. Saxena (MD, GSBTM, Govt. of Gujarat), Dr. Nirav Gandhi (Vice President, Accutest India Pvt Ltd.), Dr. Shivprakash (CEO, Synchron Research Pvt Ltd.) on 26th October, 2009.

Shivrath COE in Clinical Research was the Center for online and offline registration process for the Benchmark 61st Indian Pharmaceutical Congress, which was organized at Nirma University, Ahmedabad, Gujarat. Dr. Bhagirath Patel chaired the Registration Committee for the event. The Congress was attended by more than 20,000 participants and professionals from Pharmacy and related disciplines with nearly 10,000 registrations done from India and outside. Poster Presentations, recognized national and international speakers, pharmaceutical expo, scientific paper presentations were few of the highlights of the Event.

Shivrath COE will soon have one more feather to its cap as center has already applied to Maharaja Sayajirao University, Baroda in the year 2009 for Doctoral Programme in Pharmacy in different sub-disciplines of Clinical Research, Pharmaceutical Analysis, Pharmacology & Toxicology, Pharmacokinetics and Mathematical modeling, Pharmacovigilance, Herbal drug technology and Biosimilars etc. The objective behind this initiative was the lack of

availability of Centers who offer Doctoral degree in the field of Clinical Research with direct affiliations to CROs where participants can pursue their clinical/laboratory work with state of the art infrastructure.

In addition to this, Shivraj COE is soon joining hands with Gujarat University for two year Master Degree program – M.Sc in Clinical Research. The program has been designed keeping in view the stringent regulatory requirements and guidelines of different countries entering into the clinical research market and with an intention to give sound theoretical and much required practical exposure to the medical and para medical graduates and post graduates who wish to make a career in the field.



11.6 - Gujarat Genetic Diagnostics Center

The problem of genetic disorders in Gujarat is enormous. Millions of people are suffering from inherited diseases like thalassemia, muscular dystrophy, diabetes mellitus, coronary heart diseases etc. One-sixth of the world population living in India has never been systematically studied for the prevalence of inherited genetic disorders. Several diseases prevalent in India are yet to be identified and reported. For example, there are families whose female members over four generations do not have fingers and toes and there are families where generation after generation only disabled children are born. These cannot be explained on the basis of our current common knowledge and hence their genetic basis needs to be established. GenDiCe – Genetic Diagnostic Centre, is a GSBTM initiative which will concentrate on addressing the above issues.

The center would not only diagnose genetic disorders using advanced technologies but also identify genetically predisposed population who are at high risk of the congenital diseases. This centre would generate data of the prevalent genetic disorders in the state, as a by-product of its studies, which is totally lacking in the state presently. No such data of this region is available and the study would be first step towards a community based genetic study in Gujarat state. This would not only benefit patients for redesigning their treatment but also will be valuable for the forth coming generations in terms of having vital knowledge about their genetic status for any given disorder and also in managing prophylactic treatment for the same.

Memorandum of Understanding for developing Gujarat Genetic Diagnostic Center was signed and executed from 1st June, 2009. Since then organizational structure of the center has been developed, dedicated land with the building worth Rs 40 lacs is ready for the use, developed by university.

ORGANIZATIONAL MECHANISM

The centre has an advisory committee, headed by MD, GSBTM and having representatives from collaborating agencies /departments and eminent national scientist of the field. The advisory committee would render advice regarding the activities to be undertaken and also encourage use of this facility by their respective organization and departments. The constitution of the committee is as follows:

Sr No	Name	Designation and institute	Designation in committee
1	A. K. Saxena , IFS	Mission Director, GSBTM	Chairperson
2	Dr. Pankaj Shah	Director, GCRI	Health dept. nominee
3	Dr Sher Ali	Scientist, NII, Delhi	Member
4	Dr K. Thangaraj	Scientist, CCMB, Hyderabad	Member
5	Prof Nitai Bhattacharyya	Scientist, SINP, Kolkata	Member
6	Madhvi Joshi	Joint Director, GenDiCe & Sector Specialist, GSBTM	Member
7	Prof M. V. Rao	Director, GenDiCe, & Head, Zoology Department, GU	Member Secretary

Head, zoology department would be the Director for the center. Sector Specialist, Pharma & Healthcare, Ex-officio, will act as joint director.

First advisory committee meeting of Gujarat Genetic Diagnostic Center was organized on 12th January, 2010. All the valuable suggestions discussed during meeting were incorporated in the strategic action plan and of the center. GSBTM has issued 93 lacs out of total 198 lacs as first year financial support to the center. Center has already recruited technical manpower for the center, which is as under:

Sr. No.	Name	Designation
1	Mr. Shivashankar Chettiar	Senior research Fellow
2	Mr. Tapan Patel	Senior research Fellow
3	Mr. Gaurang Sindhav	Junior research Fellow
4	Ms Swati Thakur	Junior research Fellow
5	Ms Yasin Mansuri	Technician cum data entry operator

12.0 BTM In-House

GSBTM had its 4th and 5th Technical Advisory Committee Meeting in 2009-10.

12.1 Fourth Technical Advisory Committee Meeting

The fourth TAC Meeting was conducted on 30th May, 2009, under the chairmanship of Dr. Manju Sharma, Advisor-Biotech, Government of Gujarat. Approvals for the following were taken in the meeting:

- Constitution of Stem Cell Advisory Committee
- Industrial Biotech Training Program
- Development of Network of Gujarat Biotech Capacity Building Cell
- Development of Network of Gujarat Biotech Entrepreneurship Development Cell
- Developing Plan for EPIP Building Usage

TAC also identified the various biotech research areas and themes relevant to Gujarat, during the meeting.

12.2 Fifth Technical Advisory Committee Meeting

The fifth TAC Meeting was conducted on 25th February, 2010, under the chairmanship of Dr. Manju Sharma, Advisor-Biotech, Government of Gujarat. Approvals for the following were taken in the meeting:

- Stem Cell Training Program
- Technology Development Incubators in Universities of Gujarat
- Skill Development Program in Universities

Future roles and actions of GSBTM were discussed in the meeting.

12.3 Executive Committee Meeting

GSBTM had its 11th Executive Committee Meeting on 29th June, '09

12.4 Governing Body Meeting

GSBTM had its 6th Governing Body Meeting on 16th March, '09

13.0 Budget

During the year a total of Rs. 1100 lacs were released to GSBTM.

14.0 Audited Statement of Accounts

Hitendra B. Upadhyay
B. Com., F.C.A.

Dipakkumar V. Gusani
B. Com., F.C.A.

B. UPADHYAY & Co.,
Chartered Accountants

409, 'Abhishek'

Opp. Hotel Haveli

Sector-11,

Gandhinagar -382011.

Ph. : (079) 232-22798 (O)

**REPORT OF AUDITOR RELATING TO ACCOUNTS AUDITED
UNDER SUB - SECTION (2) OF SECTION 34 & RULE 19.**

Registration No: GUJ / 1220, Gandhinagar Dt. 23/11/2004

Name of Public Trust : GUJARAT STATE BIOTECHNOLOGY MISSION
Block No. 11, 9th Floor, Udhog bhavan, Sector No.11, Gandhinagar

We have audited the annex Balance Sheet of the above mentioned trust as at 31st March, 2010 and also the Income & Expenditure accounts for the year ended on the date and report as under :-

- (a) Accounts are maintained regularly and in accordance with the provisions of the Act and Rules.
- (b) Receipts and disbursements are properly and correctly shown in the accounts.
- (c) The cash balance and vouchers in the custody of the manager / Trustee on the date of audit were in agreement with the accounts.
- (d) All Books, deeds accounts, vouchers and other documents or records required by us were produced before us.
- (e) All inventory of movable as certified by the Trustees of the Public Trust has been / has not been produced. ----- N.A. -----
- (f) The Trustee has furnished the necessary information and explanation to our satisfaction as required.
- (g) Property or funds of the trust were not applied for the object or purpose other than the object or purpose of the Trust.
- (h) The outstanding amount for the more than one year is Rs. NIL /-. And amount written off is Rs. NIL /-.
- (i) Tenders were invited / not invited for repairs or construction, involving expenditure exceeding Rs. 5000/- ----- N.A. -----
- (j) Money of the Public Trust has not been invested contrary the provisions of the section 35.
- (k) Sale / Transfer of immovable property of the Trust has not been made U/s. 36 of the Act.

For B. Upadhyay & Co.,
Chartered Accountants

(Signature)
(H.B. Upadhyay)
Partner



Place : Gandhinagar
Date : 15/09/2010

**THE BOMBAY PUBLIC TRUST ACT, 1950
SCHEDULE IXC (VIDE RULE - 32)**

Statement of Income liable to Contribution for the year ending on 31.03.2010

Name of Public Trust : GUJARAT STATE BIOTECHNOLOGY MISSION
Block No. 11, 9th Floor, Udhog Bhavan, Sector No. 11, Gandhinagar
Registration No : GUJ / 1220, Gandhinagar Dt. 23/11/2004

	Amount	Amount
Gross Annual Income		81033479.00
Details of Income not chargeable to Contribution under Section - 58 Rule - 32.		
(i) Donation received during the year from any source		
(ii) Grants by Government and Local Authority	53736000	
(iii) Interest on Sinking or Depreciation Fund		
(iv) Amount spent for the purpose of medical relief		
(v) Deduction out of Income from Land used for Agricultural Purpose :-		0
(a) Land Revenue and Local		
(b) Rent Payable to superior Landlord		
(vi) Deduction out of income from land used for Non - Agricultural Purpose :-		
(a) Assessment, Cesses and other		
(b) Ground Rent payable to other		
(c) Insurance premia		
(d) Repairs at 8-1/3 percent of Gross		
(e) Cost of collection at 4 percent		
(vii) Cost of collection of income or Receipts from securities, stock etc. % of such income.		
(viii) Deduction on account of repairs in respect of buildings not rented and yielding no income at 8 -1/3 percent of the estimated gross annual rent.		
		53736000.00
Income liable to Contribution		27297479.00

Place : Gandhinagar
Date : 15/09/2010



**For B. Upadhyay & Co.,
Chartered Accountants**
(Signature)
**(H.B.Upadhyay)
Partner**

GUJARATI STATE BIOTECHNOLOGY MISSION
Sector : 11, Udhaybhavan, Gandhinagar

BALANCE SHEET AS ON 31.03.2010

Liabilities	Sch	Amount	Assets	Sch	Amount
Differed Grant Income			Fixed Asset		
Opening Bal			Opening Bal	E	33897225.00
ADD :			Add : During the year		4090395.00
Transfer From Grant Dev of BT Exp. - 01	A	3977687.00	Investment	F	359832162.00
For the Current Period Asset Purchase		27131139.00	FDR With GSFS	F	2374000.00
For the Previous Year Asset Purchase		112708.00	FDR with Union Bank of India		362206162.00
Transfer From Grant Guj. BT Mission - 03		6765086.00	Loans & Advances	G	19443663.69
For the Current Period Asset Purchase			Deposits		4500.00
For the Previous Year Asset Purchase			Interest Accrued But not Due	H	4518381.00
Unspent Grants Balances			TDS 2008-09		2799981.00
BT Park Fund A/c			TDS 2009-10		288105.00
Opening Unspent Grant	B	144186580.00	Bank Balances		7606467.00
Add : Interest Earned on FDR During Year		16365494.00	State Bank of India - 30001818240		62636072.66
BT Venture Fund - M.H.5424 M.H.800			State Bank of India - 30613896097		343927.00
S.H.02			Union Bank of India		3602168.00
Opening Unspent Grant		0.00			66582167.66
Add : Grant Received During the Year		5000000.00			
Less : Expenditure incurred during the year	C I	5000000.00			
Grant Research & Dev of BT					
Opening Unspent Grant		65060036.50			
Less : Transfer to Grant Dev of BT - 01		65060036.50			
Grant-3425 60 004 01 Devp. of BT					
Opening Unspent Grant		159528974.15			
Add : Transfer from Grant Research & dev. Of BT Sec.		65060036.50			
Interest Earned on FDR During Year		8222410.00			
Less : Expenditure incurred during the year	C II	24315367.10			
Less : Transfer to Differed Grant		3977687.00			
For the Current Period Asset Purchase		27131139.00			
For the Previous Year Asset Purchase		55424183.10			
		217123227.56			



Liabilities	Sch	Amount	Assets	Sch	Amount
Grant-3425 60 004 03 GSBTM					
Opening Unspent Grant		13520213.00			
Add : Grant Received During the Year		90000000.00			
Less : Expenditure incurred during the year	C III	8853267.00			
Less : Transfer to Differed Grant		112708.00			
For the Current Period Asset Purchase		6756086.00			
For the Previous Year Asset Purchase		15732061.00			
Land Contribution Refundable (Money at BT Park Savli)		6788152.00			
Gujarat Council Of Science City		11400.00			
Security & Earnest Money Deposit		25000.00			
Earnest Money Deposit	D	3637409.00			
Security Deposit - Soni Travels		25000.00			
Security Deposit - Avon Cor. Ltd		3960.00			
Salary Deduction		9460.00			
Duties & Taxes		141256.00			
Retention Money		58497.00			
Income & Expenditure		209213.00			
Other than Inhouse Projects					
Opening Balance		64583347.50			
Add : Excess of Income over Expense		1993427.00			
Inhouse Projects (Educational)		66576774.50			
Opening Balance		104300.00			
Add : Excess of Income over Expense		586450.30			
Total		493830580.35	Total		493830580.35

For B. Upadhyay & Co.,
Chartered Accountants
(H.B. Upadhyay)
Partner
Place : Gandhinagar
Date : 17/09/2010



For Gujarat State Biotechnology Mission
Mission Director
Place : Gandhinagar
Date : 10/09/10



GUJARAT STATE BIOTECHNOLOGY MISSION
Sector : 11, Udhayogbhavan ,Gandhinagar

INCOME & EXPENDITURE ACCOUNT
FOR THE YEAR ENDED ON 31.03.10

Particular	Amount	Particular	Amount
Bank charges	5771.00	Interest Income on TDS A/c	35221.00
		Interest on Bank A/c	1744995.00
		Interest on FDR	5203.00
		Tender Fees	94000.00
		Interest on Advances for project	119779.00
Excess of Income Over Expenditure	1993427.00		
Total	1999198.00	Total	1999198.00

For B. Upadhyay & Co.,
Chartered Accountants



(Signature)
(H.B. Upadhyay)
Partner

Place : Gandhinagar
Date : 1 / 09 / 2010

For Gujarat State Bioitechnology Mission

(Signature)
Mission Director

Place : Gandhinagar
Date : 1 / 09 / 2010



GUJARAT STATE BIOTECHNOLOGY MISSION
Sector : 11, Udhogbhavan , Gandhinagar
INHOUSE PROJECTS (EDUCATIONAL)
INCOME & EXPENDITURE ACCOUNT
FOR THE YEAR ENDED ON 31.03.10

Particular	Amount	Particular	Amount
Advertisement Exps.	19454.00	BT Virtual Project Fees	7000.00
Bit Virtual Programme Exps	28245.00	Fees Income	292450.30
Student Exam fees	39770.00	Exam Fee M.Phil Student	21000.00
Office / Misc. Exps.	2289.00	GGI Training Fee	425148.00
T.A. / D.A. & Honorarium Exps.	50680.00		
Workshop/Seminar/Trag. Exps.	18710.00		
Carried Forward to Next Year	586450.30		
Total	745598.30	Total	745598.30



For B. Upadhyay & Co.,
Chartered Accountants

(H.B. Upadhyay)
Partner

Place : Gandhinagar
Date : 1 / 09 / 2010

For Gujarat State Biootechnology Mission

Mission Director

Place : Gandhinagar
Date : 1 / 09 / 2010



15.0 Team

State Government had sanctioned a staff of 24 for Gujarat State Biotechnology Mission. This includes 6 technical positions and 18 administrative positions. Currently GSBTM has recruited 4 technical staff.



Dr. Snehal Bagatharia
Sector Specialist, Agriculture Biotech



Anand Bhadalkar
Sector Specialist, Industrial Biotech



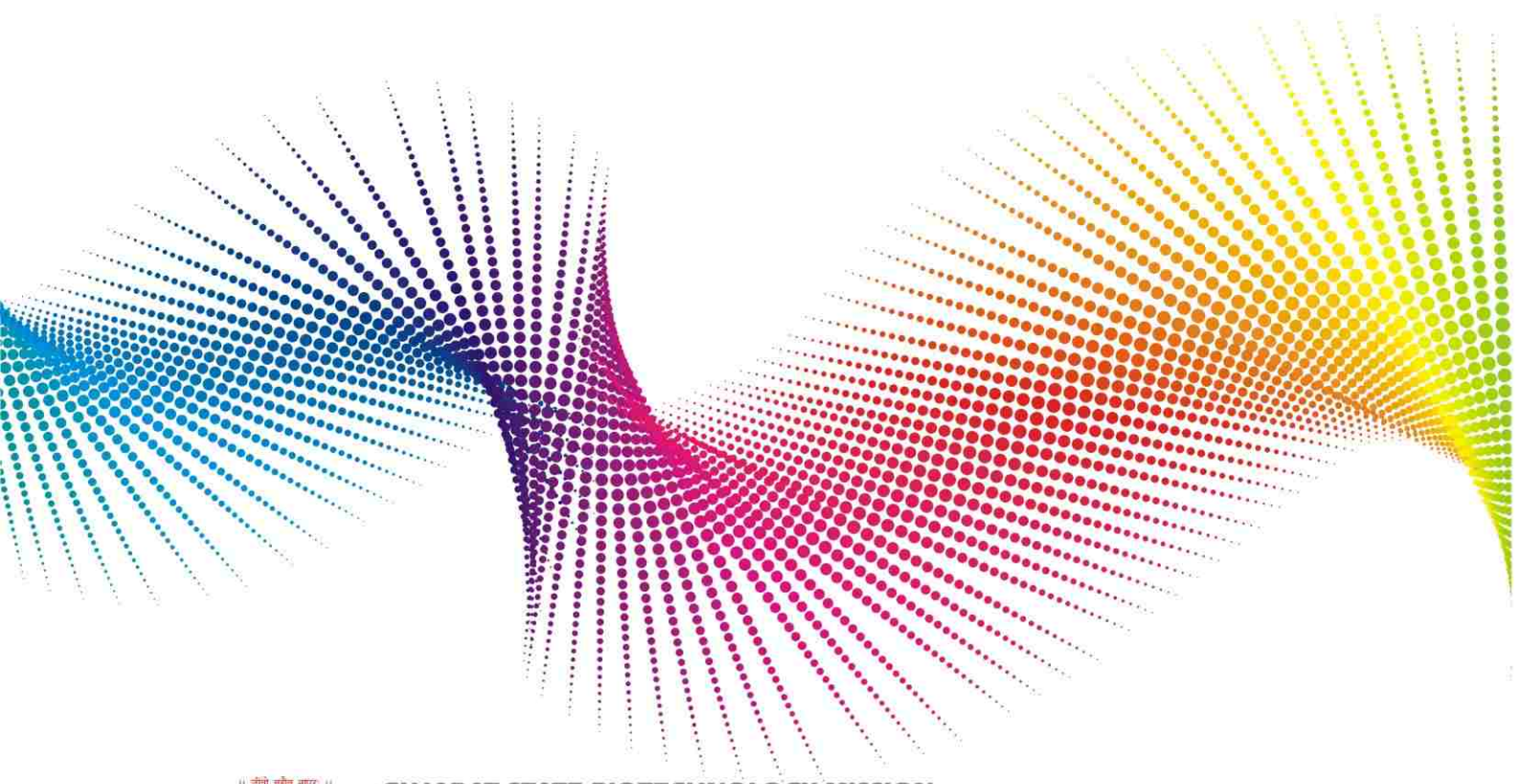
Anasuya Bhadalkar
Sector Specialist, Marine & Environment Biotech



Madhvi Joshi
Sector Specialist, Pharma & Healthcare Biotech



Bhavesh Nayak
Accounts & Administrative Officer



GUJARAT STATE BIOTECHNOLOGY MISSION

Department of Science & Technology, Government of Gujarat
Block 11, 9th Floor, Udyog Bhavan Gandhinagar-382 017, Gujarat

Ph : 079-232 52197
Email: info-btm@gujarat.gov.in

Fax: 079-232 52195
URL: <http://btm.gujarat.gov.in>