



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 2010-11 ►



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



GOVERNMENT OF GUJARAT



**Annual Report
2010-11**



Shri. Narendra Modi
Honorable Chief Minister of Gujarat State &
Chairman of Gujarat Council of Biotechnology



Shri. A. K. Jyoti, I.A.S.
Chief Secretary, Government of Gujarat &
Chairman of Governing Body, GSBTM



Shri. Ravi Saxena, I.A.S.
Addl. Chief Secretary, Department of Science & Technology,
GoG & Chairman of Executive Committee, GSBTM



Shri. Akshay Kumar Saxena, I.F.S.
Mission Director, Gujarat State Biotechnology Mission,
Department of Science & Technology, GoG

INDEX

Foreword	01
Message of The Secretary	02
About GSBTM	03
Organizational Structure	03
Mandate of the Mission	03
Approach and Strategy	03
01 Events of the Year	04
02 Specific Achievement	07
03 Surveys and Reports of the year	10
04 E-Buzz of GSBTM	11
05 R&D Institutional & Infrastructural Strengthening in Gujarat	12
06 Human Resource Development Drive of GSBTM	16
07 Biotechnology Business & Development	32
08 Promotion of Biotechnology Sector in Gujarat	34
09 Representing Gujarat at National Biotech Forums	38
10 New Initiatives	39
11 Upcoming Initiatives	40
12 Ongoing Projects	41
13 Government of India Submission	57
14 BTM In House	57
15 Budget	58
16 Audited Statement of Accounts	59
17 Constitution of GSBTM	65
17.1 Constitution of Gujarat Biotechnology Council	65
17.2 Constitution of Governing Body	66
17.3 Constitution of Executive Committee	67
17.4 Technical Advisory Committee	67
17.5 Team GSBTM	68

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 seventh 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

Shri Ravi B. 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 2010-11, provides a brief account of the activities undertaken during the year. The report is also a reflection of last seven 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 B. Saxena, I.A.S.
Additional Chief Secretary,
Department of Science & Technology,
Government of Gujarat

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 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 2010-11: Investor Summit / Bio-Invest

Government of Gujarat, in conformity with national efforts, has been organizing Vibrant Gujarat: Global Investor Summit every two years, for bringing for the enormous investment potential in Gujarat and to accelerate the rate of FDI and domestic investment in Gujarat and thereby in India.

Biotechnology has been identified as a prospective sector for investment in Gujarat, during Vibrant Gujarat events conducted earlier. The successful summits have given boost and encouragement to the sector. Like the preceding events, Biotechnology is one of the key sectors in the vibrant Gujarat: Global Investor Summit-2011. In conformity with spirit of collaboration and facilitating partnerships, GSBTM has collaborated with ABLE to jointly hold the event Bio-Invest as biotechnology seminar and under the umbrella of Vibrant Gujarat 2011.

This program marks the partnership between two brand events Bio-Invest & Vibrant Gujarat. Bio-Invest is a flagship national event of ABLE & biotechnology. Since last 6 years it has been hosted at Mumbai, financial capital of India. Vibrant Gujarat -Global investor summit, is globally branded event of the state and has been conducted since last 9 years. Both the events focus on investment and business. For the first time this event has been shifted from Mumbai to Ahmedabad. It has been a consequence of mutual efforts that Bio-Invest was brought to and hosted by GSBTM, DST, in Ahmedabad, Gujarat, under the umbrella of vibrant Gujarat-2011. The objective of Bio-Invest was to provide an annual platform to biotech industries, bankers and investors from the country to discuss the issues pertaining to development and growth of biotechnology. The program had key presence of Secretary Department of biotechnology Government of India who spoke on Biotech Vision 2020. MD, reliance Life Science which is into stem cell cord blood, molecular medicines, shared his views on newer Paradigms in Biotech business. Shri Ravi saxena, IAS & ACS DST, govt of Gujarat gave his presentation on status of biotechnology in Gujarat.

The program included 3 panel sessions on "Investment opportunities in Biotech "The excitement, driving Force & the Players", Building a successful Biotech Industry on Innovation and Globalization, Emerging technology: Newer Horizons of Business, Capital Markets and strategizing Biotech Business. There was a dedicated discussion on Gujarat focusing on "Government Initiatives and Investors perspective".

The event had strong and powerful presence of speakers and panel members. The speaker and panel members included 9 experts from capital market, Private equity, venture fund manager, investment bankers, 18 representatives from BT Industries, 4 state representatives and 5 consultants. Venture Intelligence, SBI capital markets, Kotak Private equity, Orbimed Fund Advisors, GVFL, Welcome Trust, Anand Rathi group, Antique Stock broking, Avendus Capital pvt Ltd, Biocon Pvt. Ltd., Advinus Therapeutics Pvt. Ltd., Strand Genomics, Ocimum Bio-sciences, Evolva Biotech, Monsanto Pvt. Ltd., Serum Institute of India, Stemcyte Inc. USA, Metahelix Pvt. Ltd., Medipolis GMP, VEEDA Pvt. Ltd., Concord Biotech, Amrita Therapeutics, SPAN Diagnostics.

The event also launched a short documentary on Biotechnology in Gujarat. The event saw a special message from Dr. Kiran Shaw Mazumdar, CEO Biocon. The event witnessed participation from nearly 100 biotech companies. Around 60 companies were from outside Gujarat, mainly from Mumbai, Pune, Bangalore. Nearly 40 companies from Gujarat also participated.

The key personalities included, Dr. Subramiam, CEO reliance Life Science, Dr. Vijai Chandru, CEO, Strand Genomics, Dr. Rashmi Barbhaiya, MD, Advinus therapeutics, Mrs AnuAcharya, CEO & MD, Ocimum Bio-solutions, Dr SD Ravekkar, Director Serum Institute of India, Dr K.K Narayanan, MD, Metahelix Life Sciences, Dr. Arun Chandawarkar COO Biocon, Mr. Amit Rathi, from Anand Rathi group. P.M Murli evolve Biotech.

The event also included award of best students team for DBT run program of Biotechnology Entrepreneurship Students Team program (BEST). It aims at encouraging young post graduates and doctoral students in developing Biotechnology entrepreneurship and commercialization of Bio-science. 34 participants

representing 6 Teams from IIT Mumbai, ISc Bangalore, IBB Pune, Madurai kamraj University, RGC B Trivendrum, who have been selected from different institutes and states, through nationwide competition and who have been mentored by network linkages, also made their presentation. Prizes were given to the team. Best team was awarded the prizes.



1.2 Bangalore Indian Bio 2010

GSBTM represented Gujarat at Bangalore Bio 2010, 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, Prof. Vijay Chandru, Chairman & CEO, Strand Life Sciences, Dr. Viloo Morawala Patel, Founder, Avesthagen Ltd. Mr. Alan Eisenberg, EVP, Biotechnology Industry Organization. During this event GSBTM could communicate with around 60,000 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.



1.3 Pharma-Bio World Expo-2011

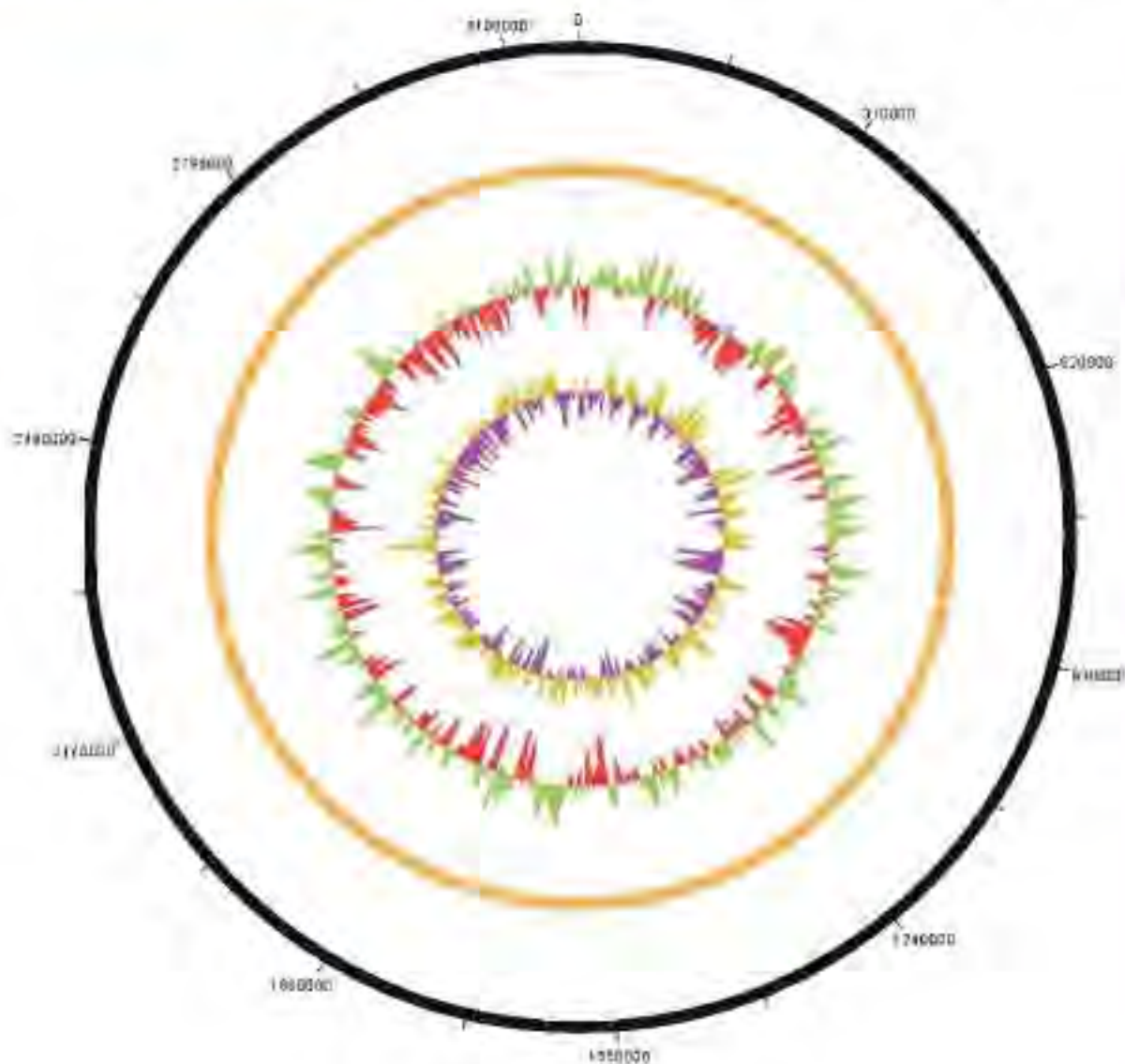
Pharma-Bio-World Expo event is networking event conducted every year by CHEMTECH foundation. This year the event was scheduled from 23-26 Feb, 2011. Request was made to GSBTM to participate in the same in exhibition. H'ble Chief Minister of Gujarat was the chief guest at inaugural program. GSBTM participated in the event as sponsor of Gujarat day & networking reception. An amount of Rs. 3,30,900/- (inclusive of taxes) was provided as sponsorship fees.



2.0 Specific Achievement:

2.1 Whole Genome Sequencing

First Bacterial genome sequenced from India: A Global contribution in the field of Microbial Genomics



Acidithiobacillus sp. GGI-221 Genome

GGI has completed whole genome sequencing of *Acidithiobacillus* sp. GGI-221. *Acidithiobacillus* is an important bacteria studied widely for bioleaching [extraction of metals]. It also offers exceptional opportunities probe life in extremely acidic environments. It may also offer insights into ancient ways of life in Archaean, acidic seas and suggest potential biomarkers to be used when searching for evidence of extra-terrestrial life. This bacterial genome is first bacterial whole genome released by NCBI from Gujarat, India and 4 more genomes are in progress shall be submitted soon from Gujarat by GGI, GSBTM. With this genome release, GGI, GSBTM, Gujarat is also enlisted in the reputed list of international organizations dealing in bacterial whole genome sequencing.

- Life supporting processes – nutrition, respiration, circulation, reproduction, excretion, sensory, in living organisms is powered by complex inter-connected metabolic pathways. All the processes are controlled by Genes. Hereditary information in living organisms is stored in DNA. Analysis of DNA provides information about the life supporting processes, their underlying metabolic pathways and their controlling mechanisms.
- DNA is basically made up of 4 constituent nucleotides –(complex organic molecules), namely Adenosine –A, Thymine-T, Guanine-G, cytosine-C. These four nucleotides, through their 3 billion combinations, form genes -the hereditary units which in turn forms genome in humans.

- The whole set of genes of an organism is called as genome. The process of sequencing and analysis of whole DNA of a cell of the organism is called Whole genome Sequencing.
- In view of its relevance, at Global level, Human Genome project was launched in 1990 in collaboration with US department of Energy, National Institute of Health, US, Wellcome trust of UK and 20 various other organizations across the world. The project was completed in period of 13 years and draft sequence was declared by US President Mr Bill Clinton.
- In human being, 99.5% of DNA is similar while remaining 0.5% is responsible for the dissimilarities amongst the human beings.
- Consequent to declaration of Human Genome sequence, work is going on globally to identify genes responsible for various diseases, disorders, structures and functions.
- Different organism due to their specific need, habitat, habit, have evolved differently and have different structure & function). Hence Genome of different plants species, animal species, micro-organisms, are different. At global level Whole genome sequencing is being done for various different groups.
- National Centre of Biotechnology Information (NCBI), US, is the Global repository where apart from Human being Whole Genome Sequence information of different animal plant and micro-organism is stored.
- Data of more than 2000 bacterial genome is released till September 2010 by National Center for Biotechnology Information.
- NCBI has released 3 Whole Genome Sequence projects from India.
 - **Acidithiobacillus Genome [GGI-221] - First bacterial whole genome release by Gujarat Genomics Initiative, DST, GoG.**
 - Buffalo whole genome by Anand Agricultural University, Anand, Gujarat
 - Plasmid Genome by NFMC, Tamilnadu
- Five Institutions are working on bacterial genomes from India.
 - These institutions are...
 - Gujarat Genomics Initiative
 - National Referral Lab on Mycoplasma, India
 - University of Delhi
 - University of Hyderabad, India
 - University of Madras
- To develop genomics research culture, Gujarat Genomics Initiative, GSBTM has initiated Whole Genome Sequencing of microorganisms
- GSBTM has completed whole genome sequencing of *Acidithiobacillus* sp. GGI-221. *Acidithiobacillus* is an important bacteria studied widely for bioleaching [extraction of metals]. It also offers exceptional opportunities probe life in extremely acidic environments. It may also offer insights into ancient ways of life in Archaean, acidic seas and suggest potential biomarkers to be used when searching for evidence of extra-terrestrial life.
- Gujarat Genomics Initiative, Gujarat Biodiversity Gene Bank and The Virtual Institute of Bioinformatics are the projects of Government of Gujarat which has created a integrated platform for this whole genome sequencing project.
- Bacterial whole genome sequencing project is a multi-institutionally coordinated project where in AAU has contributed it's machine, Gujarat Genomics Initiative provided consumables, data analysis was carried out by The Virtual Institute of Bioinformatics, DFS has provided space and dissertation work was carried out by the students. 3 Million nucleotides were analyzed by The Virtual Institute of Bioinformatics on its high performance computing cluster facilities at data center Gandhinagar.
- Sequencing Data was submitted to National Center for Biotechnology Information, Bethesda, USA. After peer review by international experts this bacterial whole genome sequence was released on 3rd September, 2010 by NCBI. NCBI has submitted this data to European Bioinformatics Institute, Hinxton, Cambridge, UK and DNA Data Bank Mishima, Japan.
- **This bacterial genome is first bacterial whole genome release by NCBI from Gujarat, India and 4 more genomes are in progress shall be submitted soon from Gujarat by GGI, GSBTM.**
- With this genome release, GGI, GSBTM, Gujarat is also enlisted in the reputed list of international organizations dealing in bacterial whole genome sequencing.

GGI-WGSeq Team

GSBTM, DST, GoG Team	Gujarat University Team
Shri. Ravi Saxena, IAS Additional Chief Secretary, DST, GoG	Prof. S. R. Dave M. J. Patel
Shri. Akshaykumar Saxena, IFS Mission Director - GSBTM Chairman - GGI, Biogene, Bit ^{Virtual}	Anand Agriculture University Team
Dr. Snehal Bagatharia Coordinator, GGI, Biogene, Bit ^{Virtual} Sector Specialist – Agri. Biotechnology	Prof. C. G. Joshi Dr. Subhash Jakeshara Dr. Prakash Koringa Manish Sajanani
Madhavi Joshi Assit. Coordinator, GGI, Biogene, Sector Specialist - Pharma & Healthcare	DFS Team: DFS provided space for GGI Laboratories to GSBTM
	Dr. J. M. Vyas, DG, DFS Dr. M. S. Dahiya, DD, DFS

Research Fellowes

GGI Team	BioGene Team	BITVirtual Team
Aanal Pandit, JRF Komal Prajapati, JRF Hiral Shukla, JRF Yama Vyas, PA	Nirali Bavishi, JRF Kalpesh Katudia, JRF Rajendra Bariya, JRF Dhaval Raval, PA Meghna Patel, PA	Zuber Saiyed, SRF Jigar Shah, SRF Ajay Mathasuriya, NA

Dissertation Students

Rachna Trivedi HNGU	Chirag Patel	SPU
Manish Rajgor HNGU	Jimit Patel	SPU
Arpit Patel HNGU	Deep Patel	SPU
Poonam Patel HNGU	Ronak Patel	SPU
Meghavi Patel SPU	Saurabh Singh SPU	
Pratik Thaker SPU	Hinesh Patel	SPU
Purav Bhatt SPU	Anand Patel	SPU
Dhaval Patel SPU		

2.2 In-silico study of anti-cancer property of Conotoxin

An R&D work of Marine Bioinformatics was undertaken and completed successfully. GSBTM had earlier prepared a database of Bioactive Molecules from Marine Organisms. A conch toxin from this database was studied for its anticancer activity. The work has relevance in the field of Drug Discovery.

It is known that potassium channels are important for cell proliferation. HERG, a potassium channel protein, is a transmembrane protein, which increases in concentration on the cell surface of cancer cells. Apart from cancer cells, this protein is found only in the brain & heart tissue, in very low number. The proliferation of cells in cancer is dependent on activation of this protein, and it has been noted that blocking of this protein with drug molecule, helps inhibit the proliferation of the cells further. The study aimed at evaluating the binding potentials of κ -PVIIA, conotoxin isolated from *Conus purpurascens* venom with HERG K⁺ channel of tumor cells, where HERG mutation has been noted. The toxin κ -conotoxins-PVIIA (κ -PVIIA) is a 27 residue peptide. The docking studies suggested that the conotoxin binds stably to the HERG protein. The study shows that the peptide interacts with the charged extracellular units of the HERG protein, i.e. the extracellular portion of the S5 domain named S5-P extracellular linker. Study of binding of toxins of similar origin, with normal potassium channels has been studied in silico. Further, wet laboratory work needs to be conducted for development of a drug molecule from this toxin, to treat some number of cancers.

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 for both is academia, whose focus is seldom oriented towards the industry, thus, leading to an Industry-Academia divide.

A study aiming to analyze the Gaps or the Industry-Academia divide for the Biotech Sector of Gujarat – one of the leading, industrialized states of India was undertaken. 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 might not be 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.

3.2 Database of Marine Biotech Companies, Marine Biotech Education Institutes & Marine Biotech Research Institutes

GSBTM has created a comprehensive database of Marine Biotech Companies, Education Institutes and Research Institutes, spread worldwide. The database of Marine Biotech Companies comprises of 105 companies, of which 6 are Indian Companies and 99 are International Companies. The database of Marine Biotech Research Institutes, includes 20 Indian and 25 International Research Institutes. The database of Marine Educational Institutes includes 10 Indian and 52 International Institutes.

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 Biotechnology Ticker

GSBTM initiated a Biotech e-News alerts system. Important news from the biotech sector is collected from different electronic and other sources, and sent across the GSBTM database of Government offices, industries and academia.

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 GSBTM 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.

5.0 R&D Institutional & Infrastructural Strengthening in Gujarat

5.1 Research Support Provided

On the basis of recommendations of TAC and approval by Governing Body in its meeting dated, March 2009, GSBTM has resumed the program of providing financial support to research projects. 100 proposals received online, were subjected to preliminary scrutiny and 76 projects were shortlisted. These projects were sent for peer review comments to sector specific experts, identified by Technical Advisory committee (TAC). The presentation of the projects was kept on 9 & 10th march, 2011. TAC, on the basis of presentation and peer review comments, has recommended the following projects and same has been approved by 14th Executive Committee.

GSBTM, DST, GoG, Research Project Support - Financial Assistance Program [FAP-2010]								
Sr.No	Investigator	Address	Project Title	Amount Recommended				Amount Requested (Rs.)
				Year I (Rs.)	Year II (Rs.)	Year III (Rs.)	Total (Rs.)	
1	Dr. Jayesh Sheth	Foundation for Research In Genetics & Endocrinology [FRIGE] Institute of Human Genetics, FRIGE House, Opp. Shraddha School Nr. Shubhada Colony, Jodhpur Gam Road, Satellite, Ahmedabad-380 015. Gujarat. INDIA	<i>Effect of Genetic Variants in PPAR gamma 2 and ADR beta 3 in Type II Diabetic Subject of Gujarat in relation to Drug Response (Thiazolidinedione)</i>	819940	599940	0	1419880	1965200
2	Dr. Rukam Singh Tomar	Department of Biotechnology Junagadh Agricultural University Junagadh-362001(Gujarat)	<i>QTL Mapping and development of SCAR marker for Fusarium wilt and Macrophomina root rot in castor.</i>	626960	626960	687680	1941600	2467000
3	Dr. R. V. Devkar	Division of Phytotherapeutics and Metabolic Endocrinology, Department of Zoology, Faculty of Science, The M.S.University of Baroda, Vadodara - 390002	<i>Molecular investigation of experimental atherosclerosis mitigation using herbs</i>	1075980	325980	356340	1758300	1811600
4	Dr. R. S. Fougat	Dept. of Agricultural Biotechnology A Center of Excellence in Biotechnology Anand Agricultural University Anand 388110 GUJARAT	<i>Whole Genome Sequencing of Isabgol (Plantago ovata F)</i>	713840	1203840	0	1917680	1997320
5	Dr. N. K. Jain	Department of Life sciences, School of Sciences, Gujarat University, Ahmedabad-380009.	<i>Interventional Procedure Optimization of Limbal Stem Cell culture and Allograft Transplantation</i>	718480	418480	448840	1585800	1999680
6	Dr. Sanjay M. Dave	Department of Life Sciences Hemchandracharya North Gujarat University PATAN - 384 265	<i>IDENTIFICATION AND CHARACTERIZATION OF ENTERIC BACTERIA IN WILD BIRD SPECIES</i>	464230	379230	213840	1057300	1065540
7	Dr.Linz-Buoy George	DEPARTMENT OF ZOOLOGY AND BIOMEDICAL TECHNOLOGY UNIVESITY SCHOOL OF SCIENCES GUJARAT UNIVERSITY AHMEDABAD - 380009 GUJARAT, INDIA	<i>DUAL In silico PREDICTION AND In vitro ANALYSIS FOR THE EVALUATION OF POTENTIAL ANTIMALARIAL DRUGS</i>	1060480	250480	280840	1591800	1991020
8	Dr. Shalini Rajkumar	Institute of Science, Nirma University, Sarkhej-Gandhinagar Highway, Chandlodia, Ahmedabad, Gujarat- 382481	<i>Diversity and Plant Promotion Abilities of Actinomycetes in the Wheat Rhizosphere in Gujarat region</i>	1344480	418480	0	1762960	1889200

9	Dr. Rajesh Patel	Bit Virtual Patan Node Department of Life Sciences Hem. North Gujarat University, Patan 384265	<i>Saline Desert Metagenomics exploration for commercially valuable enzyme</i>	1213480	0	0	1213480	1230000
10	Dr. Prakash G. Koringa	Department of Animal Genetics & Breeding, Anand Agricultural University, Near NDDB, Anand - 388 001 Gujarat	<i>Transcriptome Profiling of Horn Cancer in Kankrej Bullock</i>	1512560	0	0	1512560	1722000
11	DR ANAND KRISHNA TIWARI	School of Biological Sciences and Biotechnology Indian Institute of Advanced Research Koba, Gandhinagar, 382 007 Gujarat, India Ph: +91-79-30514250 Fax: +91- 79-30514110 Email: aktiwari@iiares.in ; aktbhu@gmail.com	<i>To study the role of ubiquitin proteasome system and molecular chaperon 70 in the progression of Alzheimer's disease using Drosophila melanogaster as a model organism.</i>	638480	0	0	638480	2093240
12	Dr. Rakesh M. Rawal	The Gujarat Cancer & Research Institute New Civil Hospital Campus Asarwa, Ahmedabad-380016	<i>Isolation and characterization of Leukemic stem cells to predict drug response and resistance</i>	708480	613480	0	1321960	1324000
13	Prof. Piyush Desai	Department of Biosciences, Veer Narmad South Gujarat University, Surat	<i>MICROBIAL PRODUCTION OF GIBBERELLINS</i>	394000	104000	87500	585500	928500
14	Amita R. Shah	B. R. D. School of Biosciences Sardar Patel University, Sardar Patel Maidan, Satellite campus, Post box No. 39, Vadtal Road, V.V.Nagar- 388120	<i>Production of beta xylosidase and accessory hemicellulolytic enzymes for effective bioconversion of plant lignocelluloses</i>	1013480	513480	433840	1960800	1986760
15	Prof. R. Begum	The Maharaja Sayajirao University of Baroda Sayajigunj Baroda - 390002. Gujarat.	<i>Identification of potential microRNAs responsible for pathogenesis of generalized Vitiligo</i>	795000	465000	465000	1725000	1971000
16	Dr. Neeta Shrivastava	B. V. Patel Pharmaceutical Education and Research Development (PERD) Centre, Thaltej-Gandhinagar Highway, Thaltej, Ahmedabad- 380054, Gujarat.	<i>Molecular Marker Assisted Authentication and Quality Control of Herbal Raw Material</i>	808480	480980	461340	1750800	2222000
17	Prof. S.R.Dave	Department of Microbiology and Biotechnology, School of Sciences, Gujarat University, Ahmedabad-380009	<i>Biotechnological recovery of metals from selected electronic wastes</i>	1296480	396480	304840	1997800	3928600
18	Prof. Vrinda Thaker	Department of Biosciences, Saurashtra University, Rajkot 360 005 Phone No.: (0281) 2586419 Cell No.: 09427223205 Fax No.: (0281) 2586419 Email : vrindathaker@yahoo.co.in	<i>Molecular marker studies on plant pathogenicity and development of pathogen diagnostic kit for major crops of Gujarat</i>	988480	998480	0	1986960	2136960
19	Dipali Dhawan	B. V. Patel Pharmaceutical Education and Research Development (PERD) Centre, Thaltej-Gandhinagar Highway, Thaltej, Ahmedabad- 380054, Gujarat.	<i>A non-viral vector for inducing pluripotency</i>	529480	523980	0	1053460	1101800

20	Neeraj Jain	Indian Institute of Advanced Research School of Biological Sciences and Biotechnology The Puri Foundation for Education in India, Koba Institutional Area, Koba, Gandhinagar-382007	<i>To study the role of Histidine residue in functioning of Arabidopsis cation/H⁺ Exchanger CAX3</i>	1043480	443480	428840	1915800	2687800
21	Dr. D Srinivasmurthy	Gujarat Vidyapeeth Ashram Road, Navji van Post-Ahmedabad 380014 Gujarat-India	<i>Degradation of Tannery waste and phenolic compounds by a novel anaerobic tannin degrading rumen bacterial isolate in pure culture and in mixed culture</i>	1044840	397340	0	1442180	1482060
22	Prof.G.C.Jadeja	B.A.College of Agriculture, A.A.U., Anand	<i>Identification and molecular characterization of genes for nutritional quality and stress resistance in major cereals of Gujarat state.</i>	891960	536960	570180	1999100	2147000
23	Dr. Mahesh Kumar Mahatma	Dept. Of Biotechnology Navsari Agricultural University Navsari-396450	<i>Identification, Isolation and molecular characterization of RcPCS (Ricinus communis phytochelatase) in Ricinus communis</i>	945580	495580	525940	1967100	1989500
Total				20648650	10192630	5265020	36106300	44137780

5.2 Mentees' Bridge - Research Mentoring Program for Researchers, Faculties & Scientists

Mentees' Bridge Program is designed for biotechnology researchers, faculties and scientists to develop competitive research proposals supporting the initiation of an externally recognized and funded research programs. Mentees' Bridge Program is visualized with an aim to facilitate better research proposal writing, capacity building and relationship building between funding agencies and investigators.

A program was organized at Indian Institute of Advanced Research on 3rd and 4th February, 2011 with the support of GSBTM. The workshop was well attended by the scientific community of Gujarat. There were 33 participants out of which 21 were from government institutes, 8 from private educational institutes and 4 from the industry. Eminent scientists representing all the major funding agencies in the country like DBT, DST, ICMR, BCIL etc were the main speakers. Scientists also shared their personal experience on research proposal writing and sanctioning of grants during the two day session. The conclusions from the workshop are given below



Conclusions of the Workshop on Writing Research Proposals held at IIAR on 3-4, February, 2011
Dr. Manju Sharma, Shri Akshay Saxena and Dr. Kailash Paliwal interacted with the participants. The following conclusions were arrived at:

1. All the participants felt that this workshop provided a very good opportunity to them.
2. This interaction with the IIAR team and GSBTM has to be sustained and continued over a period of time.
3. GSBTM may act a facilitator, mediator and advisor to help the scientists of the state of Gujarat to write and finalise the proposals. In particular information about rules and regulations and policies including biosafety has to be given.
4. It was felt that participants would like to know more about GSBTM methodology. A brief presentation about GSBTM projects and activities was made. It was informed that the website of GSBTM gives the total information.
5. Similar programs can be organized by the universities and other organizations.
6. More public level funding is required.
7. As a result of this workshop at least 30-40 projects in a year from Gujarat are expected.
8. More advertisement should be given so that the number of participants can be increased.
9. It is extremely important to focus while writing grant proposals on the clarity of the objectives mentioning both the short and long term. It is equally important to also focus and bring out clearly the outcome of the project/ deliverables. The clarity of these two issues in a project proposal is very important.
10. There must be more emphasis on interdisciplinary, multi-institutional, large projects with well-defined networking. The role and requirement along with the work plan of each participating institution must be spelt clearly in the proposal. The GSBTM may, therefore, consider these large inter-disciplinary and multi-institutional projects for support so that with the application of the research findings, impact could be clearly felt.
11. There must be clear emphasis now as per the government policy on the private/ public partnership projects. In biotechnology, it is very important to involve the industry at an appropriate time for the development of a new product, process or technology. It will also ensure that outcome of the research can be much better utilized when the industrial partnership is ensured especially in the projects in biomedical research, food biotechnology, environment, agriculture etc.
12. All the participants were informed that there will be continuity and sustainability of interaction between the GSBTM and IIAR and all the participating institutions. At any time, queries can be raised and the same will be answered. Even while writing the proposals, state level research and academic institutions can consult GSBTM / IIAR for expert advice and scientific matters before submitting it to the funding agency.

6.0 Human Resource Development Drive of GSBTM

6.1 Dissertations Supported

GGI has made collaboration with OME Research Facility, Department of Biotechnology, AAU for utilizing Next Generation Sequencing Facility for Whole Genome Sequencing Projects. Under GGI, students can work on Next Generation Sequencing Technology, by paying nominal fees, which will be portion of consumable & operational cost of Next gen equipment. It will also include the 4-5 months guidance through select faculty of university under BiT virtual project.

Following students have worked on Next Generation Technology and on Bioinformatics techniques as a part of their Dissertation:

Students Name	University	Dissertation Topic
Ms. Poonam B. Patel	Hemchandracharya North Gujarat University	Functional analysis and taxonomic classification applying bioinformatics tools on the sequences generated from <i>Bacillus megaterium</i> genome through 454 next generation sequencer
Mr. Manish L. Rajgor	Hemchandracharya North Gujarat University	Gene Finding using bioinformatics tools in the contigs generated from <i>Bacillus megaterium</i> genome through GSFLX system
Mr. Arpit B. Patel	Hemchandracharya North Gujarat University	Repeat analysis in the sequence reads generated with <i>Bacillus megaterium</i> genome through 454 sequencing technology
Ms. Rachana D. Trivedi	Hemchandracharya North Gujarat University	Metabolic analysis and phylogenetic classification applying metagenomic rapid annotation based on subsystem technology on the sequences generated from <i>Bacillus megaterium</i> genome through GS-FLX high throughput sequencer

6.2 Training Regimes of GSBTM

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

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 technology in the state. The first step towards the same is to generate dedicated skilled manpower in area of stem cell research. Visualizing the thirst and need this GSBTM has organized "Skill Development in Stem Cell Techniques: Basic Training in cell culturing" at GCRI and Stem Cure Pvt. Ltd. in two batches from 14th – 19th March, 2011.

Training was conducted on Adult Stem cell Techniques at GCRI and on Basic Stem cell Culturing at Stem Cure from 14th to 19th March, 2011 in two batches (14-16 March and 17-19 March) with 7 Participants in Each Batch. Participants came from various disciplines of medical Sciences e.g. Medicine, Pathology, Microbiology and Hematology. Senior faculties from medical colleges across the state of Gujarat participated in the training.

Following students have worked on Next Generation Technology and on Bioinformatics techniques as a part of their Dissertation:

List of Participants:

Name	Designation	Collage
Dr. Shilpa Jain	Associate Professor, Biochemistry	P.D.U Medical Collage, Rajkot
Dr. S.S. Saiyad	Professor, Anatomy	P.D.U Medical Collage, Rajkot
Dr. A. U. Meheta	Professor, O&G	P.D.U Medical Collage, Rajkot
Dr. Rahul modi	Assistant Professor, Haematology	Government Medical College, Surat
Dr. Jigna Modi	Assistant Professor, Microbiology	Government Medical College, Surat
Dr. Sandeep Nanda	Assistant Professor, pathology	Government Medical College, Surat
Dr. Dhaval Meheta	Assistant Professor, IHBT	MP Shah Medical College, Jamnagar
Dr. Vaishali Anand	Assistant Professor, pathology	Government Medical College, Bhavnagar
Dr. Pragnesh Shah	Associate Professor, pathology	Government Medical College, Bhavnagar
Dr. Mukesh Vora	Assistant Professor, Pharmacology	Government Medical College, Bhavnagar
Dr. Kairavi desai	Associate Professor, Microbiology	Government Medical College, Bhavnagar
Dr. Panna kamdar	Associate Professor, Pharmacology	Government Medical College, Bhavnagar
Dr. Nupur Bhavsar	Assistant Professor, Dentistry	Govt. Dental College And Hospital, Ahmedabad
Dr. Manasi Dhanki	Assistant Professor, Dentistry	Govt. Dental College And Hospital, Ahmedabad

Participants were given At GCRI following area were covered:

Overview of Culture room equipment, environment, monitoring and management of contamination issues in tissue culture labs.

1. Preparation of Medias for Stem cell Culture
2. Processing of umbilical cord Wharton's jelly for Mesenchymal stem cell
3. Isolation of Mono Nuclear Cells from Bone Marrow by density gradient and RBC lysis method
4. Isolation and ex-vivo expansion of CD 34+ + hematopoietic stem cells from bone marrow using immune magnetic cell sorting
5. Flow cytometric enumeration of CD34+ + cell count
6. Isolation of RNA from stem cell
7. Validation by RT-PCR based gene expression of CD34 in purified population

At Stem Cure following area were covered:

1. Various aspects of setting up a Tissue Culture Laboratory
2. Introduction of various Instruments: Laminar air flow, Centrifuge, CO2 Incubator, Inverted Phase Contrast Microscope, Weighing Balance, Liquid nitrogen Tank
3. Aseptic handling
4. Standard Tissue Culture Techniques
5. Media Preparation
6. Culture Maintenance
7. Sub Culture and Passage of cultured cell
8. Freezing of Cells
9. Thawing of Cells
10. Prevention of contamination in Cell Culture

The Training was followed by evaluation of competency level using MCQs related to topics covered in the Training. All the Participants have shown significant improvement in their perception and performance subjectively.



6.2.2 Industrial Biotech Training Program (IBTP)- 2010

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 fresher (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 aims 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. Each student is paid a nominal stipend per month for the duration of the training and also offered travels & incidentals support. Similarly, GSBTM extends nominal financial support to the Industry (towards bearing the charges for chemicals and consumables spent) for the training of each student.

In the FY 2010-11, one round of Industrial Biotech Training Programme [targeting training of students that passed in the AY 2008-09] was concluded successfully, and yet another round of Industrial Biotech Training Programme [targeting training of students that passed in the AY 2009-10] was initiated.

About 12 students in the first round and about 12 students in the second round of IBTP, all fresh graduates of M. Sc. or B.E. (Biotech) from the Biotechnology and related departments of the universities in Gujarat, were selected for the training under the aegis of IBTP. The selection of candidates for the first round was done by a committee on the basis of recommendations from the nominating Heads of Departments at various Post-Graduate Centres of learning – i.e. University Departments as well as PG Colleges. In the second round, an open advertisement was floated and candidates were encouraged to apply. The selection of candidates was done by a committee consisting of members including representatives from the training Industries. The objective of the training is to render the fresher with better employability.



6.2.3 3rd Genetic Diagnostic Training for Medical Fraternity and Young Scientists of Gujarat

Prenatal and pediatric disease diagnostic tools are the fastest growing sections of genetic diagnostics, due to more demand. The other areas of predictive diagnostics are also picking up pace, as of upcoming market of preventive and personalized medicines. The genetic labs may offer advanced tests but, the advancement has not reached the populace desired. Lack of awareness about such tests and high cost of tests are the inhibiting factors. Also, even with an increase in awareness, the State is not adequately equipped with experts in the field of genetic diagnostics, to furnish consciousness for willing people in the State.

Molecular Medico-genetics is a new, emerging discipline of importance that may be defined as the clinical application of nucleic acid technologies to elucidate, diagnose and monitor disease states as well as to evaluate non-disease states in screening, preventive medicine and its application to the growing life extension technologies. Training in the field of diagnosis of genetic disorders using "Cytogenetics and Molecular Genetic Methods" is also being implemented at five centers in the country to train young scientists/clinicians/technologists as a part of National Strategy by Govt. of India. Being multidisciplinary subject with utilization of new coming technologies for the betterment of the society, the growth of Biotechnology is oriented to develop dedicated and skilled human resource in the precedence areas to cope up with upcoming challenges in the world. Development of skilled human resource to ensure that they have the capacity and capability to carry out the activities assigned to them shall be of high relevance in the present scenario.

Looked in to the facts and with a mandate to promote and develop skilled human resource. GSBTM had conceptualized GenDioT - genetic Diagnostics training for Clinicians & Young Scientists of Gujarat with following objectives.

- The program was designed to address HR development in specialized skills of Biotechnology academia and Industry sector of Gujarat.
- Such a initiative would lead to knowledge advancement and proficiency in genetic diagnosis and Human Genetics through education, training and awareness generation
- The training would create a well trained manpower and resources in Gujarat and can accelerate research in the priority areas of R&D such as Human Genetics and genetic diagnosis.
- The training would promote investigation and development of new technologies through research and infrastructure development activities.

Training was organized during 28th February - 12th March, 2011. Zoology Department, Gujarat University & GCRI are training institutes for the same.

List of Participants:

1. Dr. Biren Parikh (Asst. Prof. Pathology, GCRI)
2. Dr. Hitendra Barot (Tutor, Pathology, BJMC)
3. Dr Bhavin Kadiyatar (Tutor, Anatomy, BJMC)
4. Dr K. P. Danger (Asst. Professor, M P Shah Medical College, Jamnagar)
5. Dr Hitesh Chauhan (Tutor, Anatomy, BJMC)
6. Dr Yogesh Umaraniya (Tutor, Anatomy, BJMC)
7. Dr. Urvi Shah (Asst. Prof, Pathology, BJMC)
8. Dr. Pooja Dave (Tutor, Pathology, BJMC)
9. Dr. Kajal Parikh (Tutor, Pathology, BJMC)
10. Hina Prajapati (RA, Gujarat University)



6.3 Student Fertilisation

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 Bardoli, Kadi, Kalol, Navsari, and Nadiad for the academic year 2009-10, 2008-09, 2007-08, 2006-07 and 2005-06 respectively.

In the year 2010-11 – the 22nd State Level Inter-Collegiate Competitions was held on 5th December, 2010, at Tolani College of Arts & Science, Adipur, Kutch.

The different Competitions were:

1. Seminar Presentation Competition for Second Year B. Sc. students [Topic: The most striking experiment to me in biosciences!]
2. Seminar Presentation Competition for Third Year B. Sc. students [Topic: The role of Microbiology in the development of biotechnology]
3. Scientific Article Writing Competition for Third Year B. Sc. students [Topic: Natural gene transfer mechanisms and their role in evolution of Prokaryotes]
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 Third Year B. Sc. Students on the Topic: Challenges in Clinical Microbiology

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
S.Y. SEMINAR	<i>The most striking experiment to me in biosciences!</i>	FIRST	VAIDEHIS. PATEL
		SECOND	SANDHYA g. NANJANI
		THIRD	TARJINI VAIDYA
T.Y. SEMINAR	<i>The role of Microbiology in the development of biotechnology</i>	FIRST	YAGNESH B. BUDDHA
		SECOND	MOHD. ZAHEEN M. CHIKHILIKAR
		THIRD	HEENA M. SATAPARA
T.Y. ARTICLE	<i>Natural gene transfer mechanisms and their role in evolution of Prokaryotes</i>	FIRST	HEENA MEENA
		SECOND	BHAVIKA H. TRIVEDI
		THIRD	DEVANG D. TANDEL
SCIENTOON	<i>Challenges in Clinical Microbiology</i>	FIRST	FAIZA SHAIKH
		SECOND	SNEHA DHOLAKIA
		THIRD	REEMA M. PATEL
EXTEMPORE SPEECH	On Current Topics in Biosciences	FIRST	DIPEEKA B. PATEL
		SECOND	DIPEN R. SATYADEV
		THIRD	DRASHTI B. PARMAR

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

Creation of world class manpower that can stand the competition at regional, nation & international level can prove to be an asset to the nation needs no further emphasis. Most of the premium institutes of Research, Education, and Profession in fields of Biotechnology have stringent norms and/or examination, designed to assess and evaluate the Subject Expertise, Eloquence, Dexterity and the Grit of the student. The students from the state have failed to make an impressive mark at such National Competitive Examinations.

Especially when the nation is looking forward to make the best of the opportunity, when the interest of the west is being focused on Asia-Pacific in general, and India & China in specific; it would be important that the state gears up for the challenges ahead. One of the key drivers in the development of the sector, necessarily is the manpower and it was deemed important to build the capacity of the students of the state, at least to match to the National competencies. Against the history of the state, it was deemed important that the candidates should be successful at National Competitive Examinations and gain entrance to various elite places of learning, as a long-term strategy towards development of sector in the state.

Our earlier learning from various programmes inclusive of the Gujarat Biotech Residential Crash Programme, aimed at building capacities of students, etc was helpful to envisage an institutional framework of Cells for Capacity Building in different regions of the state that 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 Network of 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 hub of 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 and six Cells were identified as BT-CBCs.

GSBTM developed a Blue-print for a Crash Workshop towards the training of the students for National Competitive Examinations and also identified the topics that be deliberated during the training. In the Financial Year 2010-11, two rounds of training – one, for students appearing in the National Competitive Examinations for the Academic Year 2010-11 as well as the other for students appearing in the National Competitive Examinations for the Academic Year 2011-12; were conducted by four of the GSBTM – CAPACITY

BUILDING CELLS, as per the Guidelines/ developed by GSBTM. The details of the four cells along with their Contact details are as follows:

For Students of colleges in the following Districts	GSBTM – BT-CBC	Contact Details of the Coordinator
Kutch, Sabarkantha, Banaskantha, Patan, Mehsana (other than P. S. Science & H. D. Patel Arts College, Kadi)	<u>Sheth Motilal Nyalchand Science College, Patan</u>	Mr. Darshan Marjadi GSBTM – BT-CBC Department of Biotechnology, Sheth M. N. Science College, College Campus, Rajmahal Road, Patan – 384 265 Email: darshworld@yahoo.com Tel.: 02766-220812
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@jaui.n Tel.: 0285-2672080-90-379 Fax: 0285-2670754
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
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

FIRST ROUND OF TRAINING FOR AY 2010-11:

The First Rounds of Training aimed at candidates appearing for the National Competitive Examinations in the Academic Year 2010-11. 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 was collected.

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. 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 first rounds of Crash Programs were conducted in the following four cells during:

- | | |
|---|---|
| 1. N. V. Patel College of Pure and Applied Sciences, Vallabh Vidyanagar | 5 th to 10 th May, 2010 |
| 2. Sheth Motilal Nyalchand Science College, Patan | 4 th to 9 th May, 2010 |
| 3. P. S. Science & H. D. Patel Arts College, Kadi | 3 rd to 8 th May, 2010 |
| 4. College of Agriculture, Junagadh Agriculture University, Junagadh | 3 rd to 8 th May, 2010 |

SECOND ROUNDS OF TRAINING FOR AY 2011-12: The Second Rounds of Training aimed at candidates appearing for the National Competitive Examinations in the Academic Year 2011-12. It was deliberated during various Coordinators' Meetings that bi-phased interventions be apt for the current academic year wherein the candidates can be trained over two crash workshops/training camps.

- one during the Diwali/Winter break and the other during the Summer break – after the University Examinations but before the National Competitive Examinations. However, the second workshop would not be in the Financial Year 2010-11.

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 about 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 was collected.

In order to have candidates from various colleges falling within their area, for each of the identified cells; on-line registration was activated. Similarly, to ensure, selection of candidates without any bias from the recommending teachers as well as to put in place a transparent un-biased mechanism for selection of candidates for the said Workshop, an 'On-line Screening Test' was incorporated with help of the Biotech-Capacity Building Cell at N. V. Patel College for Pure and Applied Sciences, Vallabh Vidyanagar. The BT-CBC not only helped in getting the portal for 'On-line Screening Test' operational but also contributed in developing a question bank for the same.

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. Each cell admitted about 80 students each.

The second rounds of Crash Programs were conducted in the following Four cells during:

- | | |
|---|---|
| 1. N. V. Patel College of Pure and Applied Sciences, Vallabh Vidyanagar | 13 th to 18 th November, 2010 |
| 2. Sheth Motilal Nyalchand Science College, Patan | 24 th to 26 th February, 2011 |
| 3. P. S. Science & H. D. Patel Arts College, Kadi | 25 th to 27 th February, 2011 |
| 4. College of Agriculture, Junagadh Agriculture University, Junagadh | 27 th Dec., 2010 to 1 st Jan., 2011 |

N-BT-CBC : Vallabh Vidyanagar



N-BT-CBC : Junagadh



N-BT-CBC : Kadi





N-IT-CBC : Patan



6.3.4 Seminar Support

Promotion and popularization of biotechnology is one of the mandates of GSBTM. Providing financial support to seminars, workshops are main activities. This activity encourages, interaction amongst biotech community, academia. It provides platform for students / faculty to get exposure to state, national and international level speakers.

In view of the same, GSBTM has been supporting these activities since 2004-05. In accordance with the powers delegated to MD, GSBTM by Governing body, GSBTM in its meeting dtd 17th March, 2007, GSBTM has been providing financial support to seminars and workshops.

For the year, 2010-11, the same was provided in the budget and proposals have been asked online. GSBTM, has developed system for online submission of proposals seeking financial support for seminars and workshops. The format seeks information pertaining to speakers, funding likely from other source, fees likely to be generated and fund requirement under various specified items.

The proposals received have been scrutinized, internally by GSBTM. Depending upon the case to case basis, financial support has finalized item wise, for the seminars. GSBTM seeks photographs, copy of presentation and other details from concerned agency. This material is used for documentation purpose. From this time, it is planned to place the schedule of seminars /workshops supported by GSBTM on website of GSBTM for general information and wider participation.

15 proposals have been received from various colleges, Universities and departments seeking funds to the tune of 29.50 lacs. Since agencies seek funding from multiple funding agencies and fund generation through fees, GSBTM has worked out the amount in each case. GSBTM has provided financial support to 15 seminars with a financial support of Rs. 8.15 lacs as per **Annexure- A**. Brief Details are as below.

1. **Good Clinical Practices workshop** was organized by Govt. Medical College, Bhavnagar, on 27th June, 2010. Indian delegates were 70, students 30, and number of participant 100. Applicant was Dr. Chinmay Shah. Financial support Rs. 35,000/- from Gujarat State Biotechnology Mission.
2. State level seminar on Recent Advances in Biotechnology and Bioinformatics was organized by Shri S.K. Patel college of Pharmaceutical Education and Research, on 4th to 5th October, 2010. Applicant was Dr. Vipul Kumar Prahladbhai Patel. Foreign delegates were 15 and Indian delegates were 100, students 100, and numbers of participants were 215. Financial Support of Rs.40,000/- from Gujarat State Biotechnology Mission.



3. **One day symposia on Regulatory Affairs: The Backbone of Clinical Research** was organized by **Shivrath Centre of Excellence in Clinical Research**. A Joint Venture with GSBTM, Govt. of Gujarat & Affiliate to Guj. University, on 9th October, 2010. Applicant was **Dr. Bhagirath Patel**. Indian delegates were 50, students 150, number of participants 200. Financial Support of Rs. 25,000/- from Gujarat State Biotechnology Mission.



4. **Functional Food – A new concept for sustainable livelihood** was organized by **Junagadh Agriculture University**, on 20th to 21st October, 2010. Applicant was **Rukam Singh Tomar**. Indian delegates were 30, Students 100, and number of Participants 130. Financial Support of Rs. 60,000/- from Gujarat State Biotechnology Mission.



5. **National Conference on Biodiversity of Medical and Aromatic Plants: Collection, Characterization and Utilization** was organized by **Medical and Aromatic Plants Association of India**, on 24th to 25th November, 2010. Applicant was **Dr. V S. Rana**. Foreign delegates were 3, Indian delegates were 100, Students 50, and numbers of participants were 153. Financial Support of Rs. 60,000/- from Gujarat State Biotechnology Mission.
6. **6th International Symposium on Innovations in Pharmaceutical Sciences and Technology** was organized by **B.V. Patel Pharmaceutical Education and Research Development (PERD) Centre**, on 26th to 28th November, 2010. Applicant was **Dr. Kamala K. Vasu**. Indian delegates were 300; foreign delegates were 20, students 100 and number of participants 420. Financial support of Rs. 75,000/- from Gujarat State Biotechnology Mission.
7. **Current Development in Microbial Biotechnology** was organized by **M. G. Science Institute**, on 27th November, 2010. Foreign delegates were 2, Indian delegates were 100, students 100, and number of participant 202. Financial support of Rs. 40,000/- from Gujarat State Biotechnology Mission.



8. **Scientific symposium on Genetic In Clinical Practice: Diagnosis to Therapeutics** was organized by **Foundation for Research In Genetics & Endocrinology [FRIGE]**, ON 12th December, 2010. Applicant was **Dr. Jayesh Sheth**. Indian delegates were 130, students 70, number of participant 200. Financial support of Rs. 50,000/- from Gujarat State Biotechnology Mission.





9. **Calculo-Phobic to Calculo-Philic** was organized by **Shree M. and N. Virani Science College**, on 24th to 26th November, 2010. Applicant was **Sonal J. Shah**. Students were 150 and number of participant 150. Financial support of **Rs. 30,000/-** from Gujarat State Biotechnology Mission.
10. **Exploring New Horizons In Microbial biotechnology Colloquium-2011** was organized by **Natubhai V Patel College of Pure and Applied Sciences**, on 5th January, 2011. Applicant was **Dr. Akshay Gupte**. Indian delegates were 100, students 200 and number of participant 300. Financial support of **Rs. 40,000/-** from Gujarat State Biotechnology Mission.
11. **National Level Seminar** was organized by **K S K V Kachchh University**, on 19th January, 2011. Applicant was **Pragnesh Dave**. Indian delegates were 150, students 200, and number of participant was 350. Financial support of **Rs. 60,000/-** From Gujarat State Biotechnology Mission.
12. **National symposia on "Trends in Biological Sciences"** was organized by **Sardar Patel University**, on 28th to 29th January, 2011. Applicant was **Mr. M. Nataraj**. Indian delegates were 100, students 100, and number of participant was 200. Financial support of **Rs. 65,000/-** from Gujarat State Biotechnology Mission.
13. **Indo-Aus Conference on "Biomaterials, Tissue Engineering and Drug Delivery Systems"** was organized by **Sardar Patel University**, on 10th to 12th February, 2011. Applicant was **Prof. Harish Padh**. Foreign delegates were 15, Indian delegates were 100, students 100 and number of participant was 215. Financial support of **Rs. 1,15,000/-** from Gujarat State Biotechnology Mission.
14. **International Conference on "Recent Advances in Cancer Research Bench to Bedside"** was organized by **Central University of Gujarat**, on 19th to 20th February, 2011. Applicant was **Prof. R P Singh**. Indian delegates were 20, students 80 and number of participant was 100. Financial support of **Rs. 75,000/-** from Gujarat State Biotechnology Mission.
15. **Workshop on "Application of Bioinformatics In Biotechnology Microbiology"** organized by **Mehsana UrbanBank Institute of Biosciences** on 5th to 6th March, 2011. Applicant was **Mr. Nehal Rami**. Students were 80 and number of participant was 80. Financial support of **Rs. 45,000/-** from Gujarat State Biotechnology Mission.





ANNEXURE-A

Sr. No.	Name of the Conference	Institution	Applicant	Date	Foreign delegates	Indian delegates	Students	No. of participants	Regional Coverage	Amount Requested (INR)	Sanctioned (INR)
1	Good Clinical Practices Workshop	Govt. Medical College, Bhavnagar	Dr. Chinmay Shah	27/6/2010	0	70	30	100	State	70,000	35,000
2	Recent advances in biotechnology and bioinformatics	Shri S.K. Patel college of Pharmaceutical Education and Research,	Dr. Vipulkumar Prahladbhai Patel	4/10/2010 to 5/10/2010	0	20	50	70	National	106,000	40,000
3	Regulatory Affairs: The Backbone of Clinical Research	Shivraj Center of Excellence in Clinical Research, A Joint Venture with GSBTM, Govt. of Guj., & affiliated to Guj. Uni.	Dr. Bhagirath Patel	9/10/2010	0	50	150	200	State	90,000	25,000
4	Functional Food- A new concept for sustainable livelihood	Junagadh Agricultural University	Rukam Singh Tomar	20/10/2010 to 21/10/2010	0	30	100	130	National	120,000	60,000
5	National Conference on Biodiversity of Medicinal and Aromatic Plants: Collection, Characterization and Utilization	Medicinal and Aromatic Plants Association of India	Dr. V.S. Rana	24/11/2010 to 25/11/2010	3	100	50	153	National	570,000	60,000
6	6th International Symposium on Innovations in Pharmaceutical Sciences and Technology	B. V. PATEL PHARMACEUTICAL EDUCATION AND RESEARCH DEVELOPMENT (PERD) CENTRE	Dr. Kamala K. Vasu	26/11/2010 to 28/11/2010	20	300	100	420	International	1,900,000	75,000
7	Current Developments in Microbial Biotechnology	M. G. Science Institute	MGS Science Institute	27/11/2010	2	100	100	202	National	100,000	40,000
8	Genetics in Clinical Practice: Diagnosis to Therapeutics	Foundation for Research In Genetics & Endocrinology [FRIGE]	Dr. Jayesh Sheth	12/12/2010	0	130	70	200	State	125,000	50,000

9	Calcu lo-Pho bi: to Calcu lo-Phili:	Shree M. and N. Virani Science College.	Sonal J.Shah	24/12/2010 to 26/12/2010	0	0	150	150	State	85,000	30,000
10	Exploring New Horizons in Microbial biotechnology - Colloquim -2011	Natubhai V Patel College of Pure and Applied Sciences	Dr Akshaya Gupte	5/1/2011	0	100	200	300	National	136,500	40,000
11	National Level Seminar	K S K V Kachdh University	Pragnesh Dave	19/1/2011	0	150	200	350	National	420,000	60,000
12	National Symposium on "Trends in Biological Sciences"	Sardar Patel University	M.Nataraj	28/1/2011 to 29/1/2011	0	100	100	200	National	145,000	65,000
13	Indo -Aus Conference on "Biomaterials, Tissu e Engineering and Drug Delivery Systems"	Sardar Patel University	Prof. Harish Padh	10/2/2011 to 12/2/2011	15	100	100	215	Internatio nal	315,000	115,000
14	International Conference on "Recent Advances in Cancer Research: Bench to Bedside"	Central University of Gujarat	Prof. R P Singh	19/2/2011 to 20/2/2011	0	20	80	100	Internatio nal	490,000	75,000
15	Worksho p on "Application of Bioinformatics in Biotechnology & Microbiology"	Mehsana Urban Bank Institute o f Biosciences	Mr. Nehal Rani	5/3/2011 to 6/3/2011	0	0	80	80	National	79,000	45,000
									TOTAL	4751,500	815,000

7.0 Biotechnology Business & Development

Government of Gujarat, in conformity with national efforts, has been organizing "Vibrant Gujarat: Global Investor Summit" every two years, for bringing up the enormous investment potential in Gujarat and to accelerate the rate of FDI and domestic investment in Gujarat and thereby in India. Vibrant Gujarat-Global Investor Summit-2011 was organized in the same spirit in Jan, 2011. The important sectors for focus were Energy & Power, Oil and Gas, Ports, Agriculture, Textiles, Manufacturing, SEZ, Biotechnology. Biotechnology, as fastest growing sector, has emerged as tool of promise and potential. The event resulted in mobilizing BT investments in the state and included 35 biotech projects and 35 Memorandum of Understanding (MoU) signed with committed investment of Rs 5826.4 crores in Biotechnology Sector during 2011 in Gujarat. When Gujarat state is developing as the Biotech Hub of the country, GSBTM plays a facilitators role by extending intermediately services towards these biotech investors in their future ventures. GSBTM being the nodal agency for biotechnology development and investment will be coordinating with the companies for further assistance and timely executions of the projects. Total 35 companies have made total investment of 5826.4 Crore Rs. with the approximate employment generation of 11344 people.

Vibrant Gujarat - Global Investor's summit - 2011 Biotechnology Sector

Sr. No.	Company	Title of project/Project Description	Proposed Location	Approximate Investment (in Rs. crores)	Probable Employment Generation
1	Nectar Lifesciences Ltd	To manufacture biotech fermentation based molecules in the first phase of the project.	Valsad	3500	2000
2	Altret Greenfuels Pvt. Ltd	Harvesting of algae using ETP waste water of thermal power station along with acrubbing their flue gas on waste land by making shallow ponds technique.	Mindhiyari	250	500
3	Ferments Biotech Ltd	Manufacturing of Vitamin D3 & Penicillin G amides enzyme biocatalyst & related products	Dahej	75	
4	Concord Biotech	Production of Antibiotics, Enzymes, Immunosuppressant, Funning & other biotechnology route	Ahmedabad	70	150
5	Centurion Laboratories	R & D and Formulations	Savli	18	100
6	Chervil Infrastructure Pvt. Ltd.	Bio - informatics IT-ITES SEZ (Global Knowledge Super Corridor)	Nimeta	575	4000
7	Stem Cure Private Ltd	Stemcell Development Laboratory	Ahmedabad	10	
8	Envy International Pvt. Ltd.	Collagen Baged Product advanced biomaterials for treating wounds	Vasana	63.11	85
9	Phyto Concentrates.	Manufacturing of Natural Fibers & Natural Sweeteners Herbs	BT Park, Savli	12	100
10	Chiron Behring Vaccines Pvt. Ltd.	Primary-Healthcare; Preventive Medicine	Ankleshwar	140	
11	Euresian	Bulk Drugs	Dahej	100	200
12	Swati Spentose Pvt. Ltd	Steroids & Hormones	Valsad	100	100
13	Biotron Life Science Pvt. Ltd.	Bio Pharmaceutical Product	Savli	15	50
14	Span Diagnostics Ltd [Agri Biotech Division]	Establishing of Tissue Laboratory for Large-Scale Production of Quality Planting Materials of Agricultural Crops	Sachin, GIDC	3.49	35
15	Span Diagnostics Ltd	Proposed capital expenditure is required towards comply with GMP compliance, US-FDA Norms, Dedicated production facility and development of export business	Sachin, GIDC	40	75

16	Meteoric Exim Pvt. Ltd.	Enzymes & Enzymatic Preparations	Ahmedabad	50	50
17	Century Pharmaceuticals Ltd	Commercialization of a novel recombinant protein for Asthma and Allergy.	GIDC, Halol	6	10
18	Gujarat Agro Farm Ltd	Media for Biological Product	Ahmedabad	3	50
19	Vasu Healthcare Pvt. Ltd	Harbal/Ayurvedic Medicines, Healthcare Formulation Setting up additional manufacturing facilities	Biotech Park, Savli	15	250
20	Neesa Agritech & Foods Ltd	Tiss. Cul. Lab, Tech. Institue, Neempdi	Anand	105	990
21	Poshak Bio Research Pvt. Ltd.	Bio Pesiticides, Biolarvaecides.	R. S. # 85/1 , Khambolaj	1.4	50
22	Rossari Biotech Ltd.	Enzyymes & Green Chemicals	Bharuch	50	100
23	Hanjer Green Power Pvt. Ltd	RDF based Power Plant	Surat	100	60
24	Hanjer Biotech Energies Pvt. Ltd	Integrated MSW Processing Plant	Ahmedabad	45	150
25	Dos Advanced Agro Biotech Ltd	Tissue Culture & Extract from the plant	Barvala, Ahmedabad	15	70
26	Bhagwati Agriculture	Agri Business/IT training Center to furmers & local people	Mehsana	0.15	
27	Sabre Machinery Pvt. Ltd.	Spirulina & Microalgae, Food Derivatives	Motera	5	25
28	Bappa Morya Group of Companies	Manufacturing of Medical Devices for Interventional cardiology, Pharmaceutical Products & HR, Independently as well as in technological Collaboration with MNCs, Foreign companies to be able to manufacture products of international quality for marketing in	Valsad	150	400
29	Ami Biotech Pvt. Ltd	Biotech Products	Padra Vadodara	63	350
30	Garg Green Energy And Power Ltd	Bio Diesel from any type of Carbons(Municipal Waste, Coal etc.)	Bhavnagar	100	500
31	Smart Labs India	Digital Image Analysis	Gandhinagar	10	70
32	Biomix Network Ltd	Biotenology Pharma Formulation	Gandhinagar/Chaatral	100	150
33	M/s. Algene Biotech	Manufacturing of Spirulina Powder primary processing unit	Mandvi	0.25	4
34	Global Transgenes Ltd	Development and Commercializatin of BT-Cotton Hybrids (Encoding Fusion-BT) in Collaboration with Navsari Agricultural University, Surat (Joint Project between NAU & GTL)	Navsari	10	500
35	Sheth Biotech Pvt Ltd	Medical Plantation	Surendranagar	26	170
			TOTAL	5826.4	11344

8.0 PROMOTION OF BIOTECHNOLOGY SECTOR 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.

8.1 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 contributed Rs 10 crores as initial corpus for the same from the funds available at DST, GoG, for Biotechnology.

Up till, 2011, GVFL had received many projects with request for venture financing. After due diligence, GVFL has approved following projects.

S.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
5.	Axio Biosolutions Pvt. Ltd.	RS. 20 lacs
	Total	Rs. 910.00 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, Industries Commissioner had also provided Rs. 10.0 crores for Biotech venture funds.

8.2 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.

Savli Biotech park has received Environment Clearance from MoEF, GoI. The park has received 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 many 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-Technology Business Incubation Centre along with Common Facility Centre, and Human Resource Training units; as committed by the state Government and christened as **Biotechnology Savli Park Incubator for Research, Innovation and Technopreneurship [BT-SPIRT]**; has already been discussed by a technical committee along with architectural design and has received approval from 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 Design, Build, Finance, Operate and Transfer [DBFOT] basis with the help of Gujarat Infrastructure Development Board [GIDB], Gandhinagar, as the Transaction Advisor. Bids were invited for qualification [RFQ] from eligible parties for developing the proposed BT-SPIRT on Design, Build, Finance, Operate and Transfer [DBFOT] basis but no bids were received in the first attempt.

8.3 Marine Biotechnology Park

The Marine Biotech Park is one of the flagship projects of GSBTM. GSBTM has been putting efforts to promote the project with Gujarat Industrial Development Corporation. The Park project has been taken up for feasibility and due diligence study. Also, GSBTM has requested GIDB to allocate and reserve land for the project in Dholera SIR.

8.4 Regional Workshop on Intellectual Property Management for Biotechnology Industry

This office is the nodal agency for overall development of Biotechnology in the state, working in the fields of Public Policy formation, Research Encouragement, Infrastructure Development, Human Resource Development, Biotech Business & Entrepreneurship Development, Awareness & Public consensus generation, etc. In addition, this office is conscious of the role of Intellectual Property in Knowledge-intensive fields inclusive of Biotechnology and aims at providing all possible facilitation in creation of Intellectual Property by the Industry, Research & the Academic fraternity of the state; eventually towards creation of the 'Brand Gujarat'.

With close consultation with World Intellectual Property Organization [WIPO], Geneva; Gujarat State Biotechnology Mission [GSBTM] along with BCIL, News Delhi had organized a follow-up Regional Workshop for 'Intellectual Property Management for Biotech Industry' for the western region in Ahmadabad on 4th and 5th of the October, 2010. The program was inaugurated by Additional Chief Secretary, Department of Science & Technology, Govt. of Gujarat; Dr. Ravi Dhar, Consultant IPR & Tech Transfer, BIRAP, DBT, Delhi; MD, BCIL; and Missing Director, Gujarat State Biotechnology Mission.

Schedule of the Program and the speakers were as below

Day:1, Dated 4th October, 2010	
Inaugural Session	
ACS, DST, GoG; Dr. Ravi Dhar, Consultant IPR & Tech Transfer, BIRAP, DBT, Delhi; MD, BCIL; and MD, GSBTM	
Theme: 1 Intellectual Property (IP) tools for the Biotechnology Sector	
Introduction to Industrial Property Rights	Dr. Ravi Dhar, Consultant IPR and Tech Transfer, BIRAP, DBT, Delhi
Introduction to Copying and Related Rights in India	Adv. Rasesh Parikh, Patent Attorney, Ahmedabad
Introduction to Protection of New Varieties of Plants in India	Dr. Rajni Jaiswal, Lakshmi Kumaran & Sridharan, New Delhi
Theme: 2 Intellectual Inventions-Drafting and filing of Patent Applications.	
Importance of Patents, Indian Patent Law, Patenting in key jurisdictions office procedures and Examination Practice in Biotechnology	Bharath N. S., Senior Joint Controller of Patents, Mumbai Patent Office
Biotech Inventions: Essentials of drafting a Patent Specification	Dr. Rajesh Acharya, H. K. Archarya & Co. Ahmedabad
Theme: 3 Trade Secret Management & Competitive Intelligence	
Trade Secret vs Patents as IP strategy	Dr. Kaushik Banerjee, Zydyus Cadila, Ahmedabad
Role of Competitive Intelligence, Mining and Analysis in IP Management Speaker	Dr. Rajiv I Modi, Cadila, Ahmedabad
Day:2, Dated 5th October, 2010	
Theme: 4 IP Tools for Branding	
Industrial Design Protection and importance in the Biotechnology Sector	Mr. Bhavin Kothari, National Institute of Design, Ahmedabad
Relevance of Geographical Indications	Mr. Pranit Nanavati, Nanavati Associates
Theme: 5 Traditional Knowledge And Genetic Resources	
Access and use of Genetic and Natural Resources and benefit sharing: IP Guidelines and Agreements	Dr. Vipin Kumar, National Innovation Foundation
Theme: 6 IP rights enforcement	
Issues in IPR protection in case of infringement, strategies to minimize and deal with infringement	Mr. Pranit Nanavati, Nanavati Associates, Patent attorney, Nanavati Associates
Mechanism of protection of trademarks and significance in brand building	WIPO
Theme: 7 Licensing of Technology	
Licensing: Basic principles, Licensing negotiations, Due diligence and Licensing agreements	Dr. Alpesh Pathak, Alembic
Theme: 8 IP Policies and Systems in Biotech R & D Sector	
Developing a Comprehensive IP Policy	Prof. Rakesh Basant, Indian Institute of Management, Ahmedabad
Concluding Session:	
Exploring synergies for IP facilitation in Biotech Sector	MD, GSBTM; MD, GITCO; Advisor, GUJCOST; Head, CIIE; IIM-Ahmedabad; Consultant-HR, BIRAP, DBT

The workshop was aimed at an audience of Biotech Industry; especially those ones who work for their IPR departments; though some of the participation also came from the Biotech academia with an aim of capacity building of the teachers and researchers of Gujarat.

The concluding session was navigated by this office for an intensive discussion of the status of facilitation offered to Research/Academia as well as Industry sectors of Biotech Industry in the State of Gujarat and explored the synergies possible, since most of the organizations of the field were brought on the same platform. Sensitive to the need of Biotechnology Sector of Gujarat, this office has been aiming at **AUGMENTING THE STRENGTHS OF THE STATE** towards creation of a Biotech IP Facilitation Cell [BT-IPFC]. All of the organizations agreed for the need of a Biotech IP Facilitation Cell and urged GSBTM to take a lead in the same and vouched for their total support in the interest of the stakeholders.

The workshop was attended by nearly 65 participation including 25 persons from Industries and 30 persons from Academies.





9.0 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 participated in following programs:

9.1 Indian Science Congress

98th Indian Science Congress was held at SRM University Chennai, Prime Minister Manmohan Singh inaugurated the five days event on January 3, 2011. The Congress, hosted by the SRM University, was attended by over 7,000 delegates from India and abroad, including some Nobel Laureates. The theme of the Congress was 'Quality Education and Excellence in Scientific Research in Indian Universities'. The theme was chosen as there was a need to create proper facilities and environment for research in Indian universities to carry out innovative work at the cutting edge of Science and Technology. Besides the theme session, there were 14 sessions on science and challenges in new power and renewable energy, climate change and food security including exhibition. GSBTM, DST, GoG took active participation in the stall along with the other sister organization, like BISAG, GIL, GUJCOST of Department of Science and technology, Govt. of Gujarat. More than 10,000 students and visitors visited exhibition.



10.0 New Initiatives

10.1 ENTREPRENEUR CAMPS (AHMEDABAD | VADODARA | VALLABH VIDYANAGAR | SURAT)

Entrepreneurship, especially in technology-driven areas has been a challenge in the state of Gujarat. At times, there has been lack of information regarding the business prospects in various technology-driven fields inclusive of Biotechnology that led Medium & Large groups to shy from these businesses. At times, there has been lack of awareness regarding the Support Systems possible from various sources, inclusive of the Governments' end.

Similarly, it has been realized that during start-up phase, SMEs often face a number of problems directly linked to the lack of resources: lack of human resources, lack of experience, lack of expertise in certain fields, lack of contacts, and of course, lack of financial capacity. Hence, there is need for creating awareness. Business defaults can have many causes but there is a societal interest in reducing hindrances for start-ups and small enterprises with growth potential.

Proactive Government

One of the most important issues is to improve the access to suitable finance. The State Govt. had formed a Biotechnology Venture Fund in 2006 and about 5-7 projects have been supported so far, and some more are in pipeline. In addition, this office has been undertaking some Entrepreneurship Development Programmes of varied periods. In collaboration with the NSTEDB, this office is also contemplating launch of a structured 320-contact hours programme 'Biotechnopreneur Programme' - custom-tailored to suit each of the 20-25 candidates aspiring at Bio-entrepreneurship.

The Government of India, while appreciating the necessity of developing entrepreneurship in science and technologies matters the Department of Science & Technology as formulated a National Science & Technology Entrepreneurship Development Board [NSTEDB]. Entrepreneurship Development Institute of India and Centre of Entrepreneurship Development are similar initiatives of Central Government and State Government in the same aspect.

Amongst various programs of NSTEDB remarkable there are ones to support faculty/ human resources development and development of institutional mechanism. DST, Government of India has also supported development of Science & Technology Entrepreneur Parks (STEPS) as also various incubators.

Agreement / Strategy

The strategy is to join hands with the other agencies mentioned especially, GVFL that has a mandate to operate the Gujarat Biotechnology Venture Fund as well as Foundation for MSME Clusters - that has been mandated by the Dept. of Science & Technology, Govt. of India, through its initiative NSTEDB to promote Innovative Clusters and has identified the Gujarat Lifesciences Cluster as one of the ones to be promoted. A series of Seminars - christened as 'Biopreneur Camp' in all major cities of Gujarat with an aim of addressing all of the gaps that have been identified, has been envisaged. In a half-day programme, it would be apt to give a brief picture regarding the business areas in Biotechnology, the scenario - global, national and regional as also discussing the Support Systems possible.



Businessmen operating in varied fields like chemical, pharmaceuticals, textile, etc. have already taken the first step towards entrepreneurship and if the trends world-wide are studied, it would be obvious that a large number of biotech businesses have emerged from divergence of these industries into biotechnology. Hence, it would be apt to tap the business class of Gujarat, operating in variety of sectors and showcase to them the business opportunities in biotechnology.

The Seminars aim at participation from Industry Association Members, Entrepreneurs wanting to venture in Biotech sector, researchers and professionals from the same & allied fields, etc.

Facilitator

The Surat program was done in close coordination with South Gujarat Chamber of Commerce & Industry [SGCCI], Surat and was attended by about 20-25 entrepreneurs and about 35-40 people from Academia. Similarly, the Vallabh Vidyanagar program was done in collaboration with S. P. University and was attended by about 70-80 people majorly, researchers and professionals as well as students. The Vadodara program was hosted with Federation of Gujarat Industries [FGI] and was attended by about 5-8 entrepreneurs, 4-5 representatives of companies as well as 20-30 were researchers/professionals and students. The Ahmedabad program was attended by about 120 people inclusive of about 50 people from industry (inclusive of Entrepreneur, investors, Consultants, etc) and about 30 Faculties, Researchers / Professionals, etc.

As a whole, all of the programs were well received and the participants appreciated the need for such programs.

11.0 Upcoming Initiatives

11.1 Stem Cell Research & Training Center

The area of stem cell has opened vistas of exciting opportunities for human health and Human stem cell research holds enormous potential for contributing to our understanding of fundamental human biology. It stands to offer possibility for treatments and ultimately for cures for many diseases for which adequate therapies do not exist. While dedicated initiatives have been started at country level, the realization of stem cell research and its therapeutic use, needs initiatives at state level as well. In view of its applications, potentials and healthcare relevance to society, stem cell research has been identified as key area for thrust in Pharma and Healthcare sector.

In view of the need for developing stem cell research, it is planned to establish Gujarat Stem cell centre for research & training. This is as per the recommendations made during the Brain Storming Session, held by GSBTM and attended by experts. The center is visualized as independent center operated from the funding of the State Government of Gujarat. The center will primarily focus on the permissible area of research as per DBT-ICMR guidelines. The center will also impart training for creating skilled Human resource in the area of Stem Cell Research. Technical Advisory Committee (TAC) of GSBTM has recommended that at first stage, GSBTM may develop Stem cell training laboratory by seeking proposals and continue with stem cell training program, research support. Hence GSBTM plans to develop stem Cell training laboratory. Consequent to approval by Executive Committee of GSBTM, Expression of interest has been sought from agencies / organizations / institutes, having capabilities, skills and expertise.

11.2 Biotech Incubators in Universities of Gujarat

According to a study conducted by National Biotechnology Incubation Association, it was found that 80% of the businesses fail in the first five years of their launch, if not incubated. The emergence of business incubators for start-up companies has helped reverse this trend. Incubators received their first big impetus from the U.S. Small Business Administration, which strongly promoted incubator development from 1984 until 1987, growing from just over 20 incubators in 1984 to more than 70 in 1987 and over 950 in North America today.

In India, private incubators as well as incubators in institutes have made it fairly well to success. Some successful Indian Incubators are, Agri Business Incubator, Technology Business Incubator (University of New Delhi, South Campus), Mitcon's Biotechnology Business Incubation Centre, Kalinga Institute Industrial Technology - Technology Business Incubator, Venture Centre, Vellore Institute of Technology - Technology Business Incubator, Indico and few more. A detailed document on Incubators wordover was prepared, and it was understood that incubators are not stand alone infrastructure facility but, need knowledge support and management support systems.

Incubators are professionally managed by a team of scientists and management gurus or are built-in alongwith academic institutions, which provide the knowledge base. Hence, GSBTM has initiated a scheme where GSBTM intends to incorporate the best of both professionally managed incubators and academia lead incubators, in its concept for promoting incubator system in Universities. GSBTM and University would join hands to promote these incubators.

1. The Incubator facility would be provided to the Government Universities only.
2. Land/Ready Infrastructure would be provided by University.
3. Two (2) Modular Laboratory spaces and two (2) office spaces would be created in the first phase.
4. The incubator would be managed by an Incubator Management team consisting of Incubator Manager and his/her core team, appointed by a committee having representation of GSBTM, University and other experts in the field.
5. Operation and Maintenance of the incubator would be done by the Incubator Management team.
6. The University with its existing resources would provide support for operation and maintenance, to the Incubator Management team, as and when needed.
7. The labs and office spaces would be used by In-house researchers of the University to develop or scale-up their technology and Outdoor Entrepreneurs.
8. The incubator facility would be used to develop proof-of-concept and/or scale-up activities.
9. The scale-up facility would be provided on demand basis, depending on the project for scale-up.
10. Basic and sophisticated instrumentation would be provided by GSBTM.
11. Some sophisticated instrumentation already existing with the University Departments would also have to be provided for the incubator facility, for the use by incubates.
12. GSBTM would provide funding to set up the modular labs, the Scale-up Facility and operation and maintenance.
13. The Outdoor Entrepreneurs would be charged rentals for the facility.

GSBTM has already circulated a letter to Government Universities, requesting Expression of Interest (Eoi) for such an incubator in their campus. Nearly five proposals have been received which are under the process of scrutiny.

12.0 Ongoing Projects

12.1 Marine Bioresource Centre

The Marine Bioresource Centre started its operations under the guidance of its Director, and all the minor equipments for the centre were purchased. The major equipments are under tendering.

The centre has launched its own website and information brochure. MBRC conducted its first Research Advisory Committee Meeting in November, 2010. The priority research areas for the Centre were discussed and decided in the meeting. The centre also conducted a two day National Conference on Marine Bioresource, Biotechnology and Biodiversity. The conference was attended by the regional students and faculty. Eminent scientists like Dr. I. S. Bright Singh, Dr. Aabidi, Dr. Venkatram, graced the occasion and delivered talks in the various fields of Marine Biology and Biotechnology.



12.2 The Virtual Institute of Bioinformatics

To encourage research and develop skilled manpower in bioinformatics, GSBTM has been operating Bioinformatics virtual institute. The institute is virtual institute with its 8 nodal centre, located in different universities and institutes. The institute has been recognized by Saurashtra university and offers M.Phil. In Bio-Informatics. The main objective of institute is "To utilize the network infrastructure as a strategy to initiate Bioinformatics Research and Education in Gujarat".

Bioinformatics Nodal Centres have been established at following locations,

1. Gujarat State Biotechnology Mission-Gandhinagar
2. Anand Agriculture University-Anand,
3. Gujarat University-Ahmedabad,
4. Hemachandracharya North Gujarat University-Patan,
5. Saurashtra University-Rajkot,
6. Navsari Agriculture University-Navsari,
7. Junagadh Agriculture University-Junagadh
8. Gujarat Cancer and Research Institute, Ahmedabad [Established in 2010]



Each nodal centre has been provided the [Basic infrastructure, Connectivity, Research Guide-ship to coordinators].

The salient outcome of this institute, has been as follows,

- Affiliation for M. Phil. Bioinformatics Program with Saurashtra University
- Integrated Virtual Learning Environment (IVLE) System developed for Bioinformatics M. Phil. Program
- High performance computing cluster installed in Datacentre, Gandhinagar
- Live Support portal for trouble shooting developed which has more than 60 active members
- Web conferencing facility provided to all the 8 nodes across the state
- Bioinformatics Support for Next Generation Sequencing Data Analysis, Annotation, Genome Submission, Query Addressal
- 2 National Conferences organized at HNGU Node and NAU node
- 4 workshops organized for M. Phil. Students at GSBTM Node
- Online Admission Test Module Developed

- Online Examination Portal Developed
- In-house dissertation support
- 2mbps Broadband connectivity provided to all Nodal centers across Gujarat initially, which has been upgraded to 4mbps recently.
- 30 students have already passed M. Phil. Bioinformatics Program successfully
- 1 Patent filed.
- 80% of the passed out candidates from the first batch got placement on various positions in the industries and academia [Zydus, Xcleris, Veeda, SDAU, HNGU etc.]

M. Phil. Program – 2010/11 [Research Students Enrolled]

Sr. No.		Name of Applicant	Research Topic	Research Guide
1		Nirali Bavishi	<i>In silico Approaches for DNA Barcodes of Some Species of Gujarat</i>	Dr. Snehal Bagatharia Sector Specialist - Agriculture Biotechnology Coordinator – BIT ^{Virtual} Gujarat State Biotechnology Mission
2		Aanal Pandit	<i>Annotation and Re-annotation of Some Bacterial Genomes</i>	
3		Hiral Shukla	<i>Metagenome Analysis of Some Metasources: In silico</i>	
4		Manisha Sajnani	<i>Developing a Pipeline for Transcriptome Annotation of Eukaryotes</i>	Prof C. G. Joshi Nodal Coordinator- AAU Anand Agricultural University
5		Ketan Padiya	<i>Developing a Pipeline for Exome Annotation and SNP Detection of Eukaryotes</i>	
6		Jetal Gadhavi	<i>In silico Studies of Acidithiobacillus Ferroxidans Genome</i>	Prof. Shailesh Dave Nodal Coordinator- GU Head-Department of Microbiology & Biotechnology, Gujarat University
7		Yama Vyas	<i>In silico Studies of Sulfidic Minerals Bioleaching Organism</i>	
8		Dipika Kalariya	<i>In silico Studies of Plant Peroxidase</i>	Prof. Vrinda. S. Thaker Nodal Coordinator- SU Centre for Plant Biotechnology & Genetic Engineering [CPBGE], Saurashtra University
9		Mehta Aditya	<i>In silico Analysis of Human cancer Proteome</i>	
10		Patel Nimisha	<i>In silico Analysis of Oncogenic Viral Genome</i>	Dr. Rakesh Rawal Nodal Coordinator- GCRI Head & Senior scientific officer, Biochemistry division, Civil Campus
11		Patel Ankit	<i>Glycolysis As a Potential Drug Target in Leukemia</i>	

12.3 Gujarat Genomics Initiative (GGI)

GGI was established in 2009 with the objective of creating top level genomics culture in Gujarat which involves key government organizations like Gujarat State Biotechnology Mission, DST, GoG, Directorate of Forensic Science (DFS), GoG and Gujarat Forest Department. GSBTM has established laboratory facilities in space allotted for this initiative by DFS.



GGI ACTIVITIES

Collection, isolation, identification, sequencing and banking of microbial diversity and submission to GenBank. In last last year 68 sequences are submitted to GenBank. On this basis, we are studying microbial diversity of rhizosphere soil flora.

In last year soil collection were done from below mentioned locations and microorganisms were isolated for studying microbial diversity of rhizosphere soil flora.

Sr. No.	Place of collection	No. of soil samples collected	No. of Organism isolated
1	Gandhinagar	1	23
2	Rajkot	28	238
3	Junagadh	48	291
4	Chhota Udaipur	12	81
5	Katchh	5	28
Total		103	661

In continuation with pilot project the study is also extended for finding microbial associations of microbes in various species are being studied such as from *Buchanania lanzan* (Charoli), Bamboo, Grass spp. Molecular marker development for *Ailanthus excelsa* have been initiated.



GGI-WGSeq Program

GSBTM is committed to promote and support Genomics research through its existing schemes and programs and newer ones in the future and GGI-WGSeq is one such step as a gap filling measure for optimum utilization of resources available in the state. GGI-WGSeq: Gujarat Genomics Initiative - Whole Genome Sequencing Project under umbrella program of Gujarat Genomics Initiative of Government of Gujarat funded by GSBTM. GGI-WGSeq is a project where, under the umbrella of GGI, AAU infrastructure is being utilized for initiating whole genome sequencing funded by GSBTM. GGI-WGSeq is a collaborative project under Gujarat Genomics Initiative

GGI has completed whole genome sequencing of *Acidithiobacillus* sp. GGI-221. *Acidithiobacillus* is an important bacteria studied widely for bioleaching [extraction of metals]. It also offers exceptional opportunities probe life in extremely acidic environments. It may also offer insights into ancient ways of life in Archaean, acidic seas and suggest potential biomarkers to be used when searching for evidence of extra-terrestrial life. This bacterial genome is first bacterial whole genome released by NCBI from Gujarat, India and 4 more genomes are in progress shall be submitted soon from Gujarat by GGI, GSBTM. Accession numbers obtained for 1602 contigs submitted to GenBank. With this genome release, GGI, GSBTM, Gujarat is also enlisted in the reputed list of international organizations dealing in bacterial whole genome sequencing.

Dissertation

GGI has made collaboration with OME Research Facility, Department of Biotechnology, AAU for utilizing Next Generation Sequencing Facility for Whole Genome Sequencing Projects. Under GGI-WGSeq Program the following students completed their dissertation in last year.

Academic Program

Forensic University Practical sessions conducted by GGI

Gujarat Genomics Initiative has conducted practical sessions and practical examinations of M.Sc. Forensic Science (third semester) being the collaborative initiative between GSBTM and DFS

GGI Services

GGI is offering services in the field of molecular biology at very nominal rates and high accuracy within a short period of time. In last year GGI has offered Molecular Biology Services to following industries, academia and research institutes

Sr.no. No.	Institute/Company	Service Offered
1	Concord Biotech, Ahmedabad	16s rDNA Sequencing, D2 LSU rDNA Sequencing and Bioinformatics Analysis of Bacterial and Fungal Samples
		D2 LSU rDNA Sequencing of fungal samples
		Quantative analysis of residual DNA/RNA in Sirolimus, Vancomycin
2	Sandoz Pharma, Mumbai	16s rDNA Sequencing of Bacterial Samples
3	Fermenta Biotech, Mumbai	16s rDNA Sequencing and Bioinformatics Analysis of bacterial Sample
4	Organica Biotech, Mumbai	16s rDNA Sequencing and Bioinformatics Analysis of bacterial Sample
5	Disha Bio-Tech Pvt. Ltd., Nagpur	16s rDNA sequencing and Bioinformatics analysis of bacterial samples
6	Sardar Patel University (Bioscience Dept)	16s rDNA full gene sequencing and Bioinformatics analysis of bacterial samples
7	Gujarat University	16s rDNA sequencing and Bioinformatics Analysis of bacterial samples
8	Nirma University, Ahmedabad	16s rDNA sequencing and Bioinformatics Analysis of bacterial samples
9	ARIBAS, New Vidyanagar	16s rDNA sequencing and Bioinformatics Analysis of bacterial samples
10	Ila Devi Cattract Research Institute, Ahmedabad.	D2 LSU rDNA sequencing and Bioinformatics Analysis of fungal samples

In the last financial year the following equipments are purchased through e-tendering as a part of infrastructure. The list of Equipments is as follows

No.	Name Of Instruments
1	CO ₂ Incubator
2	Deep Freezer(-86 Deg. C)
3	Deep Freezer(-10 to -40 Deg. C)
4	Gel Documentation System
5	Plate Centrifuge

Appointment in last year

One JRF and two Project Assistants were appointed in the last financial year.

Expenditure in last year

Amount Head	Amount	Expenditure	Balance
Equipments	13000000	9398066	3601934
Consumables	4500000	3277049	1222951
Manpower	1300000	765770	534230
Contingency	1200000	950599	249401
Total	20000000	14391484	5608516

Income generated in last year

Income	Amount
Services	349898
Dissertation	375000
Total	724898

12.4 Gujarat Biodiversity Gene Bank [BioGene]

GSBTM has established Gujarat Biodiversity Gene Bank for Ex-situ conservation of Forest Biodiversity of Gujarat. Biodiversity Gene Bank collates and compliments the efforts undertaken by the state by different department for screening, characterizing and development of genomic database of biodiversity of Gujarat. Gujarat Biodiversity Gene Bank is a multi-unit, multi-disciplinary, multi-institutional initiative with participating faculty, students, scientists and biotechnology industries.



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 conserves Micro organisms.

Biogene Activities in last year**1. Plant Collection**

443 Plant species are collected from Indroda Nature Park, Gandhinagar. Collection includes 443 accession representing 106 families, comprising of 134 trees, 95 shrubs, 133 herbs, 52 grasses and 29 climber species. Plant Collection from Basan Research Center includes 413 accessions of 413 CPTs representing 19 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.



Total 109 species including grasses, bamboo, rare and endangered plants collected from the forest area of Junagadh and Forest Research cum Demonstration Centre, Rajkot. As a result total 969 accessions are collected in the last year.

2. DNA Banking

In Biogene DNA is collected from fresh leaves or leaves cursed in liquid nitrogen and stored at -80 degree to extract DNA from it. DNA samples in the banks pass through extensive extraction procedures, minimizing cleaning process before using the sample. However, the quality and concentration of DNA in a sample vary with species and so concentration procedures may be needed.



Plant DNA Banking for 346 species is optimized as per International DNA Banking Standards in last year. **Following Table represents the data of collection and DNA Banking.**

LOCATION	COLLECTION	SPECIES	FAMILY	DNA STORED
INDRODA	443	443	106	113
BASAN	413	19	16	205
GFRI	4	1	1	4
JUNAGADH	85	74	20	21
RAJKOT	24	21	3	3
TOTAL	969	558	146	346

3. DNA Barcoding

DNA barcoding is a technique for characterizing species of organisms using a short DNA sequence from a standard and agreed-upon position in the genome. DNA barcode sequences are very short relative to the entire genome and they can be obtained reasonably quickly and cheaply.



DNA Bar-coding protocols are established for following species.

- Syzygium cumini
- Catharanthus roseus
- Aerva lanata
- Tectona grandis
- Gossypium arboreum
- Ruellia tuberosa
- Nerium oleander

4. Spirulina Cultivation

Spirulina is a microscopic unbranched, filamentous blue-green alga, rich in protein, vitamins especially vitamin B12 and pro-vitamin A (beta-carotene), iron, essential amino acids, minerals and essential fatty acids like gamma linolenic acid. The Spirulina has gained importance and international demand for its high value phytonutrients and pigments, which have applications in health foods, feed, therapeutics and diagnostics. It represents the most important commercial micro alga for the production of biomass as health food and animal feed.



As a result Spirulina cultivation from lab scale to pilot pond culture is established.



In the last financial year the following equipments were purchased through e-tendering as a part of infrastructure. The list of Equipments is as follows

No.	Name Of Instruments
1	Genetic Analyzer [24 Capillary]
2	Deep Freezer(-86 Deg. C)
3	Deep Freezer(-10 to -40 Deg. C)
4	LN ₂ Containers and vessels
5	Cryo Shippers
6	Programmable Controlled Freezer
7	Freeze Dryer
8	Gel Documentation
9	Shaker
10	Protein Purification System
11	2 D IEF
12	Plate Centrifuge

Appointment in last year

Total three JRF and two PA were appointed from which two JRF and two PA were appointed in the last financial year.

Expenditure in last year

Amount Head	Amount	Expenditure in last year	Total Expenditure	Balance
Equipments & Infrastructure	40000000	22276039	30478954	9521046
Consumables	9000000	815675	1001611	7998389
Travel	3000000	163181	170338	2829662
Contingency	3000000	922998	1309024	1690976
Manpower	5370000	542912	790331	4579669
Total	60370000	24720805	33750258	26619742

12.5 Gujarat Genetic Diagnostics Center

Gujarat Genetic Diagnostic Center is a joint initiative between Gujarat State Biotechnology Mission (GSBTM) and Zoology Department of Gujarat University. Zoology Department, Gujarat University has been the pioneer in the diagnosis of the genetic disorders in Gujarat. GSBTM is a state nodal agency working under the aegis of Department of Science and Technology, Government of Gujarat with a mandate to promote biotechnology in the state. GenDiCe is a unique center dedicated to extend diagnostic and research activities in the areas of Human Genetics. The aim of GenDiCe is to establish a new era in the field of medical diagnosis

The main goals of the centre, are,

1. To establish well equipped state-of-art genetic testing center in Western region of the country.
2. To reduce the burden of genetic disorders and birth defects to the individual, the family and society in general.
3. To screen affected population on basis of genetic abnormalities in Western region of the country.
4. To create awareness of the psychosocial and physical impact of genetic disorders and birth defects in general population as well as in health Professionals.

The center is functional since last one year in the campus of Gujarat University. Website for the centre is created and placed on the domain www.gendice.org. The centre was inaugurated by Education minister Hon. Vasuben Trivedi on 5th March, 2011. Tender process for the purchase of the equipment is completed. Genetic tests for DMD and thalassemia are optimised and Primers for other genetic diseases like Amenorrhea, PCOS and infertility are to be under pipe line to procure and standardize. Following is the list of patients analysed and tested by the centre.

TYPE OF DISORDER	NO.OF PATIENTS
Down syndrome	28
Turner Syndrome	5
Mental Retardation	4
Klinefelter Syndrome	1
Ambiguous Genitalia	10
Couples	22
Primary amenorrhea	16
Infertility	6
Hypospadias	8
Pseudohermaphrodite	2
Delayed Development	12
Congenital anomalies	4
Dysmorphic Feature	6
Other genetic problem	14
Total	138



12.6 LeoGEN project

Introduction:

The Gujarat State Biotechnology Mission, Department of Science & Technology, Govt. of Gujarat, in collaboration with Forest Department, under Gir Use of Modern Technology has conceptualized two projects, 1. Pilot Study on Establishing DNA Bank for Asiatic Lion and, 2. Development of Microsatellite markers for Asiatic Lion.



1. Pilot Study on Establishing DNA Bank for Asiatic Lion

DNA banks are technically sophisticated service facilities for the long-term storage of well-documented genetic material intended to ensure the long-term usefulness of this DNA for the scientific community. Basically, they consist of two key features: A DNA collection, which also includes tissue samples, and a database which is used to document all of the relevant data such as the site where the sample was found, the date it was found, the current storage location, the person who collected it, fixing of the specimens, a digital voucher, the extraction method, the quality and concentration of the DNA, sequence data and information on publications.

DNA banks are being established worldwide with a purpose to store DNA and its amplified products which is also used for the characterization of genotypes, assessment of genetic diversity, estimation of genetic relationships within, identification of duplicates, establishment of core collections as well as monitoring genetic stability and integrity.

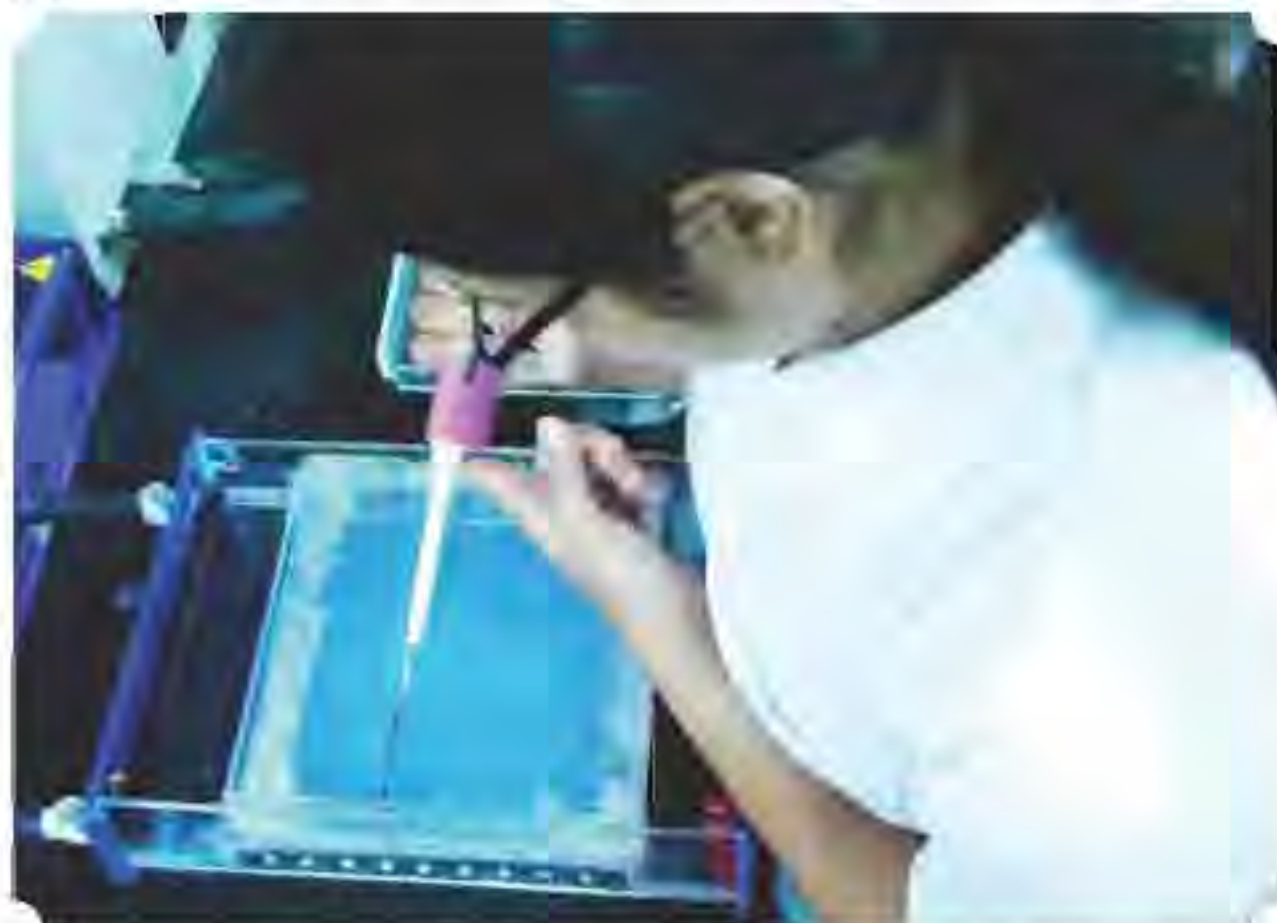


DNA banks are established to obtain knowledge to improve the efficiency of some conservation activities or to scientifically inform decisions related to the conservation of species. Other objectives of the creation of DNA banks may be related to training or distribution to scientists with an interest in different areas of biology.

DNA Bank as a depository shall store the biological material including sperms, embryo, tissues, blood (Red Blood Cells, White Blood Cells and Serum) and DNA of local wildlife species.

2. Development of Microsatellite markers for Akole lions

Species have been formed by centuries of natural selection. Different species have been selected to fit different environmental conditions. The use of microsatellites has become a standard method to estimate neutral genetic diversity in animals. This classical method is based on physical observation of such traits in adult animals and the careful maintenance of lineage records. Genetic markers provide information about allelic variation at a given locus. The increasing availability of molecular markers in animals allows the detailed analysis and evaluation of genetic diversity and also, the detection of genes influencing economically important traits. The majorities of molecular markers used nowadays with high-through put systems are microsatellite markers (simple tandem repeat, STR) and amplified fragment length polymorphisms (AFLPs). Until recently, micro-satellites were the markers used for mapping quantitative trait loci for functional traits in animals and tightly linked markers are used for marker assisted selection in practice. They are also the prerequisite for the identification of positional and functional candidate genes responsible for quantitative traits.



Microsatellite markers, AFLP markers, SNP markers, Mitochondrial DNA sequences and markers, and a Y chromosome markers dataset are important molecular data for wildlife genomics programs and also for ex-situ conservation. The use of microsatellites has become a standard method to estimate neutral genetic diversity in animals. Marker-assisted selection permits rapid identification of key individuals harboring useful genes.

Microsatellite markers are evenly distributed across genome and highly polymorphic, and can be identified

within DNA samples using PCR. The amplification capability of PCR provides the following advantages:

- Very little sample is required for a positive result, unlike traditional serological assays.
- PCR-based tests are easy to standardize and automate, ensuring reproducible results.
- PCR-based tests can be run on a variety of samples, including blood, semen, and hair.

GIR is the only abode of Asiatic lion. This is the only and single gene pool of this endangered species. It is schedule I animal as per Indian Wild Life Act, 1972. While in situ conservation efforts have been undertaken at species level, by preserving its habitat, its conservation by using genetic and modern techniques is needed. In this pilot project efforts shall be made to determine genetic composition of Asiatic Lions using DNA markers

DNA stocks from the DNA Bank would be genotyped for microsatellite markers. DNA extractions for samples will be done at Seed Gene Bank (SGB). SGB will prepare highly purified DNA extracts and will amplify the DNA loci of interest via the polymerase chain reaction (PCR) using fluorescent labeled primers. Analysis for microsatellite markers shall be done using Gene Mapper Software.

Samples will be collected lions in coordination with Sakkarbag zoo veterinary wing and sent to Gujarat Seed Gene Bank for genetic analysis and genotyping. Research will be conducted related to the genetic characterization of Lion. Genetic analyses shall be made possible by the development of highly variable, simply inherited, microsatellite DNA markers. These markers have core DNA sequences from 2-6 nucleotides in length that may be repeated from 10 to 100 times at a particular chromosomal site, and are transmitted from "both" parents thus providing a more detailed record of past breeding activity than mtDNA. Microsatellite DNA markers can be amplified by the polymerase chain reaction (PCR) from small tissue / blood samples and shall be detected through fluorescence imaging. The genotype of individual animal may be determined for a series of polymorphic DNA markers. This arrangement will be followed, till the facilities are developed at Sakkarbag under Leo-Gen project. This is approach is also adopted to reduce the cost of the project by utilizing the existing facilities and infrastructure, available with GSBTM.

Facilities:

Molecular work at Gujarat Seed Gene Bank

- DNA Sequencer
- PCR
- Micro centrifuge
- Gel Electrophoresis
- -20 Deg C Freezer
- -80 Deg C Freezer
- Bioinformatics Set up at GSBTM

Budget:

Sr.no	Subhead	DNA Banking	Microsatellite
1	Consumables & Contingency	800000	300000
2	Travel	50000	150000
3	Manpower	358800	322800
4	Equipments	645000	
	Total	1453800	1172800

LeoGen Activities:

- Blood DNA Isolation protocol optimized
- Tissue storage and DNA Isolation protocol in process
- Microsatellite markers to be optimized

12.7 Shivrath Center Of Excellence in Clinical Research

Shivrath Center for Excellence is a collaborative endeavour 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. The centre is 9001:2008 accredited facilities and is actively involved in generating trained human resource for CRO industries of Gujarat. The centre is currently running one degree and three certificate courses. Shivrath Centre of Excellence in Clinical Research got affiliated to Gujarat University on 02nd Jun 2010 for Five of its Training

Programs i.e., M.Sc. in Clinical Research (02 years, 4 semesters Full time program), Post Graduate Diploma in Clinical Research (PGDCR- 01 years, 2 semesters Full time program), Post Graduate Diploma in Advanced Clinical Research (PGDACR- 01 years, Part time program), Post Graduate Diploma in Clinical Trial Management (PGDCTM- 01 years, Part time program) and Post Graduate Diploma in Regulatory Affairs (PGDRA- Six months, Part time program). Students of the centre are regularly visiting various CROs and being taught by eminent industrialists from CRO industries. Centre organised A One Day State Level Symposia sponsored by GSRTM on Regulatory Affairs: The Backbone of Clinical Research on 09th Oct 2010 at Seminar Hall, Gujarat University, Ahmedabad. Eminent speakers like Dr. Rupesh Vala – Manager Clinical Services, Accutest India Pvt. Ltd., Ahmedabad, Mr. Nirav Chokshi, Research Scientist, Regulatory Affairs, Torrent Research Center, Bhat, Gandhinagar, Mr. Girish Parhate, Senior Regulatory affairs officer, Global Regulatory Affairs, Quintiles India Pvt. Ltd. Shared different aspects of Regulatory affairs with participants.



12.3 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, its 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 GUICOST has already developed BioACorn at C. C. Patel community science center, Vallabh Vidyanagar as a model center. Tender work for the Regional community science center at Rajkot is initiated and will be completed by this year.

12.3 Rural Development Regime

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 convert 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 devise 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.

13.0 Government of India Submissions

13.1 Marine Biotech Incubator

The state Government has been trying to implement a project of Marine Biotech Incubator-Park in the state, worth INR 80 crores. While the basic infrastructure cost would be borne by the state Government, GSBTM has submitted a proposal to Govt. of India, for the funding of the major instruments and pilot scale plant facility. The proposal has been revised as per the Department of Biotechnology, Govt. of India suggestions, and submitted for further process.

14.0 BTM In-House

14.1 Sixth Technical Advisory Committee Meeting

The sixth TAC Meeting was conducted on 7th October, 2010, under the chairmanship of Dr. Manju Sharma, Advisor-Biotech, Government of Gujarat. The committee was appraised about the progress in various projects undertaken by this office, advise was sought for the mechanism to be followed for the Financial Assistance Programme of GSBTM to support Research Projects in Gujarat and suggestions taken for reconstitution of the Technical Members of the Governing Body of GSBTM.



14.2 Seven Technical Advisory Committee Meeting

7th Meeting of the Technical Advisory Committee of GSBTM was held on 9th -10th March, 2011 in chairpersonship of Dr. (Mrs.) Manju Sharma. SSPBTM was given the charge of member secretary for the meeting. The core agenda of the meeting was to technically scrutinize the R&D proposals received by GSBTM under FAP-2010. The presentation of the projects was kept on 9 & 10th march, 2011. After presentations by more than 75 principle investigators from universities and research institutes of Gujarat, TAC has recommended the 23 projects.



14.3 Executive Committee Meeting

GSBTM had its 13th & 14th Executive Committee Meeting respectively on 13th July, 2010 & 24th March, 2011

14.4 Governing Body Meeting

GSBTM had its 7th Governing Body Meeting on 21st September, 2010

15. Budget

During the year a total of Rs. 1115 lacs were released to GSBTM.

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)

E-mail : hbupadhyay@hotmail.com

**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 annexed Balance Sheet of the above mentioned trust as at **31st March, 2011** 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

H.B. Upadhyay
Partner



Place : Gandhinagar
Date : 08/12/2011

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

Statement of Income liable to Contribution for the year ending on 31.03.2011

Name of Public Trust : GUJARAT STATE BIOTECHNOLOGY MISSION

Block No. 11, 9th Floor, Udhay Bhavan, Sector No. 11, Gandhinagar

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

	Amount	Amount
Gross Annual Income		248401458.00
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	213500000	
(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.		
Income liable to Contribution		213500000.00
		32901458.00

Place : Gandhinagar

Date : 08/12/2011

For B. Upadhyay & Co.,
Chartered Accountants

(H.B. Upadhyay)
Partner



GUJARAT STATE BIOTECHNOLOGY MISSION
Sec (or) : 11, Udhoghavan, Gandhinagar

BALANCE SHEET AS ON 31.03.2011

Liabilities	Sch	Amount	Assets	Sch	Amount
Diffused Grant Income					
Opening Bal	A	37987620.00	Fixed Asset	F	37987620.00
ADD : Transfer From Grant Dev of BT Exp. - 01 For the Current Period Asset Purchase		25633354.00	Opening Bal		25740446.00
Transfer From Grant Subj. BT Mission - 03 For the Current Period Asset Purchase		107092.00	Add : During the year		
			Investment	G	485533256.00
			FDR With GSFS		0.00
			FDR with Union Bank of India		
			Loans & Advances	H	495533256.00
					42479954.99
Unspent Grants/Balances					
BT Park Fund A/c			Deposits		4500.00
Opening Unspent Grant	B	160552074.00	Interest Accrued But not Due		95033.00
Add : Interest Earned on FDR During Year		13697693.00	TDS 2008-09		2788881.00
			TDS 2009-10		288105.00
			TDS 2010-11		24787.00
BT Venture Fund - M.H.5424 M.H.800					
S.H.02					
Opening Unspent Grant		0.00	Bank Balance		105500786.88
Add : Grant Received During the Year		100000000.00	State Bank of India - 30001816240		4072536.00
Less : Expenditure incurred during the year	C I	0.00	State Bank of India - 30513696097		
					109633324.56
Grant-3426 50 004 01 Devel. of BT					
Opening Unspent Grant		217123227.55			
Add : Grant Received During the Year		100000000.00			
Interest Earned on FDR During Year		15122614.00			
Less : Expenditure incurred during the year	C II	17082452.00			
Less : Transfer to Diffused Grant					
For the Current Period Asset Purchase		25633354.00			
		42715806.00			
		289530035.55			



Audited Statement of Accounts

Liabilities	Acc	Assets	Sch	Amount	Amount
Grant (3426 00 004 03 GSBTM)					
Opening Unspent Grant				8786152.00	
Add : Grant Received During the Year	11600000.00			11500000.00	
Less : Expenditure incurred during the year	8473595.00				
Less : Transfer to Other Govt Grant	326392.00				
For the Current Period Asset Purchase				8758867.00	5468355.00
Grant - Lepton Pilot Project					
Opening Unspent Grant				0.00	
Add : Grant Received During the Year	2003000.00			2003000.00	
Less : Expenditure incurred during the year	81843.00			81843.00	1818157.00
Grant Contribution Refundable (Money at BT Park Bank)				21400.00	21400.00
Guarant Council Of Science City				25000.00	
Security & Earnest Money Deposit					
Earnest Money Deposit				4265449.00	
Security Deposit - Solid "Travel & Security Deposit - Avelo Car Ltd				26003.30	
				3950.00	4292409.00
Salary Deduction					
Charges & Taxes				5490.00	
Retention Money				81955.00	
				3195.00	904000.00
Income & Expenditure					
Other than In-house Projects					
Opening Balance	58678774.50				
Add : Excess of Income over Expense	3451480.00			70028234.60	
In-house Projects (Educational)					
Opening Balance	893750.30				
Add : Excess of Income over Expense	513320.00			1387070.30	71229407.60
Total			Total	714687007.35	714687007.35

For B. Upadhyay & Co.,
Chartered Accountants

For Gujarat State Biotechnology Mission

B. Upadhyay
PartnerPlace : Gandhinagar
Date : 08 DEC 2011B. Upadhyay
Account OfficerB. Upadhyay
Institution DirectorPlace : Gandhinagar
Date : 08 DEC 2011

GUJARAT STATE BIOTECHNOLOGY MISSION
Sector : 11, Udhyogbhavan, Gandhinagar

INCOME & EXPENDITURE ACCOUNT
FOR THE YEAR ENDED ON 31.03.11

Particular	Amount	Particular	Amount
Bank charges	9391.00	Interest on Bank A/c	3426099.00
		Sale of Condemed Computers	31552.00
		Tender Fees	2700.00
		Misc. income	500.00
Excess of Income Over Expenditure	3451460.00		
Total	3460851.00	Total	3460851.00

For B. Upadhyay & Co.,
Chartered Accountants

(H.B. Upadhyay)
Partner

Place : Gandhinagar
Date : 07/08/2011

8 DEC 2011

For Gujarat State Biotechnology Mission

Mission Director

Place : Gandhinagar
Date : 07/08/2011

8 DEC 2011

Account Officer

17.0 Constitution of GSBTM

17.1 Constitution of Gujarat Biotechnology Council

Sr. No.	Name and/or Designation	Status
1	Hon'ble Chief Minister of Gujarat	Chairman
2	Minister of State, Industries	Member
3	Secretary, DBT, GOI	Member
4	Chief Secretary, GOG	Member
5	Principal Secretary (Finance) GOG	Member
6	Principal Secretary (Forest & Environment) GOG	Member
7	Principal Secretary (Industries & Mines) GOG	Member
8	Secretary (Higher & Technical Education) GOG	Member
9	Secretary (Health) GOG	Member
10	Secretary DST, GOG	Member
11	Secretary (Agriculture) GOG	Member
12	Dr.Manju Sharma, Principal Advisor, Science & Technology(BT Division), Gujarat	Member
13	Dr.P.K.Ghosh, Advisor, Science & Technology(BT Division)	Member
14	Director, Central Institute of Medicinal and Aromatic Plants, Lucknow	Member
15	Prof. Bharat B. Chattoo, Co-coordinator, Biotechnology Programme, Dept. of Microbiology and Biotechnology Centre, M. S. University of Baroda	Member
16	Vice-Chancellor, Anand Agricultural University	Member
17	Prof. Datta Madamwar, Head, Dept. of Biosciences, S. P. University, V. V. Nagar	Member
18	Prof. Harish Padh, Director, B. V. Patel Centre for Pharmaceutical Education and Research Development, Ahmedabad	Member
19	President, National Academy of Sciences, Allahabad	Member
20	Dr. Lalji Singh, Director, Centre for Cellular and Molecular Biology, Hyderabad	Member
21	Director, Indian Agriculture Research Institute, Delhi	Member
22	Director, Central Salt and Marine Chemicals Research Institute, Bhavnagar	Member
23	Prof. Subhash Chand, IIT, New Delhi	Member
24	Shri Pankaj Patel, CMD, Zydus Cadilla Ltd, Ahmedabad	Member
25	Shri Sudhir Vaid, MD, Concord Biotech Ltd, Ahmedabad	Member
26	Dr. Farzaan Engineer, MD, Quintiles Spectral (India) Ltd., Ahmedabad	Member
27	Dr.P.K.Desai, Span Diagnostic Ltd., Surat	Member
28	Dr.Vijay Chauthaivala, General Manager, CMB, Torrent Research Centre, Ahmedabad	Member
29	Dr.Devayani Tipre, Research Associate in DBT Project, Dept. of Microbiology, Gujarat University, Ahmedabad	Member
30	Director, National Institute of Oceanography (NIO), Goa	Member
31	Chairperson, National Dairy Development Board, Anand	Member
32	Dr.Amit Ghosh, Director, Indian Institute of Advance Research, Gandhinagar	Member
33	Mission Director, Gujarat State Biotechnology Mission	Member-Secretary

17.2 Constitution of Governing Body

No.	Name and Designation	Status
1	Chief Secretary, GoG	Chairman
2	Secretary ,DBT Gol	Member
3	Dr.Manju Sharma, Pri.Advisor(BT) to Science & Technology Department, GoG	Member
4	Principal Secretary (Industries & Mines), GoG	Member
5	Principal Secretary (Forest & Env.), GoG	Member
6	Principal Secretary (Higher & Technical Education), GoG	Member
7	Principal Secretary, (Agriculture), GoG	Member
8	Principal Secretary (Health & Family), GoG	Member
9	Secretary (Expense), Finance, GoG	Member
10	Secretary, Science & Technology, GoG	Member
11	Joint Secretary, BT, DST, GoG	Member
12	Dr.P.K.Ghosh, Advisor (BT) to Science & Technology Department, GoG	Member
13	Dr.A.M.Prabhakar, Advisor, GUJCOST, GoG	Member
14	Shri.T.P.Singh, Director, BISAG, GoG	Member
15	Prof. Bharat Chattoo, Coordinator, Dept. of Biotechnology, M.S.University, Baroda	Member
16	Dr. Dutta Madamwar, HoD, Microbiology Department, SP University, V.Vidyanagar	Member
17	Dr. Harish Padh, Director, PERD, Ahmedabad	Member
18	Dr.P.K.Ghosh, Director, CSMCRI, Bhavnagar	Member
19	Shri Pankaj Patel, CMD, Zydus, Ahmedabad	Member
20	Dr.Rasik.R.Italiya, MD, Italiya Biotech, Surat	Member
21	Mission Director, GSBTM, GoG	Member Secretary

17.3 Constitution of Executive Committee

No.	Name and Designation	Status
1	Addl. Chief Secretary, Science & Technology, Dept., GoG	Chairman
2	Pri.Secretary (Expenditure), Finance Dept., GoG	Member
3	Dy. Secretary (BT), Science & Technology, Dept., GoG	Member
4	Advisor, GUJCOST, GoG	Member
5	Director, BISAG, GoG	Member
6	Dr.Harish Padh Vice Chancellor, S.P.University, V.Vidyanagar	Member
7	Dr.P.K.Ghosh Advisor (BT), Science & Technology, Dept., GoG	Member
8	Mission Director, GSBTM	Member Secretary
9	Pri.Secretary, Education Dept., GoG	Special Invitee
10	Pri.Secretary, Agriculture & Co-operation Dept., GoG	Special Invitee

17.4 Technical Advisory Committee

Sr. No.	Name & Designation	Status
1	Dr. Manju Sharma, Pri. Advisor, BT , Science & Technology Dept., GoG,	Chairperson
2	Dr. P.K.Ghosh, Advisor, BT , Science & Technology Dept., GoG,	Member
3	Dr. Amit Ghosh, Former Director, IMTECH, Chandigarh	Member
4	Vice Chancellor, Anand Agriculture University, Anand	Member
5	Dr. Dutta Madamwar, Microbiology department, SP University, V.Vidyanagar	Member
6	Shri A.K.Saxena, IFS, Mission Director, GSBTM	Member
7	Sector Specialist, GSBTM	Member Secretary

17.5 Team GSBTM

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



Dr. Snehal Bagatharia
Sector Specialist, Agriculture Biotech



Dr. Anand Bhadalkar
Sector Specialist, Industrial Biotech



Anasuya Bhadalkar
Sector Specialist, Marine & Environment Biotech



Dr. 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>