



GOVERNMENT OF GUJARAT

Annual Report 2007-08

*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...*

*Anonymous*

॥ जीवो ब्रह्मैव नापरः ॥



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







सत्यमेव जयते

GOVERNMENT OF GUJARAT

## Annual Report 2007-08



॥ जीवो ब्रह्मैव नापरः ॥



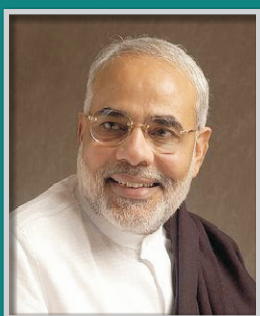
**GUJARAT STATE BIOTECHNOLOGY MISSION**



## Organizational Structure



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



**Shri. Narendra Modi**

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



**Dr. Manjula Subramaniam, I.A.S.**

Chief Secretary, Government of Gujarat &  
Chairman of Governing Body



**Shri. Raj Kumar, I.A.S.**

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



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

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

# INDEX



	Message of The Secretary	
	Foreword	01
01	Constitution	02
02	Organizational Structure	03
03	Approach and Strategy	04
04	Policy planning and related Initiatives	06
05	Biotechnology Infrastructure Development in Gujarat	08
06	Biotechnology Research, Innovation support and Development	15
07	Biotechnology Human Resource Development	17
08	Development of Biotechnology Entrepreneurship	20
09	Encouraging Biotech Business and Networking	24
10	Promotion of Biotechnology sector in Gujarat	25
11	Budget	32
12	Audit	32
13	Staff	32
14	Office Facility	32
15	Annexure	33
	Annexure 1: Accounts of GSBTM for 2007-08	34
	Annexure 2: Composition of Biotechnology Council	41
	Annexure 3: Composition of Governing Body	42
	Annexure 4: Composition of Executive Committee	42
	Annexure 5: Biotechnology Research Support Details	43



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GOVERNMENT OF GUJARAT

**Shri Raj Kumar, I.A.S.**

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. Conceptualization of overall framework, elaborate development blueprint, Specific strategies, focused action and programs, have been the salient feature of state's endeavor in the field of biotechnology.

Right from its formation in 2004-04, Gujarat State Biotechnology Mission has been slowly and steadily developing a strong platform. The key issues of policy, infrastructure, research, human resource development, entrepreneurship, business and coordination, are being addressed.

GSBTM is playing both the role of catalyst and facilitator. It is paying definite dividends. To provide an enabling environment for growth of Biotechnology, new initiatives have been taken for developing Biotech industrial clusters. To provide encouraging environment for high end application based research, sector specific facilities are being developed. To ensure the availability of skilled manpower, skill development initiatives are being taken and supported. Intensive actions have been taken to push the growth of biotech business and industries.

Gujarat is being recognized as one of the biotechnology destinations of the country. The high level of investment interest shown by the Biotechnology industries is a welcome sign. Best Bio-State Award, given to Gujarat, by Bio-spectrum, is confirmation that state is cruising along in right direction.

With every passing year, GSBTM has been consolidating the efforts of previous years. The annual report of GSBTM for the year 2007-08, provides a brief account of the activities undertaken during the year. The report is a reflection of last four years of states' endeavors, achievement and commitment towards this knowledge based sector.

It is a pleasure to be a part of such team spirit and scientific efforts. We aim for better. We endeavor for best. 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.

Raj Kumar, I.A.S.  
Secretary-DST,GoG



## FOREWORD

Constitution of GSBTM as state nodal agency for Biotechnology has provided an organizational and institutional mechanism to coordinate the Biotechnology development activities.

Running into its fourth year of existence, GSBTM is consolidating the platform for enabling the growth of biotechnology in the state, by undertaking appropriate actions or programs, in conformity with framework of goals conceptualized and strategy developed. GSBTM is carefully treading the path by playing both the role of facilitator and catalyst. Hence 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, infrastructure development, research and innovation, human resource development, promoting biotech entrepreneurship, promoting biotech business, information dissemination and awareness development.

Declaration of Biotech policy of the state, master planning of three phases of Biotech park, by private developer, developing designs of incubation centre, completion of location feasibility study, land identification, stakeholder inputs in Agro-Biotech park concept, proposal of marine biotech incubator, including proposal submission to DBT and its presentation, training program for teachers, entrepreneurship program, were few of the activities. Developing Compendium of Bio-informatics, patent database in Marine Biotechnology, drug report, have been few of the publications. GSBTM also guided and facilitated dissertation work to Bio-informatics students. During the year work has been initiated on the projects of Bio-informatics Virtual network, Biodiversity genebank, Gujarat genomic initiative and Marine resource centre.

The singular achievement during the year was Best Bio-State award given to Gujarat by Biospectrum for the year 2007, the award has been given on the basis of efforts undertaken by state government, in terms of policy, infrastructure, business and investment. Bringing Gujarat on national platform in biotechnology has been an encouraging milestone. It also poses immense responsibility to sustain and improve the enabling factors.

Critical constraints stand to decrease, as Biotechnology stakeholders, join hands in this team effort. With every passing year, the GSBTM looks forward to consolidate its efforts. 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, are growing in experience and 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"

Mission Director,  
GSBTM

## 1. CONSTITUTION

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], under the Department of Science & Technology.

### 1.1 Vision

'To realize and harness the potential of Biotechnology as a human endeavor for the highest intellectual pursuit and as an effective future delivery system for creating a disease free, nutritionally secure society living in safe, clean environment, leading to overall socio-economic growth, welfare and progress of humanity'

### 1.2 Objectives

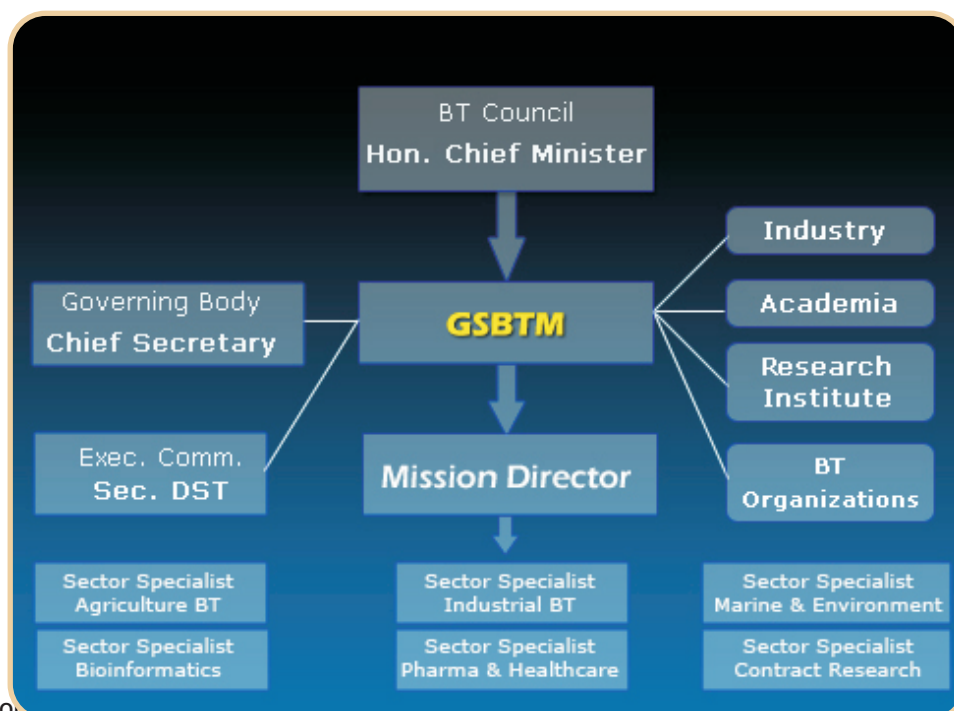
- To implement the biotech policy and programs
- To liaise between the Central and State Government, international institutions, organizations, academia, research and industry for the promotion of biotechnology sector in Gujarat
- To conduct studies and promote research in the field of biotechnology
- To promote and develop the human capacity and infrastructure support in the field of biotechnology
- To facilitate the monitoring, execution, implementation and evaluation of State Government programs in the area of biotechnology

### 1.3 Activities

- Awareness generation and knowledge upgradation programmes and information dissemination programs, like seminars, workshops, lecture series
- Network and coordination like participation in fairs and exhibitions
- Supporting and developing Centres of Excellence in various sectors of biotechnology
- Supporting and facilitating Human Resource Development in biotechnology
- Promoting biotechnology research
- Supporting infrastructure development
- Developing institutional framework for the implementation and regulation of biotechnology programmes

## 2. ORGANIZATIONAL STRUCTURE

Gujarat State Biotechnology Mission, a dedicated organizational structure under Department of Science & Technology, has been visualized as nodal agency for coordinating the Biotechnology programs and activities in the state. It's been functional as mission since April, 2004, with the appointment of two sector specialists and later on with the appointment of Mission Director. GSBTM has been visualized as an autonomous body and registered as Society during the very first year on 19th October 2004. The Memorandum of Association (MoA) incorporates the scope, duties, responsibilities and functioning of GSBTM.



As an autonomous body, Gujarat State Biotechnology Mission has formulated its the Governing Body of GSBTM is headed by Chief Secretary, Gujarat, state and includes representatives of DBT, Gol, and Secretaries of key departments, industry representatives and academicians. Executive Committee of GSBTM is headed by Secretary, Department of Science & Technology and includes representatives of industry, technical experts and interfacing departments. State government has also appointed technical experts as Principal Advisor and Advisor. The state has constituted Gujarat Council of Biotechnology, headed by H'ble Chief Minister of Gujarat and consists of experts & professionals of national & international repute.

**The 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.

To achieve the above said objectives, GSBTM has planned following:

- Policy Planning Support and Strategic Initiatives,
- Biotechnology Infrastructure Development,
- Biotechnology Research, Innovation and Development Support,
- Biotechnology Human Resource Development,
- Promoting Biotechnology Entrepreneurship,
- Encouraging Biotech Business,
- Coordination and Networking,
- Information Dissemination and Awareness Generation,

### 3. APPROACH & STRATEGY

GSBTM has been witnessing Biotechnology strengths and trends of development for more than five years now, at global, national and state level. Various efforts are made for the development of priorities and approach for excelling the Biotechnology development in the state is to identify strengths and gaps, in terms of policy planning, infrastructure, research, human resource development, biotech industries, business and related issues.

With the formation of GSBTM as state nodal agency, the main focus of GSBTM shall be to provide support to development of Biotechnology in the thrust areas, focusing on promoting biotechnology in Gujarat, projecting the state's strength at national and regional level, strengthening biotechnology research, human resource development, strengthening research infra structure, developing networking mechanisms and providing financing modalities.

Accordingly GSBTM has developed initiatives pertaining to policy planning, infrastructure development, research and innovation, human resource development, promoting biotech entrepreneurship, promoting biotech business, information dissemination and awareness generation, in the state. Developing Gujarat state as the Biotech Hub of India, efforts have been accelerated in last few years. The actions have been accordingly taken along these directions, during the year 2004-05, and have been continued with more focus in 2005-06. During the year 2006-07, consolidated efforts have been continued for developing Gujarat state as the Biotech Hub of the country.

#### 3.1 Gujarat : Bio-State of the Year 2007

Gujarat has been taking steps towards the knowledge sector and its performance in the area of Biotechnology has been taken note at the national level. For the dedicated efforts undertaken by State Government to promote Biotechnology in Gujarat were rewarded as “Best Bio-State of the year 2007”. Cyber Media is a Bangalore based established and prestigious publication group, which has been focusing and covering the growth and development of knowledge sector in India, encompassing information technology and biotechnology. It has been tracking a progress and developments taking place at National and State levels in these fields and has been taking it to intellectual professional researchers and common readers. Biospectrum is an important magazine of this publication house whose publication extends to the entire country and Asia - Pacific as well.

This magazine, dedicated to Biotechnology, has become an important source of information in this field. Biospectrum magazine is in close contact with DBT, CSIR, DST and other policy making departments of a Government of India and other States. It has nearly become a voice of Biotechnology sector and has been acting as a bridge between Government of India and the Biotechnology Stake holders. Biospectrum has been analyzing the growth and development of Biotechnology sector with reference to new products, new technology and new enterprises. It has played a key role in shaping up the Biotechnology development strategy of the country.

To encourage the originations, individuals, industries and States in the field of Biotechnology, Biospectrum magazine has instituted awards for various categories like, Person of the year award, Life time contribution

Gujarat State Receiving BioSpectrum Award for “Best Bio-State of the Year 2007”





## GSBTM at 5<sup>th</sup> BioSpectrum Awards 2007, Bangalore



award, Entrepreneur of the year award, Product of the year award and Bio state of the year award. This award was declared in the December issue of Biospectrum magazine. The award was received by GSBTM on dated 29 December, 2007 at Bangalore in the Biospectrum Award Function. For the year 2007 Gujarat State has been given Bio state of the year award on the basis of various parameters like the various initiatives taking by the State Government, various policy level and scheme level actions undertaken, involvement and contribution of key department and policy makers (Chief Ministers, Professionals etc), new investments in the field of Biotechnology in the state, and future planning.



## 4. Policy Planning and Related Initiatives

The State Biotech policy is an instrument which not only gives direction to biotechnology growth in state but also reflects a declared commitment of state government for the sector. While policy provides broad guidelines and macro-level approach, enabling implementation, needs developing specific strategies and action plans. GSBTM has been handling the responsibility of the formation of the Draft of Incentive Biotechnology Policy, which was conceptualized and initiated during 2004-05 after reviewing various existing policies of different states in the country. The same document was sought to be revised during 2006-07, with important features needed for BT industries, incorporated it and finally submitted to the state government for further consideration and approvals. For wider feedback, the document was placed on website of GSBTM and advertisement in newspaper. The same was presented in the meeting of Gujarat Council of Biotechnology. Based on this policy document, Strategic Roadmaps have been developed; key sub-sectors have been identified; thrust areas within each and specific subsector has been focus and appropriate interventions will be taken for further development by state government. Infrastructure development, Research development, Human Resource development, Entrepreneurship support, Business development, Networking, Coordination and Awareness generation etc, have been identified as the key pillars of Biotechnology development for Gujarat. After incorporating the various suggestions made during the presentation to the H'ble Chief Minister of Gujarat on 8th Dec. 2006, the Biotechnology Policy of the State was released on 17th April, 2007. The same has been put on the website of GSBTM since then.

### 4.1 Second Consecutive Year of the 11<sup>th</sup> Five Year plan

Keeping conformity with national vision GSBTM had also formulated 11th Five year plan, a tool to achieve the policy objectives and facilitate biotech-enabled development in the state. During the second consecutive year of 11th Five year plan, GSBTM has consolidated its efforts for creating Infrastructure Development, Research and Innovation, Human Resource Development, Entrepreneurship Development, Biotechnology Business and Information Dissemination for each of the Biotechnology allied sectors.

### 4.2 Brain Storming Session on Bioinformatics Sector Development in Gujarat

Bioinformatics has emerged as an interdisciplinary research area of the post-genomic time, aiming at transforming the sequencing data into the biologically meaningful knowledge. Though there is a critical insufficiency of individuals with the knowledge of multidisciplinary field of Bioinformatics.

Strengthening bioinformatics R&D and Infrastructure is emphasized by Department of Biotechnology, Ministry of Sci. & Tech., GoI, and also suggested by the members of Technical Advisory Committee, GSBTM, for the development of Bioinformatics in Gujarat state we necessitate a Brain Storming Session, where experts, professionals and scientists of the field can suggest a concrete strategy of action. To deal with the dearth of Bioinformatics expertise and institutional support blocks the further development of Biotechnology advancements and its industrial growth is needed in Gujarat. It is very much imperative to take views from the dignitary guests and scientist to build up an institution or consortium which suggests the policy to strengthen existing Bioinformatics Academia and Industrial venture in the state. With this clear objective GSBTM has invited few of the eminent personalities who can provide their expert suggestions on to overall development of the sector.



## Bioinformatics Dignitaries providing their comments for Bioinformatics sector development



The discussion focused on the major issues pertaining to the sector like Infrastructure facilitation, research and development, skilled manpower generation, industry-academia participation etc.,. The invited Key Note Speakers were, Prof. A. S. Kolaskar, Former Vice Chancellor, Pune University; Dr. T. Madhan Mohan, Director, Apex Bioinformatics Centre; Dr. K. Guruprasad, Coordinator, Centre for Cellular & Molecular Biology; Dr. Anuradha Acharya, Founder & CEO, Ocimum Biosolutions. Other invited Dignitary Guests were Dr. Manju Sharma, Principal Advisor, DST, GoG; Prof. Alok Bhattacharya, Coordinator, Bioinformatics Centre, Jawaharlal Nehru University, New Delhi; Prof. S. Ramakumar, Coordinator, Bioinformatics Centre, Indian Institute of Science, Bangalore; Prof. S. Krishnaswamy, Coordinator, Bioinformatics Centre, Madurai Kamaraj University, Madurai; Dr. P.P.Mathur, Coordinator, Bioinformatics Centre, Pondicherry University, Pondicherry. Local dignitaries were also invited as to discuss the current status and future development of the sector. State dignitaries provided their valuable inputs were, Dr. Amit Ghosh, Director, Indian Institute of Advanced Research, Koba; Dr. Desh Deepak Singh, Department-Bioinformatics & Structural Biology, Indian Institute of Advanced Research, Koba; Dr. Vijay Chauthiwale, General Manager - Discovery Research, Torrent Research Centre, Bhatt; Dr. Manish K. Gupta, Assistant Professor, Dhirubhai Ambani-Institute of Information Communication Technology, Gandhinagar; Dr. D. B. Chokshi, Head & Professor, Department of Computer Science, S. P. University, Anand; Prof. R. V. Upadhyay, Professor & Head (Dept. of Physics) & Department of Bioinformatics Bhavnagar University; Dr. Prabhudas Patel, Biochemistry Department, Gujarat Cancer & Research Institute, Ahmedabad; Dr. Rakesh Rawal, Bioinformatics Project In-charge, Gujarat Cancer & Research Institute, Ahmedabad. The inputs and recommendations of the eminent scientists, professionals and experts have been documented to strategize a path of action for further development of Bioinformatics in the state.



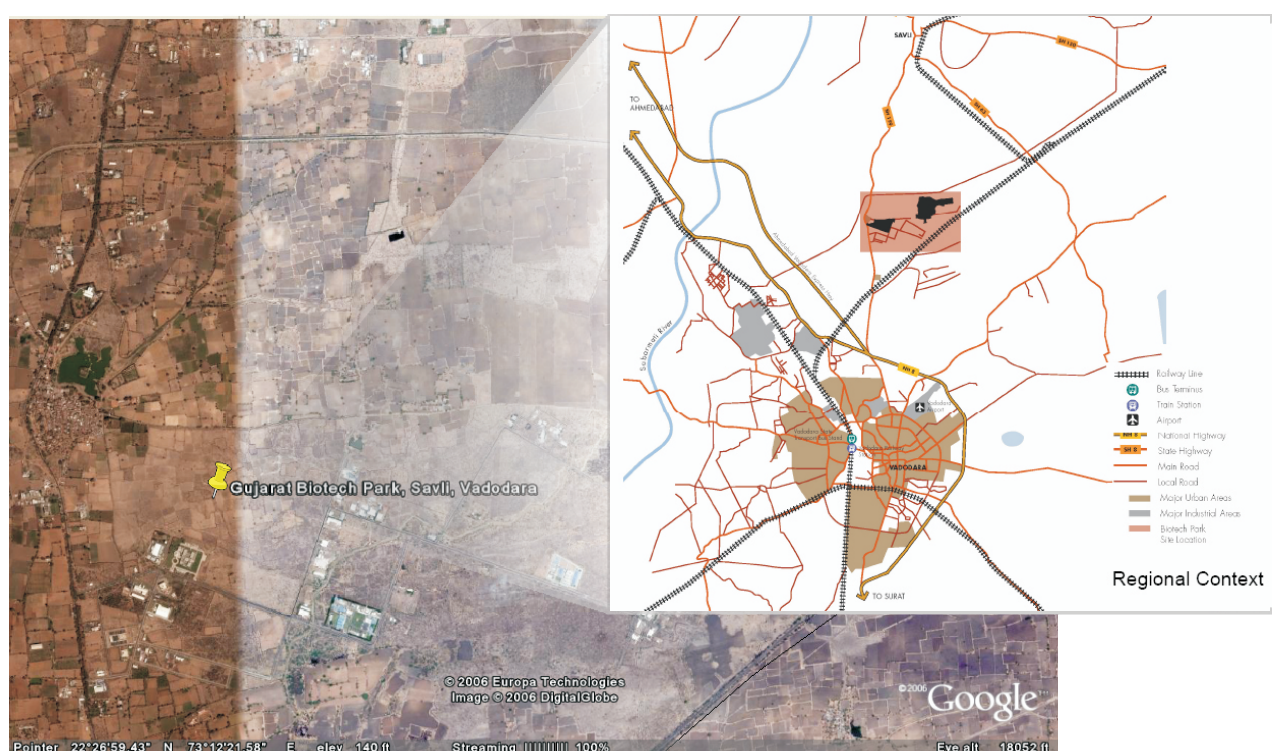
## 5. Biotechnology Infrastructure Development in Gujarat

In Gujarat, in view of the requirements of Biotech infrastructure and industries development, specialized approach for cluster development and more specific and knowledge intensive clusters in the form of Biotech parks are already welcomed by the state government. Government of Gujarat has promulgated ordinances to facilitate setting up of Special Economic Zones and Industrial parks, apart from the single window system clearance and delegated responsibilities of power, duties etc. In addition to the land availability, state government also proposes to facilitate development of other sector specific infrastructure such as centre of excellence, incubation, accreditation, testing, and validation in the respective zones.

As a result country's largest Biotechnology Park at Savli, Vadodara is taking shape into realization. The Biotechnology Park, Savli, Vadodara, is planned to be the country's largest Biotech Park, spread over the area of 700 acres which is being developed with Public Private Partnership model. After due procedure of competitive bidding, Akruti-Nirman-TCG-UIH consortium has been selected as Private Partner for developing the Biotech Park, Savli. The BT Park is being developed as SEZ, with GIDC as developer and GSBTM as co-developer. The proposal for same was developed by GSBTM / GIDC, and was submitted to Government of India. For the land allotment in proposed SEZ area, formal approval has been received for declaring 36 acre of BT Park, as SEZ, while notification is awaited. Two presentations have been done to MOEF on 10th Aug, 2007 and 27th Dec. 2007 regarding seeking environment clearance.

While Phase II & III are to be developed by private partner, Phase I has been developed by GIDC. In continued efforts for the Park, consequent to the selection of private partner, the MoU has been signed. However final permission is awaited. In accordance with conditions put by GIDC and its formal compliance, land has been allotted to two companies in Non -SEZ portion of BT park. As decided by governing body, designs of proposed incubation centre at BT park, Savli, are being developed in consultation with private partner. The same have been finalized after series of technical meeting. The work of overall master planning of Biotech Park is being done by private partner, by engaging international consultants. The Share holder agreement and Project development agreement, developed by Ernst & Young, have been finalized, after various round of discussion. The same are being legally vetted. Gujarat Akruti-TCG Biotech Ltd, Joint Venture Company (SPV) has been formed. The SPV has applied for Phase II land and has taken the possession for undertaking development.

### 5.1 Gujarat Bio-Tech Park, Savli, Vadodara



The Biotech Park, Savli, Vadodara has two components, Innovation arcade, and Industry arcade. The various components of Innovation arcade are, Common equipment library, Training centre, modular labs, Pilot plant facility, Bio-incubator, which are to be developed over a period of three phases (2006-2011). The innovation arcade shall be important facility for the Park. An area of 17 acres, earmarked, enclosed with boundary wall, by GIDC, has already been purchased from GIDC and work has to be started by GSBTM. Since Common facility centre, is very important to BT park from utility, marketing and operation perspective, it was decided that private partner may be actively involved in its designing and implementation or execution. The governing body decided private partner can develop the design and undertake execution, as per world class standards but financial liabilities of state government would be limited to the tune SOR of Roads & Building department of Govt. of Gujarat. Akruti-TCG have engaged the consultants DCPL and developed the architectural designs. The elaborate architectural and technical designs, finalized, including the estimated budget, were recommended by Incubator Overseer Committee, constituted for the purpose. The committee headed by Dr P. K. Ghosh, Advisor, BT, GoG, included Dr Amit Ghosh, Director, IIR, Gandhinagar, Shri Sudhir Vaid, MD, Concord Biotech, Dr Rustam Modi, Director & Head, Intas Biopharma Ltd., Dr Vijay Chauthaiwala, Torrent Pharma Ltd. The planned incubator has built up area of approx 197, 000 sqft, with estimated cost of around Rs. 49.55 crores.

## 5.2. Major Infrastructure Initiatives

Gujarat has definite strengths in agriculture, animal husbandry, fisheries, horticulture, etc, in terms of crops, oilseeds, medicinal plants, spices, dairy etc. Agriculture biotechnology is gaining momentum and at national level it has increased from 11% to 20%, in terms of revenue and is registering the growth of nearly, 87%. With strong raw material base, in this aspect, Gujarat can provide strong platform for development of Agriculture Biotechnology. In this respect, creating an ecosystem by providing dedicated facilities in terms of infrastructure, services etc. A dedicated Agro-Biotech Park would be a much required facility.

For conducting location and feasibility study Ernst & Young Pvt. Ltd. were engaged as management consultant of the said park. GSBTM has provided technical and relevant inputs for overall development of concept in terms of activities focus areas, facilities, components etc. Ernst & Young have completed their study and have submitted the draft report.

The proposed Agro - BT Park has multiple stakeholders in terms of different department - agriculture, animal husbandry, fisheries, dairy, horticulture, ayurveda. It has various interfacing organizations - GSFC, GNFC, GGC, Gujarat Agro-industries Corporation, Seed Corporation, Oil seed Boards, Fisheries Corporation. It has interface with various industries - seed industries, Bio-fertilizer industries, tissue culture industries, food process industries. Since Agro-Biotech Park would provide an umbrella of facilities and activities, a workshop was organized to seek wider technical inputs from Stakeholders 30th July 2007. Based on the recommendations drawn for incorporation in the Park concept are documented and further actions were initiated.

State government has taken various locations into consideration for social, urban and basic infrastructure of the park, after scrutinizing the Ahmedabad-Gandhinagar area is chosen as knowledge corridor. As an immediate action requests have been made to respective Collectors for the land availability. In this respect, critical part is the identification and availability of land. GSBTM has identified few patches of land and they are to be reserved for this purpose. GSBTM is formally requesting the land from state government. The process would entail, payment of cost decided by state government, taking possession and later on handling the related issues, involved while developing the park in public private partnership. Approx land requirement could be ranging between 150-300 acres. The requisite funds, as and when needed, will be demanded from the government.

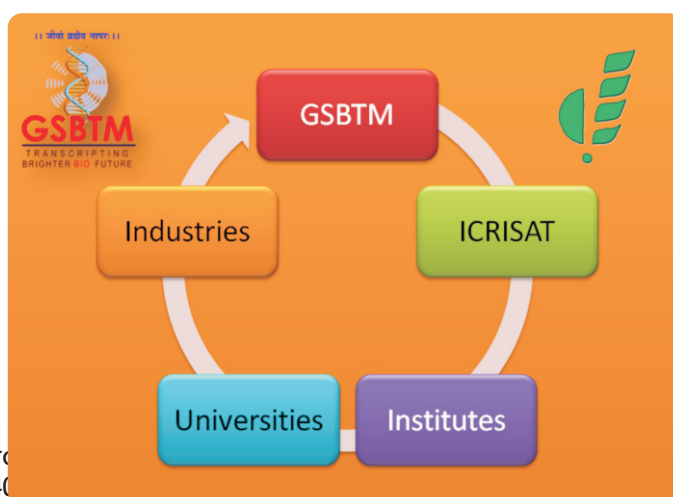
### Agri Business Incubator

Business incubation is a dynamic process of business enterprise development. Agri Business Incubator (ABI) is a specific technology oriented incubation system to create new ventures and to develop and commercialize new products in the agri business segment. Agri Business Incubation generally provides support to startup companies through agro technology, Business consultancy, Infrastructure and networking.

It is envisaged that there is a need for an agri-business incubator at Gujarat State Biotechnology Mission (GSBTM) to cater to the needs of the industry in incubating agri-biotech related companies in the state. Its main objective could be to accelerate the agri-biotech based technology transfer and commercialization, to network with R&D centers of excellence, Universities, Academic Institutions and Agri-biotech related incubators and incubates globally, to foster the creation, development and innovation of agri-biotech business in Gujarat to maintain the competitive edge in the present era of globalization and trade liberalization, to provide services on marketing assistance, quality evaluation research and development and customized technical assistance and also the center can create entrepreneurs by helping agri-biotech businesses to grow in Gujarat state.

The partnering institutes for the centre would be, GSBTM heading for Policy, Planning and Setting up the Incubator by infrastructure, ICRISAT guiding for Development, Coordination and Business Facilitation support, and State Institutes and Agriculture Corporates for Technology or Consultancy Services and enabling environment for nurturing and commercialization. The total cost of the project was approximated around Rs.300 lakhs for five years.

#### Partners For Gujarat Agri-Biotech Business Incubator



#### Infrastructure Details

- Physical Resource
- Office space - 4000 Sqft.
- Lab space - 3000 Sqft.
- Shell space - 2500 Sqft.
- Seed QC Lab space-500 Sqft.
- Total space - 10000sft
- Agricultural land - 10 ha. on need basis.
- Green house - 5 units of P2
- Biotech lab equipments and facilities
- Mobile seed processing equipment and facilities

#### Amenities

- Access to video & Tele-conferencing
- Access to conference halls
- Access to restrooms & apartment
- Access to internet & telecommunication
- Access to transportation facilities
- Access to cafeteria

### 5.3 Marine Biotechnology Park

Gujarat has longest coast line and rich marine Biodiversity. It has very high potential for developing marine biotechnology and attracting investments. The Marine Biotech Park is aimed to facilitate the start ups and the established companies. Consequent to technical; expert committee meeting, concept development, the project of developing marine Biotech Park has been submitted to DBT, Gol. A presentation has been made to DBT on 4th Oct. 2007. Based upon the requirement of the project, the location and land, for the proposed Marine Biotech Park, has been identified.

The State Level Location Analysis as well as On-site Location Analysis for the park was undertaken on the parameters of proximity to the sea, Type of the land - Agricultural, Non-agricultural, Pasture, Terrain, Existing connectivity, Manpower availability in the vicinity, Presence of other industrial activities which might complement the incubator, park activities, Presence of polluting and non-polluting industries in the vicinity,



Distance from CETPs, Agricultural produce in the nearby areas, if any, Human communities in the close vicinity of the location, etc. On the basis of above and availability of adequate land parcel, location at Sachana, village near Jamnagar has been identified. Different sites were studied for their basic aspects, needed for setting up a Marine Biotech Park. The project is envisaged to be started in 100 Acre, with possibilities of expansion at a later stage. The proposal for seeking this land for developing Marine Biotech Park has been submitted to state authorities. To provide a dedicated infrastructure, it is planned to develop Marine Biotech Park at Jamnagar. The whole concept is visualized in phased manner and it includes Marine Bio-Resource centre, multi-tenanted laboratories, incubator, pilot plant facilities, common facilities centre and amenities.

The main objective of creating Incubator in the park is to promote & develop Marine Biotech Industry in Gujarat, to provide facilities for any lacunae felt by any existing Marine and/or Aquaculture Industries, to promote linkage between industry and academia, within industry and within academia, to promote all kinds of marine technology transfers for the marine biotech industry to prosper in the State. Components of the Incubator include, Components Facilities and Quality Assurance Facility, and Animal House. The targeted Incubatees of the park can be researchers with research that can be converted to proof-of-concept, corporate R&D, entrepreneurs in marine sciences, needing certain wet lab/marine life capabilities, marine biotech & aquaculture start ups, already existing marine biotech & aquaculture companies.

While marine bio-resource centre, approved by governing body is being developed at Ayurvedic University, Marine Biotech Park, with its incubation centre and related facilities, is proposed to be developed at Jamnagar. After analyzing socio-urban-infrastructure, marine resource availability, presence of industries, future growth, air and railway connectivity etc, Jamnagar is the preferred location. Accordingly, after site visit, the land available has been identified. A formal request for allotment of land has been made. The process would entail, payment of cost decided by state government, taking possession and later on handling the related issues, involved while developing the park in public private partnership. The initial approximate land requirement is ranging between 150-300 acres.

#### Marine Bio-Resource Center

The rich marine resource of Gujarat offers vast opportunities in the field of Genetic conservation of marine biodiversity, The richness of marine resources in Gujarat and the potential of Biotechnology in conservation, finding novel uses and applications, increased productivity, sustainable use, enhancement and development of marine biotechnology, needs dedicated infrastructure, continuous research and development efforts. The vast marine bio-resource of the State, needs to be first conserved and the knowledge base generated from research on this bio-resource needs to be put to optimal use, for betterment of mankind. Establishment of centre of Marine Bio-resource would help to serve the above purpose.

The need and infrastructure for facilitating development of Marine Biotechnology in the state was discussed in meeting of Gujarat council of Biotechnology, in its meeting dated 14th June, 2005. Gujarat state biotechnology Mission has conceptualized the development of Marine Bio-resource Center. The main activities of Marine resource centre would be the Survey and data collection of the Marine Biodiversity of the State while long term objective would be, (I) Characterization of the isolates, (ii) Ex-situ conservation of the marine biodiversity by sample preservation or cultivation or other methods, (iii) creation of a gene bank for the same, (iv) Screening the marine microbial and planktonic flora for bioactive compounds & unique bioprocesses etc.

The marine resource centre would, help (i) in developing genomics databases and characterization of marine bio-resources of Gujarat, (ii) in Developing centralized facilities of genetic conservation, possible techniques for its use and practice, (iii) in Providing high level infrastructure for molecular biotechnology research to academia/ institutes and biotechnology industries, (iv) in facilitating genetic conservation of marine floral, faunal and microbial diversity, (v) in facilitating development of research skill in marine biotechnology.

The exclusive features of this proposal are, (i) It is collaborative effort between three state government agencies, (ii) It utilizes the existing strengths and resources of participating agencies, (iii) It stands to provide high end facilities and quality environment for university researchers, (iv) It is exclusive high end genomic initiative, both from national & International perspective, (v) It has strong future collaborative potential,

It being a Multi-institutional approach, in initial phase, it intends to involve key state government organizations - Gujarat State Biotechnology Mission, DST, GoG, Gujarat Ayurved University, Jamnagar, and Gujarat Forest Department. It involves collaborative efforts between three state government agencies, using their resource and respective strengths.

Consequent to the approval in the Governing body and also by technical Advisory committee of GSBTM, further action for implementation of project has been initiated. Discussion with VC, Ayurved University, has been done for the availability of space and consent of university for developing the centre. Planned action required are, formation of implementation committee, signing of MOU with university and giving project to university and release of funds in accordance with the terms and condition, specified by GSBTM.

## 5.4 HLA Registry Facility and Cord Blood Bank

During the first Biotechnology Council Meet, under the chairmanship of H'ble Chief Minister of the State, it was suggested to establish HLA Registry Facility, in the state. It is needed for the treatment of a large number of diseases prevailing in the State. In the fall out meeting of Healthcare Biotechnology Summit, held on 4th February, 2006, and also during the scientists meeting conducted on 16th May, 2006 at Gandhinagar, experts recommended to develop this facility. The capabilities for establishing and operating State Level Cord Blood Bank, Utility factor of such a facility, Operational Mechanism and Maintenance of the facility, Self sustainability of the facility, Conduct of Stem Cell Research, Ethical and Biosafety issues and other related issues. The proposed Human Leucocytes Antigen (HLA) Registry facility in the State by GSBTM to develop a ready to refer database of over 30,000 HLA Types, for addressing the blood related disorders, highly prevalent in Gujarat and also to facilitate organ transplanting was approved. In accordance with the recommendations of experts, it was decided that state based organization having technical competence would submit the project jointly with All India Institute of Medical Sciences (AIIMS), Delhi to DBT. GSBTM would facilitate the project preparation and submission. The proposal from Indu Research Foundation, Vadodara, was forwarded to AIIMS for approvals and it was approved for developing such facility at state level after considering all the parameters.

## 5.5 Gujarat Genomic Initiative

Gujarat, with its rich biodiversity, is regarded as the Gene Treasure and is one of the 34 Biodiversity hotspots of the world, having, and more than 7374 floral and faunal species. It includes 4,320 species of plants and 2,728 species of animals (GEC 1996). The State thus harbors 14% of the fish, 9% amphibians, 19% of reptiles, 37% of birds and 25% of the mammalian species recorded in the country. Dedicated program for screening and identification of new genes is required as genome initiative. More than 32 genome initiatives have been taken while all these are programs are operating with huge investment and are expected to generate new genes / genetic information, it is felt that a small step in this regard may be taken by Gujarat. GSBTM has conceptualized Gujarat Genomic initiative (GGI). GGI is planned to be a multi-unit, multi-disciplinary, multi-institutional initiative with participating faculty, students, scientists and biotechnology industries.

Being a Multi-institutional approach, in initial phase, it intends to involve key state government organizations - Gujarat State Biotechnology Mission, DST, GoG, Directorate of Forensic Science (FSL), GoG and Gujarat Forest Department. It involves collaborative efforts between three state government agencies, using their resource and respective strengths. The roles and responsibilities, of participating organizations were developed, after mutual discussion and agreement and have been incorporated in the MoU. The project is costing around Rs. 200 lack for three years. As recommended by Governing body, technical collaboration has been done with Centre for DNA Fingerprinting and Diagnostics, Hyderabad (CDFD). The space has been allotted by Forensic Science Laboratory, Gandhinagar. The equipment list has been finalized in consultation with CDFD and tender purchase procedure has been initiated. Process of engaging technical manpower has also been done.

## 5.6 Seed Gene Bank

While various global programs are operating with huge investment and are expected to generate new genes / genetic information, it is felt that a small step in this regard may be taken by Gujarat. The program of Seed 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. The development of Seed Bank is proposed to be a multi-unit, multi-disciplinary, multi-institutional initiative with participating faculty, students, scientists and biotechnology industries. Activities focus shall be on collection, inventorization and germplasm storage from key locations throughout different agro-climatic zones of Gujarat, Developing and operating a database and information network system on forest genetic resources, and operations including specialized research laboratories, training activities, infrastructure and equipment for the biotechnology community of Gujarat. It being an Multi-institutional approach, in initial phase, it intends to involve key state government organizations - Gujarat State Biotechnology Mission, DST, GoG, and Gujarat Forest Department, GoG, Centre of Medicinal and Aromatic Plants (CIMAP, Lucknow) and other universities. The roles and responsibilities, of participating organizations were developed, after mutual discussion and agreement and have been incorporated in the MoU. Gujarat Forest Department shall be contributing its infrastructure worth Rs. 2,00,00,000. Forest department has also consented to develop building infrastructure, having built up area of approx 25,000 sq ft.

Consequent to approval in the Governing body and also by technical Advisory committee of GSBTM, further action for implementation of project has been initiated. Land and location has been identified. On the receipt of the information, further action would be taken by GSBTM. The equipment list has been finalized in consultation with FSL, TGBRI, purchase procedure has been initiated. Process of engaging technical manpower has also been done; temporary space in existing laboratories of forest department has also been identified. Future actions planned are, Formation of implementation committee, Engaging technical consultants / seeking technical advice from technical institute, for designing of the building ( as technical support to forest department) , seeking purchasing the smaller equipments and engaging project based manpower.

## 5.7 Clinical Research Center

Pharma and Health care are key drivers of biotech business. Pharma and health care products are rising along with the increased number of BT drugs. A clinical research organization (CRO) can provide independent product development services primarily for the pharmaceutical, biotechnology and medical device industries. A strong foothold of the pharmaceutical industry in Gujarat has been able to foster the growth of the clinical trials activity in the State. With production needing clinical testing, CRO is going to rise as big business. The CRO market size is estimated at \$10 billion. Revenue is increasing at an annual rate of 14-16%. At Present ongoing clinical trials in India are around 5500. CRO needs dedicated skills and spectrum of skills involving Medical advisor, Clinical research associate, regulatory affair managers, auditors, data manager, system analyst, business development manager etc.

Realizing demand as well as proactive responsibility of the Government, GSBTM has conceptualized skill development program and centre for excellence in clinical training.

In accordance with MoU format and conditions stipulated by Industries commissioner, GoG for extending financial support to develop education centers under Public - Private Partnership, GSBTM made a request to Gujarat based CRO's to come forward and develop training centre in Clinical trials, either as consortium or on individual basis.

In this respect, Synchron, Gujarat based CRO, having collaboration with topmost MNC -Paraxel and Covance, has come forward and expressed their consent to establish and operate a training centre for Clinical trials on Public- Private Partnership. Shivrath Center of Clinical Research is collaboration between Industry-Academia and State government. Consequently to the recommendation by technical advisory committee, the proposal was approved by Governing body of GSBTM.

The centre will be first of its own kind of center run as public private partnership between Government of Gujarat (Gujarat State Biotechnology Mission) and a private company, Synchron Research Services Pvt. Ltd. Gujarat State Biotechnology Mission will act as Nodal Agency for Coordination with other government agency

and it will have grants over period of 3 years in public private partnership with overall quality control and financial implications sharing maximum up to 11% cost of the total project or 20 lack whichever is lesser. Shivrath Center in Clinical Research is providing all technical expertise, building infrastructure, major financial component and overall coordination of the COE. Health Department is operating as Nodal department for other issues for center pertaining to Health Department for the welfare of the state and society.

The centre is likely to start training from some short term certificate courses & trainings in clinical research and once the full fledged operation will start center will be affiliated with one University of international repute. Thereafter following course will be offered by the center, Post Graduate Diploma in Clinical Research (PGDCR) One Year full time course with intake of 100 students/professionals every year, Participants of this program will be having in house training as well as exposures at Synchron Research Services Private Limited Ahmedabad, Bangalore and Hyderabad (Bangkok and Paris will be optional). And also some specialized courses in future like Certificate course for Clinical Investigators ( 6 months course), Certificate course for Clinical Research Associates (1 year course), Certificate course for Clinical Study Coordinators ( 6 months course), Certificate course for Ethics committee Members (1 months course), Certificate course for Regulatory affairs (6 Months course), Postgraduate Diploma in Bio analytical Techniques ( 1 year course), Post Graduate program in Clinical Data Management (6 months course), Post Graduate program in Medical Communications (6 months course) etc.

Currently Shivrath Centre for Excellence in Clinical Research is registered partnership firm as per the Indian Partnership Act, 1932. The operation of the firm shall be carried out on in the name and style of "Shivrath Centre for Excellence in Clinical Research" at Anand Complex, Near Thaltej circle, Sarkhej Gandhinagar Highway, Ahmedabad. Shivrath management includes best corporate captain, leading researchers, renowned academicians, successful managers and philanthropic personalities. The project cost of first three years is Rs. of Rs. 534.0 lacs. The MoU has been signed, space has been identified and infrastructure has been developed.

## 6. Biotechnology Research, Innovation support and Development

Biotechnology is a knowledge driven sector and needs high level of support to research and development which includes, research prioritization, action plans, research support to ongoing programs and new programs, establishment of research based centre of excellences and facilitation of patenting. In continuation with the previous year, GSBTM has conceptualized the new programs with extending research support to the existing ones. It has been evolved to encourage and strengthen research culture and enabling national level participation and competence building.

### 6.1 Biotechnology Research Support

With an objective to support Biotechnology Research in Gujarat; educational institutions and agencies, GSBTM conceptualized Biotechnology research support program. It was designed to encourage fundamental research as well as applied research (inclusive of product/process/technology development) with the following objective,

- Facilitating research through Infrastructure and Fundamental Research support
- Encouraging research culture with knowledge upgradation and exchange of information on recent advances and development
- Providing common platform for interaction & knowledge exchange to the experts
- Creating a new breed and environment for Biotechnology Research
- Facilitating the conversion of Lab Biotechnologies into transferable products or processes

The nature of support to be provided, included support to Fundamental Research and Infrastructure, Product / Technology related Research, Research related to Technology Scaling-Up and Research related to Technology Transfer.

The various Research Areas supported, included Agriculture Biotechnology, Industrial Biotechnology, Animal Biotechnology, Environmental Biotechnology, Healthcare & Pharmaceutical Biotechnology, Marine Biotechnology, Bioinformatics and any other field (as deemed relevant by the Committee from time to time).

#### 6.1.1 Current & Ongoing Projects

In the above head 16 Research Projects were funded covering various sub sectors. Of the 16 projects sanctioned, 7 project belong to Agriculture Biotechnology, 3 project belong to Environment Biotechnology, 3 project belong to Industrial Biotechnology, 1 project belong to Bioinformatics, 1 project belong to Pharma Biotechnology and 1 project belong to Animal Biotechnology. Thus a total of 16 projects have been sanctioned with committed financial support for the year 2007-08 of Rs. 8468006.

### 6.2 Facilitation of Research

GSBTM has been continuously encouraging state level institutes, universities, industries to avail the opportunities from GoI. GSBTM has been coordinating and have been forwarding and recommending such projects. This year many projects with, PERD, FRIGE, SPU, IIAR, with commitment of around Rs. 2 crores have been sanctioned from DBT.

- ➔ A project on infrastructure facilities for HLA typing is sanctioned to Gujarat based institute Indu Research Foundation, Vadodara. This project has started implementing in collaboration with All India Institute of Medical Sciences, Delhi.
- ➔ This year a project from Vadodara based Century Pharma, has been submitted to DBT, under SBIRI scheme, for the platform technology of plasma fractionations, and developed in collaboration with Israel based company.
- ➔ Dr Vikas Sihirsath of Oxygen healthcare has also submitted a project to DBT, for seeking support under SBIRI scheme and which is under advanced stage of consideration.

Projects Submitted to DBT - Government of India



To encourage research by Biotechnology industries, GSBTM has been continuously encouraging state Biotechnology institutes and industries to avail the opportunities from Gol. GSBTM has been coordinating and playing pro-active role in facilitating these research projects.

A project to study on genetic disorders and its diagnosis in population of western region submitted to DBT, Delhi from Zoology Department, Gujarat University of Rs. 94 lacks in July 2007 was one of the examples of research facilitation extended from GSBTM, DST, GoG. The project entitled “Studies on genetic disorder and their diagnosis in population of western region” is aimed to undertake research in genetic polymorphism of disorders showing deletion, mutation or dysfunction of certain gene(s) that may result into clinical manifestation. The project is put forward with an intention to use tools of biotechnology and modern techniques to help and improve life of common people. This study would not only diagnose genetic disorders using advanced technologies but also identify genetically predisposed population who are at high risk for the disease, which is totally lacking in the state presently, no such data of this region is available and the study would be first step towards a community based genetic study in Gujarat state. This research would not only benefit patients for redesigning their treatment but also will be valuable for the forth coming generations in terms of having vital knowledge about their genetic status for any given disorder and also in managing prophylactic treatment for the same.

Study is divided in technically three disciplines 1. Cytogenetics, 2. Molecular Cytogenetics and 3. DNA based analysis. Patients involved in the study would be subjected to detailed questionnaire, collecting information about their clinical and familial history followed by pedigree analysis, then examined for chromosomal study, based on this preliminary report further investigation either molecular cytogenetic study or DNA based study would be undertaken. Telomeric studies would be of high significance in terms of valuable information and data revealing genetically predisposed population in community based study. Molecular study in genetic disease with high prevalence in Gujarat like Cystic fibrosis, Thalassemia, DMD/BMD (Duchene/Becker muscular dystrophy) and Y chromosome microdeletion would also disclose interesting data, which would apparently indicate genetic status and polymorphism of gene responsible and its prevalence in the population. In spite of the large magnitude of occurrence of the disorder in our population, there is a limited knowledge about their genetic variance and polymorphic form in the patients. Due to this lack of information clinicians face major problems in adopting the optimum treatment methodology, thus justifying the importance of the study.

Overall this project on completion of its objectives would contribute significantly to the scientific knowledge, opening paths for much more relative research in health and life sciences. Also the general population shall be convincingly benefited by molecular diagnostic services, which are of great need in the health sector. Medical practitioners shall utilize the report and design their treatment for the disease, which otherwise is not possible on the basis of conventional pathological assays. At the end of this study we would be able to speculate and select those specific mutations that have a higher frequency of occurrence in the local population, which will further help in narrowing down the scanning procedure for diagnosis.

## 7. Biotechnology Human Resource Development

### 7.1 Multi-Institutional Teacher's Training Program in Molecular Biology and Bioinformatics [mbtEACH]



GSBTM as a part of Biotechnology Human Resource Development strategy Skill Development Program for teachers & faculty, associated with biotechnology education, mbtEACH program, was conducted. The multi-institution program was done with the participation of 3 institutes - Anand Agri University, Gujarat Cancer Research Institute and Forensic Science Laboratory. mbtEACH is a unique endeavor of Teacher's Training program, teaching Post Graduate Bioscience faculties and research scientists coming from different universities or institutes of the state. During the program participants had received High-end Molecular Training for handling various living systems such as animal, plant [AAU], microbes [PERD] and humans [FSL]. GSBTM played the role of coordinating and organizing agency. Four different institutes involved for providing training were P.E.R.D. [B.V. Patel Pharmaceutical Education & Research Development Center], Ahmedabad, F.S.L. [Forensic Science Laboratory], Gandhinagar, A.A.U. [Anand Agriculture University], Anand and GSBTM, DST, GoG for imparted Bioinformatics Training. Day sessions included laboratory training and evening sessions at GSBTM, included Bioinformatics training sessions.

The main objective of mbtEACH was to increase the availability well trained manpower and resources in Gujarat. It aims to enhance knowledge and proficiency, in molecular biology and bioinformatics through awareness generation, education and training. The residential program was 10 days program, conducted second consecutive year, from 15th May, 2007 to 25th may, 2007. The program included 30 man-hours of theory and 60 man-hours of practical work. The program

had 26 participants, representing 15 departments from 14 colleges and 9 universities. mbtEACH Manuals were also developed for Post Graduate Teachers and Scientist of Biotechnology Institutes and Organizations of Gujarat. Molecular Biology Protocols were also compiled to provide guidelines for PCR Techniques, Bioinformatics applications, Genetic Markers and Their Application, Polymerase Chain Reaction, SNP & Genome Diversity, Gene Expression Analysis by Real-Time PCR, etc. Bioinformatics sessions were conducted for training scientists about the various Informatics applications used for Biological research. The contents included basic concepts of computation like Database Basics, Biological Databases, Predictive method Using Nucleotide sequences, Predictive method Using Protein sequence, Molecular Docking, PCR and Primer Design, Sequences analysis, New Technology in Drug Discovery etc.,

### 7.2 Genetic Diagnostic Training Program [GenDioT]



Human genetics is a complex subject which is studied by a variety of techniques which have evolved rapidly



over the past few years. Genetics, by its very nature, often involves the study of abnormality. Human Genetics is a vast ocean in which few important sectors like genetic diagnosis play important role as far as population genetics is concerned. More than 10,000 genetic disorders prevail in Human population whose diagnosis, study and analysis will be of most important to overcome the major challenges into healthcare and

allied areas. 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. Hence to address the critical issue of developing skilled manpower for handling the new technology of genetic diagnostics, a 21 days residential training program was conceptualized. After the approvals from health department, the program was conducted from 18th December, 2007 to 7th January, 2008. About 50 applications were received from different 18 academia, 10 hospitals and 2 research institutes from all over Gujarat along with one international application from Sudan. Training program accommodated 10 researchers and 5 medical fraternities from various universities, institutes and medical colleges of Gujarat.

The program was conducted through participation of three institutes - GCRI, FRIGE and Zoology Department,



Gujarat University. Program was spread over 4000 men hours, took benefit of 25 resource persons, having expertise field of molecular & genetic diagnosis. It included hands on training on Molecular biology and genetic diagnostic instruments such as M-FISH (First facility in the country funded by GSBTM) Florescence Microscope KASA, PCR, etc. A total expenditure of Rs. 6.50 lacs was incurred for conducting this program.

The training is planned to be divided into two phases where in Phase-I participants were trained for 3 weeks in the state institutes utilizing the existing infrastructures and expertise where as in Phase - II selected participants from Phase-I shall be sent to one national facility for further detailed training. Schedule of the training for practical session was followed by evening Expert Talks at where in different National and State institutes experts were invited to deliver Expert lectures on recent developments in the field of molecular medical genetics. This included, Dr. Sher Ali from NII, New Delhi, Dr. Flavian Vaz, from Wadia Hospital, Mumbai, Dr. Sonil Parikh and Dr. Rakesh Rawal from GCRI, Ahmedabad, Dr. Salil Waniawala from Shrinath Diagnostics Lab, Surat, Dr. Hema Purandhare from Center for genetic health care, Mumbai, Dr. K. Thangraj from CCMB, Hyderabad, Dr. N. P. Battacharya from SINP, Kolkatta, Dr. Frenny Bilimoria from Department of Skin and Venereal Diseases, Kesar S.A.L. Med. College and Research Centre, Dr. Rustam Modi from Intas Biopharmaceuticals, and Dr. Savita Bosekare from Lab India, Mumbai.



### On hand training designed for 15 Medico and Non-medico Researchers in Genetic Diagnosis



genetics through education, training and awareness generation. The training would promote investigation and development of new technologies through research and infrastructure development activities. As a result of this training program Pandit Dindayal Upadhyay Medical College has started Genetic Diagnostics Laboratory at Rajkot.

### 7.3 BIT<sup>Virtual</sup> - The Virtual Institute of Bioinformatics

GSBTM had conceptualized the networking of the bioinformatics education and research with different universities of the state through its proposed virtual institute of bioinformatics - [BIT Virtual] to provide the platform, where the bioinformatics specialists interact among themselves, and other biotechnology research community. The BIT Virtual, being an Multi-institutional approach, in initial phase, it intends to involve key stakeholders in Biotechnology & Bio-informatics -- Government Organization - Gujarat State Biotechnology Mission, DST, GoG, Department of Biotechnology, DBT, Gol, University & Academia - AAU, JAU, SPU, HAU, GU, and their constituent and concerned departments, Industries - Progenics, MNC and other industries.

It involves collaborative efforts between three state government agencies, utilizing their optimum resource and respective strengths. The roles and responsibilities, of participating organizations have been elaborated in the MoU. Memorandum of Understanding, details of objective, function and role and responsibility of participating organization, was prepared and discussed with each of them. The modifications suggested by them were made and the participating organizations have given their consent. Consequent to approval in the Governing body and also by Technical Advisory Committee of GSBTM, further action for implementation of project has been initiated. It includes, identification of adequate readily available building space for central facilities in Gandhinagar, identification of hardwares and softwares, seeking confirmation from state universities, interested to provide recognition to BIT virtual institute.

After having received the approvals from the State Government on 2nd November 2007, GSBTM had fastened the efforts for the establishment of the Institute and Program Implementation. The BITVirtual centralized facilities are going to be established in Gandhinagar and Identified University departments working in Biotechnology & allied areas which are not having High-End Bioinformatics Infrastructure shall be selected as BITVirtual Nodes and faculties having research experience and competence in Bioinformatics and allied areas are identified as nodal faculties for this virtual institute. As part of the software and hardware purchasing modalities, GIL has been requested to undertake the process for its purchase. Actions required to set up the facilities are, formation of implementation committee, seeking recognition from Saurashtra University, providing fellowship support to selected candidates at the rates as per DST guidelines, purchase of hardwares for central facilities and nodal centres through GIL and engaging manpower for central facilities.

GSBTM have been organized few of the meetings for the BitVirtual Institutional coordinators from participating universities and institutes, one of which was held on 28th February 2008 at GSBTM Office, Gandhinagar to discuss the various aspects related to the mechanism and modalities for implementation of the program. It was decided that BITvirtual implementation would get accomplished soon and its first batch will start with M. Phil. Degree Course in Bioinformatics from the next academic year starting from June-July. Later stage the virtual centre will also start providing P.H.D. Course in Bioinformatics.



## 8. Development of Biotechnology Entrepreneurship

Biotechnology industries are, capital intensive, power intensive, research driven and have multi sector linkages. Biotechnology industries are Research and Development oriented, manufacturing based and/or Bio-service providing. Biotechnology, have interface with multiple sectors, namely, Agriculture, healthcare, environment, marine, animal husbandry etc. The Biotechnology Industries have multiple client spectrums, characterized by starters, existing entrepreneurs venturing in BT field and established business houses diversifying in Biotechnology.

### 8.1 Biotech Venture Fund

State Government has established 50 crores, Gujarat Biotech Venture Fund in 2004. State government has committed to contribute a seed fund of Rs. 10 crores since 2004; GSBTM has released total of Rs. 7 crores to GVFL. The amount released in different years under the biotech venture fund is, in 2004-05 it was Rs. 2 crores released, in 2005-06 it was Rs. 3 crores released, in 2006-07 again Rs. 2 crores was released and during 2007-08 the amount going to be released is Rs. 3 crores.

This year two projects have been approved by Investment Board of GVFL for providing venture finance. This includes the industries like:

1. Century Pharmaceuticals Ltd. for promising development of a new drug using technology available from Israel, to develop a biotechnologically derived protein molecule as therapeutic agent for the treatment of Asthma and Allergy.
2. Celestial Biologicals Ltd. part of Intas Group for setting up project mainly for achieving production of blood plasma fractionalization based products for sale in SAARC countries.

Two more projects, Amrita Therapeutics and Aumgene Biotech for Biotechnology Venture Finance are also under consideration and due diligence.

### 8.2 Seminar on “Venture Financing and Biotechnology industry in India - Is the link missing?”

Biotech Project is one of the Capital Intensive Industries and one of the most important bottlenecks to the success of Biotech entrepreneurship is financing to such Biotech Projects. Of the various forms of financing to such Biotech Projects, Venture Capital (VC) Funding, Private Equity Funding, etc. are more popular.

Though biotechnology industry has been identified as a sunrise industry, the share of venture support to this industry is less than 14% as compared to the software sector, which accounts for about 23% of venture deals. Biotech entrepreneurship is function of availability of financial resources, technology and support. Despite, the launching of various schemes by DST, DBT, TDB, GoI, various constraints have been felt, both by the entrepreneurs as well as funding agencies. The issue needs sensitization, both from industries perspective and funding agencies. It is often reported that the Biotech Industry feels the dearth of Venture Support while the venture financing industry feels that their invitations to biotech projects do not find enough response.

In this regard, a one day workshop on “Venture Financing and Biotechnology Industry in India - is the link missing...?” was organized in collaboration with NISTADS (DST), GoI, GIDR, Ahmedabad & GSBTM on 22nd Feb. 2008 at: Gujarat Institute of Development Research, Gota, Ahmedabad- 380060. The Joint workshop focused on Gap Analysis and discussion-based exercise for the Venture Finance Industry and the Biotechnology Industry respectively.

The workshop included participation from Entrepreneurs in Biotechnology ventures, VCs, PE companies, government funding agencies for commercialization, researchers with technologies ready for commercialization. Distinct chairperson was Dr. P. Banerjee, Director, NISTADS, distinguished members of the



session were, Shri A. K. Saxena, IFS, Mission Director, GSBTM, DST, GoG, Prof. R. Parthasarathy, Director, GIDR, Ahmedabad, Shri Vishnu Varshney, Managing Director, GVFL, Ahmedabad, Dr. Purnima Sharma, Managing Director, BCIL, Dr. S. Visalakshi, Scientist F, NISTADS. From Biotechnology industries there were administrative and research experts like Dr. Geeta Sharma, Claris Life Sciences, Ahmedabad, Mr. Mani Iyer, Intas Biopharma, Dr. Janak Sheth, Century Pharma, Dr. Shama Bhat, Bhat Biotech, Bangalore. The representatives from Government funding agencies like SIBRI, TDB were also present. Gujarat Venture Finance Ltd. representative from biotechnology VCs and shared their venture experiences and also highlighted their requirements and, expectations from entrepreneur.

### 8.3 Technology Facilitation cell

While development of Biotechnology business involves entrepreneurship and investments, GSBTM has come up with products and out puts that facilitate Biotechnology foresight, entrepreneurship, business, investment and wealth creation. An immediate action needed for this is technology facilitation and support. GSBTM has been operating Technology Facilitation Cell (TFC), within GSBTM, which provides support by providing selected services, in terms of database of biotechnology available for commercialization, transfers, partnerships and later on additional roles. The cell is operational, since two years and is being run by engaging one technical personnel. The cell has developed its second product which is A Compilation of Globally available Technologies. TFC has also developed second edition of Technology Scroll which is compilation of 600 available technologies. The product is aimed to provide essential information to interested biotechnology stakeholders, both the existing ones and also the ones who are looking forward to converge towards and diversify into niche biotechnology sectors. Within one year, TFC has produced Technology Scroll (6 volume compilation), Business Plan on Bio-fertilizer, a Report on Jatropha including Database, and a Report on Tissue Culture and Bio-Diesel. These all are very well designed and made available for the stakeholders in ready to refer, printable format to have idea on different technological and entrepreneurial aspects.

### 8.4 Entrepreneurship Development Program

#### 8.4.1 Short Programme on Development of Entrepreneurship in the Business of Biotechnology

BT-EDP - 'Entrepreneurship Development Program in Biotechnology' was a five-day long residential programme with modules for both scientific as well as entrepreneurial components. After receiving the approvals from Governing body the program was conducted during 11 to 16 June, 2007. Structure of the program was emphasizing on various case studies of Entrepreneurs, teaching modules with a total of 40 lectures, 5 discussion sessions and a few Informal sessions. The lecture session include a primer on Biotechnology, Technical Entrepreneurship, Resource-base for bio-business, Business plan, Finance, Intellectual Property Rights, Biological hazards & Bio-safety regulatory guidelines, and Case studies of a few first generation Entrepreneurs.

The program had encouraged new start ups in Biotechnology, encouraging entrepreneurship skills and business management skills in scientific professionals. It had the convergence of other related industries towards biotechnology business. It will generate few BT entrepreneurs. It being a Multi-institutional approach, in initial phase, was organized by key state and national government organizations like- Gujarat





### Technical and Discussion sessions delivered by BioTechnology professionals



State Biotechnology Mission, DST, GoG, Entrepreneurship Development Institute, Gandhinagar, Gol, where key industry and government experts and professionals were invited from the state and country to address Interactive Sessions. It had also involved collaborative efforts between three state government agencies, using their resources and respective strengths.

#### 8.4.2 Entrepreneurship Development Program in Marine Biotechnology

GSBTM had organized a two day seminar at Surat & Rajkot, to identify the business opportunities available in different scientific organizations in the country. The seminar was held on 22nd and 23rd of August, 2007, with some of the very eminent scientists of the nation as speaker. The speakers focused their talk primarily on the available technologies and their viability and feasibility for Gujarat's entrepreneurs

The seminar was held in two of the most prosperous cities of Gujarat, i.e. Surat and Rajkot. Over 200 participants from different streams of education attended the seminar at both the places, making it a grand success. These were primarily Industrialists, Researchers, Academicians, M.Sc., MBA, MCA, M.Com., B.Sc., B.E.



The Seminar was organized by the Secretary, Aquaculture, Government of Gujarat, at the Veer Narmad South Gujarat University in first technical session discussed in depth different kinds of aquaculture. While Dr. Sakthivel gave an insight into the exhaustive field of both vertebrate, invertebrate and seaweed aquaculture, Dr. Sahoo dwelled more on aquaculture of seaweeds. Dr. Sahoo also talked about the different biotechnological interventions in seaweed aquaculture. He strongly emphasized on protection of the Okha coast as Marine Biosphere Protected Area. Dr. Sakthivel mentioned that MPEDA is on a lookout for developing 50,000 hectares of coastal land and Gujarat alone stands the need of 167 hatcheries, 5 feed mills and state of art infrastructure for aquaculture and produce processing. Both the scientists in their respective presentations gave a brief on the working statistics and financial implications of different aquaculture project..

University in first technical session discussed in depth different kinds of aquaculture. While Dr. Sakthivel gave an insight into the exhaustive field of both vertebrate, invertebrate and seaweed aquaculture, Dr. Sahoo dwelled more on aquaculture of seaweeds. Dr. Sahoo also talked about the different biotechnological interventions in seaweed aquaculture. He strongly emphasized on protection of the Okha coast as Marine Biosphere Protected Area. Dr. Sakthivel mentioned that MPEDA is on a lookout for developing 50,000 hectares of coastal land and Gujarat alone stands the need of 167 hatcheries, 5 feed mills and state of art infrastructure for aquaculture and produce processing. Both the scientists in their respective presentations gave a brief on the working statistics and financial implications of different aquaculture project..

The country has 3 marine biotechnology companies out of 300 biotechnology companies. Of these 3 companies one is a sister concern of the other, leaving only 2 core marine biotech ventures. The CEOs of both the companies, Dr. K. O. Issac, ABL Biotechnologies Pvt. Ltd. and Dr. Charles Bhaskar, Geomarine Biotechnologies Pvt. Ltd. were present for the seminar. They shared their valuable experience as entrepreneurs in such a niche area of biotechnology and also guided the participants on the pitfalls and success of their endeavors. Dr. Bhavnath Jha, Deputy Director Biotechnology from Central Salt and Marine Chemicals Research Institute; State's only CSIR institute, presented on the marine microbial products and molecular biology of these organisms. It was an intricate study conducted on some of the marine microbes available in the coastal regions of the State.

GSBTM and the Speakers received enquiries from the participants regarding technologies which can be possibly commercialized and continued interaction thereafter. This can very well attest the served objectives of the seminar like, to generate awareness amongst the participants about the business opportunities in Marine Life-Sciences, also to bring academicians, technology developers and facilitators and industrialists on the same platform for interaction with the new generation entrepreneurs of the State and to develop a foundation for initiation of entrepreneurship in marine biology and biotechnology.





## 9. Encouraging Biotechnology Business and Networking

### 9.1 Proposed Initiatives for Biotech Business

#### 9.1.1 Biotechnology Business and Investment

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-2007 was organized in the same spirit in Jan, 2007. 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 18 Memorandum of Understanding (MoU) signed with committed investment of Rs 1554.00 crores in Biotechnology Sector during 2007 in Gujarat.

When Gujarat state is developing as the Biotech Hub of the country, GSBTM plays a facilitator's role by extending intermediately services towards these biotech investors in their future ventures. A total of 25 projects were planned to be developed under 19 MoUs signed during Vibrant Gujarat, 2007. Up till this date, 2 projects (2 MoU) with investment of Rs. 54 crores have been commissioned and are into operation, 4 projects (2 MoU); with investment of Rs. 570 crores have been dropped. 15 projects (11 MoU) with investment of Rs.760 crores are in commence stage, 4 projects (4 MoU) with investment of Rs. 195 crores, are in planning stage. This apart, new industrial investment is being coordinated. Consequent to continuous efforts, Vaishnavi Biotech, Hyderabad based Pratistha group, has initiated activities for 95 crores investment in Bhavnagar, Gujarat.

#### MoUs signed during Vibrant Gujarat 2007

No	Company	Location of project	Title of project
1	Akruti-Nirman-TCG Group	BT Park Vadodara	Development of BT Park Savli
2	Stemcyte Technology	Gandhinagar	Umbilical Cord Blood Banking and Stem Cells Research
3	M J Biopharm	BT Park Vadodara	Development of Recombinant products
4	Zydus Group	Ahmedabad / Gandhinagar	Large manufacturing and scale-up facility for recombinant biological therapeutics
5	Intas Biopharmaceuticals Ltd	Ahmedabad / Gandhinagar	Transgenic Animals/Plasma Fractionation
6	IKF Technologies Limited	Bhuj	Biodiesel plantation and extraction
7	Anhox Biotech Pvt. Ltd.	BT Park Vadodara	Development of Recombinant products & food biotechnology
8	Concord Biotech	Dholka, Ahmedabad	Development of new Biotechnology based product
9	BDR Pharmaceuticals International Pvt. Ltd.	BT Park Vadodara	Production of biotechnology based APIs and Final Dosage products
10	I B S Bioinformatics Pvt. Ltd. and Shankus Group	Gujarat	Data Mining for Life Science, Medicinal Chemistry, Bioanalysis
11	Hester Pharmaceuticals Ltd	Kadi., Mehsana,	Development of poultry vaccines
12	NUSUN Genetic Research Ltd .	Near Gandhinagar	Biotechnology research centre in agriculture - Seed Biotechnology
13	MD Bio	BT Park Vadodara	Development of Bioinformatics software
14	Zytex Biotech Pvt. Ltd	BT Park Vadodara	Manufacture of enzymes
15	Oxygen Healthcare	BT Park Vadodara	Contract research services
16	Total Potential Cells (P) Ltd.	BT Park Vadodara	Stem cell research
17	The Asia-Pacific Bioinformatics Network (APBioNet)	Gandhinagar	The Virtual Institute of Bioinformatics [BIT <sup>Virtual</sup> ]
18	Progeniq Pvt. Ltd.	Gandhinagar	The Virtual Institute of Bioinformatics [BIT <sup>Virtual</sup> ]
19	Alexandria	Gujarat	Biotechnology Parks & Incubators

## 10.0 Promotion of Biotechnology sector in Gujarat

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.

### 10.1 Event Participation

Facilitating & Participating in Various Seminar, Symposia, Workshop during 2007

Organizing Institute	Theme of the Program	Date
1. CII – TIFAC	Interactive Seminar on New Technology Business Opportunities in Bio-Process & Bio-Products	7 <sup>th</sup> April 2007
2. NRDC and Mark Patent.Org – an Intellectual Property- (IP) Knowledge Hub	International Symposium on Global Perspective on Pharma and Biotech - IPR	19 <sup>th</sup> April 2007
3. Gujarat Cancer Research Institute and Genzyme Ltd., German company	Symposium on 'Lysosomal Storage Disorders: Helping patients with rare genetic diseases'	31 <sup>st</sup> May 2007

### 10.2 Coordination and Facilitation

#### 10.2.1 Conduction of Popular Lecture Series

GSBTM, DST, GOG has identified the need to create scientific awareness, sensitization, socio-ethical acceptance and adoption to the potentials and application of biotechnology for the purpose of Promotion, Support and facilitation for the overall development of Biotechnology in the state. Hence, GSBTM has accorded a very high priority to dissemination of scientific information, awareness generation, knowledge up-gradation and exposure by means of various Awareness programmes like seminars, workshops, lecture series, participation in fairs and exhibitions Accordingly, GSBTM has conceptualized a program of 'Popular Lecture series', which intends to bring the knowledge of the best professionals, generate awareness about fascinating world of Biotechnology, its future promises, and initiate networking between stakeholders to the doorstep of the society in a comprehensive form. Having visualized programme of Popular Lecture Series as a mandate for - dissemination of technical knowledge, creating awareness about the latest developments in the field of Biotechnology, various programs were conducted. It generated a tremendous interest and response in the Biotechnology Stake holders.

During the year 2007-08 Poplar Lecture by Dr. Naranjan S. Dhalla, PhD, MD (Hon), D.Sc. (Hon), FRSC who is a distinguished Professor & Director of CV Developments, Institute of Cardiovascular Sciences, St. Boniface General Hospital Research Centre, Faculty of Medicine, University of Manitoba, Winnipeg, Canada. Expert delivered his lecture on "Molecular Targets for Drug Development for the Treatment of Congestive Heart Failure", at Cama Hall, GCRI, Ahmedabad, addressing a big mass of Biotechnology Students, Research Scientists, Academicians and research institutes from the state.

### Popular Lecture Series Organised by GSBTM at Cama Hall, GCRI, Ahmedabad



#### 10.2.2 Facilitation/Conduction of State Level Seminars

Seminars provide opportunities of technical interaction amongst the state players, experts, professionals and enable exchange of information. This facilitates exchange of ideas and possibilities of collaborations, both within the state and in between the states. GSBTM has adopted the policy to encourage this activity by providing financial support to interested institutions. During the year, following seminars were supported. The seminar included lectures from national and international experts.

#### Financial Assistance to Various Seminar, Symposia, Workshop during 2007

No. & Name of Institute	Program	Date	Financial Assistance (in Rs.)
1. Department Of Microbiology of N. V. Patel Collage of Pure & Applied Sciences, Vallabh Vidhayanagar	National Seminar on new Horizons in Biological Sciences	23 & 24 September, 2007	50,000
2. Department of Veterinary Public Health, Anand Agriculture University, Anand	National Symposium on Horizons of Veterinary Public Health & Augmenting Veterinary / Medical & Environmental Health	29 & 30 November, 2007	1,00,000
3. Department Of Biochemistry, M. S. University, Baroda	Two days symposium on "Cancer & Apoptosis"	28 & 29 December, 2007	45,000
		<b>Total</b>	<b>1,95,000</b>



## 10.3 Awareness Generation, Dissemination of Information, Documentation, Preparation of awareness material & Literature

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, and creation of web cell.

### 10.3.1. Website:

Electronic media is potential and ideal vehicle of information dissemination. To communicate with vast spectrum of stakeholders - Academicians, professionals, experts, industries at state, region, national and international level, and informative website is highly desirable. Accordingly, to reach and have access to vast stakeholder group, GSBTM conceptualized and developed website of GSBTM. It has been developed to address needs of different stakeholders and provides relevant and pertinent information about Biotechnology of Gujarat, infrastructure, policy initiatives, research, human resource development, entrepreneurship development, Biotechnology business, networking etc. It also provides links to important biotechnology sites of Government of India.

To enable information availability to stakeholders, GSBTM operated web cell which is run by engaging the services of a net developer who have uploaded all new activities and the products information, developed by GSBTM team, with include designing, development, uploading of Independent portals of Bio-informatics, and web pages, banners of Marine EDP seminar, MbTeach 2007, Biotech EDP, Gujarat BioState Award-2007, GSBTM CDs, GenDioT program, with total web pages up to 190. Website is developed by latest technology tools for scripting and designing DoT Net and AJAX, is planned to be used for web designing.



### 10.3.2. Biotechnology E-chronicle

It is important to provide a platform and forum for sharing and disseminating biotechnology related information of Gujarat. Such effort has not been undertaken by any of the state. Accordingly, a concept of e-chronicle was developed, in - house. Since, the launch of first issue of Biotechnology E-chronicle, in 15 Aug. 2005, work is being continued. There were two issues released during 2006-07. The chronicle covers the industry, research, academic strengths of Gujarat. It has various features like Industry of the month, research institute of the month, entrepreneurs of the month, spotlight, Cartoon corner, techno-views, Bio-business etc. The print format of Biotechnology Chronicle was distributed to biotechnology stakeholders of the state and selected organizations of the country.

### 10.3.3 Documentation

#### 10.3.3.1 In-house Reports Generation



#### 1. Drug Report 2007

Drug Report has been prepared by compiling, reviewing and analyzing available database of more 1100 conventional and more than 250 biotech products with its developmental analysis and correlation with reference to global drug development necessitate.

This endeavor of GSBTM, aims to provide rational, logical and factual information to emphasize that Biotechnology, with its essential research and innovation based approach, is the sunrise industry to lead the crusade of drug development.

The objectives of preparing this report are, to provide all stakeholders, an update on drug development trend - at global, national and state level, to provide update on contribution of Biotechnology in Drug development, to provide relevant and related database and information, along with drug developmental trend analysis.

#### 2. Bioinformatics Compendium 2007

For growing Biotechnology sector from present and future perspective and the opportunities it offers at National and Global level give better understanding of the sector. The basic information, which constitutes



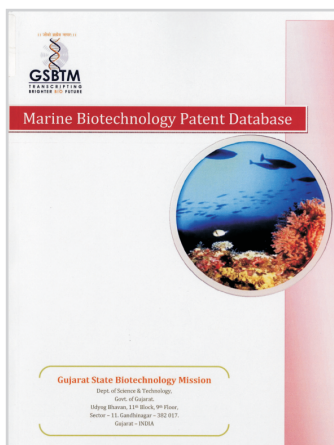


business wisdom, shall enhance entrepreneurship and investment decisions by stakeholders also. In the dynamic nature of R&D and the field of IT, knowing the status of bioinformatics products, services and applications are challengeable.

With an objective to concentrate on generating company wise profile in the field of Bioinformatics, would help us to understand the edges of information spread at local as well as global level. "Bioinformatics Compendium" gives the gist of companies' structure, functioning/centers, products, services, R&D, collaborations, etc. The "Bioinformatics Compendium" is the key data compilation of around 180 companies worldwide. A total of 188 Global and Indian companies are profiled in this compendium which is dealing with Bioinformatics research.

### 3. Marine Patent Database

The patents published from the research done worldwide, have been cataloged in the Marine Biotechnology Patents Database, anticipating, that this compilation would be a point of reference for entrepreneurs wanting to venture into marine biotechnology industry and for the researchers in marine biotech research for status of marine biotech research world over and in India. The database enlists 170 patents in marine biotechnology, under different business opportunities head, which could prove to be potent technologies for transfer in future.



The patents relate to the potent areas of investment like pharmaceuticals, nutraceuticals, industrial enzymes, enzyme inhibitors of therapeutic value and bioremediation. The Database of approximately 170 patents developed and available globally, in Marine Biotechnology. While 140 patents are from different countries, mostly USA and Europe, around 30 patents are the ones developed by research and academic institutes in India. The compilation of 140 technologies from different countries covers a total of 4 Biotechnology Sectors, namely, Pharmaceuticals and healthcare, Industrial Biotechnology, Environment & Aquaculture. Amongst these, 50 technologies belong to Industrial biotechnology, 70 to Pharmaceutical & healthcare, 30 to

aquaculture, forming the rich substratum for future business venture and entrepreneurship.

#### 10.3.3.2 Project Dissertations Undertaken

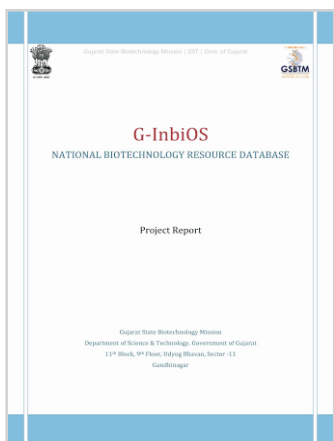
##### Dissertations Undertaken During Year 2005-2006

Student Name : Dipti Patel and Neelam Patel

Project Title : G-InBios: National Biotechnology Resource Database

Academic Institution : MCA College, Visnagar, Hemchandracharya University

G-InBios : NATIONAL BIOTECHNOLOGY RESOURCE DATABASE - GSBTM following the mandate of facilitating and encouraging the growth and development of Biotechnology in the state. Information dissemination, networking, awareness generation are the essential strategy of GSBTM. In accordance with the mandate of GSBTM and as a strategic initiative, it is visualized to establish a "G-InBios"-NATIONAL BIOTECHNOLOGY RESOURCE DATABASE for biotech and allied sectors in India and to review and record the relative activities in the nation covering various organization, eminent scientist database, scientific publications, projects, career opportunities, technology developments and important achievements. Database will serve to provide the information about major biotechnology institutes in the country.



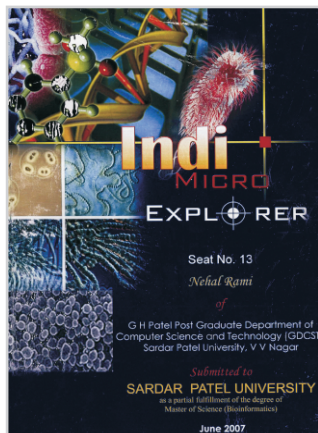
##### Dissertations Undertaken During Year 2006-2007

Student Name : Nehal Rami

Project Title : IndiMicroExplorer: Database of Indian Microbes

Academic Institution : S. P. University, Vallabh Vidyanagar, [PID:B0501]

**INDIMICROEXPLORER** - Characterization of Microorganisms, its assorted applications and their comprehensive taxonomy can provide microbial way out to critical challenges of recent epoch. INDIMICROEXPLORER is foresight in the same direction. It is a microbial database which mainly comprises Bacterial and fungal species principally reported from India and deposited in various cultures collection centres of the world. It is a compilation of Microbial database with their applications, taxonomy and sequence level information.



INDIMICROEXPLORER is an online application with three tier architecture: (1) Front End (Client side): A web browser like IE or Netscape, (2) Middle Tier: IIS server (ASP server): that handles all web request and Application Request (3) Database Server: An MS ACCESS database that store data for the application. It is a distinctive database which provides their Microbial repository along with their applications, easily accessible through Internet.

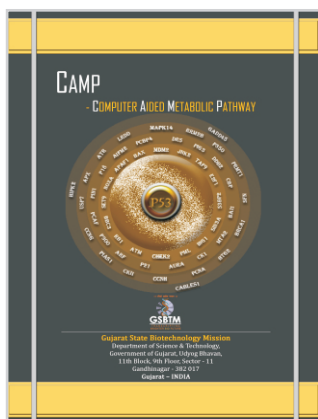
Student Name : Ajay Mathasuriya

Project Title : CAMPS: Computer-Aided Pathway Simulator

Academic Institution : S. P. University, Vallabh Vidhyanagar, [PID: B0506]

**CAMP (Computer Aided Metabolic Pathway)** - Lung cancer is one of the most common cancers worldwide, accounting for 1.2 million new cases annually. Cells are constantly under threat from the cytotoxic and mutagenic effects of DNA damaging agents. These agents can either be exogenous or formed within cells.

P53 is situated at the crossroads of a network of signaling pathways that are essential for cell growth regulation and apoptosis induced by genotoxic and non-genotoxic stresses, so called “the guardian of the genome” or the “cellular gatekeeper of growth and division”. Mutations in the evolutionarily conserved codons of the p53 tumor suppressor gene are most common genetic abnormalities found in most of the cases of lung cancers. CAMP (Computer Aided Metabolic Pathway) is repository of p53 pathways, p53 pathways proteins, pathway of lung cancer drugs (targeting p53 pathway), proteins involved in lung cancer drugs pathways, p53 mutation database and database of p53 literature. Analysis of these mutations and pathways can provide clues to the etiology of the lung cancer and function of the specific regions of p53. The patterns of mutations in the p53 tumor suppressor gene will provide clues to the mechanisms of cancer occurrence. Also the mode of action of the lung cancer drugs would provide a deep insight regarding how a more effective drug to combat lung cancer is prepared.



Student Name : Grishma Dixit

Project Title : Rumen $\mu$ Miner - Insilico Profiling of Rumen Microbes

Academic Institution : S. P. University, Vallabh Vidyanagar, [PID: B0501]

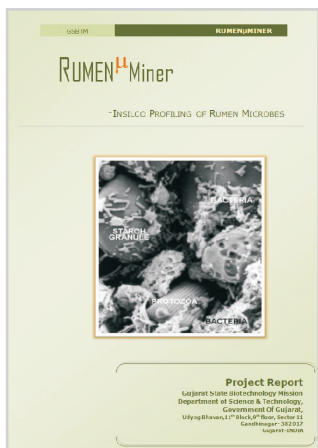
**RUMEN $\mu$ Miner -Insilco Profiling of Rumen Microbes** - The Ruminants largely depend on an intense anaerobic microbial fermentation in the rumen for the digestion of their feed. India is the world's largest dairying country, producing more than 90 million tones of dairy products a year, but this figure disguises the low productivity at village level. The problem is the diet of the dairy cattle which requires additional rumen microbes as supplements. This requires extensive study of the Rumen Microbial activity and hence an appropriate data resource on Rumen Microbes and their Enzymes. Rumen $\mu$ Miner is a web based resource dedicated to Rumen Microbes and Ruminant Enzymes. Rumen $\mu$ Miner is a curated and searchable collection of Rumen Bacteria, Rumen Protozoa and Rumen Fungi. Additionally Rumen Enzyme's detailed information has also been included.

#### Dissertations Undertaken During Year 2007-2008

Student Name : Vaibhav Barot

Project Title : GMO Simulator

Academic Institution : S. P. University, Vallabh Vidyanagar, [PID:B0620]



**Genetically Modified Organism (GMO) Stimulator** - A Genetically Modified Organism (GMO) is a plant, animal or microorganism whose genetic code has been altered, subtracted, or added (either from the same species or a different species) in order to give it characteristics that it does not have naturally. A transgenic organism contains a gene which has been artificially inserted instead of the organism acquiring them naturally. The inserted gene sequence (known as

the transgene) may come from another unrelated organism, or from a completely different species. GMO Simulator is an attempt to develop software which can engineer organisms Insilco. Till now GMO Simulator is designed for *Bacillus thuringiensis* based organisms. It identifies genes from genome of any species of Bt and suggests restriction enzymes to isolate gene of interest. It designs transgene by ligating promoter, terminator and marker genes. *Bacillus thuringiensis* produces parasporal insecticidal crystal proteins which are used as biopesticides for specific group of insects. Analysis was performed to check presence of cry like genes in organism other than *Bacillus thuringiensis*. Multiple sequence alignment was performed for cry genes and then BLAST was performed to get similar genes. There were no hits found. So we can conclude that there are no genes similar to cry genes present in an organism other than *Bacillus thuringiensis*.



Student Name : Manan Ladola

Project Title : A Comparative Homology Modeling and Docking Studies of some plant compounds for cancer proteins

Academic Institution : S. P. University, Vallabh Vidyanagar, [PID:B0621]

**Uganda State Biotechnology Museum**  
Department of Science & Technology  
University of Uganda  
Road 11, Kampala, Uganda  
Email: [ugabim@ug.ac.ug](mailto:ugabim@ug.ac.ug)

**A Comparative Homology Modeling and Docking Studies of Some Plant Compounds for Cancer Proteins - Microtubule destabilizer and stabilizer agents are important molecules in anticancer therapy. In particular, paclitaxel and docetaxel has been demonstrated to be effective for the treatment of ovarian, breast, and nonsmall cell lung carcinomas. Microtubule-interacting drugs are important agents in cancer chemotherapy. These drugs alter microtubule dynamics and engage the cell cycle surveillance mechanisms to arrest cell division in mitosis. It has been shown that these**

chemotherapeutic drugs are known to interact within a specific site on  $\beta$ -tubulin and the general location of the site has been defined by photo affinity labeling and electron crystallography.  $\beta$ -tubulin is member of the tubulin dimer is bound to GTP or GDP influences the stability of the dimer in the microtubule. Selecting the 64 ligand compound from Compendium of Indian medicinal plants and analyses the geometric optimization and structure-activity relationships and perform the docking study of anticancer plant compound including docetaxel and paclitaxel with help of the GOLD (Genetic Optimization for Ligand Docking) and also done the comparative study of ligand and drug. Result gives the binding energy or binding affinity, hydrogen bonding, and hydrophobic-hydrophobic interaction towards the  $\beta$ -tubulin and one ligand show the high fitness score comparing two drug.



Student Name : Debopriya Majumdar

Project Title : CBD - Cancer Biomarker Database

Academic Institution : S. P. University, Vallabh Vidyanagar, [PID:B0608]

Cancer Biomarker Database is an outcome of primary need for a reservoir of candidate and FDA approved biomarkers which have the potential of being used as elements for early detection and treatment of 5 different types of cancer. There has been much interest in biomarkers of cancer risk in predicting future patterns of disease, especially as cancer treatment has made such positive strides in the last few years. A

biomarker is any substance that is measured biologically and associated with an increased risk of disease. Biomarkers can be present in the serum, or be genetic testing factors, and all are being studied acutely to find out how they can be of more use in cancer screening. Cancer Biomarker Database is a compilation and classification of biomarkers that have been already used for early detection and diagnosis of different cancers as well as those that are under the investigation of researchers for their potential of being an approved marker for clinical use. The database mainly focuses on biomarkers for 5 types of cancers i.e. breast cancer, prostate cancer, colorectal cancer, ovarian cancer and chronic myeloid Leukemia. Not just the biomarkers itself, this database also provides a basic insight about the 5 different types of cancer and biomarker analysis tools for getting the so-called raw-materials for further research on them.





### 10.3.4 Publicity Material

#### 1. Biotechnology Policy of Gujarat in Brochure Format

State Government of Gujarat has developed biotechnology policy giving direction to biotechnology growth, reflecting the commitment of state government for the sector including important features needed for BT industries. The formation of “Biotech Policy 2007-2012” is an effort to spell out the underlying objectives and strategies adopted for developing Gujarat as the preferred Biotech destination in India. It will facilitate focused development and encourage spreading of biotech-enabled development all across vibrant Gujarat. A handy brochure format of Biotechnology Policy document to position and project Gujarat and Biotechnology for branding were undertaken based on the need of hour. The brochure is discussing various aspects of Biotechnology Policy like, Biotechnology: a growth engine, status of BT in Gujarat, major initiatives and planning ahead. The policy vision, objective and strategy with dedicated actions required and planned.

#### 2. Bio @ Gujarat

Bio @ Gujarat is a project showing the potential of Gujarat as a biotech hub in India. When the growing sector profiles and analysis and



The state has

infrastructure, intellectual capital and crucial linkages in value chain having potentials of Biotechnological Cluster generation. The Interactive Flash content is providing with Analytical Report and Compendium of Biotechnology organizations as a snapshot of Biotechnology Status of Gujarat. Accessing the status of biotechnology education with geographical representation is the unique effort of developing “Atlas of BT Education in Gujarat” is an important part of information shared through VCD.





## 11.0 Budget

For the year 2007-08, a total of Rs. 850 lacs Grant were released to GSBTM. Total Expense of Rs.466 lacs were accounted on 31st March 2008. It was the fourth consecutive year followed with various programs and activities planned for biotechnology development in the state. The GSBTM accounts are prepared and audit going to be accomplished by the month of July '08.

## 12.0 Audit

Consequent to the appointment of B. Upadhyay & Co., as an auditor for conducting the audit of GSBTM accounts. The accounts of GSBTM for the year 2007-08 are prepared for auditing.

## 13.0 Staff

State Government has sanctioned a staff of 24 for Gujarat State Biotechnology Mission. This includes 6 technical staff and 8 office staff and 6 supportive staff. However, during the first year, staff of 4 was recruited by Department of Science & Technology. It included three sector specialists and one Account cum Administrative officer. Subsequent to approval, given in November 2005, recruitment of 2 Deputy Section Officers has been undertaken through manpower agency. During the previous year, two Sector Specialists – Bio-informatics & Pharma & Healthcare were appointed. Thereafter an Account-cum-Administrative Officer was also appointed in the year 2007-08.

Staff Recruitment Details						
YEAR 2007-08						
No.	Designation of Post	Scale of Pay	Mode of Recruitment	No. of Post	Filled Post	Vacant Post
1	Mission Director	16400-450-20000	Deputation	1	1	-
2	Sector Specialist	12000-375-16500	Contract basis	6	5	1
3	Account-cum-Administrative Officer	6500-200-10500	Contract basis	1	1	-
4	English Steno Grade-I	6500-200-10500	Deputation / Contract basis	1	-	1
5	Dy. Section Officer	5500-175-9000	Contract basis	3	3	-
6	English Steno Grade-II	5500-175-9000	Contract basis	2	2	-
7	Clerk	3050-75-3950-80-4590	Contract basis	1	1	-
8	Data Entry Operator	3050-75-3950-80-4590	Contract basis	1	1	-
9	Peon	2500-55-2660-60-3200	Contract basis	4	4	-
			Total	20	18	2

## 14.0 Office Facility

GSBTM being a nodal agency, created under Department of Science & Technology, has its office in Udyog Bhavan. The office renovation works, have been completed to suit to specific office requirement. In view of the office requirement, for computer laboratory, technology, Web cell, library etc., renovations were done additionally.

## 15. ANNEXURE

ANNEXURE	CONTENT DETAIL
ANNEXURE – 1	Accounts of GSBTM for 2007-08
ANNEXURE – 2	Composition of Biotechnology Council
ANNEXURE – 3	Composition of Governing Body
ANNEXURE – 4	Composition of Executive Committee
ANNEXURE – 5	Biotechnology Research Support Details

**ANNEXURE-1**  
**Accounts of GSBTM for 2007-08**

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 - 382 011.  
Ph. : (079) 232-22798 (O)

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

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

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

We have audited the annex Balance Sheet of the above mentioned trust as at **31st March, 2008** 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 /- .
- (l) 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.

Place : Gandhinagar  
Date : 20/09/2008

For B. Upadhyay & Co.,  
Chartered Accountants

(H.B. Upadhyay)  
Partner





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

**Statement of Income liable to Contribution for the year ending on 31.03.2008**

**Name of Public Trust : GUJARAT STATE BIOTECHNOLOGY MISSION**

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

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

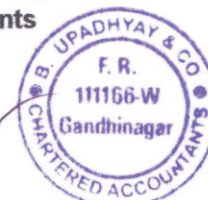
	Amount	Amount
Gross Annual Income		101829759.00
Details of Income not chargeable to Contribution under Section - 58 Rule - 32.		
(i) Donation received during the year from any source		
(ii) Grants by Government and Local Authority	85000000	
(iii) Interest on Sinking or Depreciation Fund		
(iv) Amount 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.		
		0.00
<b>Income liable to Contribution</b>		<b>101829759.00</b>

**Place : Gandhinagar**

**Date : 20/09/2008**

**For B. Upadhyay & Co.,  
Chartered Accountants**

**( H.B.Upadhyay )  
Partner**



**GUJARAT STATE BIOTECHNOLOGY MISSION**  
Sector : 11, Udhogbhavan ,Gandhinagar

**BALANCE SHEET AS ON 31.03.2008**

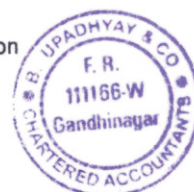
Laibilities		Amount	Assets		Amount
<b>Unspent Grants</b>			<b>Fixed Asset</b>		18934958.00
<b>BT Park Fund A/c</b>		144186580.00	(As Per Annex. 'C' )		
<b>BT Venture Fund</b>			<b>Investment</b>		301481505.00
(M.H.5424 Mi.H.800S.H.02)			FDR With GSFS GOI (Bt Park)		19489639.00
Opening	80000000.00		<b>Loans &amp; Advances</b>		
Addition During The Year	20000000.00		(As Per Annex. 'D' )		
	100000000.00		<b>Current Assets</b>		
Less Expenditure	100000000.00	0.00	Sundry Debtors		
<b>Grant-3425 60 004 01 Resea &amp; Dev Of BT</b>			Infocity Club & Resort G'nagar	488.00	
Opening	52318342.55		Pappilon Multy Media	40.00	528.00
Addition During The Year	60000000.00		<b>Deposits</b>		0.00
	112318342.55				
Less Expenditure As per Anne. A	17401157.19	94917185.36	Cash-In-Hand		202.00
<b>Research &amp; Dev of BT Sector in Gujarat</b>			State Bank of India		11958432.66
(M.H.3425 Mi.H.800S.H.03)					
<b>Grant-3425 60 004 03 Guj State BT Mission</b>	2389211.00				
Addition During The Year	5000000.00				
	7389211.00				
Less Expenditure As per Anne. A	1600495.00	5788716.00			
Land Contribution Refundable ( Money at BT Park Savli As Per Annex 'B' )		6079342.30			
Gujarat Council Of Science City		25000.00			
EMD-Capital offset		10000.00			
EMD Deposit		47000.00			
EMD-Future infotech		1000.00			
Security Deposit - Soni Travels		10000.00			
Salary Deduction		42468.00			
Duties & Taxes		293996.00			
<b>Inome &amp; Expenditure</b>					
Opening Balance	18586676.50				
Addition During Year	16817264.00	35403940.50			
<b>Total</b>		<b>351865264.66</b>	<b>Total</b>		<b>351865264.66</b>

0.00

*Vorakk*  
**Administrative Officer**  
Gujarat State Bioitechnology Mission  
Gandhinagar.

*Mission*  
**Managing Director**  
Gujarat State Bioitechnology Mission  
Gandhinagar.

*Chartered Accountant*  
**Chartered Accountant**  
Gujarat State Bioitechnology Mission  
Gandhinagar



**GUJARAT STATE BIOTECHNOLOGY MISSION**  
Sector : 11, Udhyogbhavan ,Gandhinagar

**INCOME & EXPENDITURE ACCOUNT**  
**FOR THE YEAR ENDED ON 31.03.08**

Particular	Amount	Particular	Amount
Bank charges	9145.00	Interest on Bank A/C	2326567.00
Loss on sale of Aqua Guard	3350.00	Interest On FDR	14490356.00
Excess of Income Over Expenditure	16817264.00	Misc Income	336.00
		Tender Fees	12500.00
		Suspense	0.00
<b>Total</b>	<b>16829759.00</b>	<b>Total</b>	<b>16829759.00</b>

*Vora KK*  
**Administrative Officer**  
Gujarat State Biotechnology Mission  
Gandhinagar.

*Mission*  
**Managing Director**  
Gujarat State Biotechnology Mission  
Gandhinagar.

*[Signature]*  
**Chartered Accountant**  
Gujarat State Biotechnology Mission  
Gandhinagar





# ANNEXURE - A

GSBTM (2007-08) FINAL04/07/08

Block No - 11,  
9th Floor,  
Udhyog Bhavan  
Gandhinagar

## Dev. of BT Sector in Gujarat

Group Summary

1-Apr-2007 to 31-Mar-2008

Page 1

Particulars	Opening Balance	Transactions		Closing Balance
		Debit	Credit	
<b>Biotech Infrastructure Dev.</b>		7,39,977.00	13,000.00	<b>7,26,977.00 Dr</b>
Agro BT Park		6,51,402.00	6,200.00	6,45,202.00 Dr
B.T.Park		29,913.00	6,800.00	23,113.00 Dr
Dev. of Incubators		9,670.00		9,670.00 Dr
Meeting Exp., BT Park		48,992.00		48,992.00 Dr
<b>Biotech Research Innova Support</b>		83,57,198.00	4,986.00	<b>83,52,212.00 Dr</b>
Patent Facilitation Cell		2,03,948.00		2,03,948.00 Dr
Support in Biotech Research		80,40,866.00		80,40,866.00 Dr
Workshop-Seminar-Symposium		29,601.00	4,986.00	24,615.00 Dr
Staff Salary BT Res & Innov. Exp.		82,783.00		82,783.00 Dr
<b>Co-Ordination &amp; Facilitation</b>		29,824.00		<b>29,824.00 Dr</b>
Suppo. Stakeholders Co-Ordi		29,824.00		29,824.00 Dr
<b>Establishment Exp.</b>		74,58,406.19	1,47,478.00	<b>73,10,928.19 Dr</b>
Accounting & Audit Fees		28,090.00		28,090.00 Dr
Advertisement Exp.		1,01,409.00		1,01,409.00 Dr
Books & Periodicals Exp.		8,131.00	80.00	8,051.00 Dr
ELECTRICITY EXP		4,21,612.00		4,21,612.00 Dr
GIIC M & R Exp.		1,65,901.00		1,65,901.00 Dr
Honorium Exp.		12,200.00		12,200.00 Dr
Insurance Exp.,		10,206.00		10,206.00 Dr
OFFICE EXP		1,42,217.00	1,07,625.00	34,592.00 Dr
Office Renovation Exp.		12,14,694.00	38,070.00	11,76,624.00 Dr
Office Rent Exp.		16,00,000.00		16,00,000.00 Dr
Postage & Courier Charges		61,309.03		61,309.03 Dr
Repair & Maint., Exp.		85,049.16		85,049.16 Dr
Security Charges.,		1,95,202.00		1,95,202.00 Dr
Staff Salary Exp.		23,27,466.00		23,27,466.00 Dr
Stationery Exp.		81,621.00		81,621.00 Dr
T.A. / D.A. & Meeting Charges.,		90,581.00		90,581.00 Dr
Telephone & Mobile Bill Exp.		11,651.00	1,703.00	9,948.00 Dr
Vehicle Hire Charges		9,01,067.00		9,01,067.00 Dr
<b>Event Participation</b>		20,233.00		<b>20,233.00 Dr</b>
Vibrant Gujarat-07		4,500.00		4,500.00 Dr
Conduction in Nat Exhib. Conference		14,622.00		14,622.00 Dr
Participation in Nat. Exhibi Conference		1,111.00		1,111.00 Dr
<b>Policy Plann. Supp. &amp; Stra. Initiative</b>		8,54,257.00	582.00	<b>8,53,675.00 Dr</b>
Policy Formulation-BT & Related Issue		8,54,257.00	582.00	8,53,675.00 Dr
<b>Popularization of Biotech</b>		1,03,274.00		<b>1,03,274.00 Dr</b>
Popular Lecture Series		45,484.00		45,484.00 Dr
Printing Exp. Awe. Gen & Info		57,790.00		57,790.00 Dr
<b>HOSPITALITY EXPS.</b>		4,034.00		<b>4,034.00 Dr</b>
<b>Grand Total</b>		<b>1,75,67,203.19</b>	<b>1,66,046.00</b>	<b>1,74,01,157.19 Dr</b>



ANNEXURE - A**GSBTM (2007-08) FINAL04/07/08**

Block No - 11,  
9th Floor,  
Udhyog Bhavan  
Gandhinagar

**Biotech Human Resource Dev****Group Summary**

1-Apr-2007 to 31-Mar-2008

Page 1

Particulars	Opening Balance	Transactions		Closing Balance
		Debit	Credit	
<b>Technology Facilitation</b>		2,18,365.00	900.00	<b>2,17,465.00 Dr</b>
Advertisement Exp. TFC		9,463.00		9,463.00 Dr
Office Exp. TFC		1,160.00		1,160.00 Dr
Printing Exp., TFC		15,020.00		15,020.00 Dr
Staff Salary TFC Exp.		1,80,552.00	900.00	1,79,652.00 Dr
T.A./d.A. & Honorium Exp., HRD		12,170.00		12,170.00 Dr
Advertisement Exp. HRD		1,85,904.00		1,85,904.00 Dr
Biotech Enterpre. Dev. Prog June-07		2,05,295.00	23,828.00	1,81,467.00 Dr
Meeting Exp., HRD		1,62,607.00		1,62,607.00 Dr
Office Exp. Hrd		2,910.00		2,910.00 Dr
Printing Exp. HRD		1,71,944.00		1,71,944.00 Dr
Staff Salary Exp., HRD,		12,000.00		12,000.00 Dr
Support to New Trai. Prog/ HRD Courses			13,848.00	13,848.00 Cr
Train. Prog in Spec. Institutes		1,60,420.00		1,60,420.00 Dr
Vehicle Hire Charges., HRD		72,288.00	1,381.00	70,907.00 Dr
Workshop Seminar exp., HRD		4,52,217.00	3,498.00	4,48,719.00 Dr
<b>Grand Total</b>		<b>16,43,950.00</b>	<b>43,455.00</b>	<b>16,00,495.00 Dr</b>

ANNEXURE - B**GSBTM (2007-08) FINAL04/07/08**

Block No - 11,  
9th Floor,  
Udhyog Bhavan  
Gandhinagar

**Land Contribuion Money BT Park Savli****Group Summary**

1-Apr-2007 to 31-Mar-2008

Page 1

Particulars	Opening Balance	Transactions		Closing Balance
		Debit	Credit	
Anhox Biotech Pvt. Ltd	1,000.00 Cr		2,65,050.00	2,66,050.00 Cr
BDR Pharmaceuticals Inte. Pvt. Ltd.	15,00,000.00 Cr			15,00,000.00 Cr
Hi Tech Surgical System	2,00,000.00 Cr	2,00,000.00		
M D Bio	2,86,902.30 Cr			2,86,902.30 Cr
Mebs Biotech Ltd.	24,89,300.00 Cr			24,89,300.00 Cr
M J Biopharm	11,92,950.00 Cr			11,92,950.00 Cr
Oxygen Healthcare	3,12,840.00 Cr			3,12,840.00 Cr
Scrutiny Fees Income	30,250.00 Cr	1,050.00	1,050.00	30,250.00 Cr
Sun Biotech.,			1,050.00	1,050.00 Cr
<b>Grand Total</b>	<b>60,13,242.30 Cr</b>	<b>2,01,050.00</b>	<b>2,67,150.00</b>	<b>60,79,342.30 Cr</b>



# ANNEXURE - C

GSBTM (2007-08) FINAL04/07/08

Block No - 11,  
9th Floor,  
Udhyog Bhavan  
Gandhinagar

## Fixed Assets

Group Summary

1-Apr-2007 to 31-Mar-2008

Page 1

Particulars	Opening Balance	Transactions		Closing Balance
		Debit	Credit	
<b>Computer System</b>	<b>13,35,004.00 Dr</b>	<b>24,36,021.00</b>	<b>1,28,082.00</b>	<b>36,42,943.00 Dr</b>
AquaGard System A/c	6,850.00 Dr		6,850.00	
Books	1,89,568.00 Dr			1,89,568.00 Dr
Books TFC	95,965.00 Dr			95,965.00 Dr
EPABX Machine		2,10,933.00		2,10,933.00 Dr
Furniture & Fixture Establishment	4,59,468.00 Dr	4,77,028.00		9,36,496.00 Dr
Land of BT Park, Savli	99,79,200.00 Dr	37,58,400.00		1,37,37,600.00 Dr
Mobile Instrument,		17,500.00		17,500.00 Dr
Office Equipment	40,155.00 Dr	4,800.00		44,955.00 Dr
RO System A/c		10,000.00		10,000.00 Dr
Tools & Equipment	18,341.00 Dr			18,341.00 Dr
Wall Motorised Screen,,		25,257.00		25,257.00 Dr
White Board,,		5,400.00		5,400.00 Dr
<b>Grand Total</b>	<b>1,21,24,551.00 Dr</b>	<b>69,45,339.00</b>	<b>1,34,932.00</b>	<b>1,89,34,958.00 Dr</b>

# ANNEXURE - D

GSBTM (2007-08) FINAL04/07/08

Block No - 11,  
9th Floor,  
Udhyog Bhavan  
Gandhinagar

## Loans & Advances (Asset)

Group Summary

1-Apr-2007 to 31-Mar-2008

Page 1

Particulars	Opening Balance	Transactions		Closing Balance
		Debit	Credit	
<b>M.H. 5424 Mi.H. 800 S.H. 02 Adv</b>	<b>7,00,00,000.00 Dr</b>		<b>7,00,00,000.00</b>	
Adv-Anand Agric. Uni.,		1,80,000.00		1,80,000.00 Dr
Adv - Ansuya Laheri.,		25,000.00	25,000.00	
Adv-Bhavik Gor		15,000.00	15,000.00	
Adv-Forensic Science Laboratory.,		50,000.00		50,000.00 Dr
Adv-Foundation for Res. in Genetics & Endocrinology		80,000.00	80,000.00	
Adv-Guj. Cancer & Resea. Inst.		1,50,000.00		1,50,000.00 Dr
Adv-Guj. Genomic Intitative (GGI)		4,50,000.00		4,50,000.00 Dr
Adv-Guj Insti. of Dev. Research A'bad		50,000.00		50,000.00 Dr
Adv-Guj. Uni. Zoology Dept.,		80,000.00	80,000.00	
Adv- Madhavi Joshi		5,000.00	5,000.00	
Adv-Microbiology Study Circle(J&J Sci.Coll)Nadiad		28,000.00	28,000.00	
Adv-N.V.Patel College		50,000.00		50,000.00 Dr
Adv-Rasheedunnisa Begum.,		45,000.00		45,000.00 Dr
Adv - Shri A. K. Saxena		60,000.00	60,000.00	
Adv - Snehal Bhagthariya	3,000.00 Dr		3,000.00	
Adv to Ramkya Consultancy	6,36,454.00 Dr			6,36,454.00 Dr
Adv-Transportation Update 2007 Fina. Asst. IKDRC		2,50,000.00	2,50,000.00	
Project Advance	1,72,91,101.00 Dr			1,72,91,101.00 Dr
T.D.S. - SBI	5,87,084.00 Dr			5,87,084.00 Dr
<b>Grand Total</b>	<b>8,85,17,639.00 Dr</b>	<b>15,18,000.00</b>	<b>7,05,46,000.00</b>	<b>1,94,89,639.00 Dr</b>





## ANNEXURE-2

### Constitution of Gujarat Biotechnology Council

No	Designation	Status
1	Chief Minister, Gujarat State	Chairman
2	Minister of State, Industries	Member
3	Chief Secretary, GoG	Member
4	Secretary, DBT, GoI	Member
5	Principal Advisor, GoG for Biotechnology	Member
6	Principal Secretary (Finance), GoG	Member
7	Principal Secretary (Industries & Mines), GoG	Member
8	Principal Secretary (Forest & Environment), GoG	Member
9	Secretary (Higher & Technical Education), GoG	Member
10	Secretary (Health), GoG	Member
11	Secretary, Department of Science & Technology, GoG	Member
12	Secretary (Agriculture), GoG	Member
13	Dr. S. P. S. Khanuja, Director, Central Institution for Medicinal and Aromatic Plants - CIMAP	Member
14	Dr. Bharat Chattoo, Head of Biotechnology Programme, MSU, Baroda	Member
15	Vice - Chancellor, Gujarat Agriculture University	Member
16	Dr. Datta Madamwar, Head, Dept. of Bio Science, SPU, Vallabh Vidhyanagar	Member
17	Dr. Harish Padh, Director, PERD, Ahmedabad	Member
18	Dr. Lalji Sing, Director, Centre for Cellular and Molecular Biology, Hyderabad	Member
19	Dr. V.R Kamboj, President, National Academy of Science, Allahabad	Member
20	Director, CSMCRI, Bhavnagar	Member
21	Prof. Subhash Chand, IIT, New Delhi	Member
22	Shri Pankaj Patel, CMD, Zydus Cadilla Ltd., Ahmedabad	Member
23	Shri Sudhir Vaid, MD, Concord Biotech Ltd., Ahmedabad	Member
24	Dr. Farzaan Engineer, MD, Quintiles Spectral(India)Ltd, Ahmedabad	Member
25	Director, Gujarat State Biotechnology Mission	Member Secretary
26	Dr. S. Nagrajan, Director, IARI, New Delhi	Member
27	Director, National Institute of Oceanography, Goa	Member
28	Dr. Amit Ghosh, Scientist, Director, IMTECH, Chandigarh	Member
29	Dr. P. K. Ghosh, Advisor, Cadila Pharmaceuticals, Ahmedabad	Member
30	Dr. Amrita Patel, NDDDB, Anand	Member
31	Shri P. K. De, Chairman, Span Diagnostic Ltd, Bandra	Member
32	Dr. V. Chothaiwala, GM, Torrent Research Center, Bhatt	Member
33	Dr. Devyani R. Tipre, Research Assoc., Department of Microbiology, School of Sciences, Gujarat University, Ahmedabad	Member

### ANNEXURE-3 Constitution of Governing Body Committee

No.	Designation	Status
1	Chief Secretary, Gujarat State	Chairman
2	Principal Secretary, Forest & Environment Department	Member
3	Principal Secretary, Finance Department	Member
4	Principal Secretary, Industries & Mines Department	Member
5	Principal Secretary, Health Department	Member
6	Principal Secretary, Higher & Technical Education Department	Member
7	Secretary, Agri. & Co-operation Department	Member
8	Secretary, Science & Technology Department	Member
9	Secretary, DBT, GoI	Member
10	Joint Secretary (BT), Science & Technology Department	Member
11	Director, BISAG, Gandhinagar	Member
12	Advisor, GUJCST, Gandhinagar	Member
13	Prof. Bharat B. Chattoo, M.S. University, Baroda	Member
14	Prof. Harish Padh, Director, B. V. Patel PERD Center, Ahmedabad	Member
15	Prof. Datta Madamwar, Head, S. P. University, Vallabh Vidhyanagar	Member
16	Dr. P. K Ghosh, Adviser, Cadilla, Ahmedabad	Member
17	Director, CSMCRI, Bhavnagar	Member
18	Shri Pankaj Patel, Zydus Cadila, Ahmedabad	Member
19	Mission Director, GSBTM, Gandhinagar	Member Secretary

### ANNEXURE-4 Constitution of Executive Committee

No.	Designation	Status
1	Secretary, Department of Science & Technology, GoG	Chairman
2	Secretary, Department of Technical Education, GoG	Member
3	Joint Secretary (BT), Department of Science & Technology, GoG	Member
4	Director, BISAG, GoG	Member
5	Advisor, GUJCOST, GoG	Member
8	Director, B. V. Patel P. E. R. D. Centre, Ahmedabad	Member
9	Dr. P. K. Ghosh, Advisor, DST, GoG	Member
10	Financial Advisor	Member
11	Mission Director, GSBTM	Member Secretary

## ANNEXURE-5 Biotechnology Research Support Details

### Sanctioned Projects:

No	Investigator	Title of the Project	Type	Sector	Name of Institution	Duration	Amount Sanctioned & Released 2007-08 (Rs.)
1	Dr. P. K. Ghosh	COE in Marine Biotechnology	COE	Marine Biotechnology	CSMCRI, Bhavanagar	3 Year	1910200
2	Dr. B. Chatto	COE for Agri. Biotechnology	COE	Agri. Biotechnology	Dept. Microbiology & Biotechnology	3 Year	1410000
3	DCF, Research Davison	Mycorrhizal Rhizobial Association, establishing gene bank and technology transfer to farmers in field	Major	Agri. & Allied areas	Gujarat Forest Research Institute, Gandhinagar	3 Year	615000
4	Dr. G Archana	Microbially Mediated Alleviation of Heavy Metal Toxicity to Plants and Community changes in Rhizospheric populations upon metal pollution using copper as model	Major	Agri. & Allied areas	Dept. Microbiology & Biotechnology, Vadodara	3 Year	298670
5	Prof S. Dave	Studies on Biotechnology of Heavy Metals	Major	Environmental Biotechnology	School of Science, Ahmedabad	3year	300000
6	Dr. J. Solanki	Somatotropin mediated gene expression in lactogenic pathway of buffalo	Major	Animal Biotechnology	Anand Agricultural University	3year	624600
7	Dr. S. Baxi	Characterization of Chromosome Rearrangements of Malignant Effusions with Multiplex FISH	Major	Industrial Biotechnology	GCRI, Ahmedabad	3 Year	305666
8	Dr. S. Trivedi	Study of Estrogen receptor system in human breast cancer	Major	Pharma & Healthcare	GCRI, Ahmedabad	3 Year	432300
9	Dr. V. Thaker	An Immunological approach in Agri. Biotechnology	Major	Agri Biotechnology	Bioscience Department, Saurashtra University, Rajkot	3 Year	361060



No	Investigator	Title of the Project	Type	Sector	Name of Institution	Duration	Amount Sanctioned & Released 2007-08 (Rs.)
10	Dr. H. Chhatpar	Research project in agriculture & environmental biotechnology	Major	Agri & Environmental Biotechnology	Dept. Microbiology & Biotechnology, Vadodara	3 Year	1780860
11	Dr. D. R. Patel	Development of Cell Lines Resistant to Alternaria Blight using in vitro Techniques	Minor	Agriculture Biotechnology	Plant Tissue Culture Lab, AAU, Anand	3 Year	193600
12	Dr. R. Patel	Protein Expression Profile of Haloalkalophilic Bacteria	Minor	Industrial Biotechnology , Bioinformatics	Hemchandracharya University, Patan	1 Year	-
13	Dr. L. J. Parekh	Bioremediation of Metallic Pollutants from Electroplating Effluents	Minor	Environmental Biotechnology	Shree M & N Virani Science College, Rajkot	2 Year	-
14	Dr. K. Kaliya	Functional Abnormality of glycosylated IgG in diabetes mellitus and their role in progression of secondary complications such as diabetic nephropathy	Minor	Basic Research	S.P. University, Vallabh Vidhyanagar	2 Year	-
15	Dr. D. Madamwar	Preparation and characterization of immobilized lipase for flavor production	Minor	Industrial Biotechnology	S.P. University Vallabh Vidhyanagar	3 Year	236050
16	Dr. G. Nareshkumar	Genetic Manipulation of Rhizobium for improved P nutrition	Minor	Agri. & Allied areas	Bio Chemistry Dept, MS Uni, Baroda	2 Year	-

## GUJARAT STATE BIOTECHNOLOGY MISSION

### Scientific Officers



**Dr. Snehal Bagatharia**

Sector Specialist - Agriculture Biotechnology (Class-I)  
[ssabtm@gujarat.gov.in](mailto:ssabtm@gujarat.gov.in)



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**Ms. Madhvi Joshi**

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**Ms. Nikita Patel**

Sector Specialist –Bioinformatics (Class-I)  
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### **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](mailto:info-btm@gujarat.gov.in)

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