Statement of Outlays and Outcomes/Targets: Annual Plan 2005-06

(Rs. in crores)

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
1.	Human Resource Development	To generate skilled human resource in multidisciplinary area of Biotechnology and popularization of Biotechnology.	18.50	Quarter-I • 2 New PG courses will be supported- 10-15 students each • 40 Post Doctoral Fellows (PDFs) will be selected • 100 Junior Research Fellows (JRFs) will be selected • 15 seminars/symposia will be supported • 3 short term training courses will be supported - 10-15 Scientists per course Quarter-II • 2 New PG courses will be supported- 10 to 15 students each • 50 Junior Research Fellows (JRFs) will join • 15 seminars/ symposia will be supported • 3 short term training courses will be supported -10 to 15 scientists per course Quarter-III • 2 New PG courses will be supported • 35 Post Doctoral Fellows (PDFs) will be selected • 50 Junior Research Fellows (JRFs) will be selected • 15 seminars/symposia will be supported • 3 short term training courses will be supported • 100 PG students will be selected for 6 months industrial training	*	Possible inadequacy of specif ic proposals from institutes which may need modification

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				Quarter-IV • 2 New PG courses will be supported • 15 seminars/symposia will be supported • 3 short term training courses will be supported • 50 industrial trainees will join • National Science say will be celebrated in 30 Universities/R&D Institutions		
2.	Biotech Facilities, Centers of Excellence and Programme support	The overall objectives of this scheme is a. To promote establishment of repositories for conservation/ preservation of living organisms including microbes both useful and harmful in agriculture, human health, animal husbandry and bio-industries b. To create state of the art facilities for use by scientific community and institutions in the following thrust areas - Development of GLP (Good Laboratory Practice) compliant state-of-the-art animal house facility. - Establishment of Centres for Microbial Repository. - Development of Proteomics facility.	45.00	Quarter-I • Initiate action for: - Establishment of the Flowcytometry Facility, at the Department of Biotechnoogy, AIIMS, New Delhi. - Upgradation of the Existing Computer Infrastructure at the Bioinformatics Facility of Centre for DNA Fingerprinting and Diagnostics. - Development of Confocal Microscopy Facility at the Institute of Life Sciences, Bhubhaneshwar. - Construction of the Animal House for research work in areas of human health and diseases, transgenic crops and microbial enzymes for industrial use at University of Delhi (South Campus) will be completed. Quarter-II • Initiate activity for setting up of centre of Excellence as per/developed priority area. Quarter-III • Actions to be taken for achieving targets for Quarter IV		- - - Institutional and other necessary clearance Inadequacy of proposals and repeated discussions with PI

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		c. To promote and strengthen institutional capacity in specific thematic areas of biotechnology with a multi-disciplinary research effort by expanding and developing capabilities in biotechnology research, d. To promote and strengthen institutional capacity in specific thematic areas of biotechnology with a multi-disciplinary research effort by expanding and developing capabilities in biotechnology research, e. Establishment of core facilities and enhancing infrastructure needed to carry out objectives of the programmes.		Quarter-IV • The fMRI facility at National Brain Research Centre , Gurgaon to become functional		Administrative and other procedural delays in the institute for purchase etc.
3.	Research and Development					a) Inadequate proposals as per merit b) Multiple partners c). Administrative and procedural delays in institute d) regulatory and other clearances

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3.1	Agriculture Biotechnology					
3.1.1	***Crop and Biofertilizers***	**a. Crop** • To develop suitable transgenics resistance to various biotic/abiotic stresses, hetrosis breeding and crop improvement through marker aided selection • Under crop Biofortification programes for alleviating micro-nutrient malnutrition to be launched. • Development of cotton transgenics for resistance to bollworm, CLCV • Launching of new projects in the area of plant molecular virology	15.00	Quarter-I • Launching network programme on millet improvement through Biotechnological interventions. • Completion of Rice Genome Sequencing Targets assigned to India(chromosome 11, region 57.3 –116.2 cm) as a part of our International commitment of International Rice Genome Sequencing Programme. Quarter-II • Collection of *Bacillus thuringensis* strains from Western Ghats and North-Eastern Regions for cloning and characterization of novel genes effective against insect pests. • Cloning of genes and their promoters conferring to salinity and dehydration stress tolerance in rice.		(a) - - -

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
		b. Biofertilizers • Development of Transgenic Microbial Inoculants having high nitrogen fixation ability, nutrient solubilization and mobilization etc. • Research and Development leading to new technology packages. • Transfer of mass production technologies for biofertilizers for their commercial production. • Generation of projects to develop technologies for making available biofertilizers in liquid carrier.		Quarter-III • Cloning and characterization of some useful genes under rice functional genomics programme. • Undertake multi-location field trials of hybrid of mustard developed through barnase/barstar technology (s) for use in certain crops. Quarter-IV • Undertake green house /field evaluation of transgenic chickpea and pigeonpea resistant to pod borers. • Development of Molecular markers for use in the wheat breeding programme. • Launching a network programme on development of liquid biofertilizer		- (b & d) (b & d) - (a)

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3.1.2	***Biological Pesticides***	• Market survey on biopesticides • Generation of toxicological data of potential biopesticides. • Road map for biopesticides • Registration of *Trichoderma viride* as biopesticide.	5.00	Quarter-I • Market survey on biopesticides is to be completed. • Generation of toxicological data of potential biopesticides. • Preparation of road map for biopesticides • Biopesticide *(Trichoderma viride)* is to be registered. Quarter-II • Bioactive principles of leaf extract of *Phlogacanthus thrysiflorus* would be tested against tea mosquito bug and these active principles are to be identified. • Finalisation of comprehensive website on biopesticides. • Purification and characterisation of novel insecticidal toxins from *Photorhabdus* and *Xenorhabdus spp.* of bacteria from entomopathogenic nematodes. Quarter-III • Efficacy of two heat tolerant new species viz. *Steinernema masoodi* and *S. seemai* would be established against *Helicoverpa armigera* in pulse crops grown under high temperature regimes. • Technical brochures highlighting the achievements of some of the completed projects would be prepared.		- - - (d) (b & d)

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				• Molecular characterisation of agriculturally important microorganism (Fungi, bacteria and nematodes) to be done Quarter-IV • Genetic improvement of strains of entomopathogenic nematodes (for adaptation to extreme environment) with enhanced efficacy against *Helicoverpa armigera* is to be done. • Compilation of the achievements of the R&D projects in the form of publication. • Programme on storage pests on cereals, vegetable, fruits and plantation crops to be launched.		- - -
3.2	Bioresource Develop-ment and Utilization					

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
3.2.1	***National Bioresource Develop - ment Board***	a. To prepare CDs on digitized inventories of animal, microbial and marine resources b. To develop 12, 000 EST's and 200 clones in sugarcane.To sequence 2000 clones c. To prepare Pesticide formulations of plant origin for microplot testing d. To develop commercially viable and cost effective biofertilizer formulation e. To transfer salt tolerant genes from mangrove species to rice plants for developing salt tolerant plants f. Biodiversity characterization of Central India, Eastern Ghats, Mangrove regions at landscape level. g. To conduct vacation training programme	15.00	Quarter-1 • Nine CDs on digitized inventories of animal, microbial and marine resources to be ready for release • 3000 Expressed Sequence Tags (EST's) and 50 full length clones on sugarcane will be ready • Sequencing of 500 genomic and cDNA clones of Sugarcane • Biofertilizer formulation (using salt tolerant nitrogen fixing and phosphate solubilizing bacterium) to be transferred to industry • Salt tolerant gene transferred to Indica rice variety IR-20 first limited field trial to be initiated • Three Vacation training programmes for school children on bioresources to be conducted-75 students to be benefited. Quarter-II • An additional 3000 EST's and 50 full length clones on sugarcane will be ready • Sequencing of an additional 500 genomic and cDNA clones of Sugarcane • Two Pesticide formulations of plant origin to be ready for microplot testing • Agro-technology packages for *Hedychium spicatum* and *Valeriana jatamansi* to be standardized • Butterfly Park at Bannerghatta, Bangalore to be ready for trial run for public		- (b) - (b & d) (d) (a) - - (b & d) (b) (c)

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				• Three Vacation training programmes for school children on bioresources to be conducted. - 75 students		(a)
				• Multilocation field testing of biopesticide formulation of plant origin against boll worm		(b & d)
				• Salt tolerant gene transferred to Indica rice variety IR-20 multilocational field trial to be initiated.		(d)
				• Product formulation with novel SOD		(b & d)
				Quarter-III		
				• An additional 3000 EST's and 50 full length clones on sugarcane will be ready		-
				• Sequencing of an additional 500 genomic and cDNA clones of Sugarcane		-
				• Process for sclerol production from *Salvia sclarea* to be ready		-
				• Multilocation field testing of biopesticide formulation of plant origin against boll worm to be continued.		(b)
				• Activity of Biopesticide compound to be tested.		-
				• Sequencing of 4000 EST's from Mangrove plant *A. marina* will be completed		-

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				Quarter-IV • Additional 3000 EST's and 50 full length clones on sugarcane will be ready • Sequencing of 500 genomic and cDNA clones of Sugarcane. • Toxicity evaluation of the biopesticide formulation. • Field testing of biopesticide formulation of plant origin against boll worm • Salt tolerant gene transferred to Indica rice variety IR-20 multilocational field trial to continue • 90% mapping of Central India, Eastern Ghat and Mangrove region to be completed for landscape characterization through Remote Sensing.		- - (b & d) (d) (d) (b)
3.2.2	***Medicinal and Aromatic plants***	• To launch new projects on development of herbal products for veterinary health care in identified areas • To launch new projects in identified areas of genomics and metabolic engineering of medicinal & aromatic plants.	7.00	Quarter-1 • To Organize Brainstorming session in April, 2005 to identify the project ideas Quarter-II • New projects on development of herbal products for veterinary health care in identified areas to be launched Quarter-III • Pre-clinical and toxicity studies on herbal preparation developed from *Terminalia arjuna* for left ventricular dysfunction to be completed		- (a) -

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		• To develop at least three standardized herbal preparation with specific therapeutic purpose (ready for toxicity studies). • To complete Pre-clinical toxicity studies on herbal preparations developed for left ventricular dysfunction, diabetes type II and amoebiosis		Quarter-IV • Clinical trials on herbal preparation developed from *Terminalia arjuna* on patients with for left ventricular dysfunction to be initiated subject to necessary approvals. • Pre-clinical and toxicity studies on herbal preparation developed from *Oxalis corniculata* for amoebiasis to be completed.		(b & d) (b & d)
3.2.3	***Plant Biotechnology***	**Plant** • To sequence 2 Mb euchromatic region of chromosome –V of tomato • Large scale multiplication of apple root stocks through micro propagation and its field transfer and demonstration in three states - HP, Uttranchal and J&K • Farm evaluation of tissue culture raised black pepper in 100 hectares of farmers fields	15.00	Quarter-1 **Forestry, Horticulture & Plantation Crops:** • Nursery plantations of 10000 micropropagated Apple root stocks in HP and Uttranchal • Release of database for 150 clones of Germplasm under Tea Network Project **Biofuels:** • Clonal nurseries of elite *Jatropha* collections to be established at 10 locations. • 200 hect. of elite *Jatropha* plantation will be raised for demonstration.		(b) (b) (b & c)

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		• Field demonstration of micropropogated bamboo s in 100 hectares in different states of the country • Characterization of Tea Germplasm **Biofuel** ➢ To develop clonal nurseries of superior *Jatropha* collections ➢ To demonstrate *Jatropha* plantation in 200 ha of land across 10-15 centers in the country ➢ To develop alternate feed stock for Biofuel ➢ Cost effective process for Biofuel development		Quarter-II **Forestry, Horticulture & Plantation crops:** • Development of Tomato BAC libraries • 210 hectares of field demonstrations of Bamboo plantations to be completed • Plantation of 100 hectares under farm evaluations of Tissue Culture black pepper plants • Large scale demonstration of disease free shoot tip grafted citrus (10000 plants). **Biofuels:** • Pilot scale testing of biodiesel transesterification technology. • Large scale production and nursery development of elite *Jatropha* • Conservation of *Jatropha* germplalsm collected from 12 centres Quarter-III **Forestry, Horticulture & Plantation crops:** • Formulation of guidelines for Tissue Culture for 4 prioritized crops • Evaluation of immuno diagnostic kits for plantation (spices) crops for disease detection • Training at 2 locations for adoption of Tissue Culture technologies at grass toot level **Biofuels:** • Chemical characterization of elite *Jatropha* collection. • Testing of alternative feedstock for ethanol production.		- (b & c) (b & c) (b & c) (c) (c) - - (b) - - -

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				Quarter-IV **Forestry, Horticulture & Plantation crops:** • Nursery production of Bamboo for 300 hectares for demonstrations in 7 States • Nursery production of 1000 double grafted virus free citrus plants • Sequencing of 2 Mb of chromosome V of Tomato **Biofuels:** • Mass production of *Botrycoccus* for hydrocarbon production • Testing of efficacy of thermotolerant yeast strain for enhanced ethanol recovery		(b & c) (b & c) - - -
3.2.4	***Animal Biotechnology***	• Protocol for testing of recombinant anthrax vaccine in livestock. • Development of recombinant anthrax vaccine. • Road map for Animal biotechnology • Molecular characterization of indigenous goat breeds.	7.00	Quarter-1 • Formulation of protocol for testing of recombinant anthrax vaccine in livestock • Review of the status of phase I / II clinical trials of recombinant anthrax vaccine • Preparation of road map for Animal biotechnology • Molecular characterisation of indigenous goat breeds is to be done Quarter-II • Field testing / evaluation of ELISA kit developed to monitor the immune status of animals vaccinated against *Haemorrhagic septicemia* to be done		(b) - - - (b& d)

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				• *In vitro* testing of edema factor and lethal factor mutants of anthrax. This will help to develop an improved vaccine against anthrax. • Testing of ELISA based diagnostic kit of peste des petits ruminants virus to be completed. • Programme on bovine tuberculosis to be launched <u>Quarter-III</u> • Multicentric programme under Animal Nutrition to be launched • Production of mice pips/buffalo calves from cloned embryos • Clinical testing of lens (animals collagen) in animal and their immunological behaviour to be completed Quarter-IV • 5000 cDNA clones would be sequenced to develop EST's from somatic cells of buffalos. • EST's of X-chromosome of buffalo and its chromosomal painting is to be completed		(b & d) (b) (a) (a) (b) (b& d) - -

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3.2.5	***Aquaculture and Marine Biotechnology***	- Development of diagnostics and vaccines for major diseases in aquaculture; - Study molecular biology of Indian species, identification of useful genes and constructs for trait development; - Bioactive molecules from marine organisms for therapeutic and industrial applications; - In vitro tissue culture, cell culture in aquaculture species; - Front-line demonstrations to prove techno-economic viability of aquaculture of non-traditional species for diversification in aquaculture;	4.00	<u>Quarter-1</u> • Construction of eco-hatchery for carp seed production in Nagaland University • Validation of Bioreactor technology for prawn hatchery <u>Quarter-II</u> • Establishment of prawn hatchery in Tripura • Cell lines development of brackish water prawn species • Training programme for above 50 prawn farmers and entrepreneurs on culture and seed production <u>Quarter-III</u> • Validation of plant based prophylactics for shrimp health management in culture system to be completed • Development of genetic markers for brackish water prawn species <u>Quarter-IV</u> • Development of protocol for seabass fish cell lines • Development of genetic markers for freshwater prawn species Validation of recombinant protein as vaccine for fish pathogen *Aeromonas hydrophila*		(c) (c& d) (c & d) - (b) (b & d) - - - (b)

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3.2.6	***Seri-Biotechnology***	• To prepare the Road-map on sericulture biotechnology for next 5-years • To launch new collaborative project on identification of DNA markers linked to QTLs (cocoon weight and cocoon shell weight) • To carry out immune response and challenge tests of PPRV antigenic proteins (produced in silkworm larvae using Bm NPV system) by IISc, Bangalore in collaboration with IVRI, Mukteshwar • To launch new collaborative project on post-cocoon processing of silk towards improvement of quality of silk. • silkworm (*A. mylitta*)	7.00	<u>Quarter-1</u> • Animal challenge studies of PPRV antigenic proteins expressed in silkworm (*Bombyx mori*) to be initiated jointly by IISc, Bangalore and IVRI, Mukteshwar. • Sequencing of about 10,000 ESTs in muga silkworm (*Antheraea assama*) to be completed. • Preparation of Road Map for seribiotechnology <u>Quarter-II</u> • Sequencing of about 10,000 ESTs in muga silkworm (*A. assama*) to be completed. • Sequencing of about 1,000 ESTs in tropical tasar silkworm (*A. mylitta*) to be completed. • Animal challenge studies of PPRV antigenic proteins expressed in silkworm (*B. mori*) to be completed. <u>Quarter-III</u> • Sequencing of about 10,000 ESTs in muga silkworm to be completed. • Sequencing of about 1,000 ESTs in tropical tasar silkwom to be completed. • Up to 50 microsatellite markers in mulberry to be identified		(b & d) - - - - (d) - - -

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		• To identify silkworm (*Bombyx mori)* lines resistant to Bm NPV through molecular marker assisted breeding under Network project • To develop microsatellite markers in mulberry under the project on molecular linkage map. • To meet the Indian commitment under International Consortium on Lepidopteran genomics for developing data base of about 30,000 ESTs in muga silkworm (*Antheraeau assama)* and tropical tasar • To strengthen CDFD, Hyderabad in frontier areas of silkworm genomics research		Quarter-IV • Sequencing of about 1,000 ESTs in tropical tasar silkworm to be completed. • Development of up to four potential silkworm lines (*Bombyx mori*) resistant to grasserie disease through molecular marker assisted breeding. • Net house evaluation of putative transgenic resistant to abiotic stress in mulberry to be carried out		- - (d)

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3.3	Basic Research & Emerging Areas	• Support projects in Nanobiotechnology as a Thrust Area. Initiate programmes on other frontier and emerging areas RNAi, Bioengineering, quantum dot. • To monitor progress of the on-going projects and evaluation of completion projects, preparation of agenda including summary notes on achievements of on-going and completed projects, to deal with other matters related to Task Force meetings.	10.00	<u>Quarter-I</u> • Projects will be generated for diagnosis and treatment of cancer based on application of quantum dots and nanoparticles. The projects in other areas will also be implemented based on the merit and rational in national • To organize workshops to discuss possible areas of research in biomaterials, biosensors, bioinstrumentation and tissue engineering by inviting clinicians and industry <u>Quarter-II</u> • Preparation of a comprehensive Road Map in Bioengineering • To organize workshop on bioengineering with participation by industry Quarter-III • Implementation of five R&D projects <u>Quarter-IV</u> • Implementation of ten R&D projects		(a) - (a) (a)

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3.4	Medical Biotechnology	To draw a road map on the future requirements towards development of new diagnostic assay systems To define the priority areas for future research of microbicides, lepto-spirosis, leishmaniasis To finalize protocols for curcumin trials for various types of cancers Organize a brain-storming for revamping of the tuberculosis programme Focused discussion on vector biology as a follow up of the Dengue meeting organized in January, 2005 To define road map and organize clinical trial workshop To form stem cell city clusters	35.00	<u>Quarter-1</u> **Diagnostics** - Implementation of newer diagnostic assay system using quantum dots. - Validation of serological based dengue diagnostics. **Oncology** - Finalization of draft strategy paper on cancer research. - Development of protocols for clinical trials using curcumin for oral, head & neck and cervical cancer. **Stem Cell Research** - Preparation of road map for stem cell research in the country - To organize clinical trial workshop and discuss guidelines for regulation of clinical research using stem cells - Finalisation of the strategy for cardiac stem cell research - Vellore city cluster programme to be launched for the expansion of mesenchymal stem cells (MSC) that may be used for *in vitro* expansion for tissue engineering / tissue repair and as immunomodulators. - Pune City cluster programme to be launched - Launching of programme to establish human embryonic stem cell lines		(b, c & d) - - (b) - - - (b & c) (b & c) (b & c)

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		To define road map, identify priorities in terms of R&D, clinical trial and validation research and to initiate need based focused programme Organize a brain-storming for revamping of the tuberculosis programme Focused discussion on vector biology To define road map and organize clinical trial workshop for stem cell research To form stem cell city clusters To organize disease specific meetings and initiate focused targeted programme with clinicians To assess the feasibility of D C based immuno-therapy approaches		Quarter-II **Oncology** - An end- to- end multi-centric project on HPV with diagnostics, development of candidate vaccines and site preparation for clinical trials will be launched. **Molecular Cardiology** - Strategy paper to initiate focused projects will be prepared **Stem Cell Research** - To formulate guidelines for stem cell research jointly with Indian Council of Medical Research (ICMR) - Finalisation of the strategy for use of stem cells in orthopedic application and preparation of road map for stem cell research in the country - Cardiac stem cell proposal from the Hyderabad city clusters programme to be launched - To initiate discussion on stem cell banking Quarter-III **Stem Cell** • The cultured corneal epithelium from limbal tissue/stem cells will be characterized further using new markers and methods and evaluated for long term survival of the transplanted cells. The autologous limbal epithelial transplantation being carried out in the patients diagnosed with limbal stem cell deficiency will be further standardized and characterisation of limbal stem cells will be initiated		(b, c & d) - - - (a, b & c) -

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				Quarter-IV **Oncology** - Review the implementation of multi-centric HPV and curcumin trial projects. **Stem Cell Research** - Human embryonic stem cell lines will be established - **The technology established at Christian** Medical college, Vellore for hematopoietic stem cell transplantation, to be made available to other centers in India for application in their own places		- (c & d) (b & d)
3.5	Vaccine Research & Development	Development of rotaviral diarrhoea vaccine Development of malaria vaccine To draw a road map on the future R&D activities of HIV / AIDS with emphasis on vaccine development. Development of pneumococcal vaccine Development of Influenza vaccine	10.00	Quarter-1 - To conduct phase-I rotaviral diarrhoea vaccine trial in infants with AGMK based vaccine. - Production of vero cell based rotaviral diarrhoea vaccine under cGMP conditions at BBIL, Hyderabad. - Production of clinical grade malaria vaccine ($PfMSP1_{19}$ and PfF2) at BBIL, Hyderabad under cGMP conditions – five batches each. - Compilation of data of Phase-IIa cholera vaccine trial and approval of DCG(I) for phase-II adults study. - Comparison of immunogenecity studies of Japanese Encephalitis vaccine between commercial vaccines vis-à-vis tissue culture based vaccine candidates. 7 - Carrying out clinical trials using Mw (for tuberculosis) at eight centers, patient's recruitment etc.		(b & d) (b, c & d) (b, c & d) (b & d) (b) (b, c & d)

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				- Testing of tuberculosis candidate vaccines in animal models for immunogenecity and setting up of interim Aerosol facility at CJIL, Agra for challenge studies.		(b, c & d)
				- Organisation of DBT-ICMR interactive meeting on HIV/AIDS towards identification of future thrust areas.		-
				- To continue the animal experimentation with combined DNA rabies vaccine (CRV) for animals.		-
				Quarter-II • Analyzing phase-I clinical trial data generated with AGMK based rotaviral diarrhoea vaccine and steps to be initiated to conduct phase-II clinical trial.		(b & d)
				• Continuing production of vero cell based rotaviral diarrhoea vaccine at BBIL, Hyderabad and carrying out toxicological studies.		(b, c & d)
				• Continuing production of clinical grade malaria vaccine at BBIL, Hyderabad and carrying out toxicological studies.		(b, c & d)
				• Animal studies on vero cell based Japanese Encephalitis candidate vaccine and product optimization in association with industry.		(b, c & d)
				• Setting up of Aerosol Challenge facility at ICGEB, New Delhi and to conduct challenge experiments.		(b, c & d)

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				• Initiatives for cGMP grade production and commercialization of Vi-conjugate typhoid vaccine. • Implementation of multi-centric interactive projects on HIV/AIDS and Microbicides. • Initiation of activities towards cGMP grade production of Vaccinogens for HIV/AIDS & commercialization. • Protocol design for testing human rabies vaccine. <u>Quarter-III</u> • Finalization of phase-I AGMK based rotaviral diarrhoea vaccine clinical data and pre-clinical data of vero cell based rotaviral diarrhoea vaccine (toxicological studies) produced at BBIL, Hyderabad. • Finalization of malaria vaccine toxicological data produced at BBIL, Hyderabad. • Initiation of pre-clinical toxicological studies of the typhoid vaccine. • Experimental studies on human rabies vaccine. • Continuation of activities on CGMP production for HIV/AIDS vaccine. • New R&D initiatives in the areas of tuberculosis. malaria, leishmaniasis, leptospirosis, bird flu etc		(b & c) (a & b) (b & c) (b, c & d) (b & c) (b & d) (b & d) (b & d) - (a)

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				Quarter-IV • Initiation of phase-I clinical trial with vero cell based rotaviral diarrhoea vaccine. • Initiation of phase-I clinical trial of malaria vaccine. • Continuation of the toxicological studies for Vi typhoid vaccine. • Finalization of cholera vaccine trial. • To continue experimental studies on human rabies vaccine. • Initiation of preclinical toxicological studies for HIV/AIDS vaccine.		(b, c & d) (b, c & d) - (b & d) - (b & d)
3.6	Human Genetics & Genomics	To organize scientific meetings to discuss priority areas of research in human genetics and genomics To implement focused targeted programme in these areas	30.00	Quarter-1 To organize expert group meeting to develop roadmap/strategy in human genetics and genomics. Quarter-II • To finalize the priority areas through brain storming session in the area of pharmacogenomics and RNAi Quarter-III • To initiate focused projects in the area of proteomics, pharmacogenomics, RNAi and also to set up atleast two genetic units to provide diagnosis and counseling to affected families.		- (a)

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				Quarter-IV • Review of data generated under human genome diversity projects and finalize future strategy		-
3.7	Environ-mental Bio-technology	Application of biotechnology for biodiversity conservation and characterization, restoration of environmental quality.	7.00	Quarter-1 Pilot scale Bioscrubber facility for deodorization of pyridine gaseous effluents at M/s Jubilant Organosys Ltd., Gajraula setup by NEERI, Nagpur to be made fully functional Quarter-II • Training course for 20 scientists on documentation of biological resources, plant molecular biology by Delhi University/MSSRF,Chennai/UAS, Bangalore • Inauguration of LACONES facility at Hyderabad • Restoration of degraded ecosystems at Bhatti and Asola to be successfully demonstrated by Delhi University. • Development of bench scale reactor for treatment of waste containing pesticide HCH at NEERI, Nagpur.		(b, c & d) (b & c) (b & c) (b) (b & c)

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				Quarter-III • Training course for 20 scientists on documentation of biological resources, plant molecular biology by Delhi University/ MSSRF, Chennai/ UAS, Bangalore • Training course for 40 participants from the local community on restoration of degraded ecosystems and coastal ecosystems by Delhi University/MSSRF, Chennai/UAS, Bangalore • Development of technology for degradation of pesticide endosulfan at Thapar Instt., Patiala		(b) (b) (b, c & d)
				Quarter-IV • Training course for 20 scientists on documentation of biological resources, plant molecular biology by Delhi University/ MSSRF, Chennai/UAS, Bangalore • Training course for 40 participants from community on restoration of degraded ecosystems and coastal ecosystems by Delhi University/ MSSRF, Chennai/UAS, Bangalore • Development of technology for bio-desulphurisation of diesel and heavy fuel oil at laboratory scale at TERI, New Delhi. • Network programme on carbon sequestration to be launched jointly with National Thermal Power Corporation Ltd.		(b) (b) (b, c & d) (a & b)

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
4.	Biotechnology for Societal Development					
4.1	***Programmes for SC/ST and Rural Population***	Economic empowerment of target population through demonstration and training programmes using biotechnologies viz. biofertilizers, biopesticides, sericulture, aquaculture, mushroom cultivation, bee keeping, organic farming, horticulture, value addition to food processing and product making etc.	3.00	Quarter-1 Economic empowerment of target population through demonstration and training programmes using biotechnologies viz. biofertilizers, biopesticides, sericulture, aquaculture, mushroom cultivation, bee keeping, organic farming, horticulture, value addition to food processing and product making etc. 5,000 people to benefit (total) Quarter-II - Economic empowerment of target population through demonstration and training programmes using biotechnologies viz. biofertilizers, biopesticides, sericulture, aquaculture, mushroom cultivation, bee keeping, organic farming, horticulture, value addition to food processing and product making etc. Additional 5,000 people (total 10,000 people) to benefit		Receipt of adequate proposals, need for trained human resource, identification of suitable extension agencies and necessary clearance from Sate Government

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				Quarter-III • Economic empowerment of target population through demonstration and training programmes using biotechnologies viz. biofertilizers, biopesticides, sericulture, aquaculture, mushroom cultivation, bee keeping, organic farming, horticulture, value addition to food processing and product making etc. Additional 5000 people (total 15,000 people) to benefit Quarter-IV • Economic empowerment of target population through demonstration and training programmes using biotechnologies viz. biofertilizers, biopesticides, sericulture, aquaculture, mushroom cultivation, bee keeping, organic farming, horticulture, value addition to food processing and product making etc. Additional 5000 people (total 20,000 people) to benefit		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
4.2	***Economic empowerment to Women, Rural and SC/ST population***	• To develop, promote & use biotechnological processes and tools for entrepreneurship development and provide employment opportunities to women. • To set up facilities for economic empowerment of urban as well as rural women through linkages between research institutions and industrial units and also scale up the basic technologies for commercial utilization and impart training in relevant areas to develop a pool of skilled and well trained women. • To support R&D projects specifically addressing the problems or for developing technologies packages relevant to them.	5.00	<u>Quarter-1</u> • Release of CD: containing training module on biotechnology and bioinformatics for rural women of Maharashtra • Economic empowerment and Training using softer biotechnologies* : To benefit 3000 women * Cultivation of aromatic and medicinal plants, mushroom, biological control of plant pests and diseases, biofuel, vanilla, stevia; solid waste management, vermicomposting, biofertilizers, organic farming, aquaculture, seaweed cultivation, floriculture, sericulture, horticulture poultry farming, animal husbandry, human health care and preparation of biocrafts. <u>Quarter-II</u> • Economic empowerment and Training using softer biotechnologies*: To benefit additional 3000 women. * Cultivation of aromatic and medicinal plants, mushroom, biological control of plant pests and diseases, biofuel, vanilla, stevia; solid waste management, vermicomposting, biofertilizers, organic farming, aquaculture, seaweed cultivation, floriculture, sericulture, horticulture poultry farming, animal husbandry, human health care and preparation of biocrafts.		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				Quarter-III • economic empowerment and Training using softer biotechnologies*: To benefit additional 3000 women. * Cultivation of aromatic and medicinal plants, mushroom, biological control of plant pests and diseases, biofuel, vanilla, stevia; solid waste management, vermicomposting, biofertilizers, organic farming, aquaculture, seaweed cultivation, floriculture, sericulture, horticulture poultry farming, animal husbandry, human health care and preparation of biocrafts. Quarter-IV • Economic empowerment and Training using softer biotechnologies*: To benefit additional 3000 women. * Cultivation of aromatic and medicinal plants, mushroom, biological control of plant pests and diseases, biofuel, vanilla, stevia; solid waste management, vermicomposting, biofertilizers, organic farming, aquaculture, seaweed cultivation, floriculture, sericulture, horticulture poultry farming, animal husbandry, human health care and preparation of biocrafts.		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
5.	Bio-process and Product Development					
5.1	*Food and Nutrition*	1. Demonstration and Transfer of developed Technology for "Nutrient Supplements" to entrepreneur(s). 2. Generation of programmes in the area of Nutraceuticals for holistic health. 3. Demonstration and Transfer of developed Technology for rapid detection of Food Borne Pathogens to entrepreneur. 4. Introduction of Nutrient supplements in the Governments Nutrition Programme (at least one state).	10.00	Quarter-1 Transfer of Technology for "Nutrient Supplements" to entrepreneur (s). Quarter-II New network programme on Nutraceutical & Probiotics to be launched. Quarter-III Technology on Diagnostic Kits for detection of Food Borne Pathogens to be transferred to entrepreneurs Quarter-IV • Introduction of the Nutrient Supplements in the Governments Nutrition Programmes (at least 01 State). • Three Referral Centres to be set up for detection of Genetically Modified Food		Multiple agency involvement, adoption of technology by user agencies, necessary clearances and approval

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
5.2	***Microbial & Industrial Biotechnology***	Technology development for urokinase production Development of cholesterol biosensor Development of a technology for production of recombinant proteins Development of a technology for arsenic free drinking water Technology development for a single dose vaccine especially for infections for which multi dose vaccines are required presently To set up and validate pilot plant for dairy waste water Improvement of NEVA-HIV kit	5.00	<u>Quarter-1</u> • Technology will be developed for the production of urokinase (thrombolytic protein) upto 400 mg per day in a Hollow Fiber Bioreactor using human kidney cell line. • Cholesterol biosensor based on colorimetry technique for clinical validation will be ready. • Pilot scale technology for high throughput purification and refolding of recombinant human growth hormone upto 200 mg from inclusion bodies of *E.coli* will be developed. • A device for removal of arsenic from ground water will be tested in different places in Barasat, near Kolkata and a usable domestic water treatment system will be developed for arsenic contaminated areas. • Programme for development of single dose vaccine for hepatitis B and rabies using biodegradable polymer matrix will be taken up <u>Quarter-II</u> • Performance evaluation of wastewater treatment at steady state operation of the demonstration unit set up at dairy industry will be taken up <u>Quarter-III</u> • A new formulation of reagents for all subtypes of HIV-1 including O subtype and HIV-2 will be developed and tested towards improvement of already commercialized and marketed NEVA-HIV kit.		Multiple agency involvement and necessary clearance and approval Multiple partners, necessary clearances and approval

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
		To generate required data on use of different doses of Fungisome™ for treatment of fungal infection, febrile neutropenia and/or Kala Azar. To demonstrate the technology for treatment of dairy waste water at pilot level at industry site To demonstrate the technology at large scale for production of recombinant protein, if found necessary by the Task Force Lab scale technology already assigned to BCIL. If required, perfection of the technology will be taken up.		<u>Quarter-IV</u> • Programmes on use of Fungisome for treatment of systemic fungal infection, febrile neutropenia and/or Kala Azar will be initiated. • Technology for wastewater treatment based on novel high cell density process will be demonstrated at pilot level. • Technology to get pure bioactive human growth hormone at large scale (around 500 mg) in one single batch operation from inclusion bodies of *E.coli* will be perfected. • Programme will be implemented towards perfection of technology for production and purification of asparginase, an anticancer drug.		Inadequacy of proposals, discussions with institute Multiple agency participation & adoption of technology - Inadequate proposals and discussion with institutes

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
5.3	***Biosafety***	• Permissions to conduct various studies to generate biosafety data on rDNA pharama products, field studies on transgenic crops • import of GMOs for research purposes, policy frame work on biosafety regulations.	1.00	<u>Quarter-1</u> • Permits will be issued based on the recommendations of three meetings of Review Committee of Genetic Manipulation (RCGM). • Website on biosafety will be finalized. • Project on Indian GMO research information system (IGMORIS) will be initiated. <u>Quarter-II</u> • Permits to be issued based on the recommendations of three meetings of RCGM • Dedicated website of biosafety will be launched • compilation of data for IGMORIS project • Organization of capacity building workshop on biosafety to benefit atleast 100 members of Institutional Biosafety Committees (IBSCs). <u>Quarter-III</u> • Issue of permits based on the recommendations of three meetings of RCGM; • Operationalisation of website on biosafety by IBSCs; completion of data on GMO research in the IGMORIS project; • organization of capacity building workshop on biosafety to benefit atleast 100 members of IBSCs		Necessary approvals by the Committees, no dedicated staff position has been created in DBT for handling regulation inspite of enormous increase on workload. There is no substitute available in the absence of the concerned officer

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				Quarter-IV Issue of permits based on the recommendations of three meetings of RCGM; organization of capacity building workshop on biosafety to benefit atleast 100 members of IBSCs; launch of IGMORIS website on the biosafety portal of the department.		
6.	Bio-informatics	(i) to provide a national bioinformation network to link the scientists in various organizations involved in Human Resource Development, R&D and manufacturing activities in biotechnology. ii) to build up information resources, prepare databases on biotechnology and to develop tools and techniques for handling the relevant information. iii) to Perform research in advanced methods of computer-based information processing for analyzing the structure and function of biologically important molecules.	16.00	Quarter-1 • Development of National Bioinformatics Portal Site for resource sharing • Organizing 20 training programmes in Bioinformatics and computational Biology through BTISnet centers • Establishment of 4 new Sub-DICs (sanctioned in the last quarter of the Financial Year 2004-2005) Quarter-II • Subscription of electronic journals in biotechnology for the major institutions to be in place. • Development of web enabled Project Registry System for DBT. • Introduction of National Eligibility Test in Bioinformatics (NETBI) for HRD quality improvement		Multiple agency interaction, receipt of adequate proposal

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		iv) to evolve and implement training programmes on education of users. v) to promote international collaboration towards exchange of scientific information in biotechnology through the development of appropriate network arrangements.		• Evolving and introducing base activity standards for the BTIS centers • Organizing 25 training programmes in Bioinformatics and computational biology through BTISnet centers. <u>Quarter-III</u> • Industrial training for 20 students pursuing advance diploma course in bioinformatics • Establishment of one more Sub-DIC under BTInet • Organizing 30 training programmes in Bioinformatics and Computational Biology through BTISnet centers <u>Quarter-IV</u> • Industrial training for 20 students pursing advanced diploma course in bioinformatics • Organizing 30 training programmes in Bioinformatics and computational biology through BTISnet center • Establishment of one more Sub-DIC under BTISnet		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
7.	International Cooperation		10.00			
7.1	International Bilateral Programmes and SAC-Overseas	International cooperation aims at updating and advancing the State-of-the-Art in Biotechnology in the country by promoting bilateral as well as multilateral international collaborations.		<u>Quarter I</u> Indo-Danish joint committee constituted. Meeting to be held in September, 2005 The 171st Session of Executive Board of recommended the establishment of Regional Centre for Education and Training in Biotechnology. MOU between UNESCO and DBT has been cleared by MEA, MHA. Cabinet note initiated. <u>Quarter II</u> 7th CRHR JWG meeting in Washington, August 2005. Will consider funding for 6 new projects. IPAC meeting in August, 2005. Will consider funding for projects under Indo-Mongolia, -Singapore & -Germany. The first Indo-Danish Biotech Steering Committee will meet on 18-20th Sept., 05 in Denmark to work out the road-map for future collaborations. Indo-Finland MOU in biotechnology to be signed between DBT and Finland Academy of Sciences.		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				Quarter III UNESCO agreement to be signed. Joint Indo-UK call for proposals to be issued. CNRS, France have agreed to support five slots for training of Indian scientists in biotechnology. Indo-Cyprus Joint Workshop (proposed) "Biotechnology : Trade opportunities in an emerging market" Quarter IV 16th SAC(O) to be held. Joint Indo-Finland workshop to be held The EU and India would organize a Conference on development of vaccines for HIV/AIDS, malaria and tuberculosis. Likely Joint Indo-French call for proposals.		
7.2	Bio-technology Overseas Associateship	Capacity building of technically trained human resources	5.00	Quarter I Screening and Selection Committee considered 179 applications and selected 48 candidates for the award. Quarter II, III & IV Sanctions and PTAs for all 48 candidates to be issued. Advertisement for 2005-06 to be issued in November. Proposal for 10 merit based scholarships for cutting-edge areas of biotechnology would also be funded.		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
7.3.	International Centre for Genetic Engineering and Bio-technology	Host-country contribution provided by DBT	7.50	Quarter I 1st release of Rs. 1.25 crores made. Quarter II - IV Balance would be released. Applications for Pre- and post doctoral scholarships short-listed and endorsed.		
7.4.	Deputations	Foreign visits of DBT officials	0.50	Quarter I 11 deputation cases processed. Quarter II – IV Deputation cases would be dealt with as and when		
8.0	Autonomous Institutes	To continue Basic Research towards application for technology process and product development				

Department of Bio-Technology

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
8.1.	National Institute of Immunology (NII), New Delhi	• To undertake, aid, promote, guide and coordinate research of a high caliber in basic and applied immunology; • To carry out research for development of new vaccines, immunodiagnostic kits, immunological reagents; • To interact with industry for manufacture of products developed from the research leads • to provide and promote linkages between various scientific research agencies/ laboratories in the field of immunology, vaccine development and related areas	32.00	<u>Quarter I</u> • Preparation of Pilot scale killed JE vaccines • Proof of principle for adino based next generation JE vaccine Quarter II • Initiate work on protein based pneumococcal vaccine <u>Quarter III</u> • Initiate work for basic infrastructure of NII - II campus. <u>Quarter IV</u> • Besides continuation of the research against the various major areas of interest, research projects are proposed to be taken up after approval of the Scientific Advisory Committee of NII. • Initiation of work on Incubator laboratory facility to be taken up in the second campus of the Institute. • Development of Campus II at Faridabad.		Subject to approval

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
8.2.	National Centre for Cell Science (NCCS), Pune	• Service, Training and Research & Development. • To receive, identify, maintain, store, grow and supply: Animal and human cells/cell cultures, cell lines of both existing (typed) and newly developed, hybrid cells including hybridomas; Tissues, organs, eggs (including fertilized) and embryos. Unicellular, obligate pathogens, parasites and vectors, plasmids, genes and genomic libraries. • Develop, prepare, quality control and supply culture media, other reagents and materials and cell products independently and in collaboration with industry and other organizations.	25.00	<u>Quarter I</u> • To supply cell lines and cell cultures • To Provide Trainings • To initiate programme on quantum dot based assay systems • Start activities on Embryonic stem cells • Continuation of activities towards development of anti HIV & anti osteoporotic compounds • To continue R&D efforts in the areas of cancer biology, cell biology including stem-cell biology, insect molecular biology, diabetes, infection & immunity, drug discovery, genomics, proteomics and generation of transgenic knock-out animals. • Continuation of the phase-II building construction comprising of lab, auditorium, hotels etc. <u>Quarter II</u> • To supply cell lines and cell cultures • To Provide Trainings • Production of quantum dots for diagnostic purpose • - Initiate R&D efforts on Hematopoietic stem cells • Testing of the new compounds *in vitro & in vivo* • To continue R&D efforts in the areas of cancer biology, cell biology including stem-cell biology, insect molecular biology, diabetes, infection & immunity, drug discovery, genomics, proteomics and generation of transgenic knock-out animals.		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
		• Research and development in the above and cell culture related materials and products • To establish and conduct post-graduate courses, workshops, • seminars, symposia and training programmes in the related fields. • To serve as National Reference Center for tissue culture, tissue • banking, cell products and data bank etc		• Continuation of the phase-II building construction comprising of lab, auditorium, hotels etc. <u>Quarter III</u> • To supply cell lines and cell cultures • To Provide Trainings • Efforts towards development of quantum dot based assay systems • Start activities on Mesenchymal stem cells • Analysis of the results • To continue R&D efforts in the areas of cancer biology, cell biology including stem-cell biology, insect molecular biology, diabetes, infection & immunity, drug discovery, genomics, proteomics and generation of transgenic knock-out animals. • Continuation of the phase-II building construction comprising of lab, auditorium, hotels etc. <u>Quarter IV</u> • To supply cell lines and cell cultures • To Provide Trainings • Continuance of the efforts for development quantum dot based assay systems • Standardization & optimization of *in vitro* procedures for growing stem cell lines for further experimentation and usage • Product formulation and development		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
8.3.	Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad	• To establish DNA diagnostic methods for detecting genetic disorders and to develop probes for such detection; • To use DNA fingerprinting techniques for the authentication of plant and animal cell material, cell lines and to develop new probes where necessary for such purposes; • To provide training in DNA fingerprinting techniques and offer consultancy services to medical institutions, public health agencies and industry in the country;	20.00	• To continue R&D efforts in the areas of cancer biology, cell biology including stem-cell biology, insect molecular biology, diabetes, infection & immunity, drug discovery, genomics, proteomics and generation of transgenic knock-out animals. • Continuation of the phase-II building construction comprising of lab, auditorium, hotels etc. <u>Quarter-1</u> • DNA Fingerprinting Services – Paternity / Maternity/ Foetus Identity, Murder, Rape, testing of victims and accused / wildlife identification – 40 to 60 cases • DNA Diagnostics Services – Biochemical Genetics, Cytogenetics, Clinical Genetics, Molecular Genetics – 800 to 900 cases • Bioinformatics services – porting and development of 10 bioinformatics tools - Development of National database of genetic disorders (10%) - 5 manpower would be trained. - Training Workshop & Symposia in areas mentioned above		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
		• To undertake basic, applied and development R & D work; • To collaborate with foreign research institutions and laboratories and other international organizations; and establish affiliation with recognized universities and institutions • To acquire or transfer technical know-how from/to entrepreneurs & industries and, to register patents, designs & technical know-how in the interest of the Centre; • To carryout DNA profile and related analysis in civil cases like paternity disputes, immigration, and exchange of new-borns in hospitals, for various agencies including private parties, on appropriate payment • To provide DNA fingerprinting and related analysis and facilities to crime investigation agencies;		<u>Quarter II</u> • DNA Fingerprinting Services – Paternity / Maternity/ Fetus Identity, Murder, Rape, testing of victims and accused / wildlife identification – 40 to 60 cases • DNA Diagnostics Services – Biochemical Genetics, Cytogenetics, Clinical Genetics, Molecular Genetics – 800 to 900 cases • Bioinformatics services – porting and development of 10 bioinformatics tools • Development of National data-base of genetic disorders (10%) • 5 manpower would be trained • Training Workshop & Symposia in areas mentioned above <u>Quarter-III</u> • DNA Fingerprinting Services – Paternity / Maternity/ Fetus Identity, Murder, Rape, testing of victims and accused / wildlife identification – 40 to 60 cases • DNA Diagnostics Services – Biochemical Genetics, Cytogenetics, Clinical Genetics, Molecular Genetics – 800 to 900 cases • Bioinformatics services – Porting and development of 10 bioinformatics tools • Development of National database of genetic disorders (10%) • 5 manpower would be trained • Training Workshop & Symposia		

S.No	Name of the Schemes/ Programmes	Intended Objective/Outcome	Annual Plan 2005-06 Outlay	Quantified Deliverables (on quarterly basis)	Processes/ Timelines of approvals	Remarks/Risk Factors
				Quarter-IV • DNA Fingerprinting Services – Paternity / Maternity/ Foetus Identity, Murder, Rape, testing of victims and accused / wildlife identification – 40 to 60 cases • DNA Diagnostics Services – Biochemical Genetics, Cytogenetics, Clinical Genetics, Molecular Genetics – 800 to 900 cases • Bioinformatics services – porting and Development of 10 bioinformatics tools; development of National database of genetic disorders (10%); 5 persons to be trained Training Workshop & Symposia in areas mentioned above		

8.4.	National Brain Research Centre (NBRC), Manesar	• consolidate, network, and undertake basic research of high calibre in neuroscience and establish linkages with national/international organisations involved in neuroscience research • undertake basic research to understand brain function in disease and normal conditions. The networking would involve either forming new linkages or augmenting existing linkages between various laboratories working in the field of neuroscience.	13.80	Quarter-1 • Completion of Block–2 facility for cell culture work. • Completion of admission for M.Sc and Ph.D and Conducting final examination Quarter-II • Completion of excavation for construction of Institute Block - 1. • Starting of construction of fMRI Building. • Installation of Flow Cytometer establishment of core facility. • Starting of M.Sc and Ph.D course for 2005 – 2006. Quarter-III & IV • Installation, commissioning and operationalization of fMRI and neuro imaging facility		

8.5.	National Center for Plant Genome Research (NCPGR), New Delhi	• To undertake research identified aspects of plant genome. • To undertake, aid, promote, guide and coordinate research of high caliber in basic and applied plant molecular biology. • To take up fundamental work related to gene-isolation, function, regulation and mapping. • To develop morphological, biochemical and molecular markers for monitoring plant traits. • To analyze plant genomes in terms primary and secondary metabolic pathways, growth and development, environment adaptations, pests and pathogen Interactions, phylogeny and evaolution.	12.70	<u>Quarter-I</u> • Work on fruit ripening genes will be extended. • MAPK signaling pathway of rice will be investigated. • Comparative genomics will be pursued in chickpea, pea, C. roseus, cereals and millets and tomato to discover new genes and corresponding promoters for their characterization, manipulation and use. <u>Quarter-II</u> • Inauguration of new campus • Mutants accessions and hairy root lines of C. roseus will be investigated for their genetic differences to uncover genetic regulation elements governing expression of alkaloid traits. <u>Quarter-III</u> • Field trials on OXDC-tomato will be extended as per RCGM/GEAC norms. Work on the realization of AmA1 overexpression in rice, sweet potato and cassava and OXDC in Lathyrus and groundnut will be intensified.		

		• To identify and manipulate plant and on pathogen/pest genes for combating diseases and pests and for abiotic stress tolerance. • To resource, analyse and manipulate genes for imparting improved nutritional quality to select crop plants. • To utilize molecular biology approaches along with tissue culture and genetic engineering technology to identify important genes and manipulate these for generating transgenic plants with improved agronomic characters and pathogen/stress resistance. • Production and testing of transgenic plants for improved crop productivity and quality and understanding of plant genomics.		• Progress will be made in the use of differential expression between control and variously stressed chickpea cultivars to identify new genes and relate them with their functions in the promotion/arrest of Fusarium and Ascochyta caused diseases, growth during dark and determination of drought tolerance in chickpea. <u>Quarter-IV</u> • The selected AmA1 lines will enter into large-scale GEAC trials. • New DNA-based markers will be developed in chickpea and other legumes, Catharanthus roseus and cereals and millets to develop/extend the respective maps, for positional cloning of genes, to take place newly identified/defined markers on the maps, for transfer of markers between plants of same and different families, to pyramid genes of interest and for relating proteins, genes and their map positions.		

8.6.	Institute of Bioresources and Sustainable Development (IBSD), Imphal	• To set up the state-of-the-art biotechnology research facilities at Imphal for sustainable development of bioresources. • To study and document the unique biodiversity of the region. • To develop biotechnological interventions for sustainable development and utilisation of bioresources. • To generate technological packages for employment generation and economic progress of the region. • To collaborate with other institutions/organisations/universities in furthering research pursuits in bioresources. • To undertake capacity building (human resource development).	3.00	Quarter-I • To develop network projects in NE region by involving other organizations / institutions. • To organize training programmes on bioresource conservation and utilization in collaboration with other institutions / organizations. • To launch some society related programmes on bioresource development and utilization in collaboration with other institutions. Quarter-II • To develop network projects in NE region by involving other organizations / institutions. • To organize training programmes on bioresource conservation and utilization in collaboration with other institutions / organizations. • To launch some society related programmes on bioresource development and utilization in collaboration with other institutions. Quarter III • Acquisition of 30 acres land from the Govt. of Manipur Quarter-IV • Creation of necessary infrastructure for the identified research projects will be completed so as to make the institute fully operational • Construction of research block and animal house to begin		

8.7.	Institute of Life Science (ILS), Bhubaneswar	• Conduct basic research for product and process development in the areas of • Molecular Biology of aging and Cancer • Infectious Diseases • Bio-resource Development, Conservation and Utilization\ • Environmental Biotechnology	12.00	Quarter I • To develop an action plan for developing programmes in the identified priorities areas • Approval of EFC for 10th Plan Quarter II • To develop network programmes • To complete all recruitments Quarter III • To organize interactive meetings for network programme and priority areas • To finalize the building plan and award the contract Quarter IV • Construction of research block and animal house to begin		
		TOTAL S&T	**400.00**			

- The timelines for approvals for new activities to be initiated has been indicated quarterwise under deliverables.

	I & M SECTOR					
9.	Setting up of Biotechnology Parks/ Pilot Plant Facilities/ Incubators	Establishment of Biotech Park, incubators for promotion of R&D and commercialisation of technology.	25.00	Completion of 1 Biotech Park at Lucknow and 1 Biotech Incubation Centre at Biotech Park, Hyderabad.. Implementation of 4 Biotech Incubator facilities at Biotech Parks being set up by Kerala, Karnataka, Punjab and H.P.	-	
10	Public Private Partnership	Public-Private partnership and forging effective links with academia particularly in up scaling and validation of laboratory research so that research leads can be commercialized. The focus here will be on • Product of major societal relevance and • Promoting innovative, unique technology with large economic potential through development of partnership with innovators from universities, national R&D institutions, academic institutions and industry.	20.00	• 5 to 7 Ph.I. Proposals • Collaborative commercialisation of New Business ideas & innovation	• SIBRI (**) EFC Note - End August • EFC – End September • Approval – End October	The success of the scheme & demand for funds depends on response received from R&D sector /corporate world and SMEs
		TOTAL I&M	**45.00**			
		GRAND TOTAL	**445.00**			

(*) Only GBS No IEBR
(**) SIBRI – Small Business Innovative Research Initiative