

MINISTRY OF SCIENCE AND TECHNOLOGY

DEMAND NO. 84

Department of Biotechnology

A. The Budget allocations, net of recoveries, are given below:

		<i>(In crores of Rupees)</i>								
Major Head	Budget 2004-2005			Revised 2004-2005			Budget 2005-2006			
	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	
Revenue	310.00	13.45	323.45	320.00	13.45	333.45	443.00	13.60	456.60	
Capital	...	...	...	...	...	...	2.00	...	2.00	
Total	310.00	13.45	323.45	320.00	13.45	333.45	445.00	13.60	458.60	
1. Secretariat - Economic Services	3451	...	4.68	4.68	...	4.68	4.68	...	4.90	4.90
Other Scientific Research										
2. Assistance to Scientific Institutions/Professional Bodies										
2.01 National Institute of Immunology	3425	28.00	0.85	28.85	28.00	0.85	28.85	32.00	0.80	32.80
2.02 National Centre for Cell Science	3425	15.00	0.42	15.42	15.00	0.42	15.42	25.00	0.40	25.40
2.03 Centre for DNA Finger printing and Diagnostics	3425	12.00	...	12.00	12.00	...	12.00	20.00	...	20.00
2.04 National Brain Research Centre	3425	21.00	...	21.00	21.00	...	21.00	13.80	...	13.80
2.05 National Centre for Plant Genome Research	3425	10.00	...	10.00	10.00	...	10.00	12.70	...	12.70
2.06 Institute of Bioresources and Sustainable Development	3425	3.50	...	3.50	3.50	...	3.50	3.00	...	3.00
2.07 Institute of Life Sciences	3425	5.00	...	5.00	5.00	...	5.00	12.00	...	12.00
<i>Total</i>	<i>94.50</i>	<i>1.27</i>	<i>95.77</i>	<i>94.50</i>	<i>1.27</i>	<i>95.77</i>	<i>118.50</i>	<i>1.20</i>	<i>119.70</i>	
3. Assistance to Other Scientific Bodies										
3.01 Human Resource Development	3425	15.00	...	15.00	15.00	...	15.00	18.50	...	18.50
3.02 Bioinformatics	3425	16.00	...	16.00	16.00	...	16.00	17.00	...	17.00
3.03 Biotech Facilities, Centres of Excellence and Programme Support	3425	14.00	...	14.00	14.00	...	14.00	45.00	...	45.00
3.04 Research and Development	3425	132.50	...	132.50	132.50	...	132.50	164.00	...	164.00
3.05 Biotechnology for Societal Development	3425	9.00	...	9.00	9.00	...	9.00	11.00	...	11.00
3.06 Bio-Process and Product Development	3425	10.00	...	10.00	10.00	...	10.00	16.00	...	16.00
<i>Total</i>	<i>196.50</i>	<i>...</i>	<i>196.50</i>	<i>196.50</i>	<i>...</i>	<i>196.50</i>	<i>271.50</i>	<i>...</i>	<i>271.50</i>	
4. I&M Sector										
4.01 Assistance for Technology Incubators, Pilot Projects, Biotechnology Parks and Biotech Development Fund	3425	10.00	...	10.00	20.00	...	20.00	25.00	...	25.00
4.02 Public Private Partnership	3425	...	...	...	...	...	...	18.00	...	18.00
	7425	...	...	...	...	...	...	2.00	...	2.00
<i>Total</i>	<i>...</i>	<i>...</i>	<i>...</i>	<i>...</i>	<i>...</i>	<i>...</i>	<i>...</i>	<i>20.00</i>	<i>...</i>	<i>20.00</i>
5. International Cooperation	3425	9.00	...	9.00	9.00	...	9.00	10.00	...	10.00
6. International Centre for Genetic Engineering & Bio-Tech.	3425	...	7.50	7.50	...	7.50	7.50	...	7.50	7.50
Grand Total		310.00	13.45	323.45	320.00	13.45	333.45	445.00	13.60	458.60
C. Plan Outlay										
	Head of Dev	Budget Support	IEBR	Total	Budget Support	IEBR	Total	Budget Support	IEBR	Total
Other Scientific Research	13425	310.00	...	310.00	320.00	...	320.00	445.00	...	445.00

1. **SECRETARIAT-ECONOMIC SERVICE:** provides for expenditure on the secretariat of the department

2. **ASSISTANCE TO SCIENTIFIC INSTITUTIONS / PROFESSIONAL BODIES:**

2.01 **National Institute of Immunology (NII), New Delhi:** It is proposed to initiate work on Incubator Laboratory Facility at the second campus of the Institute, besides continuation of the research against the various major areas of interest. For the development of Campus II at Faridabad minimum essential staff quarters may be built on the plot of land allotted by the Delhi Development Authority.

2.02 **National Centre for Cell Science (NCCS), Pune:** NCCS will focus on development of new cell lines from human (adult and fetal) and animal tissues; research and development in the area of cancer biology, cell biology, insect molecular biology, diabetes, infection and immunity; drug discovery programme includes genomics, proteomic; generation of transgenic and knock-out mice to generate transgenic/knock-out mice for the molecules identified at the centre (SMAR-1, BDCF, leishmania protein gp63 etc).

2.03 **Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad:** The new activities of CDFD include: improvised methodologies for high throughput STR based DNA fingerprinting; new diagnostics tools development; DNA fingerprinting of ethnic populations in India; computational biology of pathogenic mutations; host-parasite interactions during cellular signaling; setting up a Centre for molecular ecology and biodiversity; laboratory for plant genetic fingerprinting; sequencing of the *Mycobacterium w*; drafting new legislation on DNA for enactment by the parliament; creation and maintenance of databases for the protein models; integrated approach to understand the biology of *M. tuberculosis* using genetic, immunological and structural aspects; genetics and epidemiology of Leptospirosis; HRD and manpower development.

2.04 **National Brain Research Centre (NBRC), Manesar:** The phase II construction of NBRC campus would continue and additional hostel and transit accommodation would be built. The major areas of research include computational neuroscience, system and cognitive neuroscience, stem cell research, developmental neurobiology and basic research towards understanding of neurological and psychiatric disorders. Efforts will be directed at both understanding fundamental issues of brain function as well as understanding disease processes that have a huge effect on disease burden in developing societies.

2.05 **National Centre for Plant Genome Research (NCPGR), New Delhi:** It is proposed to take up construction of a hostel to accommodate 85 students. The activities include large-scale GEAC trials of selected AmA1 lines: extension of field trials on OXDC-tomato as per RCGM/GEAC norms: AmA-1 overexpression in rice, sweet potato and cassava and OXDC in Lathyrus and groundnut; development of new DNA-based markers in chickpea and other legumes, *Catharanthus roseus*: comparative genomics of chickpea, pea, *C. roseus*, cereals and millets and tomato to discover new genes and corresponding promoters for their characterization, manipulation and use: investigation of mutants accessions and hairy root lines of *C. roseus* and investigation of MAPK signaling pathway of rice.

2.06 **Institute of Bioresources and Sustainable Development (IBSD), Imphal:** The Institute will focus its activities on development of 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 and to launch some society related programmes on bioresource development and utilization in collaboration with other institutions. Creation of necessary infrastructure for the identified research projects will be completed so as to make the institute fully operational.

2.07 **Institute of Life Sciences, Bhubaneswar:** It is proposed to build the Animal House facility which is a mandatory requirement for undertaking the research programmes. The research laboratories also need modification and renovation to meet the needs of the increased research faculty. A Research Scholars hostel is also proposed since the Institute is now attracting research students from across the country. The research programmes proposed are molecular biology of aging, infectious diseases such as cholera, malaria and filariasis; bio-resource development, conservation and utilization; stress biology and molecular microbiology-plant microbe interaction and microbial prospecting. The research area in environmental biotechnology includes; salt tolerance in plants; proline accumulation under abiotic stress, the possible mechanism; ocean colour and ocean primary productivity study

3. **ASSISTANCE TO OTHER SCIENTIFIC SCHEMES:**

3.01 **Human Resource Development:** Human Resource Development activities have been strengthened and programmes initiated in some new areas. 5 new courses will be supported by the end of March, 2005. 6 new specialized courses in multidisciplinary area of Biotechnology will be supported during 2005-06.

3.02 **Bioinformatics :** Four new bioinformatics centres at the level of sub-DICs are proposed to be established at remote places where the biotechnology activities are progressing well. 3 more Super Computing facilities shall be established at various locations and networked on BIOGRID in order to make available this powerful system for the national users. High speed and large bandwidth network connectivity will be extended to other BTISnet centers. It is also proposed to establish world class Institute of Bioinformatics.

3.03 **Biotech Facilities, Centres of Excellence & Programme Support :** During the current year it is proposed to set up a **Centre of Excellence for Biotechnology for Public Health** with the main emphasis an identifying, scale up, evaluating and promoting use of new technologies that are appropriate and affordable by socio-economically low and rural populations.

The following new programs institution creation activities have been initiated (i) Clinical proteomics program for biomolecules and diagnostics (ii) Virtual national network for stem cell research: activities at Vellore and Hyderabad have commenced and the activities will be extended to Hyderabad, Pune, Bangalore and Delhi. (iii) Marine biotech programmes at Cochin (iv) Environmental Biotech programmes at UAS, Bangalore and MSSRF, Chennai (v) A programme on establishing agribiotech centres in some selected agriculture universities would also be started.

3.04 **Research & Development :** In the area of **Agriculture**, projects for development of new generation crops through genetic engineering and DNA marker assisted breeding for Pests and diseases; drought and salinity tolerance and enhanced specific nutrient value in terms of micronutrients have been accorded high priority. A special initiative has been launched on improving

nutritional status of food crops - rice and wheat through biofortification with micronutrients such as iron and zinc.

3.05 Biotechnology for Societal Development : The thrust on **societal development** is being further emphasized. It is proposed to set up Bioresource Rural Complexes in 4-5 locations across the country which aim at holistic sustainable development of the rural / women population through technology demonstration and training which will help in employment and income generation.

3.06 Bio-process and Product Development : Under **Food and Nutrition** area, programmes have been reoriented to focus on the priorities of the Common Minimum Programme. The thrust is on development of low cost nutrient food supplements, health food/nutraceuticals, food additives, biofunctional foods and value added products from agricultural residues. An important development is zinc as an immunomodulator for prevention of diarrhoea and pneumonia in children. Technology for stable, low cost zinc formulation is being transferred to ORS manufacturing companies in partnership with World Health Organisation. A partnership is being established with PATH for promotion of ultra rice, for developing micronutrient such as iron, zinc and vitamin A. Scientific review of this product resulted in a reason to promote this product in India. Efforts to identify a suitable industrial partner are in progress.

4. I&M Sector :

4.01 *Biotech parks*

Under **I & M Sector**, Biotech Park at Lucknow is now progressing well and will be operational by March, 2005. Activities of the Biotech Parks at Lucknow and Hyderabad will continue. More projects from State Governments and other organizations will be evaluated and suitable actions would be taken for establishment of technology incubators, pilot projects etc. as per agreed guideline. Based on the success of the two existing parks and keeping in view the interest and need of different states, it is proposed to support Biotech Park / Incubator facilities in different states.

4.02 *Public-Private partnership*

A special effort is being made to promote **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 on promoting innovative, unique technology with large economic potential through development of partnership with innovators from universities, national R&D institutions, academic institutions and industry.

5. International Cooperation : International Cooperation programme are continuing with 21 countries under bilateral cooperation. In addition multi-lateral cooperation is also being further strengthened. Ongoing programmes with US, FRG and other countries will be pursued. Indo-US collaborative programme will be initiated in agriculture and genomics under the Indo-US S&T forum. Regional Centre for Education and Training in Biotechnology is to be set up under the auspices of UNESCO.

6. International Centre for Genetic Engineering and Biotechnology: ICGEB has been established with two components one in New Delhi and the other in Trieste, Italy with the objective of bringing the fruits of modern biotechnology to the developing countries. Intensive scientific research is performed in a total of six groups viz., malaria, virology, immunology, recombinant gene products, plant molecular biology and insect resistance. In addition to research, there are several trainings and other schemes such as post-doctoral and Ph.D. programmes as well as organisation of training courses and symposia. In addition to the two components, the ICGEB has a network of national regional and international co-operating R&D centres which endeavour to promote an active programme of research and development towards fulfilling the stated objectives. Government of India is providing assistance for meeting recurring cost for running the Centre in New Delhi. The research work in the area of Hepatitis, Malaria, recombinant gene product, plant molecular biology, plant resistance and plant transformation is continuing. ICGEB had transferred Technologies for HIV-I and HIV-II diagnostic kits, hepatitis C diagnostic kit, hepatitis B vaccines, erythropoietin, alpha-interferon, genome interferon, human growth hormone and granulocyte colony stimulating factor.