

2. ADVISORY COMMITTEES

There are two apex level advisory committees, one Biotechnology Research and Promotion Committee, 16 Task Forces and expert committees which advise the Department on policy matters, research priorities, institutional frame work, and monitoring and evaluation of R&D projects. These consist of many experts drawn from universities, industry, research laboratories and NGOs.

2.1. SCIENTIFIC ADVISORY COMMITTEE (SAC-DBT)

The 10th meeting of SAC-DBT was held on March 12, 1999. The Committee noted that the recommendations of the ninth meeting have been fully implemented by the department. The members appreciated the efforts of the department in the areas of genome research, molecular taxonomy, new vaccines and diagnostics and expansion of bioinformatics centres. The following recommendations were made:

- DBT may institute National Bioscience Awards for career development to young scientists.
- There is a need for establishing a patent facilitation cell in DBT to process advise and provide information on various patent issues.
- To evolve a mechanism for growing public awareness, public perception, popularisation of biotechnology in view of the growing concerns of consumers, farmers and policy makers.

As a follow up, department has established a patent facilitation cell. Published a bi-annual newsletter namely BIOTECH NEWS and a mechanism for popularisation of biotechnology through debates, seminars and interactive sessions during the year 1999-2000.

The Scientific Advisory Committee was reconstituted during the year. The composition of the reconstituted Committee may be seen at Annexure-I. The first meeting of the reconstituted Committee was held on November 25, 1999. The members appreciated the progress in various activities in promoting research in biotechnology by the department. It was noted that due to DBT's efforts, every biologist in India feels that quality of science and biology has improved. Scientific community also realises that the DBT not only promoting basic research but also encouraging commercial thinking in terms of technology transfer and patenting. The specific suggestions given by the Committee were:

The Department may prepare a policy paper relating to genetically modified food in consultation with experts.

- ◆ Transgenic Research in Plants in India needs to be promoted further with adequate prioritisation of research goals. Traits related to productivity and resistance such as abiotic and biotic stress resistances as well as quality of food in terms of vitamin and mineral enrichment are important.
- ◆ The proponents of transgenic plants both the government and private sectors along with the scientists involved should be concerned about environmental risks if any. Special research projects to assess the impact of any possible risks should be supported for this purpose and results of such experimentation should be made public.
- ◆ The existing regulatory guidelines are in order. There is a need to strengthen the mechanism of evaluation of food toxicity and allergenicity and certification of GM foods in India. Testing facilities must be strengthened.

- ◆ Efforts to educate the public about the overall benefits of genetic engineering particularly related to health and nutrition with scientific basis need to be strengthened.
- ◆ Improvement of nutritional quality of the crops relevant to India should be a high priority keeping in view the large number of malnourished people in India.

Among the other issues, the Committee recommended to institute a chair in the name of Prof. G.N.Ramachandran and participation of DBT in international rice genome programme with adequate linkages, infrastructure and pooled expertise.

2.2 STANDING ADVISORY COMMITTEE (OVERSEAS) (SAC (O))

The Tenth meeting of the SAC (O) was held on December 12-14, 1999. Besides on presentations by scientists in special areas of research, the Committee reviewed programme on Immunological Approaches to Fertility Control. Detailed discussions were held on computational modelling for drug design, human genome research, patent and IPR issues, and linkages with industry. The activities of the National Brain Research Centre were considered. A special session on discussion on Biotechnology for 21st Century was held and specific areas for future research in agriculture, environment, medical biotechnology and human genetics, the priority areas were identified. These were:

Computational Modelling: Protein structure of known and unknown domains; Development of inhibitors using high throughput screens; Development of second generation compounds using 3D structure, thermodynamics etc.; Structural dynamics in tuberculosis including setting up of expression library; Use of high throughput technology for protein production; Understanding of physiology of compounds.

Agriculture Biotechnology: National Policy, Objectives, capability for product development; Clear policy framework for exchange of knowledge within the country or outside; Application of molecular maps; Gene cloning for evaluation of germplasm; Genetic Engineering; Use of genetically modified organisms; Isolation of new genes; Study of additional genes for stress resistance; Functional genomics to identify genes; Link between structural genomics and functional genomics; Studies on role of different genes through high throughput technology; Study on set of genes and studies on transcription factors including role of transcription factors which help regulate different functions; transcription profiling capabilities; Studies on polymorphisms; Study of smallest genome; Molecular mapping; Participation in chromosomal sequencing efforts in rice; Targeting specific crops for total genome sequencing or specific genome sequencing; Studies on whole rice genome chip; To create facility for chip array technology; Studies on proteomics which will include changes influenced by cellular functions or metabolic changes; Studies on open reading frame in different family proteins; Studies on basic nutrition to increase yield and quality with more amino acids, improved fat and protein quality, micronutrients etc.; Functional nutrients for specific functions including diseases, lifestyle and longevity etc.; Improvement of crops for iron deficiency; Agronomic traits including designer crops by use of biotechnology for high yield, size, for nutrition and nitrogen assimilation, computing biology between microbial and agronomic traits; Studies on specific traits including resistance to drought, heat tolerance, pre-harvest sprouting and different diseases; Build capability for one to two crops to help in breeding and application of biotechnology with more genes; Studies on important crops for the country such as rice and wheat; National Policies for research on oilseed crops like mustard and arabidopsis; Identification of model system for pulses; Improvement in plant quality for biomass and fuel quality; Agribusiness opportunities for employment.

Medical Biotechnology & Human Genetics: Emphasis on multisectoral efforts designed to the needs of the poor people; Capacity building; Development of science force; Good information system; Surveillance and registry of diseases; Development of useable technologies, simple, acceptable, economical, sustainable, easy to perform; Vaccine development in areas of interest like behavioural research, retroviral developments, vectors, promoters, inserts etc.; Development and procurement of diagnostics; Priority setting within country and with respect to global, international and regional network; Global health research initiative for co-operation and partnership with neighbouring countries for study of geographical variations, clinical trials of developed vaccines, establishing joint field stations as testing facilities; Development of policies, roles and financial resources in important areas of genetics and genomics; Setting up of major facilities for high throughput technology; Studies on proteomics, defining of metabolic pathways, use of transgenic model etc; Studies in genomics to include mapping and sequencing to identify disease loci using large scale projects and modern technologies; comparative genomics; gene mining technologies; Identification of polymorphism important for Indian population; Strategies to develop gene based diagnostic system using microarrays, microchips etc; Strong functional studies using transcriptional profiling, robots; Identify functions of genes (functional genomics, pharmaco genomics); Functional genomics for disease diagnosis and study of human and microbial genomics based on priority; Identification of genes that affect health and disease; Identify species variations in population; Studies on genetic disorders, nutritional genes, nutritional defects; Study of ecology, environment and diseases using molecular markers; Strengthening of teaching of molecular medicine at selected medical colleges; Utilise information to develop useful diagnostics and wherever required use gene therapy; Development of drugs ; Identify targets for appropriate interventions; Therapeutic technologies using candidate vaccines, monoclonal antibodies, potential therapeutic compounds, protein of important molecules and use of small molecules; Infectious Diseases; Development of areas of bioinstrumentation; Study of ecology, environment and diseases using molecular markers.

Environmental Biotechnology: Cleaner technology; clean water and pollution problems.

The recommendations would be used for developing new projects.

2.3. BIOTECHNOLOGY RESEARCH AND PROMOTION COMMITTEE (BRPC)

The Biotechnology Research and Promotion Committee (BRPC) was constituted in April 1997. The terms of reference of the BRPC were revised during the 4th BRPC, according to the revised terms, projects costing more than Rs. 1.00 crore and recommended by the Task Force would be considered by the BRPC. Programme Support, mission projects, integrated multi-institutional projects and generated projects costing above Rs. 1.00 crore would be placed directly before the BRPC after having obtained the comments from the expert committee.

During the year the BRPC considered a total of 35 projects. The 4 Jai Vigyan Mission projects were recommended by the BRPC and implemented by the Department. The progress of the

recommended projects was monitored; presentations were made for 6 projects by the respective PI's and reports of the Expert Committees constituted by the BRPC for 5 Network programmes were also presented.