

liver disease to a large extent and also for cancer of the liver. To assure safety of blood, pre-transfusion screening for HIV and hepatitis-B is already mandatory in all blood banks in India and screening for hepatitis-C has commenced in the year 2000.

In view of the seriousness of hepatitis-C to cause infection, the sequencing of the Indian isolate gathers importance. Using facilities provided by the Department of Biotechnology (DBT), New Delhi at the Deccan College of Medical Sciences and Allied Hospitals, Hyderabad (DCMS), Indian scientists in collaboration with industries such as Sudershan Biotech Ltd and Shantha Biotech Pvt Ltd have completed the sequencing. Currently, there is no vaccine available against HCV and it is hoped that ultimately this could be realized.

C. M. Habibullah (DCMS), while presenting the results said that under the Indo-US Vaccine Action Programme (VAP), the DBT had sanctioned a project 'Molecular characterization and immuno-diagnosis of hepatitis-C virus infection in India', where an attempt was made to develop an indigenous peptide-based ELISA kit. Partnership with Ramareddy V. Guntaka at the University of Tennessee, who is also associated with Sudershan Biotech Ltd, resulted in cloning work being taken up at the DCMS and Shantha Biotech Pvt Ltd, and the whole genome sequencing was carried out in Guntaka's laboratory.

According to Habibullah, the hyper variable region (HVR-1) is involved in viral binding to the receptor and is also the region that is responsible for the genetic variation among different

groups of HCV. The genetic heterogeneity of Indian isolates is not well understood and it is proposed that molecular epidemiological studies all over India would be undertaken. It is hoped that identification of critical regions in the viral genome and screening drugs for antiviral activity would be accomplished.

Manju Sharma (Secretary, DBT) said 'the sequencing of the Indian isolates of hepatitis-C virus has opened up enormous opportunities for development of diagnostics, vaccines and new drug targets'.

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Fund for improvement on S&T infrastructure in universities and higher educational institutions (FIST)

It is universally acknowledged that the universities are cradles of innovation, and research in universities has a three-tier effect. These are the quality of undergraduate and post-graduate education and the value of research. This mode of research and generation of high-quality manpower is the most cost-effective and *sine quo non* for the development of India. There has been a serious neglect of support for research in universities and there is a dire need to extend support for infrastructure for research and training. The launching of the FIST programme by the Department of Science and Technology (DST) has been widely acclaimed by the scientific community and has aroused aspirations.

The Government approval for the FIST programme was given in December 1999, with an allocation of Rs 75 crores during the duration of the 9th Plan. The programme was formally announced subsequently. The response to this scheme has been extraordinary and DST processed the proposals (1158 proposals received) in a very efficient and exemplary manner, with the involvement of a large number of highly respected scientists. A strict and highly objective

scrutiny has resulted in identification of over 200 departments from 89 academic institutions throughout the country, for support at bare minimum levels, designated as Level-I and Level-II. In Level-I, it is expected to provide funds for improving quality of teaching and research through modernization of laboratories and by augmentation of library facilities. In Level-II, it is envisaged to support state-of-the-art equipment and setting up laboratories conforming to good laboratory practices (GLP) norms, for conducting internationally competitive research. In both the levels, support would be provided for infrastructure facilities,

networking facilities and maintenance of equipment. These recommendations were arrived at, through different expert committees and presentations by prospective departments and a final scrutiny by the FIST Advisory Board (FISTAB). In this very first exercise, the Advisory Board has recommended Rs 112 crores. It is expected that during the 9th Plan, Rs 112 crores may be made available against the allocation of Rs 75 crores.

The availability of funds for the approved programme is inadequate. The fund (Rs 20 crores) available for the programme during 2000–2001 was fully utilized and that (Rs 35 crores) available

Table 1. Number of proposals received for the programme

Subject area	Level-I	Level-II	Total
Life sciences	290	121	411
Physical sciences	95	38	133
Engineering sciences	231	115	346
Chemical sciences	88	35	123
Earth and Atmospheric sciences	54	20	74
Mathematical sciences	54	17	71
Total	812	346	1158

Source: DST Annual Report 2000–2001.

Table 2. FISTAB recommendations

Subject area	Level-I (Rupees in crores) [No. of departments]	Level-II (Rupees in crores) [No. of departments]	Total (Rupees in crores) [No. of departments]
Life sciences	27.29 [78]	9.92 [8]	37.21 [86]
Physical sciences	9.31 [31]	5.65 [5]	14.96 [36]
Chemical sciences	11.09 [24]	9.41 [7]	20.50 [31]
Engineering sciences	13.69 [33]	12.54 [9]	26.23 [42]
Earth and Atmospheric sciences	6.79 [15]	4.17 [3]	10.96 [18]
Mathematical sciences	0.97 [5]	1.10 [3]	2.07 [8]
Total	69.14 [186]	42.79 [35]	111.93 [221]

Source: DST Annual Report 2000–2001.

during the current year, i.e. 2001–2002 would also be utilized completely for providing support to the identified departments. Table 1 gives the number of proposals received from various universities and academic institutions.

The DST, through a two-tier committee structure: FISTAB and six subject

expert committees for the above-mentioned broad subject areas, short-listed 295 proposals (Level-I: 199; Level-II: 96) for detailed presentation. Subsequent to the presentations by the short-listed departments/institutions, 222 proposals (Level-I: 158, Level-II: 64) in all subject areas, at a total cost of Rs 118.82 crores

for 5-year duration, were recommended by the expert committees for consideration of the FISTAB. The FISTAB has finally recommended 221 proposals (Level-I: 186; Level-II: 35) at a total budget of Rs 111.93 crores, for five years. The details of the recommended budget are given in Table 2.

Interaction meetings: Value addition in DST's R&D projects on animal sciences

Of late, there has been revival of interest in organismic biology, the world over¹. The Programme Advisory Committee (PAC) on 'Animal behaviour, ecology and evolution', of the Department of Science and Technology (DST) was rechristened as PAC on animal sciences in 1996, to focus attention on faunal studies. The PAC aimed to strengthen the basic research activities in the animal sciences (read zoology), primarily across the universities and academic institutions through extramural R&D support.

The number of research proposals received in DST on animal sciences was dimly low to begin with, only 27 in 1996. The financial share of sanctioned projects was only 8% of the total expenditure under life sciences during 1990–1994. The rest, 92% was shared by the three remaining PACs on plant sciences, biochemistry, microbiology, cellular and molecular biology and medical sciences. The average cost of a project under animal sciences was Rs 8.50 lakhs only, as against the average cost of Rs 12.50 lakhs for a life sciences project.

The proposals submitted under PAC on animal sciences for funding were weak on various counts. Many of the projects were highly ambitious in terms of goals set for a period of three years with limited financial and human resources. Majority of them were poorly formulated with disjointed and non-complementary objectives, inadequate review of literature, inappropriate methodology, inflated budget and wrong choice of equipments, so much so that many a time it appeared as if the principal investigator (PI) wanted to set up a whole department or an institution. Also the research topics chosen, were not in the line of specialization of the proposer, but closer to the 'current fashion', irrespective of his/her past publications or experience. The other shortcomings were their repetitive research content, and poor presentations². These contributed to a very poor approval rate, hardly around 20% of the total projects considered.

The proposals received from institutes of specialized agencies such as Indian Council of Agricultural Research (ICAR) and Council of Scientific and Industrial

Research (CSIR), etc. if they were in the very field for which these institutes were set up, generally did not attract a positive response. But the proposals which were not within the main mandate of the institute and dealt with the problems requiring extramural funds, were examined on their own merit, without any prejudice.

The PAC on animal sciences was highly concerned about this poor state of affairs. The Science and Engineering Research Council (SERC) – the apex body which oversees the extramural R&D funding in basic sciences and engineering within DST, was taking stock of its achievements during the past five years (1990–1994)³ across the PACs and was in an introspective mood to ponder over the strengths and weaknesses of its various R&D funding programmes. The exercise by PACs-LS resulted in a document which provided a base for discussion on how to improve the status of R&D funding in animal sciences⁴.

It was evident that additional inputs were essential in the proposals, if the arrival and approval rates had to improve. Therefore, it was decided to organize a