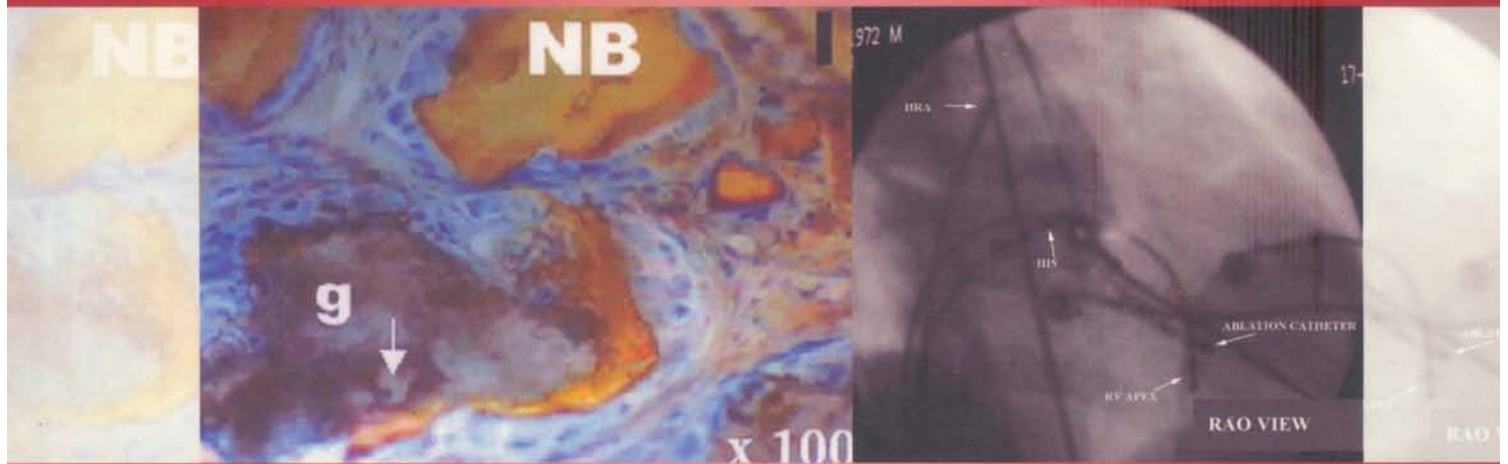


SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY



Annual Report
2002-2003



Annual Report 2002-2003

SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY

THIRUVANANTHAPURAM - 695 011

KERALA, INDIA

Annual Report
2002-2003

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ORIGINS

The origins of the Institute reach back to 1973 when the Royal family of Travancore gifted a multi-storied building for the people and the Government of Kerala resolved to develop the gift as the Sree Chitra Tirunal Medical Center for medical specialties.

Sri.P.N.Haksar inaugurated the Medical Center in 1976 and the growth of a Biomedical Engineering and Technology Wing followed quickly at the Satelmond Palace, Poojappura, 11 kilometers away from the hospital campus.

The concept and achievement of uniting technology and medical sciences within a single institutional framework was regarded sufficiently important by the Government of India to declare it as an *Institute of National Importance* by an Act of Parliament in 1980.

The objectives of the Institute as laid down in the Act are

1. promotion of biomedical engineering and technology
2. demonstration of high standards of patient care and
3. development of post-graduate training programs of the highest quality in advanced medical specialties and biomedical engineering and technology.



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OVERVIEW

The progress of the Institute during the year under review was marked by improvement in the quality and quantum of services, consolidation of the gains of the previous year and new initiatives.

On the Biomedical Technology front, a number of devices and implants were at various stages of development, technology transfer and commercialization. The large sized porous hydroxyapatite granules for orthopaedic application was poised to enter the market, even as the technologies for membrane oxygenator and vascular graft were transferred to South India Drugs and Devices and TTK Health Care respectively. Several technologies including haemoconcentrator, centrifugal pump and bioglass were undergoing development. The new initiatives in strengthening the area of instrumentation development was also progressing satisfactorily. The Institute - Industry partnership was further reinforced not only by the increasingly closer interaction with our industrial partners, but also by setting up an Industry-Institute Partnership Cell with assistance from the AICTE. The workshops and courses being organized by the Cell were intended to increase the awareness of the issues involved in developing healthcare technology, as well as its commercial scope. It is also hoped that such interactions will lead to the widening of our industrial partnership network, thus facilitating commercialization of the Institute's technologies.

The hospital services registered a modest increase in the number of patients being treated; and further optimization of management strategies resulted in greater turnover with better outcome. A major structural and functional change in outpatient services to enhance the comfort and convenience of the patients was nearing completion. Efforts were also being undertaken to improve the quality of life of patients with chronic neurological diseases like Parkinson's Disease, epilepsy and dementias. Biomedical waste management was a priority item of implementation in the hospital.

The Achutha Menon Centre maintained the pace of its activities in research, teaching and consultancy in public health. The Centre prepared reports on idle capacity in Government hospitals and desirable structural reforms in health care delivery services in Kerala. As part of a national initiative, it organized sentinel surveillance system for cardiovascular diseases among industrial workers. A unique effort for gender sensitization of medical education was begun, in addition to conducting

several seminars, short term courses and workshops. The large number of national and international research projects awarded to the Centre attested to the credibility it had established in public health research, and its relevance to the society as a whole, and the health sciences in particular.

Genetic studies of Epilepsy and Fronto temporal dementia, relationship between coconut oil consumption and coronary artery disease, laser based techniques for cancer detection, the role of galectin-I in the fate of erythrocytes and in blocking tumour metastasis, studies on the antiviral properties of selected medicinal plants and the international STICH (Surgical Trial in India Cerebral Haemorrhage) trial were some of the clinical and biomedical research being carried out in the Institute.

Continuing studies on substance P held out exciting possibilities of its role in regulating cardiac fibroblast function.

The Institute organized and/or played host to many national and international seminars and conferences. By participating in science exhibitions, holding the National Science Day and by taking part in urban and rural health awareness programmes, the Institute worked for the dissemination of knowledge and the popularization of science. The contribution of the nursing services to the academic activities of the Institute was particularly noteworthy.

The Institute, in short, strove to remain faithful to the mandate given to it by the Parliament of India.

HIGHLIGHTS OF THE YEAR

The clinical evaluation of the membrane oxygenator and its technology transfer to SIDD, Chennai successfully completed; multicentre clinical evaluation initiated.

Multicentre clinical trial of large sized porous hydroxyapatite granules for orthopaedic application has been completed and the product is ready for commercial sale.

The licence agreement for commercialisation of the Chitra-SITRA large diameter vascular graft signed with M/s. TTK-Healthcare Ltd. Chennai.

An Industry-Institute partnership cell started, which is aimed to foster industry participation in biomedical technology development.

Structural and functional alterations made in Out-patient Department following six-sigma study to achieve better patient satisfaction.

Measures launched to implement Biomedical Waste Rules 1998

Genetic studies in several neurological diseases initiated.

Department of Radiology selected by Board of Research in Nuclear Sciences for a major funding for detection and treatment of cancer using laser based techniques.

Achutha Menon Centre pioneers an initiative for gender sensitization in medical education and among health professionals.

Achutha Menon Centre, as part of a national initiative, organizes a sentinel surveillance system for cardiovascular disease among industrial workers.

BIOMEDICAL TECHNOLOGY DEVELOPMENT

The clinical evaluation of the Membrane oxygenator and its technology transfer were successfully completed during the year. Many new projects were initiated and others continued to make good progress. The details of all these activities are given in the following sections.

The completion of accreditation of the Quality system by Comité Français D'Accreditation (COFRAC) of France has taken more time than expected. The major reason seems to have been our very unique focus in the areas of biomaterials and medical devices. For materials characterisation, even COFRAC had to find and train a new auditor, which they eventually did in July 2002. As of March 2003, the technical examination of our application has been completed and the audit team constituted. The site audit is scheduled for July first week. However, the delay was used to consolidate and continuously improve the quality system with two internal audits and regular quarterly technical management meetings.

Medical device industries, research institutions and students continued to patronize the biocompatibility evaluation and analytical testing services of the Institute. Contracts worth Rs.25 lakhs were obtained for carrying out studies and tests from these external sources during the year.

PRODUCT DEVELOPMENT AND TECHNOLOGY TRANSFER

(A) ARTIFICIAL ORGANS

The Division of Artificial Organs consisting of the Modelling, Prototyping and Devices Testing laboratories has been involved in a number of product development activities as described below.

Membrane Oxygenator and Hemoconcentrator

The First phase of clinical evaluation of 25 units was completed by the Department of Cardiovascular and Thoracic surgery during 2002. This division was involved in the data analysis and reporting. The technology transfer to SIDD, Chennai has been completed and the multi-centre Clinical Evaluation was started in March 2003 in collaboration with the Industry. The units required for the MCT are being supplied by the Industry now.

The development of a hemoconcentrator under the sponsorship of SIDD, Chennai progressed satisfactorily during the year. Process and Quality assurance procedures were standardized and in-vitro testing is in progress.

Vascular Graft

This is a collaborative project with the South India Textile Research Association, Coimbatore and the technology is being jointly transferred by the two institutions to M/s. TTK Healthcare Ltd., Chennai. A pilot production of 100 vascular grafts in six different sizes for the multicentric clinical trials has been completed. The design and development of the final packaging for the products is being carried out by the industry for distribution to different centres for clinical evaluation.

Centrifugal Pump

The DST funded project for the development of a Centrifugal blood pump made significant progress during the year. Initial in-vitro blood evaluation has been very encouraging. An improved drive unit was developed and a vendor identified for the development of an advanced microprocessor controlled drive units. Product validation including animal evaluation of the final configurations is expected to be completed this year.

Artificial Heart Valves

A project for the development of a NEW MODEL of the Chitra heart valve based on research conducted earlier in the Institute was sanctioned in March 2003 under the PATSER scheme of funding by DSIR, Govt. of India. This collaborative project with TTK Healthcare is aimed at developing an improved model with MRI compatibility and is based on design optimisation studies carried out earlier here. It is expected that this new model will result in reduced post-operative clinical complications, which are inherent in all mechanical valves today.

The project sponsored by TTK Healthcare for the development and testing of three additional sizes of the current model of the TTK-Chitra heart valve progressed well during the year. The design has been completed; prototyping and evaluation are in progress.

Hydrocephalus Shunts – Test system for performance evaluation

Development of a Mark II computerized test system for 100% qualification of Hydrocephalus shunts was sponsored by M/s. Hindustan Latex Ltd, Trivandrum. The work on this new and improved 30 channel computerized test system was started in November 2002 and will enable the company to increase their production capacity without additional manpower.

(B) BIOMATERIALS AND DEVICES

Dental Composites

The scale-up and technology transfer of the 4 dental products: - Chemical cure, Light Cure, Radiopaque dental composite and Dentine bonding agent to Dynamic Orthopedics Ltd., Aluva progressed despite some difficulties. The multicentric clinical evaluation is in the final stages and is expected to be completed shortly.

Fibrin Glue

The scale up and pilot production of fibrin glue, developed by the Thrombosis unit and sponsored by ATMRF, Ahmedabad, ran into difficulties in the area of viral inactivation of the products. The monitoring committee of TIFAC, which is funding this programme of ATMRF, has asked for extended standardization and validation of the viral inactivation procedures. Standardisation of two viral inactivation processes has been completed. Final validation has been planned for completion by September 2003 following which the product will enter multi-centre clinical evaluation with the necessary regulatory approvals.

Hydroxyapatite and Bioglass

Multi-centric clinical trial of large sized porous HAP granules for orthopaedic application has been completed in five centres and the product is ready for commercial sale. The technology for this product has been transferred to Dynamic Orthopedics Ltd., Aluva. Limited clinical trials of a bioactive glass composite for various periodontal and related applications have been completed. Multi-centre trials and technology transfer for this product are being initiated. Toxicological evaluation of a new self-setting calcium phosphate based bone cements is in progress.

Wound Dressings

Dynamic Orthopaedics Pvt. Ltd., Aluva, sponsored scale-up of Chitosan based wound dressings developed by Biosurface Technology made slow progress due to various reasons. Training of two of their staff in the preparation of the dressings has been completed and Ethics committee approval was obtained for clinical evaluation. Materials will be supplied as and when the packaging material is qualified and supplied by the industrial partner.

The development of Silver-oxide coated dressings in the Laboratory for Polymer Analysis has been completed under sponsorship of the same company. Scale-up and clinical evaluation of this product are planned for the coming year in collaboration with the industry.

Heparin Coating of Intra-Ocular Lenses

The project sponsored by Aurolab, Madurai for the heparin coating of IOLs made considerable progress. Refinement and standardisation of the process for immobilization of heparin on the IOLs by functionalisation without losing optical clarity has been carried out. The final phase of estimating the activity of the coated heparin is underway and is expected to be completed shortly.

(C) DIAGNOSTICS AND INSTRUMENTATION

Antibiotic Sensitivity of Mastitic Milk – Field Kit for Testing

An Institute funded project for making 200 kits was started by the Division of Vivarium. This would enable the standardization of the novel "FIELD KIT" for testing antibiotic sensitivity of mastitic milk in dairy animals. An extended field trail using the 200 kits was initiated and is progressing well. The results obtained so far are very encouraging and the trials are expected to be completed during mid 2003. Technology transfer activities for this product have been initiated.

Disposable ECG Electrodes

Work progressed on the development of disposable ECG electrodes in the Instrumentation laboratory. Prototype ECG electrodes fabricated using conductive

polymers were found to provide good quality ECG recordings. The next step is to carry out testing of these electrodes as per the International standards. Development of a test system for meeting these standards has been completed. Work on standardization of materials and processes are expected to be completed in this coming year.

Artefact Free Breathing Monitor

The first prototype instrumentation for an artefact free breathing monitor was developed under a DST funded project. The results of initial trials were promising. Further improvements are being carried out to increase the reliability of the system. Instrumentation to reduce cardiac artefacts using adaptive filtering techniques was also developed.

Image Reconstruction for Electrical Impedance Tomography

Development of an image reconstruction algorithm for an Electrical Impedance Tomography System was carried out. The 'sensitivity matrix' method was adopted for this purpose. The forward problem was solved using Finite Element methods and the inverse problem was solved by a method based on truncated singular value decomposition. Further development is being continued.

(D) TECHNOLOGY TRANSFER SERVICES

Technology Transfer Cell

The cell coordinated the following activities involved in the scale-up and feasibility studies under MOU agreements sponsored by industry.

- (1) Dental composites : M/s. Dynamic Technomedicals Pvt. Ltd., Aluva

- (2) Heparinisation of IOL : M/s. AUROLAB, Madurai, TN., and
- (3) Chitosan based wound dressings : M/s. Dynamic Technomedicals Pvt. Ltd., Aluva

The license agreement for commercialization of the Large Diameter Vascular Graft technology was jointly signed by the Institute and South India Textile Research Association, Coimbatore with M/s. TTK Healthcare Ltd., Chennai.

The license fee and royalty earnings that have been capitalised in the Technology Development Fund now

yield reasonable amounts for supporting targeted development activities. Five short term projects of 1 year duration each were sanctioned for a total Rs.7.89 lakhs during the year.

Technology Proving Facility

Routine maintenance of the clean areas was carried out regularly and the facilities made available for the fabrication of Membrane Oxygenators for the first phase of clinical evaluation in the Institute.

TESTING, QUALITY SYSTEM MANAGEMENT AND TECHNICAL SERVICES

(A) TESTING SERVICES

Customer Services

About 200 test requests were received from external customers alone and around 1000 external samples were analyzed. An equal number of samples from internal customers were also handled. Customers were assisted in the proper selection of tests and for reasonable access to the laboratories. Feedback from external customers was regularly obtained. An internal customers' meet was organized to get feedback and suggestions for improving the test services. Testing support to two industries was extended for product evaluation as per details below.

Testing support provided

Laboratory & Tests	External Requests	Internal Requests	No. of Samples Analysed
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Analytical Tests /Material Characterization

Laboratory For Polymer

Analysis

Thermal analysis	90	115	875
Infrared / UV-Vis spectroscopy			
HPLC, GC			
Mechanical Properties			

Bioceramics :

X-Ray diffraction and Vickers microhardness	40	3	150
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Scanning Electron Microscopy	40	30	290
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Transmission Electron Microscopy	10	3	50
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Dental Products :

Mechanical properties of Dental materials	12	10	360
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Biological Evaluation**Tissue Culture :**

Cytotoxicity and Cell adhesion	7	30	150
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Thrombosis research unit :

In vitro blood compatibility	10	22	100
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Toxicology :

Irritation, sensitisation, intramuscular

implantation and pyrogen tests	2	18	30
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Product Evaluation support provided

No	Sponsor	Study	Main Laboratory
1	Hindustan Latex Ltd. Trivandrum	a. Evaluation of whole blood bags and platelet bags b. Screening study for Platelet bags under development c. Evaluation of platelet bags in comparison with CONTROLS	Thrombosis Research Unit
2	Sahajanand Medical Technologies Pvt. Ltd. Surat	Biofunctional and Pharmacokinetic evaluation of drug coated endovascular stents in Porcine model	Vivarium
3		Evaluation of Cardiac arrhythmic effect of Paclitaxel surge release from a polymer matrix in porcine model	Vivarium
4		Hemocompatibility of anti-restenosis drug eluting stents in vitro release	Thrombosis Research Unit
5		Accelerated aging studies on drug coated stents	Devices Testing
6		In vitro estimation of half time release point of Paclitaxel from drug eluting stents	Lab for Polymer Analysis
7		Toxicological evaluation of drug Toxicology eluting endovascular stents	

Coronary Stent Evaluation

Following the successful evaluation of a stainless steel coronary stent for Sahajanand Technoventions Ltd., Surat last year, which enabled them to obtain the CE mark, the company sponsored more studies this year, one for the evaluation of their Paclitaxel coated stents and another for their Sirolimus coated stents. A major part of these studies involves biofunctional evaluation in a pig model in the Division of Vivarium. Other parts are cytotoxicity, toxicological and blood compatibility evaluation of the coated stents. The studies are scheduled for completion during 2003.

Platelet Storage Bags

A second batch of platelet storage bags being developed for Hindustan Latex Ltd., Trivandrum were screened using a limited set of tests to determine the most promising design. Further detailed studies for the viability and functionality of platelets stored in the new bag in comparison to other commercially available bags have been initiated and are scheduled for completion in the first half of 2003.

Medical Devices Package Validation

During the current year, two accelerated aging studies for M/s. Sahajanand Vascular Technologies, Surat for their drug coated cardiovascular stents were taken up and are in progress.

(B) QUALITY SYSTEM MANAGEMENT

Validation documents and other details requested by the accreditation agency COFRAC, were sent in October 2002. As per the latest information, they have completed the technical examination of our

application and the audit team has been constituted. The site audit is now scheduled for July 2003.

The various laboratories involved in this programme continued to provide regular testing services to both internal and external customers. All of them continuously reviewed and updated their various procedures and improved the quality of testing services with the introduction of suitable quality control methods. Efforts to obtain relevant Certified Reference Materials for controls from various international agencies continued. In some cases no CRMs are available internationally and hence efforts to develop internal Reference Materials (RMs) continued. Standard L929 mouse fibroblast cell line and other standard microbiological lines were obtained from ATCC, USA as part of this program.

Calibration Services

During the year, the Calibration Cell carried out more than 320 calibrations. Of these, 190 were directly related to the testing services being accredited. New procedures were introduced during the year for :

1. Calibration of laboratory timers
2. Efficacy testing of Ultrasonic cleaners and
3. Efficacy testing of Ethylene Oxide Sterilizers

The Calibration Cell in collaboration with the Divisions of Artificial Organs, Toxicology and Tissue culture is involved in developing in house reference materials (RM) for use during various testing activities. The validation of in-house RMs for Cytotoxicity testing through Inter Laboratory Comparison studies is in progress.

Proficiency testing and inter-laboratory comparisons

Laboratory	Parameters	Organised by	Remarks
Thrombosis Remsearch	Automated full blood count and coagulation assays.	Royal College of Pathologists of Australia (RCPA)	All results within acceptable limits
Histopathology	Technical exercise for H&E	RCPA staining.	In progress
Bioceramics	Microhardness & X-Ray diffraction analysis.	ILC by lab with 3 others	Results were all comparable
Tissue Culture	Cytotoxicity using ISO elution, Agar overlay and direct contact	ILC organised by Devices Testing	In progress with 3 international labs

Quality Cell

The Quality Cell continued its support for the routine monitoring of the quality system with four Technical Management Committee meetings and two Management Review Committee meetings. Two internal audits were conducted. As part of the continuous improvement of the quality system, review and revision of documents continued.

Microbiology

The microbiological monitoring of controlled environments, sterility testing, testing of antimicrobial property of materials and bacterial adhesion studies were carried out. It also supported Vivarium in the health care monitoring of laboratory animals. Work procedures were updated and new ones added to ensure full compliance of the laboratory with the requirements of the quality system. The first major internal audit of the lab was conducted this year.

*(C) TECHNICAL SERVICES**Intellectual Property Rights and Technical Co-ordination Cell*

Eight new patent applications were filed, while 4 of the earlier ones were granted as per table below. The current status of the Institute's patents and designs is as follows :

- Patents held (sealed) : 46 Nos.
- Patents filed and pending : 48 Nos.
- Designs held (sealed) : 13 Nos.

The Patent cell also handled the visits of academicians to the BMT Wing and coordinated the participation in science expositions, showcasing the Institute's achievements. The institute participated in the NATIONAL SCIENCE CONGRESS held at Bangalore University, from Jan 3rd -7th, 2003.

Engineering Services

Tool Room Division : Fabrication of jigs, fixtures and moulds for the various projects were carried out. 138 work orders related to machining and fabrication of moulds were executed during the year. The notable ones are:

- Blood Pump Impellers, Pump case, bottom plate, connector and Pivot bearings for the Centrifugal Blood pump project.
- Rectangular Punch and Die sets for Polymer Processing and Bioceramics labs.
- Lyophilizer jars and holders for stacking antibiotic test kit vials for Vivarium.
- Hemoconcentrator shell and end caps.
- Parallel blood flow testing chambers thrombosis research unit.

The major maintenance activities carried out include:

- Electrical control panels in the sub-station were modified to operate two generators simultaneously to handle electrical power requirements of BMT Wing.
- One room for experimental animals with the required rate of air changes under controlled conditions of humidity and temperature was established.

The division also continued to support the running and maintenance of the various utility services like electricity, water, sewerage, air-conditioning, telephones, in the BMT Wing.

Industry-Institute Partnership Cell

IIPC was started under a sponsored project of AICTE, New Delhi. Three workshops/courses were organized

during this first year of operation :

1. Biomaterials & Medical Devices: Quality Awareness Programme - September 26-28, 2002.
2. Biomaterials Informatics & Intellectual Property Rights - November 29-30, 2002.
3. Biomedical Implants & Tissue Engineering - March 7-8, 2003.

More such workshops are being planned for the coming year. Based on the experience gained so far, it is expected that these workshops would be improved and more industry participation could be generated leading to increasing awareness and spread of the scope of application of biomaterials and medical devices.

BMT Wing Library

The library has a collection of 9081 books and 5098 bound back volumes. During the current year, 222 books and 96 back volumes were added. Currently 77 journals are being subscribed. The collection also includes 1920 standards and 270 patents.

The information management system in the library is based on the UNSESCO software, ISIS for Windows. The acquisition, circulation and cataloguing are carried out on the system, as also maintaining databases of Current contents in Engineering, Life Sciences and Physical sciences. The information is accessible to the users on the intra-net of the Wing.

As part of supporting the Quality system, the library updates all relevant national and international standards. During the year 157 standards were added to the collection.

BIOMATERIALS RESEARCH AND DEVELOPMENT

Bioceramics

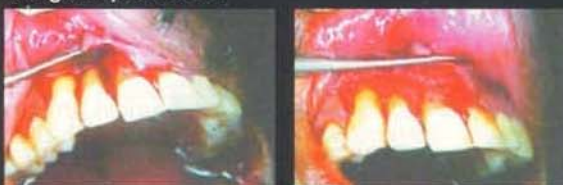
A new type of injectable calcium phosphate cement has been formulated, which has versatile applications in skeletal repair. In vitro studies and in-vivo studies are in progress.

The latest initiative is the preparation of shaped bioceramic components for various clinical applications like burr-hole buttons for neurosurgery. Dense and porous ceramic blocks of varying porosity and shapes for use as scaffolds for cranioplasty, laminoplasty and filling applications are currently undergoing mechanical evaluation and biological screening. The in vitro tests on new polymer-ceramic composites and biomimetic coatings are progressing.

The laboratory is actively involved in the area of biomimetic processing of bioactive composites in collaboration with National Institute of Advanced Industrial Science and Technology, Nagoya, Japan. The work, based on functionalization of synthetic polymers such as polymethyl methacrylate (PMMA) and its biomimetic behaviour towards in vitro growth of calcium phosphate has produced promising results.

PERIODONTAL REPAIR USING BIOACTIVE GLASS COMPOSITE

Surgical procedure



Radiographs



HYDROXYAPATITE POROUS GRANULES

Used for tibial plateau fracture repair

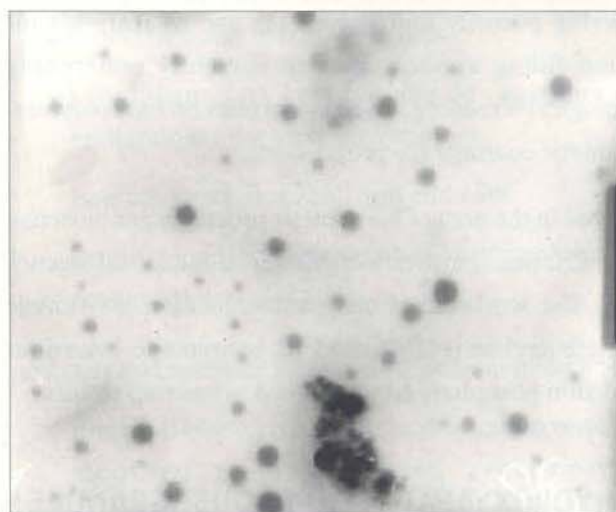


Post-Operative

After 1 year

Biosurface Technology

The project on Stimuli Sensitive Polymeric Nanoparticle based Advanced Drug Delivery System for cancer, diabetes and antibacterials, under the NMITLI programme of CSIR progressed well. Nanoparticles loaded with insulin have been prepared and tested in diabetic rats as well as normal pigs with good results. Further work is in progress to scale up the process and validate the product by detailed stability studies and animal evaluation in diabetic pigs.



Transmission Electron Photomicrograph of insulin loaded polymeric nanoparticles along with the size calculator

A DST funded project for studies on Langmuir-Blodgett monolayers on polymer substrates for blood compatibility was started in November 2002. Studies on the effect of phospholipid layer coated onto polymer substrate in the formation of apatite crystals of insulin and antibiotics have been initiated. Work is in progress to study the blood compatibility of these phospholipid layers.

Work was initiated on a second generation wound dressing material for treatment of burns. The quality of the film has been improved significantly and efforts

are being made to bind silver nitrate for antibacterial effect. Loading the membrane with appropriate growth factors has been planned for the current year.

Dental Products

Development of a single solution bonding agent was the major focus of activity during the year. This novel fifth generation bonding agent, combines priming and bonding activity in one product, thus making the clinicians' job a lot easier. For this, a novel dicarboxylic acid monomer was synthesized. The adhesive strength of the bonding agent formulations derived from this compound were measured and compared with SINGLE BOND, one of the currently imported and popular single solution bonding agent. The results showed superior properties in our product. It is currently undergoing cytotoxicity evaluation.

The DST funded project work on the development of an organically modified ceramic for dental applications (ORMOCERS) made good progress. Various compositions are being evaluated for their mechanical and setting properties. Further work to take this project to its logical conclusion is in progress.

Testing facilities were extended to postgraduate dental students for determination of mechanical properties of various dental materials. A project for the development of a new photoinitiator for dental composites was sanctioned by STEC, Trivandrum.

Polymer Analysis

Affinity sites for antibacterial drugs were created using the methodology of non-covalent imprinting on the surface of commonly used polymers such as PVC, polyurethane etc. These materials were found to retain the bound drugs for a prolonged period indicating

their suitability for different applications. Polymer complexes based on polyvinyl alcohol and capable of responding to the presence of glucose were synthesized and evaluated with the aim of developing simple glucose sensing elements. Further work on these programmes are continuing.

In the STEC funded project on Biopolymers for Medical applications, the extraction and purification of the biopolymers such as hyaluronic acid and collagen from natural sources was standardized. The purified hyaluronic acid was characterized for its physicochemical properties. Copolymers of hyaluronic acid, collagen and chitosan with a range of vinyl monomers were attempted for diverse long-term medical applications.

Polymer Chemistry

Work was continued on a rapidly gelling polymer system based on gelatin and alginic acid dialdehyde as a possible wound dressing material. The effect of various parameters on the gelling time of this wound dressing system was optimized and one set of experiments have been carried out on rats. The data collected so far, indicate that this system is highly biocompatible, biodegradable and does not cause any adverse reactions. Wound healing is very good and further development work is in progress.

The use of the same rapidly gelling system as an injectable scaffold for cell encapsulation and drug delivery was a new initiative this year. Hepatocytes were encapsulated in the gel and their viability and proliferation were studied up to 4 weeks. Results showed that their growth and proliferation were well supported. Hepatocytes are difficult to grow in culture and even with scaffolds the reported maximum period of their survival is only 7 days.

Radiopaque polyurethanes could have a number of applications in the biomedical area. A new 5-iodine-containing molecule was synthesized and incorporated into urethanes to give it radio-opacity. The biocompatibility and mechanical properties of these iodinated polyurethanes are being studied.

Tween 20 is a surfactant used to desorb proteins from surfaces. Tween 20-methacrylate was synthesized and copolymerized with methyl methacrylate in small proportions in order to study whether it would resist protein adsorption and the consequent biochemical events such as platelet adhesion and thrombus formation. Platelet studies indicated low adhesion - a pointer to the blood-compatible nature of the surface.

Polymer Division

Work was continued on the development of biodegradable bone fixation materials. In vitro studies to determine the degradation of cross-linked poly (propylene fumarate) (PPF) in simulated physiological fluids and the effect of calcium carbonate as an additive on its properties were carried out. The studies show that calcium carbonate is a good biocompatible filler in the currently used bone cement both for adjusting the pH conditions of the composites during implantation and also for optimising the physical and mechanical properties.

Work on the development of orthopaedic casting tapes was initiated with the aim of having a light weight, high strength and radiolucent product, made using indigenously available polyurethane raw materials. This is expected to result in an improved cost-effective alternative to the presently used plaster of paris.

Polymer Processing Laboratory

The DST funded research project "Hydroxyapatite (HAP) – ethylene vinyl acetate co-polymer (EVA)

composites for bone substitute applications” was completed during the year. The composite material showed promise as it passed the toxicological evaluation and showed promising results in bone implantation experiments.

The DST funded project “Development of non-toxic latex formulations for biomedical applications” in collaboration with toxicology division, made good progress. A number of formulations have been studied with the aim of reducing the toxicity due to vulcanization chemicals. A method to quantify the

migration of residual dithiocarbamate accelerators into biological medium is being developed.

The Indo-German Joint research project entitled “Fabrication of clinically significant shapes of hydroxyapatite-ethylene vinyl acetate composites for bone substitute applications by special thermoforming techniques” progressed well with shaping of the composites into three-dimensional contour at the Institute for Composites Materials, University of Kaiserslautern, Germany.

BIOLOGICAL RESEARCH AND EVALUATION

Implant Biology

Tissue Culture : Primary hepatocytes were isolated and maintained in standard two-dimensional and three-dimensional matrices like collagen sponge & collagen-chitosan. Viability & functional activities of cells grown on these matrices using biochemical and molecular biology techniques are in progress. Co-culture systems involving isolation and maintenance of primary cell cultures of endothelial cells and hepatocytes were standardised. Attempts to develop a co-culture system for studying the functionality of hepatocytes are in progress. Cells grown on thermo-sensitive polymer coated tissue culture dishes gave encouraging results.

Studies on ceramic materials like Hydroxyapatite, Bioactive glasses and their composite on long term cultures with osteoblast cells demonstrated biomineralisation, evidenced by histochemical staining. *In vitro* results obtained are in agreement with already generated *in vivo* data for these materials.

Histopathology Laboratory : Three research programmes viz. (a) molecular mechanisms of tissue response to implant debris, (b) cellular and molecular mechanisms of polymer degradation and (c) immune response to polymer degradation were initiated during the year. Study of retrieved human implants continued, which included light and scanning electron microscopic observations of tissue and implant material.

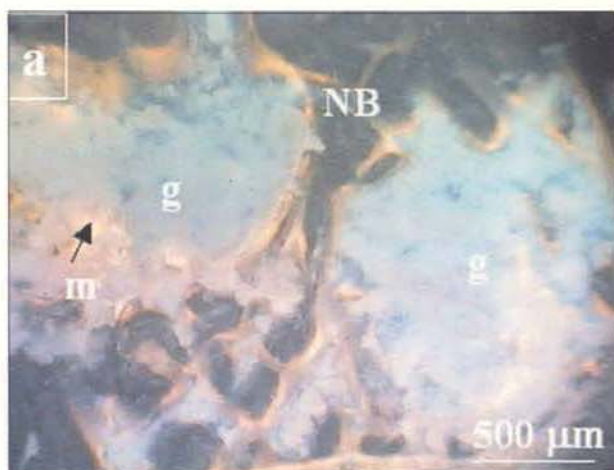
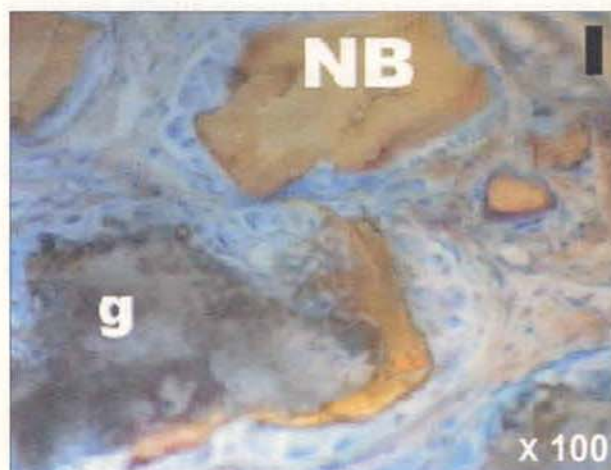
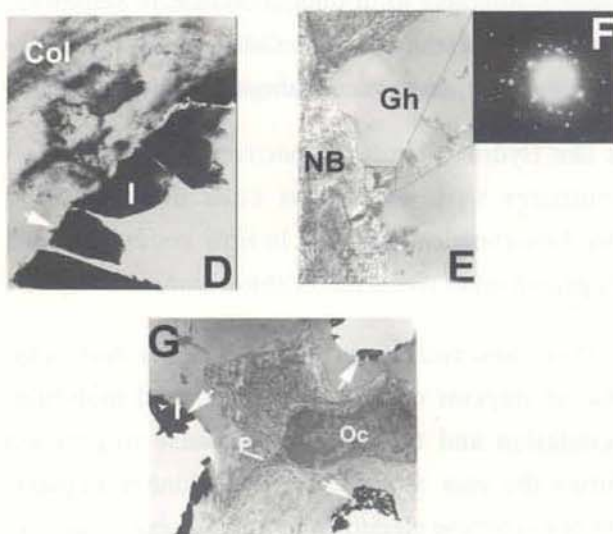


Fig. Fluorescence micrographs of undecalcified, unstained, 100 mm thin cross sections of bioactive glass-ceramic system granules implanted in rabbit tibial bone after 2 weeks, embedded in polymethylmethacrylate (PMMA).



Photomicrographs of Triphasic Bioactive Composite System (HABGS) non-porous, 300 – 350 mm size granules coated with 5 mg of Fibrin glue implanted in mice quadriceps muscle after 28 days (NB = new bone; g = granule)

Transmission Electron Microscopy : S. Abiraman completed his PhD thesis and was awarded the degree for his work on "In vitro and In vivo characterizations of bioactive calcium phosphate ceramic, glass ceramic, and their composite with fibrin glue in osteogenesis and oseointegration for orthopaedic application". TEM studies of the bone-ceramic interface of Chitra ceramic granules for bone substitute use were carried out.



Transmission electron micrographs of decalcified Spurr embedded Calcium phosphate calcium silicate system (HABGS) non-porous granules implanted site in rabbit tibial bone (50 – 70 nm ultrathin sections) stained with uranyl acetate and lead citrate – (D) - the interface of microcrystals of HABGS and mineralized collagen (x 25,000); (E)- interface of the ghost of HABGS with bone (x 3, 500) and inset (F) shows the selected area electron diffraction pattern for the mineralized bone with the microcrystals (camera length 0.8 M); and (G) - a single osteocyte with long processes into the mineralized bone, visualized in the interstices of the HABGS granules (x8,000).

Microbiology

Implant associated infections are becoming a serious hazard with the increasing use of implants and other devices like catheters, guide wires, stents, pacemakers,

contact lenses etc. The surfaces of indwelling medical devices are excellent platforms for adhesion and multiplication of bacteria and biofilm formation. The present antimicrobial arsenal is incapable of eradicating the micro-organisms in biofilms. Hence, novel approaches are needed to combat such implant related infections. This involves an understanding at the molecular level, the interactions between bacteria and biomaterials and development of suitable strategies to counter it.

This year, work on the analysis of the interactions of *E.coli*, *Pseudomonas aeruginosa*, and *Proteus* species with silver oxide coated and uncoated latex material for possible application in the development of infection resistant Foley's urinary catheter was carried out. The studies involved characterization of silver oxide coated/uncoated materials, bacterial adhesion and migration studies and analysis of protein expression in biofilms. Further work will be continued in the coming years.

Molecular Medicine

Gene expression profiling of epileptic brain : The underlying biochemical pathways associated with the development of epilepsy are still not well elucidated. A pilocarpine rat model has been developed to study the gene expression changes accompanying epileptic seizure. Differential display PCR has been used to identify mRNAs that are differentially expressed between three groups of rats: a) control b) during pilocarpine induced status epilepticus (SE) and c) after recovery from SE. Thirty six differentially expressing genes have been isolated and cloned so far. Defining the functional role of these genes in neurons is one of the main objectives of this ongoing study.

Development of recombinant growth factor, TGF α for wound healing : Growth factors are peptide

hormones, which play important roles in wound healing. Epidermal growth factor homologue TGF α can induce faster epidermal regeneration in second degree burns. Work on the development a recombinant TGF α as a wound healing enhancer has been started. The aim is to use this growth factor along with the wound dressing materials under development in the Institute or as a direct application for victims of burns and diabetics.

Thrombosis Research

The DST funded project for tissue engineering of vascular grafts made good progress. Coating of small diameter vascular grafts with fibrin based matrix proteins was standardized. Endothelial cell monolayer grown on the coated conduits were exposed to platelet rich plasma (PRP) at a shear stress levels of 37 dynes/cm² and the ability of the surface to resist platelet adhesion and shear stress was established in comparison with bare material. The next stage in the development is animal studies, which are planned in sheep.



Coating of small diameter vascular graft with fibrin based matrix proteins was standardized. Endothelial cell monolayer grown on the coated conduits were exposed to PRP at a shear stress of 37 dynes cm⁻² and the ability of the surface to resist platelet adhesion and shear stress was established in comparison with bare material.

Platelet glycoproteins IIb and IIIa were isolated and antibodies raised against them in hen were purified from their egg yolk. Activity of the antibodies was tested using platelet aggregometry. Antigen binding fragment (Fab) of the egg yolk antibody (IgY) was also purified. The antibody raised against GPIIIa and its Fab was found to effectively inhibit platelet aggregation induced by collagen and ADP in a dose dependent manner. Monoclonal antibodies are one of the currently used therapeutic agents as inhibitors of GPIIb/IIIa. The aim here is to evaluate the potency of the Fab as an antiplatelet agent for therapeutic applications.

Work on the development of Antivenom for use against viper bites, based on antibodies raised in pure bred White Leghorn hens was started during the year. The method of production of antibodies and its purification from egg yolk had been standardised previously. Now, the antibodies will be isolated, tested in suitable animal models and validated. The project is expected to result in the development of purer antivenom, thus improving the efficacy of treatment and reducing the complications with use of the currently available ones.

Toxicology Evaluation and Small Animal House

Toxicology Division provided support for the toxicity and safety evaluation of various candidate biomaterials and end products. The division provided support for the routine water analysis needs of the wing.

The following research activities were initiated:

- Development and testing of a gelatinous material that has the potential to be used as a biomaterial.

- A pilot study for determining the feasibility of taking MRI Scan of rats for possible development of an epileptic model using biological substrate.

Small Animal House : The main activity is the care and management of small animals like guinea pig, rabbit, rat and mice required for toxicological evaluation and other research studies.

Vivarium

The division is responsible for supporting and carrying out large animal evaluation of materials and devices. For this, large animals like sheep, goat and pigs are

procured, conditioned and maintained in well ventilated areas designed for each species. The experimental facilities include a well-equipped large animal operation theatre, radiography and a clinical laboratory.

Major studies conducted during the year were :

- Biofunctional and pharmacokinetic evaluation of drug coated endovascular stents
- Evaluation of cardiac arrhythmic effect of Paclitaxel surge release from polymer matrix in a porcine model.

PATENTS GRANTED

1. **Migration resistant plasticized poly (vinyl chloride)-PVC**
Indian Patent Application 709/MAS/95, dated: 13.06.1995.
Inventor : A. Jayakrishnan, Division of Polymer Chemistry
2. **A process for the preparation of calcium caseinate containing a drug**
Indian Patent No. 187640, dated: 24.06.1996.
Inventor : A.Jayakrishnan, Division of Polymer Chemistry
3. **A Process for the preparation of fibrin glue from donor plasma units**
Indian Patent No. 187 639, dated:17.05.1999.
Inventor : Lissy Kalliyanakrishnan, Thrombosis Research Unit
4. **A Process for the preparation of anti-snake venom in hens and isolation of immunoglobulins from chicken egg yolk**
Indian Patent Application 2697/MAS/98; dated: 30.11.1998.
Inventor : Lissy Kalliyanakrishnan, Mary Vasantha Bai, Thrombosis Research Unit.

HEALTH SCIENCE STUDIES

Health Science Studies (AMCHSS) sustained its excellence in public health training and research in the reporting year.

TRAINING PROGRAMS

The World Health Organization continued to support eight MPH students who joined in the year 2002 under the WHO fellowship program. In addition they are supporting another eight students who joined AMCHSS in the year 2003. The new batch of eight students came from the states of Sikkim, West Bengal, Gujarat and Bihar giving a representation of the north, east and western parts of India. This is the only public health training program that is being supported by the World health organization in India. In addition to the students supported by the WHO one student from Myanmar and another from Sudan also joined for the MPH program in the year 2003 giving the program an international flavor. With another eight students selected from the open category the total number of MPH students increased to 18 in 2003. The number of applicants for the open category is increasing every year. For the last batch there were over 40 applicants for 8 seats.

As a part of future development of the centre modifications are being planned for the MPH program. One of the changes is to extend the duration of the MPH program to two years. The proposal has been placed before the academic committee of the institute for approval. In addition short courses will also be offered. The short courses will be planned in such a way to enable outside participants to join exclusively for these courses. The idea for the short course was spurred because of the considerable interest of in-service candidates to join such short courses. Many funding organizations are also willing to support short courses in public health. Many of these short courses could be part of the MPH program also. As a part of the project supported by the MacArthur Foundation there is scope for developing two short courses one on "Gender and Medical Education" and another on "Making Pregnancy Safer".

In addition to the MPH program, the centre started a PhD program in Public Health in the current year. There were 6 applicants for the PhD program. One student joined the PhD program this year.

Eight students of the 2001-2002 batch successfully completed the MPH programme. A list of dissertations is included.

Dissertations submitted in June, 2002 (Graduates – 2002)

Sl. No.	Name of the Candidate	Title
1.	Manju Nair R.	Maternal Determinants of low birth weight – A hospital based case control study in Trivandrum.
2.	Rohina Joshi	Perinatal and Neonatal Mortality in Rural Pubjab: A community based case control study.
3.	Paul Kumaran P	Assessment of Community Infection Ratio in the “Model DOTS Project” area for Tuberculosis Control.
4.	Ajay V. S.	Expenditure pattern, Perceived Quality and Financing Sources for Pregnancy and Delivery Services in Rural Thiruvananthapuram, Kerala.
5.	Jeemon. P	Assessment of Capacity for control of cardiovascular disease and diabetes in rural Kerala.
6.	Pradeepkumar K. P	Overweight, Hypertension and self-reported Diabetes Mellitus : prevalence, Awareness and Health seeking behaviour among office goers of Thiruvananthapuram Corporation, Kerala.
7.	Rani. K.R.	Study of impaired mobility among elderly – An urban community based study done in Thiruvananthapuram Corporation, Kerala, India.
8.	K. Sandeep	Assessment of capacity for control of cardiovascular diseases and diabetes in Urban Kerala.

RESEARCH PROJECTS**Completed Projects*****Public Health Schools Without Walls: A Networking of Public Health Institutions.***

The Rockefeller Foundation supported this project. The objective of the project was to prepare an inventory of public health institutions in Asia and Africa. A team of 4 members, two from Asia and two

from Africa was constituted to coordinate the activities of this project.

Achutha Menon Centre was given the responsibility to prepare the inventory of institutions in the Asia Region and School of Public Health Pretoria South Africa was to prepare the inventory in the Africa Region. The AMCHSS concentrated its activities in India and countries of the South East Asia Region. The information compiled included name and address

of institutions offering postgraduate training programs in public health, name of the course, annual intake and the source of funding.

The inventory was published as a book, which also contains the public health schools network activities in the reporting year. A website was also created (www.amchss.org/phswow) as part of this project. As planned in the project, as soon as the project was completed the website was merged with the website of our institute. The directory of public health schools with contact addresses should enable institutions to collaborate and establish linkages with one another. The website will be useful in making contact among institutions and share resources. Work in the Africa Region is still progressing.

Current Status of Service Delivery in the Health and Family Welfare Sector in Kerala with Special Reference to Reproductive and Child Health Program

The Directorate of Health Services, Government of Kerala, using a grant from the European Commission supported the project. This study was conducted in five selected districts in Kerala. Data was collected from 5000 selected households (3500 rural and 1500 urban). Information on antenatal care, delivery practices, immunization coverage, birth weight, awareness on sexually transmitted disease etc and utilization of health centres was collected using a pre-tested questionnaire.

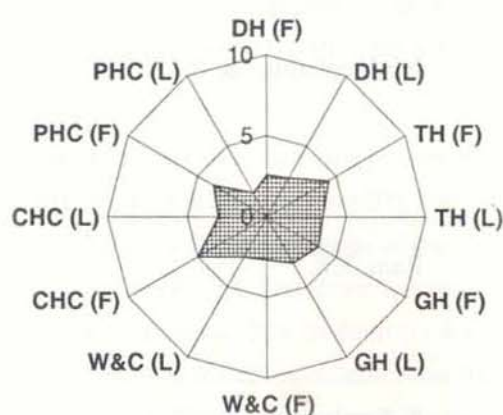
One of the most important findings of this study was that there is a reduction in immunization coverage from previous years particularly in the district of Malappuram where the oral polio vaccine third dose and Diphtheria Pertusis Tetanus (DPT) vaccine third dose were taken only by 50% of children aged 1-2 years. In all the other districts studied the coverage

was around 90%. This could be one of the reasons why the only polio case from Kerala was reported from Malappuram in the year 2002.

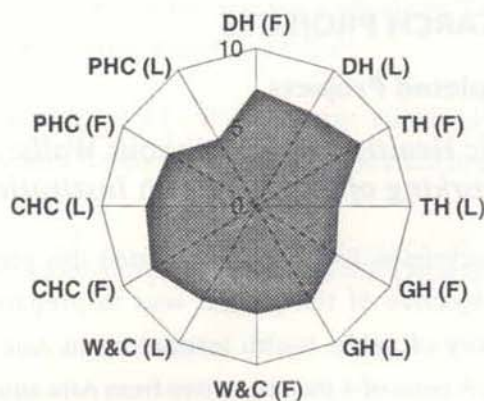
Idle Capacity in Resource Strapped Government Hospitals in Kerala: Size, Distribution and Determining Factors

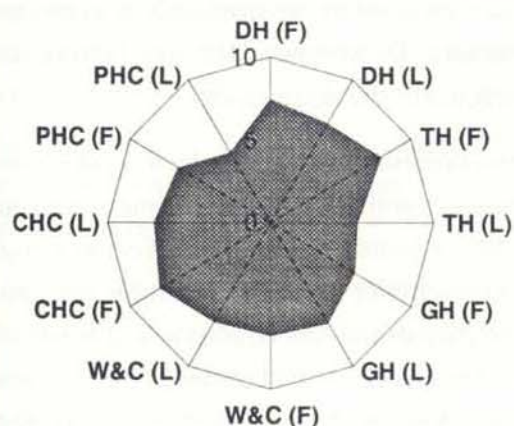
The Project was funded by Alliance for Health Policy and Systems Research, an initiative of the Global Forum for Health Research, in collaboration with the World Health Organization, Geneva, Switzerland. The study revealed that improved coverage and quality

Infrastructure Access



Quality of infrastructure



Quality of infrastructure

of care resulted in steep increase in life expectancy and decline in the crude death rate in Kerala. Yet, there are critical gaps in infrastructure, manpower, equipment and drugs resulting in the inability of the government healthcare system to meet the high demand for health services in Kerala. The unmet need is currently serviced by the private sector, resulting in denial of service to persons unable to pay.

The government health services have large idle capacity, which can help meet part of this demand by marginal investment and /or efficient management practices. The project aimed to estimate the size, distribution and determining factors of idle capacity in public health care system in Kerala. The objective was to document the nature and quantum of facilities remaining underutilised or misutilised for want of resources or matching skills.

Define/Redefine the Job Responsibilities of Various Categories of Employees under the Kerala Health Services

The Kerala Government Health Services department using the grant from European Commission supported

this project. We studied the existing job responsibilities of primary health care workforce and examined them in the context of the guidelines prescribed by Government of India. We collected opinion of 10 to 40% of all categories of employees viz. Junior Public Health Nurses, Junior Health Inspectors, Lady Health Inspectors, Health Inspectors, Lady Health Supervisors, Health Supervisors and Medical Officers, from all the 14 districts in the State. We conducted Focus Group Discussions, personal interviews and consultative meetings with these categories as well as community members, Panchayati Raj and other elected representatives, leader of trade unions and professional organizations, officials at the district, state and central levels, academicians, administrators and key personnel involved in the training of workforce. We studied the community perception on these workers and their expectations from them.

Further, the workers were subjected to "Work Sampling" to study their actual time utilization pattern. We found that majority of workforce in primary health care sector in Kerala had their job responsibilities defined decades back. The existing job responsibilities have serious limitations in the context of the epidemiologic and demographic transitions in the state. Lack of uniformity in duty hours across the districts and even within districts was found to be another major setback. More than 50% of all cadres of employees and the community were strongly for redefining the job. Community expectations from the workforce were also found to be different from what they could offer now. Based on the study it could be concluded that the job responsibilities of workforce in primary health care in Kerala need redefining.

Ongoing Projects

Research, Training and Advocacy for Gender Sensitization of Medical Education and Capacity Building of Health Professionals for Reduction of Maternal Mortality and Morbidity

The study encompasses three major components:

- (a) a regional level initiative for the gender sensitization of medical educationists and the health professionals in general,
- (b) a training programme for preparing health professionals in making pregnancy safer and
- (c) development of the AMCHSS as an institution for research, training and advocacy for gender sensitization and expansion of its public health training.

The first component is a major challenge and its success would produce well formulated and tested suggestions for the government for changes in the content and method of medical education; and also in the setting in which medical education is imparted.

Our major activities would be :

- (i) preparing review papers from gender perspective on the textbooks of several subjects in medicine
- (ii) conducting each year a two weeks training programme for medical college teachers, managers and policy makers for the medical education and other medical professionals, and
- (iii) in six states, viz Rajasthan, Gujarat, Maharashtra, Karnataka, Goa and Kerala to follow up the trainees and conduct three days training programs and/or gender based research projects.

The second component is for developing a two weeks short training course on "Making Pregnancy Safer".

The third component includes many assorted institutional building activities such as organization of seminars, TN Krishnan Memorial Lecture series, publications of the institute, etc.

The short courses developed under this project would be integrated with the MPH programme in due course. The WHO-South East Asia office has highly appreciated the work being done on gender sensitization of medical education and it has come forward to support the first session of the short course on the subject with their South East Asia Region participants. We have completed one year of this project; two more years are remaining. The national seminar to discuss the papers reviewing medical textbooks from gender perspective is scheduled to take place in the last week of July 2003. The first short term training on Gender and Medical Education for the Indian as well as South East Asian participants will take place from November 3 to 15, 2003. The first session of the short course "Making Pregnancy Safer" is schedule to take place in January 2004.

Establishment of a Sentinel Surveillance System for Cardiovascular Disease in Travancore Titanium Products Ltd., Trivandrum

The project is a part of the national cardiovascular disease surveillance in the Indian Industry population. Demographic information and risk factors like smoking, alcohol use, physical inactivity, diet habits etc. are being collected from all the 1500 employees of the factory. In addition height, weight, waist circumference, blood pressure and pulse rate are measured from all the employees and their family members. From a sub sample of the employees and their family members detailed information on risk factors are collected. Fasting blood sugar, total

cholesterol, HDL cholesterol and triglycerides are also estimated in a sub sample of the population. Blood samples have been collected from 1095 employees and family members. The samples are also being sent regularly for external quality control in the coordinating centre at the All India Institute of Medical Sciences New Delhi.

In the next phase of the project health education on reducing risk factors for cardiovascular diseases will be provided to the employees and the family members. The above-mentioned measurements will be repeated subsequently to see the impact of health education on CVD risk factors.

Community Based Detection and Monitoring of Hypertension in Kumarakom Panchayath

This is funded by the Kerala Research Program for Local Level Development, Centre for Development Studies, Trivandrum. The main objective of this project is to reduce risk factors of non-communicable diseases by people's participation. All adults above the age of 30 years in Kumarakom Panchayath were identified and interviewed by trained volunteers. Information on risk factors was collected using a pre-tested interview schedule and height, weight, waist circumference and blood pressure were measured.

After the first round of measurement health education for reducing risk factors, on topics such as tobacco use, alcohol use, over eating, lack of physical activity, will be provided to the people in neighborhood groups which are already established in the Panchayath during the peoples plan campaign. The selected volunteers are given a BP apparatus, weighing scale and a measuring tape to monitor the various measurements. During the monitoring time also health education will be provided by interpersonal communication.

Political Decentralization and Status of Reproductive Health in Kerala.

Centre for Health and Gender Equity (CHANGE), Washington DC funds this project. In keeping with the 73rd Constitutional Amendment Act of Govt of India, Kerala opted for a complete decentralization in the form of 'devolution' through a political initiative called People's Plan Campaign (PPC) in 1996 and transferred 35-40 % of the IX Five year plan funds and government healthcare centres to the Panchayath.

This study attempts to understand the impact of PPC on health, especially reproductive health. The specific objectives are: to study the structures and processes within the health sector, vis-à-vis women's reproductive health, to examine the role of primary health care system in delivering reproductive health care services, to examine the role of the people's plan campaign in improving local priority setting for women's reproductive health needs and to examine the dynamics of women's reproductive health care seeking in terms of socio-economic, culture and gender factors.

Gender and Poverty Issues in Tuberculosis in the WHO South-East Asia Region

This project funded by the WHO-South East Asia Regional Office, consists of two phases. The first phase include the preparation of a comprehensive annotated bibliography and review of literature on poverty and gender dimensions of tuberculosis in countries of the WHO South-East Asia Region. In the second phase, based on the findings from the review, a protocol for rapid appraisal of gender and poverty-related barriers to accessing DOTS services for tuberculosis is to be developed, field-tested and finalized. The annotated bibliography was completed in 2001 and a review paper was produced in mid 2002.

The review examined how gender differences and poverty influenced exposure/risk/vulnerability prevalence/incidence, type (site) of infection, severity, duration and outcome recognition of symptoms and perceptions access to and use of health services and compliance with treatment quality of services received, and social and economic consequences of illness. Drawing on insights from the review into barriers to access of women and marginalized sections of the population to services for tuberculosis, and through a process of consultations and meetings with public sector health providers and researchers as well as representatives of women's groups, a protocol for rapid appraisal was developed. The protocol consisted of a series of five instruments: the patient, the care giver, the service provider, and a facility check-list. The protocol was field-tested in two locations: Urban and suburban Trivandrum in Kerala, and rural Kanchipuram in Tamil Nadu. Male and female patients from different age groups were interviewed in out-patient and in-patient facilities, and service providers in the public and private sectors were interviewed. Extensive revisions were carried out to the instruments based on the field-testing. Three volumes – an annotated bibliography, a review paper and a protocol have been produced from this project.

Small Grants Programme on Gender and Social Issues in Reproductive Health

This project is supported by the Ford Foundation. During 2002-2003, eleven proposals were selected from a total of 83 proposals submitted for research on gender and social issues in reproductive health. A team of 10 public health, reproductive health and gender experts conducted the selection. Detailed comments for revision of proposals were sent to each of the selected grantees.

A methodology workshop was held in January 2003 where the revised proposals were discussed in detail and further inputs given by the selection committee members who were now constituted into an Advisory Group to support the grantees throughout the research process. Further revisions of the proposals have been undertaken. The data collection phase of the studies will commence by July 2003.

Situational Analysis of MTP Services in Kerala: Provider Perspectives

This is part of a multi-centric study in six states of India under the aegis of the Abortion Assessment Project of India, co-ordinated by Centre for Enquiry into Health and Allied Themes (CEHAT), Mumbai. The study is an attempt to assess and analyze abortion services in Kerala from a providers' perspective, including organization, management, facilities, technology, registration, training certification and utilization in the public and private sector.

A cross sectional survey carried out in two districts of the Kerala covered 85 health institutions and 107 abortion providers. In addition several case studies were also conducted to understand the quality of services and to identify problems related to abortion services. Preliminary analysis of the data points to the need of streamlining the process of site registration, and the need to improve the quality of services in the public sector by proper referral from lower level institutions and equipping these with infrastructure and staff to deal with first trimester abortions.

Strengthening Health Research in Non-Government Organizations in India

This is a collaborative project funded by the Rockefeller Foundation, US. The project is coordinated by the Tata Institute of Social Sciences Mumbai in

collaboration with AMCHSS of SCTIMST and three other national level non-governmental organizations. During the first phase of the project, 2600 NGOs from all over India were contacted. Using a preliminary questionnaire, information was collected from 500 NGOs.

A workshop was organized for selected 157 NGOs for preparing research proposals in health research. Out of the 102 research proposals received, 57 proposals were selected using a criteria developed by the advisory committee for the project. These research proposals were fine tuned in another workshop and the investigators are in the process of data collection. Once the data collection is completed there will be further workshops to enable the NGOs for learning data entry and data analysis. The first workshop for data analysis is scheduled during the last week of June 2003.

Newly Initiated Projects

Tobacco Cessation Training and Research in India and Indonesia.

This is a collaborative project among India, Indonesia and the United States. The Fogarty International centre of the National Institutes of Health, USA is supporting the project. The collaborating institutions are University of Minnesota USA, Achutha Menon Centre for Health Science Studies of SCTIMST and Gaja Mada University, Indonesia. The overall objective of this project is to strengthen the capacity for training and research in tobacco cessation in India and Indonesia.

The specific objectives of the project are :

- (1) to develop knowledge capacity through intensive training in the state of the art research in tobacco cessation for selected researchers from India and Indonesia (Four researchers are selected from India)

- (2) foster experimental capacity through formative research focusing on topics essential for the appropriate and successful adaptation of cessation interventions shown to be efficacious in high-income countries and
- (3) expand educational system capacity through the development of a culturally – tailored tobacco curriculum.

Private Health Sector Performance (PSP) - the Role of Non-Governmental Health Care: A Study of its Scope and Potential

While public sector continues to be the major provider of services for the typical "public goods" in health, such as mass health promotion and immunization, non-government providers are the dominant source of personal health care of public health significance, including acute care for many important communicable diseases like tuberculosis, malaria, HIV/AIDS, diarrhea, and respiratory infections. Non-government providers are also often the main source of health care for the poor, despite the stated availability of free or low-cost public services. Given the size and penetration of this sector, a key policy debate around the world today is, whether and how, the government can mobilize this sector in improving the health system's performances in terms of reception and care, service quality, health outcomes, financial protection, and the equity of distribution of these outcomes.

The overall objective of this project is to strengthen health systems' performance and their outcome in terms of improved health. Another objective is to seek ways through which the non-government sector can be involved in providing health care to the public, and in particular those in most need, while ensuring financial protection of those seeking this care.

PATIENT CARE

Hospitals today have changed from its traditional philosophy of care and cure process to providing cost-effective, high tech, consumer oriented services to the people. The modern approach of management of such institutions is not only to provide excellence in clinical care but also judicious use of resources like man, material and facilities. The revolution in health care due to advances in information technology, legislations in health care sector and increasing awareness amongst the public about health care services have made hospital management all the more challenging.

During the year 2002-2003, the hospital services continued to provide patient care at a high standard of quality. The number of registrations and admissions were increased in the Department of Cardiology.

Out Patient Department being the first point of contact, development of OPD was given utmost importance during the year. A core group was constituted to target the improvement of satisfaction level of patients. As per the data collected from the patients, modifications in the OPD including scheduling of appointments, structural changes, special information counters and refreshment stalls were undertaken to achieve the desired outcome.

The management of bio-medical waste has assumed great significance with the enactment of 'Biomedical Wastes Rules 1998'. Measures were initiated for its implementation which included purchase of equipments, training of staff etc.

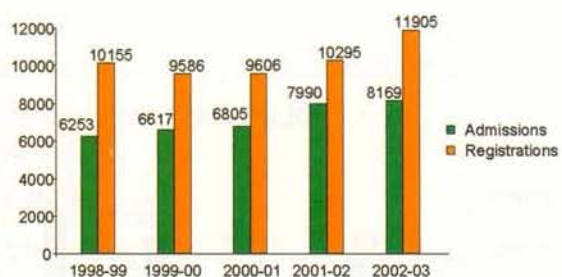
Training programmes were imparted to apprentice trainees in Medico Social Work and Dietary. Observer trainees in Physiotherapy continued to attend the section.

Medical Records

Medical Records Department added 12000 new charts to the old collection of 3.3 lakhs. During the year 2002-03 there was an increase of 10% in all activities viz. registrations, admissions, discharges, reviews, investigations and operations.

The quality of Out Patient Service improved after the Six-Sigma report was implemented. Due to shortage of place in Medical Records Department, 1,00,000 charts were screened and 32,000 old charts of patients who have not reviewed for the past 10 years were shifted to BMT wing Poojapura for preservation for next 5 years. 67,122 charts were pruned. In addition 57,045 charts were retrieved for review and 15,122 charts were issued for correspondence with patients and referring doctors and study purposes.

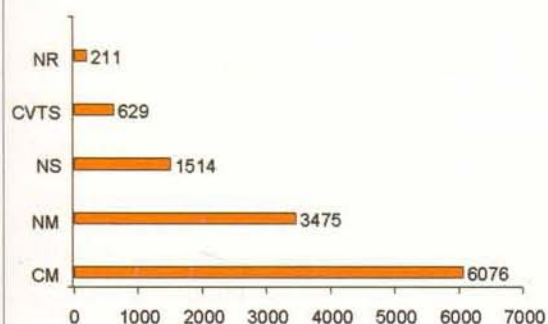
HOSPITAL STATISTICS



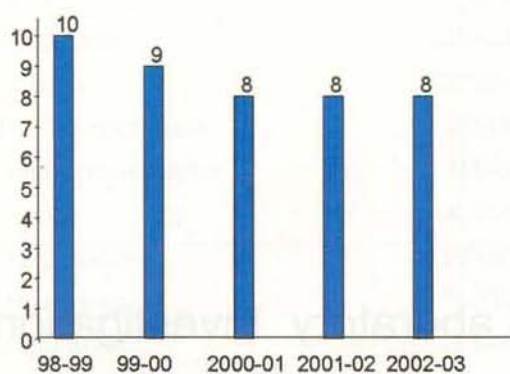
IN PATIENTS IN 2002-03



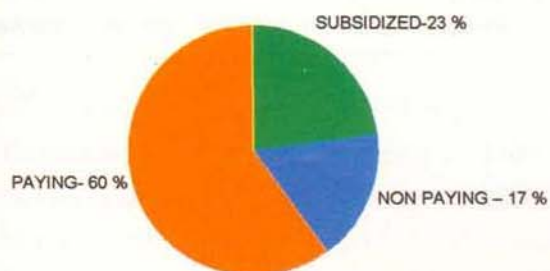
NEW REGISTRATIONS 2002- 03



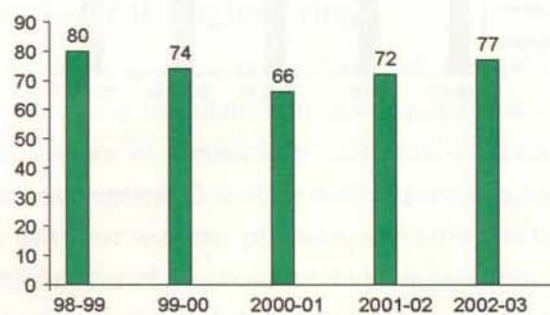
LENGTH OF STAY

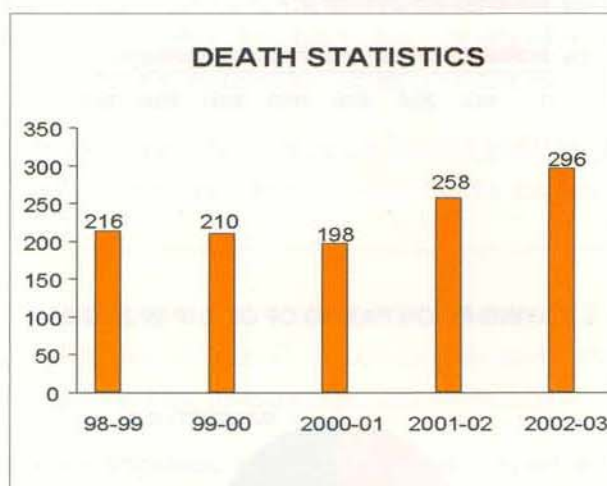
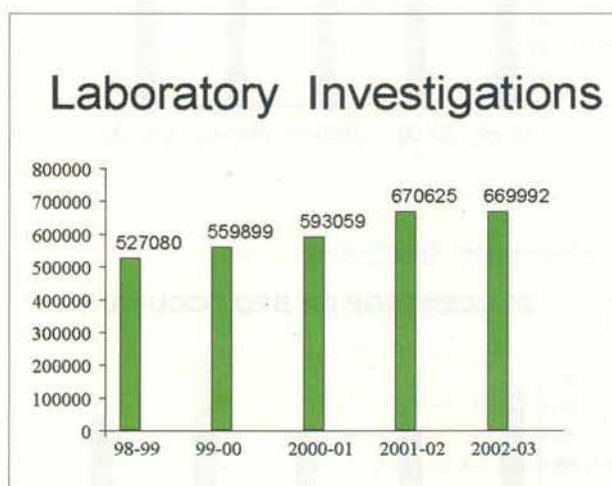
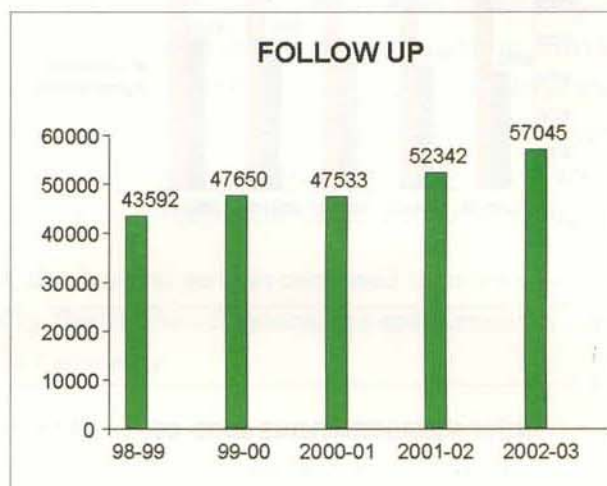
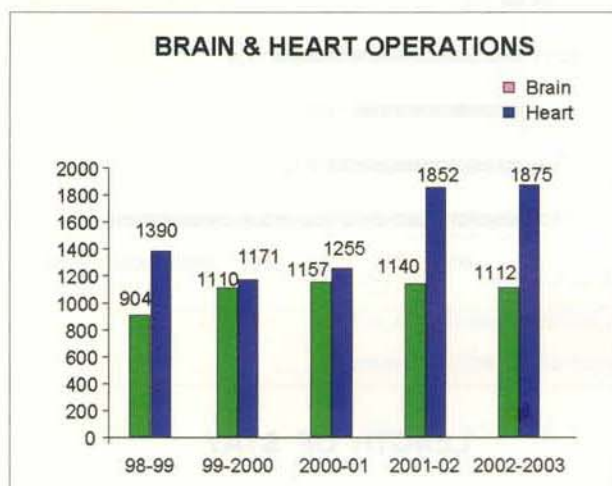


PAYING & NON PAYING OF OP & IP IN 2002-03



PERCENTAGE OF BED OCCUPANCY





IMPORTANT STATISTICS

Sanctioned Bed	236
Bed Occupancy	77
Cardiovascular and Thoracic Surgery	1875
Neurosurgery	1112
New Cases	11905
Repeat Cases	57045
Admissions	8169
Discharges	8143
Deaths	296
Non-Paying (%)	17
Paying (%)	83
Average Length of Stay (in days)	8
Bed Turnover Rate	35
Percentage of Mortality	4
Percentage of Post Operative Mortality	4
Sophisticated Investigations	36432
Laboratory Investigations	669992
X-rays	24631
Physiotherapy	47650
Electrocardiogram	19378
Echocardiogram	20875
Electromyogram	695
Pacemaker Implantation	101
Perfusion	1384

Anesthesiology

Anesthesia support was given as shown below.

Patients	Number
Cardiovascular & Thoracic surgery	2100
Neurosurgery	1070
Neurological, cardiac and radiological procedures	390

Biochemistry

Activities of the division comprised of both routine clinical laboratory services, including clinical biochemistry, clinical pathology and hematology as well as research related to clinical problems.

Clinical Laboratory Services

The Central Clinical Laboratory functioned round the clock providing investigative support in clinical chemistry, hematology and clinical pathology. The total number of procedures crossed 5.05 lakhs and details are given in the following table :

Nature of investigation	Number
Lipids	14079
Electrolytes	135421
Enzymes	22599
Liver function tests	28518
Blood urea nitrogen	21597
Glucose	32154
Blood gasses	29426
Hematology	96239
Coagulation	28846
Urine analysis	47414
CSF studies	3595
Electrophoresis	110
Miscellaneous	45197

Biomedical Engineering

As in previous years, the activities of the division included the installation of new equipments and maintenance of equipments and utilities, keeping maximum uptime. One of the most important activity for this year was the provision of infrastructure facilities for the successful implementations of recommendations of the Sigma Six study. All the engineers of Biomedical Engineering Division had

actively participated in the implementation of Sigma Six Committee recommendations. Restructuring of rooms, laboratories, OPDs, extension of electrical power lines, chilled water lines and medical gas lines, installation of air conditioning units, token display system, public address system, communication system etc were completed in record time with minimum expenditure.

Specifications of the state of the art models of MRI Units, PAC Systems, EEG Units, EMG units, Operating Theatre equipments for CVTS and Neurosurgery departments were prepared in consultation with the concerned heads of departments and submitted to the Director for tendering.

Major new installations done in the current year includes :

- One state of the art, high end, Cardio Vascular Ultrasound System for Department of Cardiology.
- One 18 Channel EEG, one 32 Channel Video EEG Recording system (both indigenous) and two numbers of neuro stimulators for Department of Neurology.
- Fifteen multi parameters modular monitors (Viridia 24C) and Eight Biphasic Defibrillators for use in various ICUs, Operation theatres and wards.
- Three numbers of ICU Ventilators and Two numbers of portable Ventilators.

Blood Transfusion Services

Round the clock service was provided for surgical as well as interventional procedures. As an outreach service programme blood support was given to a large

number of hospitals in Trivandrum District. Constant efforts were made to step up voluntary blood donations including mobile blood collection camps. Hospital Transfusion committee meetings were helpful in formulating guidelines for better transfusion practice based on current blood usage patterns. Talks conducted on behalf of hospital transfusion committee helped to create awareness among the users.

Data of blood components prepared :

RBC	4309
Plasma (FFP & SDP)	3716
Platelets (PRP, PC, AP- PLC)	625

30% of components prepared were utilized by outside hospitals.

New Initiatives during the year were :

- Platelet function studies in different types of platelet storage bags.
- Comparison of platelet yield by manual and automated methods of blood collection.
- Collaborating with Thrombosis Unit for preparation of Fibrin Glue for scale up operations.
- Collaborating with Thrombosis Unit for quality control of fresh frozen plasma intended for cryoprecipitate preparation.

Cardiology

During the year, 6076 new patients were registered in the department and 3205 patients were treated as inpatients. The non-invasive cardiac laboratory performed 20875 2D-Echo Doppler studies, 1605 treadmill exercise tests, 471 Hotter studies, 357

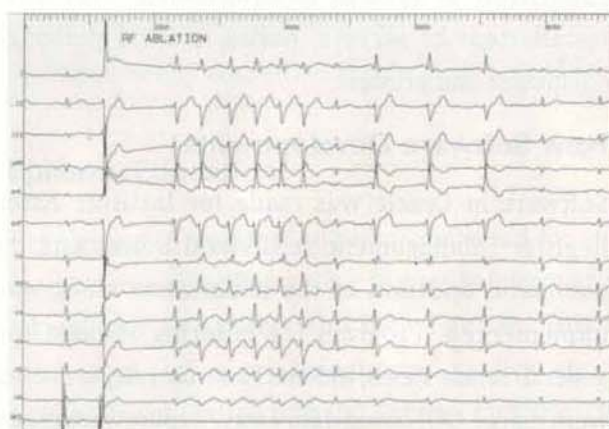
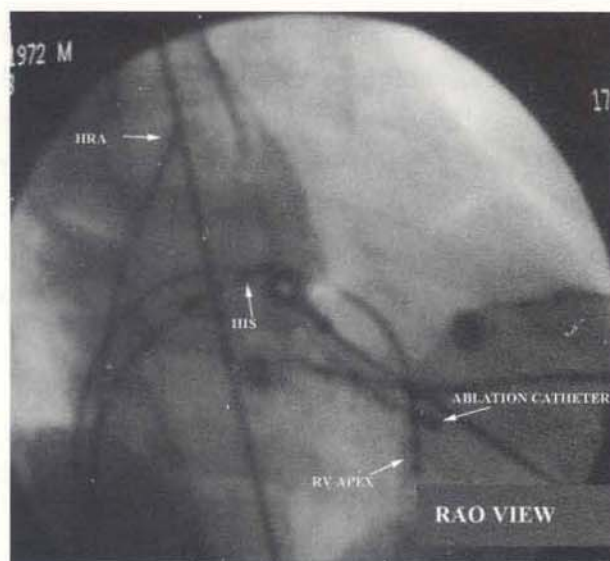
transesophageal echo studies and over 20000 electrocardiograms.

The following invasive and interventional procedure were performed in the cardiac catheterization laboratory :

INVASIVE INVESTIGATIONS AND PROCEDURES

Coronary Angiograms	1474
Cardiac Catheterization Studies	291
Cardiac Electrophysiology Studies	39
Percutaneous Transluminal Coronary Angioplasty and/or Coronary Stent Implants	295
Balloon Mitral Commissurotomy	201
Potent Ducts Arteriosis Coil Embolization	64
Atrial Septal Defect Amplatzer Device Closure	13
Potent Ducts Arteriosis Device Closure	8
Balloon Pulmanonary Valvotomy	19
Balloon Aortic Valvotomy	6
Balloon Atrial Septostomy	15
EPS + Radiofrequency	
Ablation for Tachyarlythanas	43
Pacemaker Implants	101
Miscellaneous Procedures	4

Primary angioplasty is presently being offered to all patients reporting with acute myocardial infarction. The Department of Cardiology performed the first percutaneous septal ablation of hypertrophic obstructive cardiomyopathy, which is now an accepted treatment for hypertrophic obstructive cardiomyopathy.



Cardiovascular and Thoracic Surgery

A total 1900 operations were performed in the department during the year. Of these 1400 were open heart operations and the rest were general thoracic, vascular and closed-heart procedures. The waiting period for patients was brought down considerably, presently, the waiting period for congenital cardiac case is about six months and valve replacement about an year and a half. There is no waiting period for thoracic and vascular cases.

The department acquired a state-of-the-art machine for surgical radiofrequency ablation in atrial fibrillation. This procedure will help to convert a large number of patients - undergoing valve replacement or otherwise - from atrial fibrillation to sinus rhythm, thus improving their quality of life. We are the first institution in South India and third in the country to acquire this machine.

Computer Division

Routine activities involved the software and hardware maintenance for all the user departments.

Division made remarkable progress with the expansion of system environments with new installations of servers, nodes, several personal computers and printers.

New Software Developments

Software in Oracle was made for Institute Asset Register Management at General Stores and its automatic updation of the department stock was implemented. Program for entering request for general/ration items, indents from user departments were made. GUI based data entry/ report were made for EEG, Pathology and Immunopathology. New program was implemented for OP patient scheduling.

Efforts were also made to familiarize the faculty and staff on the best utilization of the machine and software's. System expansion grouped toward more closer application with increasing LAN interlinks.

Microbiology

Routine microbiological investigations were carried out in Bacteriology, Virology and Immunology and an increasing trend in the number of laboratory

investigations was observed. Initiatives were taken for a major upgradation of the laboratory with purchases sanctioned for a thermal cycler, lyophiliser, gel electrophoresis system, trinocular microscope, Milli-Q water system and an electronic balance. Hepatitis C Virus antibody screening for patient's samples was introduced.

We played a major role in the lab diagnosis of Dengue cases during the recent winter epidemic of aseptic meningitis that occurred in this part of Kerala.

Neurology

The Department, in addition to the general outpatient and inpatient services, initiated several new activities and research projects. The ongoing programmes in subspecialties and the department in general, are outlines below :

The R. Madhavan Nayar Centre for Comprehensive Epilepsy Care

The R. Madhavan Nayar Centre for Comprehensive Epilepsy Care, the first of its kind in India has completed 5 years of its meritorious service in patient care, education and research. The new initiatives started last year, intraoperative electrocorticography, cortical stimulation and mapping, and invasive monitoring are being performed regularly. Ours is the only epilepsy program in the country undertaking these advanced neurophysiological investigations. People with epilepsy come from all over the country seeking advanced epilepsy care. In fact over one-third of our patients currently are from outside Kerala. The community-based epilepsy care and related research are progressing steadily. It is encouraging to note that several neurophysicians and surgeons from India and abroad visited the center to learn from our experience and seeking our help in developing

comprehensive epilepsy care facilities. We are very gratified from the fact one such center developed in the neighboring Sri Lanka has already undertaken a dozen epilepsy surgeries within a short period.

Epilepsy Care

Epilepsy clinic is conducted regularly at SCTIMST on Wednesday and Friday, and twice monthly at community outreach epilepsy clinics at PHC Changaramkulam and Ansar Hospital, Perumpilavu, on 1st and 3rd Sundays, respectively. Patients with refractory epilepsy undergo presurgical evaluation and if found suitable undergo surgery. They are also receiving a detailed psychosocial and occupational counseling. Intraoperative and extraoperative cortical stimulation and mapping, intraoperative electrocorticography and invasive monitoring are being done in selected cases.

Two epilepsy camps were conducted at Thodupuzha, Idukki district on July 14, 2002 and at Kasargode on February 23, 2003. A team consisting of consultants, postgraduate students, psychologists and medical social workers participated. Each of these camps were attended by nearly one hundred patients, who received, in addition to medical attention, education about the positive aspects of life with epilepsy.

PATIENTS SEEN AND PROCEDURES

Patients	Number
Epilepsy Clinic attendance	4232
Outreach Epilepsy Clinic attendance	1375
Epilepsy Ward admissions	331

Procedures	Number
Electroencephalography (EEG)	2510
Video - EEG telemetry	259
Electrocorticography	69
Invasive monitoring	17
Cortical stimulation & mapping	20
Intracarotid amobarbital (Wada) procedure)	27
Epilepsy surgeries	68
Temporal	46
Extratemporal	12
Neuropsychological evaluation	300
Counseling and relaxation therapy	138
Visual Acuity and Visual Field	1159

Epilepsy Education

Regular group sessions are being conducted for one hour before each epilepsy clinic to provide information on epilepsy to patients and their families. This is moderated by a psychologist and medical social worker. In connection with the National Epilepsy Day, on November 16th, a recitation and music competition for children with epilepsy was held and prizes were distributed. In addition a medical education program for general practitioners about management of epilepsies was conducted on 17th of November. Lectures on various aspects of epilepsy were delivered by Dr. K. Radhakrishnan, Dr. P. Joseph Cherian, Dr. P. N. Sylaja and Mrs. Aley Alaxander. A panel discussion was arranged at the end with active participation from the audience. Three issues of 'Pratheeksha', a quarterly publication of the Epilepsy Self Help Group, was brought out during this academic year. Prateeksha forms an important medium of epilepsy education,

where patients' are provided with an opportunity not only to read what others have to say, but can express their own thoughts in print.

Neuromuscular Section

PATIENTS SEEN AND PROCEDURES

No: of clinic attendance	894
VEP	148
SSEP	6
ENMG	864

Movement Disorder Section

New initiatives include :

1. Genetic study of Parkinson's disease, Parkinsonism plus syndromes and dystonias in South India.
2. EMG- guided Botox treatment for spasticity and dystonia.

PATIENTS SEEN AND PROCEDURES

Movement Disorder clinic visit	934
Botox treatment	50
Pallidotomy	17
Thalamotomy	3
DBS	4
Postoperative evaluation	109

Cognition & Behavioural Neurology Section

New Initiatives during the year :

1. Aiding the Alzheimer's & Related Disorders Society of India, Trivandrum Chapter, set up a Dementia Day-Care Centre in Trivandrum, with a program of monthly visits of the CBNC team to the day-care center on the last Thursday of every month.

2. Initiation of Carer meeting for families of patients with dementia, the first of which was organized on 9th February 2002 at the Dementia Day Care Center, Trivandrum, in collaboration with the Alzheimer's & Related Disorders Society of India, Trivandrum Chapter. Attended by 8 patients and their families it was a good success.

PATIENTS SEEN AND PROCEDURES

Clinic	Attendance
Memory & Neurobehavioural	207
Dementia and related problems	126
Non-Dementia Patients	81
New Patients with Dementia	50
Speech Therapy Visits	522
Speech Evaluations Visits	234
Audiometry Studies	160
Neuropsychological Testing	172

Stroke Section

PATIENTS SEEN AND PROCEDURES

No. of clinic attendance	974
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Neurosurgery

Though the number of major surgical procedures remained almost the same as compared to last year, they were distinctly more complicated and challenging, as neurosurgical facilities are available in most of the hospitals in the state, both government and private sectors, for performing routine neurosurgical procedures. The major areas of focus were: Neuro-vascular, angle, Skull base lesions, Cerebella pontine, Endoscopy, Epilepsy and

Movement disorder surgery and craniovertebral / spinal instrumentation. A total of 1110 cases were operated with an overall mortality figure of less than 3 %.

The faculty and the students maintained the high standards of the institute in the conferences, symposiums and seminars attended. The department organized '**IVth Annual Conference of the Skull Base Surgery Society of India**' in September 2002, which was attended by national and international faculty and various delegates from all over India. Apart from these the department has been actively involved in the Trivandrum Neuroclub and Neuro-oncology club meets every month.

NUMBER OF PATIENTS OPERATED

Lesions	Number
Vascular	157
Cerebello pontine angle	39
Sellar/ Suprasellar	73
Skull base	64
Epilepsy	85
Movement disorder	31
Stereotactic procedure	34
Endoscopy	64
Posterior fossa tumours	53
Spine	143
Craniovertebral junction	38
Supratentorial tumours	207
Others	122
Total	1110

Nursing Service

Since the total bed strength in the hospital increased to 236, additional staff nurse were appointed to cope with the increased demands.

Nursing personnel took the initiative in updating their professional knowledge by joining BSc Nursing Course under IGNOU programme, and taking various administration courses, which resulted in remarkable improvements in the standard of nursing practice and quality care. Emphasis was given to maintain high quality nursing care through continuing nursing education (CNE) programme. Ward and ICU bedside teaching were carried out.

Monthly ward sisters meetings were carried out to discuss various issues and solving problems. Staff nurses meetings were carried out once in 2-3 months to discuss their problems and solving it.

Mrs. Remani John MSc (N) Staff Nurse was given special assignment as Service Coordinator to carry out Staff Development activities. Comprehensive awareness training on biomedical waste management and safe precautions was organized for all the nurses, Unit Helpers and Cleaning Attendants working in SCTIMST and BMT wing Poojappura.

A formal orientation programme for newly appointed (both temporary and permanent staff nurses and cleaning attendants) was developed.

An update in Nursing Managerial Skill was conducted from 28.01.02 to 06.02.02. Head Nurses, Nursing Superintendent and Senior Staff Nurses from various medical colleges and District hospitals and SCTIMST attended the course aimed at improving managerial capability of nurse managers.

Pathology

During the year, the department performed histopathological analysis in 1425 surgical specimens from patients undergoing surgical treatment for Neuro and Cardiac diseases. Intra-operative tissue diagnosis (Frozen section) was offered in 385 patients. Muscle

histochemical studies were performed in 45 muscle biopsies. Immunopathological investigations were performed in 2100 cases. Apart from the service oriented diagnostic work, the department also participated in regular teaching programmes (Case demonstration, Clinico-pathological conference and seminars) for the postgraduate students in Neurology and Neuro- surgery.

Radiology

The statistics for the investigative procedures done during the year are given below :

DIAGNOSTIC PROCEDURES

Procedures	No. of Cases
Plain X-rays	24548
Magnetic Resonance Imaging	2596
Computerised Tomography	4558
Ultra Sound Scans	2442

INVASIVE DIAGNOSTIC PROCEDURES

Procedures	No. of Cases
Peripheral Angio	225
4 Vessel Angio	512
Miscellaneous	32

INTERVENTIONAL PROCEDURES

Interventional Procedures	Total (No. of cases/ Procedures done)
Cerebral arteriovenous malformations	35/74
Dural arteriovenous fistula	2/5
CCF	6/5
Aneurysm coiling	6/6
Vein of Galen malformation	2/6

Carotid stenting	5/5
Intracranial angioplasty stenting	1/1
Occlusion Test (Carotid)	1/1
Thrombolysis	9/14
Spinal AVM/AVF	7/9
Angioplasty : Aorta or Branches	3/3
Peripheral Iliac	14/19
Femoro - popliteal	6/6
Non Vascular Stents	4/4
Bronchial Artery Embolisation	14/30
Vascular stents (other than carotids)	3/3
Tumour Embolisation	18/31
Oesophageal dilatation	2/2
PTBD	3/3
Percutaneous CT Guided Bx	60/60
Laser ablation osteoid osteoma	1/1
Uterine Artery Embolisation	10/28
Catheter retrieval	2/2
WADA Test	28/56
Vertebroplasty	8/14
Gastrointestinal bleed embolization	2/2
Embolization of extracranial vascular malformations	12/22
Hemiazygos vein coiling	1/1
MAPCA embolization	3/6

INTERVENTIONAL RADIOLOGY

A total of 295 patients were treated by interventional radiology procedures.

Registrations	211
Admissions	172

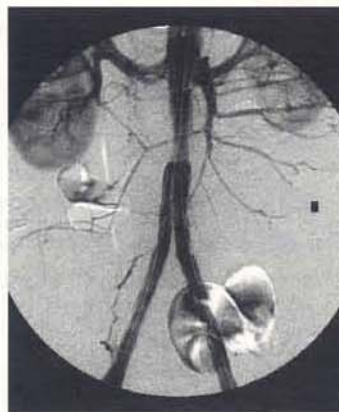
Infra Renal Abdominal Aortic ANEURYSM
Pre STENT



DSA AP & LAT Showing ANEURYSM

SSD image

Infra Renal Abdominal Aortic ANEURYSM
Post STENT



STENT in situ

The department organized the National Laser Symposium 2002 - sponsored by the Department of

Atomic Energy. A report on the symposium is given under Functions, Workshops and Conferences.

CLINICAL RESEARCH

Biochemistry

Risk factors in coronary artery disease

Investigations were focused to find out if consumption of coconut oil, a saturated fat rich in lauric acid, would result in a higher blood cholesterol levels leading to enhanced prevalence of coronary artery disease in Kerala. To realize this objective, lipid profile and life style of CAD patients (300) were compared with angiographically normal subjects (80) having no coronary lesion ("normal coronaries"). All the subjects screened had total cholesterol ranging from 110 to 480 mg%. The mean blood levels of total cholesterol and LDL -cholesterol were almost similar in CAD patients and persons with "normal coronaries". Hypercholesterolaemia was seen only in 25% of CAD patients and in 20% of subjects with "normal coronaries". Smoking (63%) seemed to be the major non-lipid risk factor associated with CAD followed by overweight (56%), hypertension (46%) and diabetes mellitus (41%). Majority of the patients were physically inactive. Total cholesterol showed positive association to smoking and hypertension. People do not just depend on a single fat source but are consuming a variety of other fatty foods in varying quantity and quality. Therefore the wide range of cholesterol levels seen in our subjects possibly is determined by the caloric intake, individual's overall metabolic activity and eventually the lifestyle characteristics. A very good percentage of the patients (28%) had confirmed coronary lesion even though their cholesterol was at a desirable level of <200 mg%. This indicates that cholesterol levels alone is not an accurate predictor of the presence of coronary lesion.

Lipoprotein (a), {Lp(a)} is currently recognized as a genetically determined lipoprotein associated with increased prevalence of atherosclerotic vascular disease. However the mechanism of Lp(a) entry across the vessel wall has not been fully established. Lp(a) closely resembles LDL and it is distinguished by the presence of an additional glycoprotein, namely apo(a). Lp (a) varies widely in concentration due to its heterogeneous nature in size. Lp(a) was quantitated in nearly 100 CAD patients and controls. Further work is in progress to determine the frequency of occurrence of common Lp(a) isoforms in our subjects and its recognition by endothelial cells.

Tissue lectin and ligands in serum and erythrocytes

It was demonstrated for the first time that human heart lectin galectin-1 can agglutinate human erythrocytes sugar-dependently regardless of blood group. Six glycoproteins on the erythrocytes membrane that were responsible for this recognition were isolated by affinity chromatography. This recognition indicated that tissue galectin-1 may be instrumental in the physiological fate of senescent or transformed erythrocytes.

Glycopeptides were isolated from human erythrocytes using pepsin digestion of the cells and molecular sieve chromatography. The glycopeptides were found to be about 400 times more inhibitory towards galectin-1 than lactose, the sugar so far used to inhibit galectin-1 mediated tumour colonization, indicating the potential of these immunologically safe glycopeptides in blocking tumour metastasis.

It was also demonstrated that desialylated IgA₁, but not any other immunoglobulin was recognized by human heart galectin-1. Since IgA₁ alone contains T antigen among immunoglobulins, this supports the hypothesis that galectin-1 may be involved in localizing tumour cells which are characterized by the presence of surface T antigen unlike normal cells. This finding also underlines the role of tissue galectin-1 in anchoring of IgA₁ immune complexes during immune inflammation.

Cardiology

A collaborative study in genomics of familial hypertrophic cardiomyopathy, is being continued, along with Madurai Kamaraj University and Max Plank University, Germany.

Cardiovascular and Thoracic Surgery

The Spictra Membrane Oxygenator has completed successful clinical trials. Now multicentric trials have started in six other hospitals in different parts of the country.

Cellular and Molecular Cardiology

The division continued to explore the molecular mechanisms of cardiac fibrosis as well as basis of cardiac injury in magnesium deficiency, and investigate the role of endocardial endothelium in the regulation of cardiac interstitium.

Neuronal control of cardiac growth : Does substance P regulate cardiac fibroblast function?

The possibility of a neural pathway of activation of cardiac fibroblasts in the context of myocardial ischemia has been a subject of investigation in this laboratory over the last few years. As a sequel to earlier studies on the modulation of cardiac fibroblast activity by substance P under normoxic conditions, investigations were initiated to delineate the response of cardiac fibroblasts to hypoxia and to ascertain if hypoxia modulates the response of these cells to substance P. Objectives of the investigation are :

- to test the hypothesis that substance P has a trophic action on cardiac fibroblasts
- to examine whether substance P exerts its action on cardiac fibroblasts by a rise in intracellular Ca²⁺ levels
- to look for age-related differences in the responsiveness of cardiac fibroblasts to substance P and
- to test the postulation that substance P may modulate fibroblast function in myocardial infarction.

Angiotensin II in the pathogenesis of myocardial lesions in magnesium deficiency

This study is a sequel to earlier work in this laboratory on cardiac fibrogenesis in an experimental model of acute magnesium deficiency. The objective is to test the hypothesis that angiotensin II drives the pathogenic cascade in acute magnesium deficiency. Specifically, the study would determine if angiotensin II enhances cardiac fibroblast proliferation and collagen deposition associated with dietary deficiency of magnesium.

Role of reactive oxygen species in hypertension and cardiac hypertrophy

Experiments are in progress to examine the role of reactive oxygen species in hypertension and ventricular hypertrophy. *In vitro* studies using cardiomyocytes exposure to superoxide generators induced hypertrophy in isolated rat cardiomyocytes. In the studies in patients, lipid peroxidation was found to be significantly high in hypertensive individuals compared to control.

The mechanical response of the papillary muscle was examined following exposure to reactive oxygen species in conjunction with marginal magnesium deficiency. The negative inotropic response to oxidative stress was augmented when associated with marginal decrease in extracellular magnesium. The biochemical mechanism mediating the functional changes is being examined.

Molecular basis of endomyocardial fibrosis

The study aims to test the hypothesis that cerium activates cardiac endothelial cells to release factors which are mitogenic to cardiac fibroblasts. Porcine ventricular endothelial cells and rat cardiac

microvascular endothelial cells were isolated and cultured using standard protocols. These cells were activated with known proinflammatory agents, tumor necrosis factor- α and bacterial lipopolysaccharide and other agents including cerium. Soluble adhesion molecules sICAM-1 and sVCAM-1 and interleukins IL-6 and IL-8 released into the medium by the cells were assayed using sandwich ELISA. Maximum release of adhesion molecules and interleukins was observed at 9 hours after activation of cells by cerium at 0.5mM concentration.

Neonatal rat cardiac fibroblasts were grown in conditioned medium from activated endothelial cells. Conditioned medium from cerium activated endothelial cells were found to induce a proliferative response in cardiac fibroblasts. Further investigations planned include the assay of cardiac fibroblast collagen synthesis and study of signal transduction pathways involved in the mitogenic response of fibroblasts.

Microbiology

A collaborative project was initiated with Peninsular Polymers Ltd. on "Antiviral principles from Indian medicinal plants & their possible use to make blood transfusion safe & as antiviral drugs. The main objective is to screen medicinal plants claimed to be effective against viral infections in Ayurveda and Tribal Medicine for possible antiviral activity. The ultimate aim is to obtain a safe and effective antiviral agent particularly against blood borne viruses for use as an antiviral agent in blood for transfusion.

This project in collaboration with Tropical Botanic Garden and Research Institute is funded by DBT and is titled "Studies on anti-viral properties of some known medicinal plants vis-à-vis phytomedicine development".

Neurology

Epilepsy research

The Phase II of the epidemiological survey on epilepsy was completed this year. This involved clinical and genetic characterization of the community based cohort of persons with epilepsy and a case control study to define the risk factors for epilepsy. This study is being funded by the Indian Epilepsy Association.

The phenotypic and genotypic characterization of juvenile myoclonic epilepsy, in collaboration with and funding from the Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, is nearing completion. This multicenter genetic research, involving over 300 patients with juvenile myoclonic epilepsy is going to provide an immense amount of valuable information about this common generalized epilepsy syndrome as seen in our country.

The other research activities in the department are :

- The utility of sphenoidal electrodes in the evaluation of patients with temporal lobe epilepsy
- Multivariate predictors of seizure outcome and actuarial approach in patient with temporal lobe epilepsy who underwent anterior temporal lobectomy
- Cost-effectiveness of epilepsy surgery versus continued medical treatment in patients with medically refractory temporal lobe epilepsy
- Occupational outcome of patients with medically refractory epilepsies and
- One-year post-operative outcome as a predictor of long-term outcome after temporal lobe epilepsy surgery.

Neuromuscular section

This department is a modal center for the WHO programme on "Surveillance of acute flaccid paralysis in children" in collaboration with the Virology Institute at Kunoor.

Movement disorder section

Research activities and collaborative programmes include :

- Clinical and genetic study of Parkinson's disease, Parkinsonism plus syndromes and dystonia in South India was initiated in collaboration with Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore.
- Clinical, quality of life and neuropsychological outcomes of deep brain stimulation for Parkinson's disease.
- Long- term outcome of pallidotomy and thalamotomy for movement disorders.
- EMG guided Botox treatment for spasticity and dystonia.

Cognition & behavioural neurology section

A genetic study on the *tau* gene mutation in frontotemporal dementia was initiated in collaboration with the Jaslok Hospital & Research Centre, Mumbai.

A new neuropsychological test battery for semantic memory and knowledge assessment was designed and field-tested. Norms on it were also derived.

A new scale 'Instrumental Activities of Daily Living Scale for the Elderly' was designed, standardized and validated.

A new project on understanding the role of the anterior temporal lobe in processing of semantic knowledge & memory in humans was initiated in

collaboration with the R. Madhavan Nayar Centre for Comprehensive Epilepsy Care.

Stroke section

Clinico-anatomical correlates of aphasia in stroke patients and effect of speech therapy on the outcome of these patients are being studied in collaboration with CNBC and radiology sections.

Clinical and angiographic characteristics of cervico cranial arterial dissection and outcome in patients with such problems are also being studied.

Neurosurgery

The following research programs were carried out in the department :

1. *Role of mucoid vasculopathy in the etiopathogenesis of cerebral aneurysms (Continuing)*
2. Corrosion casts of cerebral vessels
3. *Genetics of SAH : Role of Endoglin gene polymorphism.*

The various collaborative programs were :

1. *p 53 gene mutations in gliomas* in collaboration with Rajiv Gandhi Institute of Biotechnology, Trivandrum.
2. *STICH Trial* : Multicentric international STICH trial is (Surgical trial in intracerebral hemorrhage) jointly conducted by the Stroke Association and the Medical Research Council of United Kingdom with Prof. Mendelow from Newcastle General Hospital, England as the Principal investigator. The institute has contributed 21 patients to the total of 1033 patients recruited. The process of analysis of

the data has started and final report will come out at the end of this year.

3. *Fibrin glue*. The clinical trial in the institute was completed. Phase III (Multicentric trial) will start on obtaining approval from the Drug Controller of India.

Pathology

During the year, the department submitted the following research projects which are awaiting financial assistance.

- (a) Demonstration of *Mycobacterium tuberculosis* by an *in-situ* hybridization and immunocytochemical method in the CSF-cytospin smears for the diagnosis of tuberculous meningitis.
- (b) Molecular pathogenesis of malignant glioma.
- (c) Proliferative markers in non-functioning pituitary adenomas and
- (d) Neuropathological evaluation of temporal lobe epilepsy.

The role of cytokines in the pathogenesis and prognosis of Guillain Barre syndrome (GBS).

The department during the year completed the DBT sponsored research project - The role of cytokines in the pathogenesis and prognosis of Guillain Barre syndrome (GBS). 65% of GBS patients at the time of admission had elevated levels of circulating Cytokine-Tumor Necrosis Factor alpha (TNFa) and this may account for the inflammatory demyelination of peripheral nerves in these patients. Following plasma exchange (PE) or intravenous immunoglobulin (IVIg) therapy, there is a definite decrease in the serum TNFa concentration in these patients.

However patients treated with IVIg alone, there is a concomitant increase in the serum concentration of soluble TNF receptors, particularly TNF-RII. It is being postulated that elevated serum concentration of soluble TNF receptors may inhibit the neural demyelinating effect of TNF α and thus may play a protective role on patients with GBS. In general GBS patients treated with IVG showed better clinical response than GBS patients treated by PE.

Radiology

Detection and Treatment of Cancer using Laser based Techniques

A BRNS funded project for the 'detection and treatment of cancer using laser based techniques' was initiated. A Spex - fluorolog spectrofluorometer has been installed under this project. The main objectives of the project are :

A. early diagnosis of cancer using fluorescence spectroscopic methods - animal Experimentation part includes :

(i) Induction of chemical carcinoma in the oral cavity of Golden Syrian Hamster using 1, 12 Dimethyl benzanthrazene (ii) Auto fluorescence spectroscopic study of the induced carcinoma at various stages of transformation from normal to malignancy along with histopathological study and their comparative evaluation and (iii) Fluorescence spectroscopic study of the induced oral induced carcinoma of Golden Syrian Hamster incorporating various photosensitizing agents like porphyrins and histopathological studies.

B. Characterisation and diagnosis of atherosclerosis using spectroscopic methods- Experimental part includes:

(i) Induction of atherosclerosis in the carotid artery of pigs and (ii) Autofluorescence and Photosensitiser induced fluorescence study of the induced arterial plaque as a characterization study of the same.

C. Clinical application of the fluorescence spectroscopic methods for early diagnosis of cancer. Studies that have been conducted so far are :

1. Study of autofluorescence from the diseased and normal breast tissue to assess the feasibility of fluorescence spectroscopic study in the early diagnosis of breast cancer.
2. Early diagnosis of oral cavity diseases using light/laser induced Fluorescence spectroscopy.
3. *Invitro* assessment of colon cancer using fluorescence spectroscopy.
4. Studies on the commonly found white spot disease of 'jumbo prawn' using spectroscopic methods.
5. Characterization and differentiation of :
 - (i) benign and malignant mediastinal tumour
 - (ii) calcified mitral valve and non calcified mitral valve with regurgitation.

The department is also involved in an Indo Italian collaborative Project on 'Diffusion Weighted Imaging and other Magnetic Resonance based Imaging Modalities in Human Stroke'

MAJOR EQUIPMENTS PURCHASED DURING THE YEAR

1. Cardiovascular Ultrasound System
2. EEG (Video) Machine (Digital), 32 channel
3. Irrigated Radiofrequency Device for Surgical Maze
4. Heart Lung Machine 8000
5. Electrosurgical Unit, Diathermy (ESU)
6. Operating Microscope Moller 3-1000
7. Blair Hugger Patient Warming Unit
8. External Demand Pulx Generator with accessories (external pacemaker)
9. Biphasic Defibrillator cum Monitor
10. Cardiac Patient Monitoring System : Multichannel
11. Semicaps 2000P Passive Image Capture System
12. Nicolet Viking Select-8 Channel EMG, EP System
13. 72 channel Digital EEG, Expandable to 256 channel
14. Mobile Vascular Imaging System
15. Anaesthesia Monitor
16. Anaesthesia Gas System
17. Portable Monitor
18. Video Camera (SONY Handycam)
19. Computers - Pentium 4 @ 1.7 GHz - (Two numbers)
20. Laptop Pentium III 800 MHz
21. Temporary Pacemaker with cables (Single Chamber)
22. Hydro Extractor
23. Uninterrupted Power Supply System (UPS) 200 KVA, 15 KVA - (Two numbers)
24. Servers Xeon 1.8 GHz, PIII 1.26 GHz - (Two numbers)
25. Sluice Machine 6-10 Kg
26. Motor Vehicles - Car - Hindustan Ambassador
27. Motor Vehicle - Pick up Vehicle
28. Laser Scanner for Barcoding
29. Portable Ventilator
30. Dish/Instrument Washer
31. Machines for Activated Clotting time Estimation - (Two numbers)
32. Syringe Pump
33. Ultrasonic Surgical Aspirator
34. Donor Couch
35. Heating Bath Circulator

36. Knifemaker for Ultrathin sectioning
37. Viscometer
38. Pump Drive
39. Water Bath - Shaking
40. Calibration Bath - Bench Top
41. Thermal Cycler (Two numbers)
42. Autoclave - Vertical
43. Incubator - Microbiological
44. Differential Refractive Index Detector
45. Digital Camera
46. Stirrer Electromagnetic Multiposition
47. Balance Electronic Top Pan
48. Biphasic Defibrillator cum Monitor
49. Lyophiliser Benchtop model
50. Refrigerator
51. Multimedia LCD Projector
52. Heater Cooler -hemotherm
53. Fibre Optic Lights - (Two numbers)
54. Operation Theatre Tables - (Two numbers)
55. Fraction Collector
56. Beckman Coulter Haematology Analyser
57. Chromophare Light Combination
58. Isomet Low Speed Saw
59. Mini Protean - 3 Electrophoresis Cell with Power Pac
60. Freeze Dryers - (Two numbers)
61. Milli-Q Academic Water Purification System
62. Elix-3 Water Purification System
63. UV/VIS Spectro Photometer
64. Mycootoxin Analyser
65. ICU Ventilators- (Two numbers)
66. Mercury Porosimeter
67. Hot & Cold High Pressure Water Jet Cleaner
68. Inverted Research Microscope

ACADEMIC ACTIVITIES

Division of Academic Affairs

Student Enrolment

The student strength for DM/MCh degrees and Post Doctoral Certificate Courses during the year was 60. The Master of Public Health degree programme has 33 scholars. The Institute has, as of now, 25 scholars for the Ph.D programme, 20 scholars enrolled for the Post Basic Nursing Certificate programme and 31 scholars for the various diploma programmes.

List of candidates enrolled currently for DM/MCh/PDCC/PhD and MPH programmes.

DM (Cardiology)

Balu Vaidyanathan, MD
Bijulal S., MD
Byju C. K, MD
Edwin Francis, MD
Harikrishnan M.S., MD
Hemant Madan, MD
Mukundan C., MD
Nirmal Kumar P, MD
Rajeev E., MD
Siva Subramanian P, MD
Sreeram G., MD
Stijimon Joseph, MD
Vinod Thomas, MD

DM (Neurology)

Firosh Khan S., MD
Parameswaran K., MD
Praveen Kumar, MD
Rajesh B., MD
Rakesh H. Shah, MD
Ruchir Divatia, MD
Sajith S., MD

Somarajan A., MD
Sreekumar J., MD
Sudeeran K., MD
Syam K., MD
Tomin Mooney, MD

DM (Neuro Radiology)

Dandu Ravi Varma, MD
Hemant Sonwalkar, MD
Jayadevan E.R., MD
Sukalyan Purkayastha, MD

MCh (Cardiovascular and Thoracic Surgery)

Akbari Jayesh Kumar, MS
Gopakumar V., MS
Manoranjana Misra, MS
Milan Kundu, MS
Murali Krishna, MS
Murugu Sundara Pandiyan R., MS
Pathak Sameet Aravind, MS
Rajaneesh Duara, MS
Sai Kiran K.V.S.S., MS
Sanjay Theodore A.C., MS
Sathyaki N.P., MS

MCh (Neurosurgery)

Bhaskar S., MS
Krishnakumar K., MS
Komal Prasad, MS
Mukund Prasad, MS
Prakash N.C., MS
Purendare Harshad Rajendra, MS
Raghavan S. Iyengar, MS
Rajeshkumar J., MS
Somesh Desai, MS
Sudish Karunakaran, MBBS
Sunil Valentine, MS

Venkata Srinivasa Rao Nooti, MS

PDCC (Anaesthesiology)

Ajay B, Rao, MD
Chetana Anand M.M, MD
Dholakia Hiren Aravindbhai, MD
Gopala Krishnan, MD
Pradeep Bhaskar, MD
Ravi K.M, MD

PDCC (Radiology)

Rajesh Kannan, MD

Post DM /MCh Fellow

Easwer H.V., MCh
Krishnakumar Nair, DM
Samhita Panda, DM

Ph.D Candidates

Anilkumar P R.
Anuradha
Asha S. Mathew
Bernadette K. Madathil
Biji Balakrishnan
Bijoy Chellan
Divya P
Elizabeth K. Abraham
Godwin S.K.
Indira Adiga S.
Kaladhar
Krishnaprasad C.
Leena Kuruvila
Manju L.
Neethu Mohan
Nishi K. K.
Priyanjana Prabhakar
Renuka N.

Sailaja G. S.
Sangeetha S. R.
Sapna S.
Shiney Velayudhan
Siddarth Banerjee
Sunitha S. S.
Vijai J.

Master of Public Health students enrolled in January 2002

Asha Raghavan
Bimal Kumar Rai
Chitra Grace A.
Devashish Bhattacharyya
Kanchana T.
Karma Jigme Tobgay
Laxmaiah
Sailesh Mohan
Sonia Andrews
Thankachy Yamini Ramachandran
Thinlay Wongyal
Tseten Yamphel Bhutia
Vinai Krishna Sinha

Master of Public Health students enrolled in January 2003

Aravind P.
Arupkumar Chakrabartty
Asim Kumar Das Malakar
Aung Cho
Dave Paresh Vamanrao
Gracy A.J.
Gupteswar Singh
Iype Joseph

Kabita Khatri
Manju Renjith Darwin
Namgay Shenga
Prasanth K.S.
Raj Prabha Moktan
Ramakrishna G.S.
Raval Dinkar Kantilal
Satyajit Chakrabarti
Senthil Arasi
Shrihari J.S.

MPH Course Curriculum

The first curriculum formulated was followed for 1997 and 1998 batches, second revised curriculum was followed for 1999 and 2000 batches and the third revised curriculum was followed for 2001, 2002 & 2003 batches.

Revision of curriculum and extension of duration of studies:

The duration of the MPH programme from inception is 18 months with four terms and without any summer vacation, without any long breaks between terms, 6 day weekly schedules, a residential programme equated to more than a two year Post Graduate programme in India. However it will be more convincing to call it a two year course, if the programme spans over two academic years and the decision has been taken to implement the same from the academic session 2004 revising the curriculum again giving space for internship, vacation etc.

WHO Fellowship Programme

The Ministry of Health and Family Welfare, Govt. India nominated 8 medical officers from different states of India for the MPH course under WHO Fellowship

programme in January, 2002 and another 8 medical officers in January 2003.

Candidates awarded Ph.D Degree

Scholar's Name	Thesis Title	Guide
1. Sumi Mary George	Immunodiagnostic System for Neuro-Tuberculosis suited to Laboratories in Developing Countries.	Dr. V. V. Radha krishnan
2. Abiraman S.	Invitro and Invivo Characterizations of Bioactive Calcium Phosphate Ceramic, Glass Ceramic, and their composite with Fibrin Glue in Osteogenesis and Osseointegration for Orthopaedic Application.	Dr. Annie John

List of successful Candidates for DM/MCh

Name of Candidates	Degree	Speciality
Krishna Kumar K.	DM	Cardiology
Anand Srinivasan K.	DM	Cardiology
Sonny P. Jacob	DM	Cardiology
Krishnakumar Nair	DM	Cardiology
Girish Warriar	MCh	CVTS
Amit Mishra	MCh	CVTS
Anbarasu M.	MCh	CVTS
Baiju S. Dharan	MCh	CVTS
Anand K. T.	MCh	CVTS
Ashalatha R.	DM	Neurology
Sanjeev V. K.	DM	Neurology
Vinayan K.	DM	Neurology

Mathew Abraham	MCh	Neurosurgery
Mathu Retnam	MCh	Neurosurgery
Easwer H. V.	MCh	Neurosurgery

List of successful candidates

Post Doctoral Certificate Programme

Name of Candidates	Speciality
Mohan David	Anaesthesiology
Srikanth M. L.	Anaesthesiology
Sameer P. Mande	Anaesthesiology
Vishwas Malik	Anaesthesiology
Nikhil Desai	Anaesthesiology
Dinesh A.	Anaesthesiology
Rajendran V.	Radiology
Madhavi Latha	Vascular Surgery

List of successful candidates

Master of Public Health (MPH)

Name of Candidates
Rohina Joshi
Sandeep K.
Ajay V. S.
Pradeep Kumar V. K.
Jeemon P.
Rani K. R.
Manju Nair R.
Paul Kumaran P.

List of successful candidates for Post Basic Certificate Programme

Name of Candidates	Speciality
Benu Paulose	Cardiac Nursing
Blessy Kavithazhe	Cardiac Nursing
Jija Mary Varghese	Cardiac Nursing
Liji S. George	Cardiac Nursing
Manjusha V.	Cardiac Nursing
Minimol Joseph	Cardiac Nursing
Preeetha S. K. Nair	Cardiac Nursing
Shinu Varghese	Cardiac Nursing

Raji Kuriakose	Cardiac Nursing
Cynthya Flora Stephen	Cardiac Nursing
Deepti Abraham	Cardiac Nursing
Ambili M. B.	Neuro Nursing
Asha Aravind	Neuro Nursing
Elizabeth Cherian	Neuro Nursing
Jessin Samuel	Neuro Nursing
Mayadevi P	Neuro Nursing
Sunitha Varghese	Neuro Nursing
Maja J. Varappally	Neuro Nursing

List of successful candidates for Diploma and Certificate Programmes

Name of Candidates	Speciality
Sheeja S.	Cardiac Lab Technology
Anitha S. S.	Neuro Technology
Deepak Kumar A.	Neuro Technology
Baiju Bavura	Operation Theatre Technology
Beegum Thaslim N.	Clinical Perfusion
Sareesh Kumar C. H.	Medical Records Science
Vivek P. J.	Medical Records Science
Seena S.	Advanced Medical Imaging Technology
Shitha S.	Advanced Medical Imaging Technology
Jinu K. J.	Advanced Medical Imaging Technology

Nursing Education

The fifteenth batch of Cardiovascular and Thoracic Nursing and the eleventh batch of Neuro Nursing students successfully completed their programme in December 2002. There were 18 graduates this year adding up the total number to 212 over the past 15 years. Currently 11 students are undergoing training in CVT Nursing and 9 students in Neuro Nursing.

Nursing students from Institutions all over the country were provided clinical experience for periods varying from two weeks to one month. Fourteen postgraduate students from 3 Institutions and 222 graduate students from six Institutions utilized the clinical field of this Institute for their study purpose. Nursing students from Karolinska Institute, Sweden also visited the Institute during the current year. The details are given below.

Institute	Progra- mme	Dura- tion	No. of Students
College of Nursing Thiruvananthapuram	MSc Nursing	2 weeks 5 weeks	4 3
Annai JKK Sampoorani Ammal College of Nursing, Koramapalayam	MSc Nursing	2 months	3
College of Nursing Kozhikode	MSc Nursing	1 week	4
College of Nursing Thiruvananthapuram	BSc Nursing	2 weeks	40
College of Nursing Kozhikode	BSc Nursing	2 weeks	37
College of Nursing Kottayam	BSc Nursing	2 weeks	38
Sree Mukambika College of Nursing, Kulasekharam	BSc Nursing	1 day	48
Cooperative College of Nursing, Thalassery	BSc Nursing	2 weeks	22
Christian College of Nursing Neyyoor, Kanyakumari	BSc Nursing	2 weeks	38
Karolinka Institute, Sweden	GNM	1 day	18

Established an ongoing Continuing Education Programme for Nurses as a preparation for FCP and promotion. Conducted two DGHS aided ten days training programme.

First session of Critical Care Holistic Approach was organized from 09.01.2003 to 18.01.2003. Twentyfive staff nurses working in different hospitals in Kerala and ten staff nurses from SCTIMST have participated in the training programme, which is aimed at updating and improving the knowledge, skill and attitude of the nurses, working in critical care environment.

M.Sc Nursing Programme

Preliminary works for starting an M.Sc Nursing Programme (2 years) in Medical Surgical Nursing is over. A draft syllabus is prepared, discussed and approved by the curriculum committee. Proposals are sent to State Government, State Nursing Council and Indian Nursing Council for approval.

Library

Since its inception in 1975, Library supported the Academic and Research programmes of the Institute with its valuable resources. It is fully computerised for both house keeping and information retrieval

purpose by using latest information technologies like CD-ROM Network, Intranet and Internet etc.

During this year, Hospital wing library reached its number of book collection to 11620 and Bound Volumes to 12950. Current journals subscribed in this library is 120 in which 15 journals are Indian. BMT wing library, Poojapura developed its Book collection to 9303, Bound volumes to 5194, current journals subscribed by the library is 77.

Since our library is a member of DELNET (Developing Network), New Delhi, we are using their service for our users. Nearly 400 articles requested have processed and collected the photocopies through this service system.

Photocopying work of the library documents (Books and Journals) has given to private agency to get a faster service to the users.

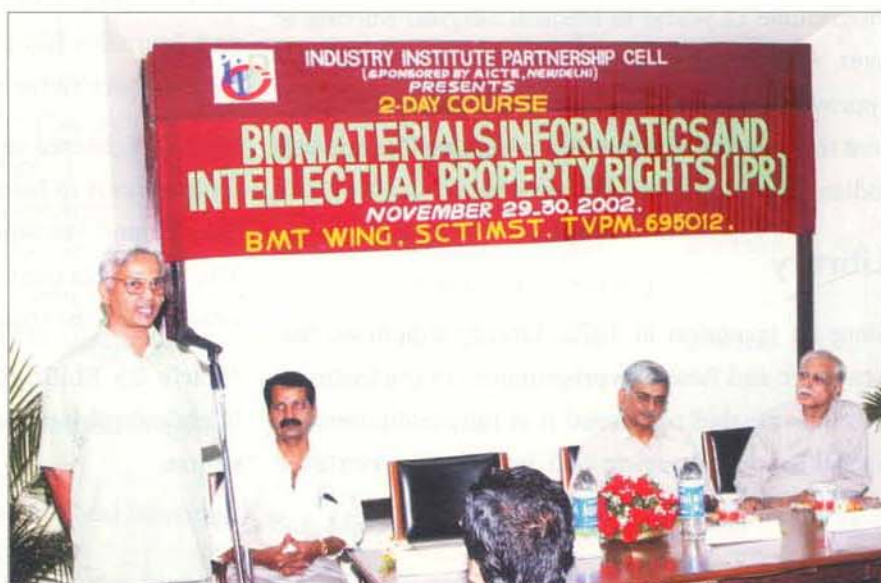
Library registered nearly 65 journals which offer free online access to Institutional Print Only subscribers. User ID and Passwords circulated among the users. This facilitates them to browse or download full text articles from the concerned websites of those journals.

Nearly 25 BLISc students from Farook College, Kozhikode visited the institute library as part of their course.

FUNCTIONS, WORKSHOPS AND CONFERENCES

The Industry Institute Partnership Cell funded by AICTE, New Delhi organized three Workshops during the year. The main objectives of these workshops were to develop awareness and relevance of quality in biomedical technology amongst the Indian Industry. Dr. C.P. Sharma was the coordinator of these workshops. The details of the workshops are given below.

- 1) **'Biomaterials & Medical Devices: Quality Awareness Programme'** was conducted during September 26-28. Bringing the Industry and Institute onto a single platform it focused on issues & challenges in developing biomedical technology. GMP, Sterilisation, Quality assurance, Ethical issues and Testing were covered. There were 12 delegates (5 from other states); all from the industry.



Prof. C.C. Kartha, Dean inaugurates the course on Biomaterials Informatics

- 2) **Workshop on Biomaterials Informatics & Intellectual Property Rights** was conducted during November 29-30. The focus was on development of biomaterials, associated testing facility, quality system, IPR, its generation, utilization and global scenario. There were 30 delegates (2 from other states); 5 from industry, 18 students and 7 faculty from University.



Prof. K. Mohandas addressing the participants at the workshop on Biomedical Implants & Tissue Engineering.

- 3) **Workshop on Biomedical Implants & Tissue Engineering** was organized during March 7-8. The meeting aimed to train participants in the development of biomedical technology by focussing on tissue engineering and medical devices. The workshop had 20 delegates (8 from other states); 7 from industry, 7 students and 6 faculty from University.

The IVth Annual Conference of Skull Base Surgery Society of India was organized by the Department of Neurosurgery in September. Eminent national and international neurosurgeons participated in this conference. On September 12, a live surgery workshop was organized in which **Prof. Kawase** from Japan and **Prof. Chandranath Sen** from USA operated and demonstrated techniques to the august gathering. On following two days, there were lectures and deliberations of personal experience of the eminent surgeons, which was enlightening to others.

The institute organized '**Med Info 2002**', a **National Workshop on "Information Systems and Knowledge Management Services for Health Care"** in collaboration with IIITM-K, Trivandrum on 7th and 8th December 2002. The aim of the programme was to provide a fair grounding of the state-of-the-art organization aspects and effective uses of current and emerging information systems and services related to different aspects of health care. The programme was attended by doctors, health care administrators and IT personnel in the health care sector. Our Director inaugurated the Workshop and Dr. Srivatsan, Director, IIITM-K presided over the Inaugural function. Dr. R.K. Sarma, Medical Superintendent, AIIMS delivered a lecture on "IT in health care-An administrator's perspective".

The National Laser Symposium

The National Laser Symposium (NLS - 2002) sponsored by the Department of Atomic Energy - Board of Research in Nuclear Sciences was jointly

organized by Centre for Advanced Technology (CAT), Indore, our Institute and the Department of Optoelectronics, University of Kerala, Thiruvananthapuram during November 14-16, 2002. A Mini Symposium on the Application of Lasers in Medicine and Biology was held on the second day of the symposium to emphasize the role of lasers in Medicine.



Dr. Anil Kakodkar, Chairman, Atomic Energy Commission inaugurates Laser Symposium 2002

The Symposium was inaugurated by Dr. Anil Kakodkar, Chairman, Atomic Energy Commission and Secretary to the Department of Atomic Energy at 09.00 am on November 14 at AMC Auditorium. Dr. K. Mohandas, Director presided over the function. Dr. B. Ekbal, Vice Chancellor of the University of Kerala released the Seminar proceedings. This was followed by a keynote address by Dr. D. D. Bhawalkar, Director, Centre for Advanced Technology, Indore.

The deliberations of the Symposium included plenary talks on the state of the art, invited talks by leading experts and contributed paper presentations by young researchers and presentations of theses of 2002 by research students. Topics covered included Laser physics and technology, applications of lasers in

industry, medicine, biology, defense, spectroscopy, material science, communication, pollution monitoring etc. Topics such as laser plasma interaction, integrated and quantum optics were also discussed during the symposium.

International Teaching Seminar on Cardiovascular Disease Epidemiology and Prevention

Achutha Menon Centre for Health Science Studies was the co-organizer for the 35th Ten Day International Teaching Seminar in Kerala on "Cardiovascular Disease Epidemiology and Prevention". Forty health professionals from 22 countries, drawn from all continents, met and discussed the growing threat of heart and blood vessel diseases. They include cardiologists, physicians, pediatricians, nutritionists, epidemiologists, social scientists and statisticians.

The Seminar was convened by the World Heart Foundation, which is the apex body for all national cardiac societies and heart foundations across the world. The seminar began on 12 September, 2002 and concluded on 23 September. This is the first time that this international teaching seminar is being held in India. Dr. K. Mohandas, Director of the Institute inaugurated the Seminar. Prof. K. Srinath Reddy, Professor of Cardiology, All India Institute of Medical Sciences was the organizing secretary. As a part of this seminar, the Centre also organized a one day CME Programme on "Coronary Prevention: From Risk Factors to Comprehensive Risk Reduction".

A Seminar on 'Enhancing Public Health Capacity of Health Systems' was held on 6 January, 2003 and the paper was presented by Dr. K. Mohandas Director of the Institute.

The **T.N. Krishnan Memorial Lecture on 'Gender and Medical Education'** was conducted at AMC on 9 January, 2003. The lecture was given by Prof. Sharon Fonn, University of Witwatersrand, South Africa.



Prof. Sharon Fonn

Dr. M.K. Rajakumar, Fellow of Academy of Science (Malaysia), and former president of Malaysian Medical Association and World Organization of Family Doctors gave a lecture on **'Ethical Issues in End of Life Care'** on 3 February, 2003.



Dr. M.K. Rajakumar

Dr. Peter Orris, Director, Occupational Health Services Institute, UIC School of Public Health, University of Illinois gave a lecture on **'Medical Waste Management'** on 21 February, 2003.



Participants in rapt attention at the workshop on 'Political Decentralisation and Status of Reproductive Health'.

A three day Workshop on **'Ethics in Biomedical Research'** was organized by AMC during February 26-28, 2003.



Prof. K. Mohandas talking to the participants at the workshop on Ethics in Biomedical Research.

A dissemination workshop on **'Political Decentralisation and status of reproductive health in Kerala'** was held at AMC on 4 March, 2003.

Another dissemination workshop on **'Situational Analysis of MTP services in Kerala'** was conducted by AMC on March 5, 2003.

Ms. Padma Prakash, Deputy Editor, Economic and Political Weekly, Mumbai conducted a **'Writing Workshop'** at AMC during June 9-13, 2002.



Dr. Padma Prakash



Dr. M. Sambasivan receiving a copy of Silver Jubilee Souvenir from Shri G. Karthikeyan, Hon'ble Minister for Culture, Govt. of Kerala



Shri G. Karthikeyan, Hon'ble Minister for Culture, Govt. of Kerala inaugurating the Institute Day Celebrations in the traditional way



Mrs. Bhavana Radhakrishnan sings a melody



Prof. K. Mohandas speaks at the inauguration of the Town Official Language Implementation Committee



Hon'ble Minister for Revenue, Shri. K. M. Mani addressing the audience after releasing the document Vision 2020, at Technology Day Celebrations



Dr. K. N. Ninan, VSSC delivering the Science Day Lecture



Research Scholars in rapt attention on Science day

EXTERNALLY FUNDED RESEARCH PROJECTS

ACHUTHA MENON CENTRE FOR HEALTH SCIENCE STUDIES

NEWLY INITIATED PROJECTS

Sl. No.	Title	Principal Investigator	Funding Agency
1	An Exploratory Study on the Gender Dimensions in Heart Diseases and its Interface with Reproductive Health among Patients in a Tertiary Cardiac Care Hospital in Trivandrum	Dr. R. Sukanya	Ford Foundation (sub project)
2	Research, Training and Advocacy for Gender Sensitization of Medical Education and Capacity Building of Health Professionals for Reduction of Maternal Mortality and Morbidity	Dr. Mala Ramanathan Dr. Amar Jesani	MacArthur Foundation
3	Independent Review of the Enhanced Malaria Control Project in India	Dr. K.R. Thankappan	Directorate of National Anti Malaria Programme Govt. of India
4	Private Health Sector Performance	Dr. D. Varatharajan	Karolinska Institute, Sweden
5	Development of Sentinel Health Monitoring Centers in India	Dr. K.R. Thankappan	ICMR, CSIR, New Delhi
6	Tobacco Cessation Research and Training in India and Indonesia	Dr. K.R. Thankappan	University of Minnesota

ONGOING PROJECTS

1	Define/redefine the Job Responsibilities of Various Categories of Employees in the Kerala Health Services	Dr. V. Mohanan Nair	Directorate of Health Service
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Sl. No.	Title	Principal Investigator	Funding Agency
2	Situational Analysis of MTP services in Kerala : Provider Perspective	Dr. Mala Ramanathan	AIIMS New Delhi
3	Community Based Detection and Monitoring of Hypertension in Kumarakom Panchayat, Kottayam	Dr. K. R. Thankappan	ICMR
4	Gender and Tuberculosis, STIs and HIV/AIDS in the WHO South East Asia Region	Dr. R. Sukanya	WHO
5	Establishment on Sentinel Surveillance Systems in Indian Industry	Dr. K.R. Thankappan	AIIMS New Delhi
6	Gender and Social issues in Reproductive Health	Dr. T.K. Sundari Ravindran	Ford Foundation
7	Political Decentralization & Status of Reproductive Health in Kerala	Dr. Mala Ramanathan	Tide Foundation
8	Strengthening of Research in Health	Dr. K.R. Thankappan	Tata Inst. of Social Science

COMPLETED PROJECTS

1	Public Health Schools Without Walls	Dr. K.R. Thankappan	Rockefeller Foundation
2	Current Status of Service Delivery in the Health and Family Welfare Sector in Kerala	Dr. K.R. Thankappan	Directorate of Health Service
3	Workshop-study tour of DHOs from Gujarat	Dr. D. Varatharajan	IIM, Ahmedabad
4	Control of CVDs and Diabetes in Kerala	Dr. K.R. Thankappan	ICHDC, New Delhi

HOSPITAL WING**NEWLY INITIATED PROJECTS**

Sl. No.	Title	Principal Investigator	Funding Agency
1	Effect of blood donation on body iron stores and relationship between body iron and ischaemic heart disease	Dr. Sathyabhama	Terumo Penpol
2	Angiotensin II in the pathogenesis of myocardial lesions in magnesium deficiency	Dr. K. ShivaKumar	ICMR New Delhi
3	Open-label, multicenter randomized trail to evaluate the development of components of polycystic ovary syndrome (PCOS) in female subjects with newly diagnosed epilepsy initializing anti-epileptic drug treatment on either lamotrigine or valporate monotherapy	Dr. K. Radhakrishnan	Quantiles Spectral
4	Antiviral principles from Indian medical plants and their possible use to make blood transfusion safe and as antiviral drugs	Ms. Molly Antony	Terumo Penpol
5	Evaluation of the sub-types of dementia in the cognitively impaired elderly subjects in urban Kerala	Dr. Mathuranath	STED Govt. of Kerala
6	Diffusion Weighted imaging and other magnetic resonance based imaging modalities in human stroke	Dr. A. K.Gupta	DST

ONGOING PROJECTS

1	Physio anthropometric study of the lower extremity of the Indian population	Dr. A K Gupta	Indian Population Project
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Sl. No.	Title	Principal Investigator	Funding Agency
2	Clinical and genetic studies of Parkinson's disease, Parkinsonian syndromes and idiopathic dystonia in India	Dr. Asha Kishore	Kerala Transport Dev. Corporaton
3	Identification and characterization of protective antigens of mycobacterium tuberculosis	Dr. Muralidhar Katti	STEC, Kerala
4	Project on improvement of voluntary blood donor base to Kerala research project scheme	Dr. Jaisy Mathai	Centre for Dev. Studies
5	Antiviral & antifungal studies of indigenous medicinal plants of Western Ghats	Dr. J. Shanmugham	STEC, Kerala
6	Investigation of serum and urinary mucopolysaccharides in patients with coronary artery and cerebrovascular disease	Dr. Sandhyamani	STEC, Kerala
7	Group interaction in psycho social care of epilepsey	Mr. Jayachandran	Indian Epilepsy Association
8	Does cerium activate endocardial endothelial cells? (Molecular basis of endomyocardial Fibrosis)	Dr. C.C. Kartha	DST, Govt. of India
9	Indian registry of epilepsy & pregnancy co-ordination	Dr. Sanjeev V. Thomas	Indian Epilepsy Association
10	Health awareness programmes	Ms. T. V. Hemalatha	SBT, Trivandrum
11	Cognition & behavioural neurology center (CBNC)	Dr. Mathuranath	SBT, Trivandrum Indian Ladies Assn. Abudhabi
12	Trial of zolmitriptan	Dr. Asha Kishore	Quintiles Spectral
13	A double blind, placebo controlled paralled group study to assess the efficacy, safety and tolerability of BTS-74398 in patients	Dr. Asha Kishore	Quintiles Spectral

Sl. No.	Title	Principal Investigator	Funding Agency
14	Detection and treatment of cancer using laser based techniques	Dr. A K Gupta	BRNS, DAE Govt. of India
15	European registry of epilepsy and pregnancy	Dr. Sanjeev V. Thomas	European Registry
16	Blood component separation unit	Dr. Jaisy Mathai	Kerala State Aids Control Society
17	Neuronal control of cardiac growth : Does substance regulate cardiac fibroblast function ?	Dr. K. Shivakumar	DST, Govt. of India
18	Estimating prevalence and types of dementia and cognitive Impairment in elderly persons	Dr. Mathuranath	Sri Ratan Tata Trust
19	Risk factor for epilepsy : A population based case control study	Dr. K. Radhakrishnan	Indian Epilepsy Association

COMPLETED PROJECTS

1	Modulation of myocarmal contraction by sub-optimal level of extra cellular image in free radical stress	Dr. R. Renuka Nair	DST, Govt. of India
2	Evaluation of cytokines in the pathogenesis and prognosis of Gulian Barre syndrome	Dr. V. V. Radhakrishnan	DBT, Govt. of India
3	Vitamin D and its relationship to coronary artery disease in a tropical population	Dr. C.C. Kartha	BRNS, DAE Govt. of India

BIOMEDICAL TECHNOLOGY WING**NEWLY INITIATED PROJECTS**

Sl. No.	Title	Principal Investigator	Funding Agency
1.	Immune mechanisms of polyurethane degradation	Dr. Mira Mohanty	Board of Life Sciences Research DRDO, New Delhi
2.	New radiopaque polyurethanes for biomedical applications	Dr. Nirmala R. James	CSIR Research Associateship
3.	Injectable adhesive biomaterials for vascular applications	Dr. A. Jayakrishnan	Indo French Centre for Promotion of Advanced Research
4.	Langmuir Blodgett film deposition onto polymer substrates : blood compatibility	Dr. C.P. Sharma	DST, Govt. of India

ONGOING PROJECTS

1.	Development of co-culture system for bioartificial liver	Dr. T.V. Kumari	STEC, Kerala
2.	Development of an artefact-free breathing monitor based on impedance pneumography	Dr. Niranjana D. Khambete	DST, Govt. of India, New Delhi
3.	Design and development of blood pump control and monitoring unit with disposable centrifugal pump head for extra-corporeal circulation	Mr. D.S. Nagesh	DST, Govt. of India, New Delhi
4.	Identification of the promoter region of human synaptotagmin I gene by 5' RACE	Dr. T. Anoopkumar	STEC, Kerala
5.	Biopolymers for medical applications	Dr. Prabha D. Nair	STEC, Kerala

Sl. No.	Title	Principal Investigator	Funding Agency
6.	Fabrication of clinically significant shapes of hydroxyapatite-ethylene vinyl acetate composites for bone substitute application by special thermoforming techniques	Dr. P Ramesh (DST-DAAD programme with Institute of Composites Materials Ltd., University of Kaiserslautern, Germany)	DST, Govt. of India
7.	Experimental evaluation of endothelialized biomaterial for vascular implants	Dr. Lissy K. Krishnan	DST, Govt. of India
8.	Non-toxic latex formulation for biomedical application	Dr. P.V. Mohanan	DST, Govt. of India

COMPLETED PROJECTS

1	Stimuli sensitive polymeric nanoparticle based advanced drug delivery systems for cancer, diabetes and antibacterials	Dr. C.P. Sharma	CSIR under New Millenium Indian Technology Leadership Initiative (NMITLI)
2	Hydroxyapatite-ethylene vinyl acetate co-polymer composites for bone substitute applications	Dr. P Ramesh	DST, Govt. of India

SCTIMST TECHNOLOGY DEVELOPMENT FUND PROJECTS**NEWLY INITIATED PROJECTS**

Sl. No.	Title	Principal Investigator	Funding Agency
1	Field kit for testing antibiotic sensitivity of mastitic milk	Dr. P. R. Umashanker	6 months
2	<i>In vivo</i> evaluation of the efficacy of anti-viper venom antibodies to neutralize the effects of venom	Dr. Lissy K. Krishnan	1 year
3	Orthopaedic casting tapes using indigenously available polyurethane raw materials	Dr. M. Jayabalan	1 year
4	Test set-up for disposable ECG electrodes	Dr. Niranjan D. Khambete	1 year
5	Recombinant transforming growth factor alpha (TGF α)	Dr. T. Anoopkumar	1 year

COMPLETED PROJECTS

1	Osteogenic potential of ceramics - an <i>in vitro</i> study	Dr. T. V. Kumari	3 years
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INDUSTRY SPONSORED PROJECTS**ONGOING**

Sl. No.	Title	Principal Investigator	Funding Agency
1	Development of haemoconcentrator	Mr. D. S. Nagesh	SIDD, Chennai
2	Development of new sizes of TTK-Chitra heart valve	Mr. C.V. Muraleedharan	TTK Healthcare Ltd.
3	Wound dressing materials	Dr. C. P. Sharma	Dynamic Techno-medicals P Ltd. Aluva
4	Industry Institute Partnership Cell	Dr. C. P. Sharma	AICTE, New Delhi
5	Fibrin glue - scale up and viral inactivation	Dr. Lissy K. Krishnan	ATMRE, Ahmedabad
6	Heparinization of intraocular lenses	Dr. K. Sreenivasan	AUROLAB, Madurai

COMPLETED PROJECTS

1	Development of a hollow fibre based membrane oxygenator	Dr. G.S. Bhuvaneshwar	SPIC Pharma Ltd. Chennai
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STUDENT PROJECTS IN BIOMEDICAL TECHNOLOGY WING

Sl. No.	Title	Name of the Student(s) and Qualification	Supervised by
1.	A distributed data acquisition system for process variables	M. Manoj, R. Ramsankar R. Ranjith and S. Venkiteswaran B.Tech in Electronics & Instrumentation, Noorul Islam College of Engg. Kumaracoil Tamil Nadu	C.V. Muraleedharan Artificial Organs Device Testing Laboratory
2.	A comparative evaluation of sealing ability of new self-setting injectable calcium phosphate cements	Dr. V. Arun Kumar. MDS, MGR Medical University	Dr. H.K. Varma & Dr. Manoj Komath Bioceramic
3.	Development and characterization of bioadhesive buccal drug delivery system for insulin based on methacrylic acid, chitosan and alginate	V.K. Hridya M.Sc. Chemistry (Polymer Science), Catholicate College, Pathanamthitta	C. P. Sharma Biosurface Technology
4.	pH Sensitive microspheres based on chitosan and alginate for it's antibiotic delivery	Jinu John MSc. Chemistry (Polymer Chemistry), St. Berchman's College, Changanassery	C. P. Sharma Biosurface Technology
5.	Development and characterization of porous bioceramic microspheres based on hydroxyapatite and its application towards protein delivery	Preeti Narayanan M.Tech (Materials Science), Barkatullah University, Bhopal	C. P. Sharma Biosurface Technology
6.	An <i>In Vitro</i> comparative study of the strength properties of six-core build up materials	Dr. T. N. Girish MDS(Conservative Dentistry & Endodontics), Dental College, Calicut	V. Kalliyana Krishnan Dental Products Lab

Sl. No.	Title	Name of the Student(s) and Qualification	Supervised by
7.	A comparative study on properties of five dental restorative composite materials	P.B. Binitha MSc (Chemistry), Mahatma Gandhi University, Kottayam	V. Kalliyana Krishnan Dental Products Lab
8	Synthesis and characterization of pyromellitic glycerol dimethacrylate and its use for a single solution bonding agent	Manoj Mathew Thomas B.Tech. (Poly Engineering), College of Engineering, Thodupuzha	V. Kalliyana Krishnan Dental Products Lab
9.	Evaluation of chitra ceramic granules as bone substitutes : transmission electron microscopical study of the bone-ceramic interface	Y. Anie M.Sc. Biochemistry, MG University, Kottayam	Dr. Annie John Implant Biology
10.	An immunohistochemical study of the distribution and morphometry of actin and desmin positive cells in the digestive system of rat	V. M. Nisha MSc in Biochemistry MG University Kottayam	T.V. Anilkumar Implant Biology
11.	A histochemical study of the healing response of skeletal muscle to implanted biomaterials Thiruvananthapuram	S. S. Swathy MSc in Biochemistry, University of Kerala,	T.V. Anilkumar Implant Biology
12.	Interaction between bioactive calcium phosphate ceramics and osteoblast cell lines: An <i>in vitro</i> study	K. Shinomol George MSc. in Biochemistry, M.G. University, Kottayam	T. V. Kumari Implant Biology
13.	Design and development of prototype controller for implantable continuous flow left ventricular assist device	J. Vijay Surya M.E. in Centre for Medical Electronics in Anna University, Chennai	Mr. D.S. Nagesh Artificial Organs Modelling and Prototyping
14.	Permeation of a few model compounds through poly aniline coated polyurethane.	Seena Thomas MSc Dissertation in M.G. University	Dr. K. Sreenivasan Lab for Polymer Analysis

Sl. No.	Title	Name of the Student(s) and Qualification	Supervised by
15.	Synthesis and evaluation of Semi-IPNs based on PVA and Poly amino Phenyl boronic acid.	S. Swapna M.Sc. Dissertation in M.G. University	Dr. K. Sreenivasan Lab for Polymer Analysis
16.	Synthesis and characterization of a radiopaque polymer	Juby Philip M.Sc. Chemistry in Catholicate College, Pathanamthitta	Dr. A. Jayakrishnan Polymer Chemistry
17.	Studies on azidation of alginic acid towards a photocrosslinkable polymer	Pushpitha Baby Thomas M.Sc. Chemistry in S. B. College, Changanassery	Dr. A. Jayakrishnan Polymer Chemistry
18.	Studies on biodegradation of crosslinked poly propylene fumarate in Ringer's solution	Maya Chandran M.Sc. in St. Berchman's College, Changanassery	Dr. M. Jayabalan Polymer Lab
19.	Studies on biodegradable carboxy terminated poly propylene fumarate oligomer	Sheeba Samuel M.Sc. in Catholicate College, Pathanamthitta	Dr. M. Jayabalan Polymer Lab
20.	PTCA Catheters : a study on the design features and material analysis	P. G. Sreelekha M.Tech. (Polymer Science & Rubber Technology) Cochin University of Science and Technology, Kochi	Dr. Roy Joseph & Dr. P. Ramesh, Polymer Processing Division
21.	Effect of processing conditions and reinforcement on the properties of ultra high molecular weight polyethylene	K. G. Linu Tresa B.Tech. (Polymer Science & Rubber Technology) Cochin University of Science and Technology, Kochi	Dr. Roy Joseph Polymer Processing Division
22.	Development of electrically conductive polymer composites for ECG electrode fabrication	P. H. Jasmin Mol M.Sc. (Polymer Chemistry) School of Chemical Sciences, MG University, Kottayam	P. Ramesh Polymer Processing Division

Sl. No.	Title	Name of the Student(s) and Qualification	Supervised by
23.	Isolation of glycoprotein IIb-IIIa from human platelets and development of their antibodies in hens	K. P. Manjusha MSc in School of Biosciences MG University, Kottayam	Dr. Lissy K. Krishnan Thrombosis Research Unit
24.	Isolation of platelet membrane glycoproteins by lectin affinity chromatography	Cynthia Varghese MSc in Biotechnology Karpagam Arts & Science College, Coimbatore	Dr. Lissy K. Krishnan Thrombosis Research Unit
25.	Isolation of platelet alpha granule proteins by heparin sepharose affinity chromatography	Benoy John Varghese M.Sc. in Muthayammal College of Arts & Science Rasipuram, Tamil Nadu	Dr. Lissy K. Krishnan Thrombosis Research Unit
26.	Purification and functional evaluation of Fab from Anti – Gp IIb/IIIa IgY	I. S. Aswathy MSc in Biochemistry University of Kerala	Dr. Lissy K. Krishnan Thrombosis Research Unit

STUDENT PROJECTS IN HOSPITAL WING

1	A study of fibroblast cell proliferation : A superoxide anion mediated response	Smitha George Dept. of Gene Technology J.J. College of Arts & Science Pudukkottai	Dr. R. Renuka Nair Cellular and Molecular Cardiology
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SCIENTIFIC PUBLICATIONS

Publications

Books

Jesani Amar, Madhiwalla Neha (Eds.). *Gender and Medical Education*, AMCHSS/SCTIMST and CEHAT Mumbai/Trivandrum 2002; 136 pages.

Thankappan KR, Mohandas K, Ijsselmuiden C, Matchaba-Hove R, Renjith M. *Public Health Schools Without Walls-A report of activities 2001-2002*. Achutha Menon Centre for Health Science Studies, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum 2002.

Publications in Journals/Books

Abiraman S, Varma HK, Kumari TV, Umashanker PR and John A. Fibrin glue as an osteoinductive protein in a mouse model. *Biomaterials* 2002; 23:3023-3031.

Abiraman S, Varma HK, Kumari TV, Umashankar PR. and Annie John. Preliminary *in vitro* and *in vivo* characterization of a sol-gel derived bioactive glass ceramic system. *Bulletin of Materials Science* 2002; 25: 419 – 429.

Ajit Kumar VK, Harikrishnan S and Tharakan JM. Post myocardial infarction ventricular septal rupture in a patient with single coronary artery. *Int J Cardiol* 2002; 83: 285-287.

Anil Bhat, Harikrishnan S, Tharakan JM, Titus T, Ajith Kumar VK, Sivasankaran S, Francis Bimal and Krishnamoorthy KM. Comparison of percutaneous transmitral commissurotomy using Inoue balloon technique and metallic commissurotomy-intermediate and short term follow up results of a randomised study. *Am Heart J* 2002; 144: 1074-1080.

Annie John, Abiraman S, Varma H K, Kumari TV and Umashankar PR. Bone growth response with porous hydroxyapatite granules in a critical sized lapine tibial-defect model. *Bulletin of Materials Science* 2002; 25: 141 – 154.

Annie John, Ikada Y and Tabata Y. Tissue engineered bone and adipose tissue – an *in vitro* study. *Trends Biomater Artif Organs* 2002; 16: 28 – 33.

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Lakshmi S, Pradeep Kumar SS and Jayakrishnan A. Bacterial adhesion onto azidated poly (vinyl chloride) surfaces. *J Biomed Mater Res* 2002; 61:26-32.

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HONOURS, AWARDS AND RECOGNITIONS

Dr. Renuka Nair R., Scientist, Division of Cellular and Molecular Cardiology was awarded by the Indian Council of Medical Research, the 'Amrut Mody-Unichem Prize for research in Cardiology.

Dr. VV. Radhakrishnan has been selected by the Medical Council of India for the prestigious Dr B.C Roy award for the year 2002.

Prof. Suresh Nair has been nominated as the Vice-president of Asian Congress of Neurological Surgeons for 2 years. He has also been elected as an executive committee member of Neurological Society of India for 2 years.

Prof. RN. Bhattacharya has been nominated as a member of National Board of Examination for the Superspeciality Neurosurgery.

Prof. RN. Bhattacharya has been elected as President, Neurological Society of India, Kerala Chapter 2003.

Dr. SK. Jawahar has successfully completed the Master's in Hospital Administration from AIIMS, New Delhi and also received the Diploma in Health Administration from the National Board of Examinations.

Dr. SK. Jawahar was nominated by University of Kerala to be a member of an expert group to advice academic activities of Master of Hospital Administration programme.

Dr. Rajneesh Kachhara has been elected as the CME coordinator for the Annual Conference of NSI, Kerala Chapter.

Dr. Rajneesh Kachhara has become a member of the editorial board of Neurology India.

Dr. Ravi Mohan Rao was conferred the Best Paper award for the paper '*Outcome of Pediatric epilepsy surgery*' in the Annual conference of Pediatric Neurosurgery 2002.

Mr. K. Vijayakumar continues his membership in Board of Studies and Faculty in Cochin University, Kerala State Council for Vocational Training, and Electro Medical Equipment Sectional Committee (MHD -19) of Bureau of Indian Standards. His service as technical expert for selection of sophisticated and costly equipments

for outside Government Institutions like Kerala State Health Services Directorate, KHRWS, Medical College Hospital Development Society, was also made available.

Dr. C.P. Sharma continued to be the Editor of Trends in Biomaterials & Artificial Organs.

Dr. C.P.Sharma became member of National Organising Committee of XIII National Conference of Society for Biomaterials and Artificial Organs during December 20-21, 2002 at Jadavpur University/ CGCRI, Jadavpur.

Dr. C. P. Sharma was in SASAT Advisory Board, Symposium on New Perspectives on Risk Factors and Management of Cardiovascular Diseases on 24th October 2002, at AMC, SCTIMST, Trivandrum.

Dr. Kalliyana Krishnan V. was nominated into the panel of eminent personalities prepared by Kerala State Science & Technology Museum and Priyadarshini Planetarium for propagating science education to students and public.

Dr. Asha Kishore was elected to the research committee of the World Federation of Neurology, on Parkinson's and related disorders.

VISITORS

ACHUTHA MENON CENTRE

A team from the University of Minnesota visited this center on 1 April, 2002.

Mr. Jacob Helpert, Journalist and Author of 'Homes of the Brave' from the USA gave a lecture on "Writing Process" on 17th April, 2002.

Dr. Chandrakant S. Pandav, Faculty Member, Centre for Community Medicine, AIIMS, New Delhi gave a lecture on "Iodine Deficiency Disorder and Human Resource Development" on 22 June, 2002.

Dr. Sunita Bandewar, Centre for Enquiry into Health and Allied Themes, Pune gave lectures on "Anthropological Perspectives of Health" from 21 – 27 October, 2002.

15 Public Health students from the Harvard School of Public Health, USA attended a one month short course at this center.

Dr. C.A.K. Yesudian, Professor/Head, Department of Health Services Studies, TISS, Mumbai visited the center and gave lectures on "Management in Public Health" from 13 – 25 May, 2002.

Dr. Vikram Patel, Senior Lecturer, Dept. Inf. & TD, London School of H&T Medicine, London visited the center and gave lectures on "Intermediate Epidemiology" from 4 – 9 August, 2002.

Dr. Asok Dayalchand, Institute of Health Management, Maharashtra gave lectures on "Management in Public Health" from 26th May to 6th June, 2002.

Prof. Richard A. Cash, Professor, Harvard School of Public Health, Boston, USA gave lectures on "Intermediate Epidemiology -infectious diseases" from 6th January to 3 March, 2003.

BMT WING

Dr. A. K. Chakraborty, Director NABL visited the BMT Wing laboratories on 1st February 2003 for assessment of the activities.

Dr. R. Suryanarayanan, Director, Laboratoire de Physico - Chimie de l'Etat Solide, Universite Paris -Sud, France visited BMT Wing from Jan 29 to Feb 8, 2003 and gave a talk on "Nano particles: physical properties and their biomedical application" on 07 Feb., 2003.

Dr. Hala Zreiqat, Department of Pathology, School of Medical Sciences, University of New South Wales, Sydney 2052, Australia visited the Division of Implant Biology on Jan. 17, 2003 and delivered a lecture on 'Altered matrix around long term prosthesis'.

Dr. Michael Gelinsky and Ms. Romy Rothe, Tissue Engineering and Biomineralization research group, The Max Bergmann Center of Biomaterials, Technical University, Dresden, Germany, visited the Transmission Electron Microscopy Laboratory for discussion towards a collaborative project on "Scaffolds for Tissue Engineering and Bone Mineralization studies". Dr. Gelinsky delivered a lecture on "Biomimetic attempts for hard tissue reconstruction".

Professor B.H. Brown, Chairman, Department of Medical Physics and Clinical Engineering, The University of Sheffield, UK, visited the Instrumentation Laboratory. During his visit a collaborative research programme on "Early Detection of Cervical Cancer using Electrical Impedance Spectroscopy" was finalized.

Professor Shyam Sunder, Professor and Head, Department of Medicine at Banaras Hindu University, Varanasi visited the Division of Polymer Chemistry, gave a presentation on "Leishmaniasis" and held discussions about possible collaboration in the development of new therapeutic strategies for Leishmaniasis, based on polymer microspheres and polymer-drug conjugates.

Dr. Elsie Damien, Dept. of Histopathology, University College, London, UK visited the Polymer Processing laboratory and delivered a lecture titled "Enhancement of osteointegration of bone replacement biomaterials".

HOSPITAL WING

Prof. Hirotoishi Sano, Fujita Health University Japan, visited the Department of Neurosurgery and spoke on aneurysm surgery on Dec. 12, 2002.

Prof. Kawase, Prof. Kanno and Prof. Kato from Japan, Prof. Chandranath Sen and Dr. Peter Costantino from USA and Prof. Grotenhuis from Netherlands visited the Department of Neurosurgery during the IVth Annual conference of skull base surgery in September 2002.

Mr. R.P. Sengupta, Consultant Neurosurgeon, New Castle General Hospital, New Castle, UK, visited the Department of Neurosurgery and delivered lectures on aneurysm surgery on Dec. 12, 2002.

Dr. D. K. Sharma, Additional Professor, Department of Hospital Administration, AIIMS visited the Hospital on 19th July 2002 and delivered a talk on 'Challenges in Indian Hospitals and the Changing Role of Hospital Administrators'.

Dr. Sunil Gupta, Associate Professor of Neurosurgery Chandigarh spent two weeks in the Department of Neurosurgery for 2 weeks for epilepsy surgery in July 2002 as an observer.

Dr. Sunil Pereira, his neurology colleagues and the team involved in epilepsy surgery in Sri Lanka visited the Department of Neurosurgery in December 2002.

Dr. Uttam Kumar, Consultant Neurosurgeon in Lourdes Hospital Cochin spent one week in the Department of Neurosurgery as an observer.

Dr. Watanabe from Nagoya University visited the Department of Neurosurgery as an observer for a period of one month during August - September.

VISITS ABROAD OF FACULTY MEMBERS

Dr. Bejoy Thomas went to Belgium for study and training in functional MR imaging under BOYSCAST Fellowship for a period of one year from March 2002 to March 2003.

Dr. Mala Ramanathan is on her sabbatical leave doing research in Harward School of Public Health, Boston, USA for one year from November 2002.

Dr. K. Mohandas, Director visited BRAC Projects, Dhaka, Bangladesh in April 2002 and held discussions about BRAC Projects with the Director, Dr. A. M. R. Chowdhury and staff at BRAC. He also visited and delivered a lecture at the Chinese Centre for Disease Control and Prevention, Beijing, China in May 2002 and delivered a lecture at the Gadjah Mada University, Yogyakarta, Indonesia in May 2002.

Dr. Prabha D. Nair rejoined the Polymer Analysis Division after completion of sabbatical leave. During the period she was Visiting Professor at the University of Washington and Georgia Institute of Technology, USA where she participated in a joint programme of Bioengineering and Tissue engineering.

Dr. K. R. Thankappan visited National Institute of Preventive and Social Medicine (NIPSOM) and Bangladesh Rural Advancement Committee (BRAC) at Dhaka Bangladesh as a part of the project 'Public health schools without walls networking' during April 28-29, 2002.

VISITS ABROAD OF STUDENTS

Ms. Shiny Velayudhan from Polymer Processing visited Institute for Composite Materials, University of Kaiserslautern, Germany, during September 7th to November 24th, 2002 as part of the on-going Indo-German (DST-DAAD) joint-research programme.

CONFERENCES, MEETINGS AND WORKSHOPS ATTENDED BY STAFF

INTERNATIONAL CONFERENCES

Name of the Conference	Venue & Date	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Non Communicable Disease Surveillance Workshop	Asian Institute of Public Health, Mahidol University, Bangkok, Thailand April 22-26, 2002	Dr. K. R. Thankappan	Temporary Advisor to World Health Organization South East Asia Region Office
Afrihealth Meeting May 16-17, 2002	Geneva, Switzerland	Dr. K. R. Thankappan	Networking of Public Health Institutions in the Asia Region
Gadja Mada University Indonesia	Indonesia May 29-30, 2002	Dr. K. R. Thankappan	Kerala Model of Development
Centres for Disease Control, China	Beijing, China May 28, 2002	Dr. K. R. Thankappan	Public Health Schools Without Walls
Consultation Meeting 'Future Challenges Facing the World Health Organization	Aruzha Tanzania Nov. 11, 2002	Dr. K. R. Thankappan	Temporary Advisor to on Capacity Strengthening on Health Research NGOs
Global Forum for Health Research -Forum 6 Meeting	Arusha Tanzania Nov. 12-15, 2002	Dr. K. R. Thankappan	Participant
Inter-country meeting of public health institutions	WHO/SEARO New Delhi Feb. 11-14, 2003	Dr. K. R. Thankappan	Emerging Trends in Public Health: Experiences in Networking and Training in Gender Issues

Name of the Conference	Venue & Date	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
International Conference on Right to Health : Implementation and Monitoring by IFHHRO	Soesterberg The Netherlands May 22-28, 2002	Dr. Amar Jesani	Participant
The International Symposium on Gender, Health and Politics in South Asia	Heidelberg, Germany July 18-19, 2002	Dr. Amar Jesani	Gender, Well being and Quality of Life
9 th International Women and Health Meeting (IWHM)	Toronto, Canada August 8 to 19, 2002	Dr. Amar Jesani	Women and Fundamentalism
Consultation/Meeting on Advancing Dialogue on Health and Human Rights	WHO, Geneva December 10, 2002	Dr. Amar Jesani	Campaign for Right to Health in India
International Conference on Monitoring Right to Health	BMA, London, UK	Dr. Amar Jesani	Participant February 14-20, 2003
PANAP Taskforce on Women in Agriculture	Penang, Malaysia Feb 7-11, 2003	Dr. R. Sukanya	Participant
Bioethics Intensive Training Programme of the University of Philippines	The Philippines	Dr. Amar Jesani	Participant March 31-April 7, 2003
Preparatory Meeting for the 9 th International Women and Health Meeting	Toronto, Canada July 22-23, 2002	Dr. Amar Jesani	Participant
Society of Biomaterials Meeting	Florida, USA April 2002	Dr. Prabha D. Nair	Porous scaffolds containing amino acids networks as matrices for tissue engineering Local delivery

Name of the Conference	Venue & Date	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
2 nd EMBS-BMES International meeting	Houston, USA October 2002	Dr. Prabha D. Nair	Porous scaffolds for tissue engineering of the heart valve
UWEB Symposium on Gels, Genes and Grafts	Hawaii, USA December 2002	Dr. Prabha D. Nair	Porous albumin scaffolds for tissue engineering.
Georgia Tech/Emory Centre for the Engineering of Living Tissue	Atlanta, USA March 2002	Dr. Prabha D. Nair	Amino acid based biomaterials for tissue engineering
NSF Site Visit Meeting at the University of Washington	USA	Dr. Prabha D. Nair	Novel porous biomaterials
4 th Asian Conference of Neurological Surgeons	Hong Kong Nov 26-30, 2002	Prof. Suresh Nair	Surgical Management of Syringohydromyelia with Chiari Malformation
4 th Asian Conference of Neurological Surgeons	Hong Kong Nov 26-30, 2002	Dr. Rajneesh Kachhara	Intramedullary Glial Neoplasms
North American Epilepsy Society Conference	Seattle, USA Dec. 6-11, 2002	Dr. M. Bhaskar Rao	Epilepsy Surgery
Invited Faculty at Universities of Kyoto and University of Nagoya	Japan Feb. 2003	Dr. Suresh Nair	'Management Philosophy and Surgical Experience of Spinal Intramedullary Glial Neoplasm
30 th French Colloquium on Magnesium' at the University Rene Descartes.	Paris Sept. 21, 2002	Dr. K Shivakumar	'Cardiac fibrogenesis in two different models of magnesium deficit in rats'.
Symposium Neuroradiologicum	Paris Aug. 18-24, 2002	Dr. A. K. Gupta	Presented 5 papers and 3 posters at the seminar

Name of the Conference	Venue & Date	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Symposium Neuroradiologicum seminar	Paris Aug. 18-24, 2002	Dr. T. R. Kapilamoorthy	Presented 5 papers and 3 posters at the
International Symposium on Ethical, Legal and Social Issues in Genomics.	WHO, New Delhi October 26, 2002	Dr. Amar Jesani	Genomics and Rights of Communities
35 th International Teaching Seminar on Cardiovascular Epidemiology and Prevention by World Heart Federation	Trivandrum Sept-2002	Dr. R. Sukanya	Fellow
International Seminar on 'Role of Private Sector in Health Care in India' by ISHA, Bangalore	Bangalore Nov. 7-9, 2002	Dr. D. Varatharajan	Bridging Rural-Urban Gap in the Provision of Health Care in India : How can Private Sector Help?
Indo-Canadian Genomics Policy Executive course	Kumarakom, India Jan 20-24, 2003	Dr. D. Varatharajan	Participant
XIV International Congress on Parkinson's Disease	Helsinki, Finland August, 2002	Dr. Asha Kishore	Presented Scientific Papers
1st Indo-Canadian Conference on Movement Disorders disease	Mumbai Feb., 2003	Dr. Asha Kishore	Two invited lectures on (i) Huntington's (ii) The Many faces of Parkinsonism
International Conference on Movement Disorders	Chennai	Dr. Asha Kishore	Invited National Faculty gave lecture on 'fessioning Surgeries in Parkinson's Disease'

NATIONAL, REGIONAL AND STATE CONFERENCES

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Annual Conference of ISACON Kerala Chapter	Kannur	Dr. P K. Neema	The Choice of Anesthesia on Outcome
Annual Conference of ISA	Coimbatore	Dr. P K. Neema	Post CABG patient for Non-Cardiac Surgery.
6th Annual Conference of IACTA	Lucknow	Dr. P K. Neema	Defective Triple Lumen Catheter - An Unusual Cause of Hypotension
6th Annual Conference of IACTA	Lucknow	Dr. S. Rupa	a) What is to be done when an Oxygenator fails? b) A Guide Wire Complication c) Use of Subarachnoid Drain to Treat Pleural Effusion
6th Annual Conference of IACTA	Lucknow	Dr. V. Shrinivas Gandhinglajkar	A novel Method to Treat Refractory Ventricular Arrhythmia after Aortic Valve Replacement.
6th Annual Conference of IACTA	Lucknow	Dr. P K. Sinha	Comparison between Lumbar and Thoracic Epidural Buprenorphine on Postoperative Pain Relief following Thoracotomy - A Double Blind, Randomized Study

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
6th Annual Conference of IACTA	Lucknow	Dr. Vishwas Mallik	TEE Guided Resection of Renal Cell Carcinoma - Extending into Inferior Vena Cava : A Case Report
6th Annual Conference of IACTA	Lucknow	Dr. Nikhil Desai	Normothermic Passive Retrograde Cerebral Perfusion for the Treatment of Air Embolism after Aortic Valve Replacement : A Case Report
50th Annual Conference of Indian Society of Anesthetists	Coimbatore	Dr. Thomas Koshy	Uncommon Associations with Atrial Septal Defect : Case Report
50th Annual Conference of Indian Society of Anesthetists	Coimbatore	Dr. S. Rupa	Conscious Sedation and Monitored Anesthesia Care for Awake Craniotomy with Intra Operative Brain Mapping / Stimulation.
50th Annual Conference of Indian Society of Anesthetist	Coimbatore	Dr. P. K. Neema	Anesthetic and Surgical Management for a Hypertensive Patent Ductus Arteriosus Closure in a Patient with Right Pulmonary Hypoplasia.
50th Annual Conference of Indian Society of Anesthetist	Coimbatore	Dr. Raghunath S. Nalgirkar	Anesthetic Management of a Case of Morbidly Obese Patient for Transpenoidal Excision of a Pituitary Adenoma. Anesthetic Management of a Case of Iliac Artery Aneurysm with Fistula

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
			into Iliac Vein leading to Cardiac Failure and Renal Dysfunction.
50th Annual Conference of Indian Society of Anesthetist	Coimbatore	Dr. S. Manikandan	Perioperative Anesthetic Management in Lennox - Gastaut Syndrome: A Case Report
Annual Conference of Neuroanesthesiologists	Kollam	Dr. Raghunath S. Nalgirkar	Cardiopulmonary by-pass : Our Experience
Annual Conference of Neuroanesthesiologists	Kollam	Dr. V. Shrinivas	Carotid Artery Injury during Transphenoidal Resection of Pituitary Tumour: Anesthesia Perspective.
77 th Annual Conference of the Indian Medical Association	Trivandrum	Dr. Thomas Koshy	Preoperative Assessment of a Patient for Anesthesia
Annual conference of ISACON Kerala Chapter	Kannur	Dr. S. Rupa	Risk assessment in cardiac patients
Annual conference of ISA	Coimbatore	Dr. S. Rupa	Perioperative low cardiac output
Inauguration of website of the Kerala state branch of ISA	Kannur	Dr. S. Rupa	Management of seizure in the ICU
Satellite Symposium on Extra cellular matrix in Health and Diseases	Trivandrum	Dr. P. S. Appukuttan	Terminal α -linked galactose and T antigen as alternative ligands for plant and galactose specific proteins

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Symposium on 'New Perspectives on Risk Factors and Management of Cardiovascular Disease	Trivandrum	Dr. P. S. Appukuttan	Contributed an article to and edited its proceedings.
Annual Conference of International Society for heart research-Indian section	Trivandrum	Dr. N. Jayakumari	'Modification of amino acid side-chains in proteins during myocardial reperfusion by coronary angioplasty.
Symposium on New Perspectives on Risk Factors and Management of Cardiovascular Disease	Trivandrum	Dr. N. Jayakumari	Participant
WHO workshop on 'Clinical Use of Blood' organized by Indian Society of Anaesthesiologists, World Federation Societies of Anaesthesiologists and SAARC Country Anaesthesiologists	Chennai	Dr. Jaisy Mathai	Participant
Symposium 'New Perspectives in Risk factors & Management of Cardiovascular Diseases' at the Kerala Chapter Meeting of South Asian Society of Atherosclerosis and Transfusion	Trivandrum	Dr. Jaisy Mathai	Participated and prepared a paper on 'Emerging Technologies in Transfusion Medicine for publication in souvenir
Preconference CME organized by 43 rd Annual conference of Indian Society of Haematology and Transfusion Medicine	Calicut	Dr. P. V. Sulochana	'Safe Transfusion Strategies to be Adopted in Indian Context'
43 rd National conference of Indian Society of Haematology and Transfusion Medicine	Calicut	Dr. Jaisy Mathai	'Swirling phenomenon - a Quality Check for Platelets,'

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Discussion Meeting to Prepare a Proposal for Blood Storage Centres for Submission to European Commission at the State AIDS Cell.	Trivandrum	Dr. Jaisy Mathai	Discussant
National Workshop on Information System and Knowledge, Management Services for Health Care organized by IIITM-Kerala	Trivandrum	Dr. Sathyabhama	Participant
Seminar on Networking of Voluntary Organizers arranged by State Bank of Travancore	Trivandrum	Dr. P. V. Sulochana	Relevance of Transfusion Transmitted Diseases in Blood safety
World Consumer Rights Day Celebrations organized by Centre of Indian Consumer Protection and Research	Trivandrum	Dr. P. V. Sulochana	Blood Transfusion and Infective Complications
World Consumer Rights Day Celebrations organized by Centre of Indian Consumer Protection and Research	Trivandrum	Mrs Usha Kandasamy	Networking for Voluntary Blood Donation
Workshop on Health Equity in India: People and systems	Hyderabad	Dr. K. R. Thankappan	Participant
National Seminar on Women's Right to Health by Women's Initiatives	Trivandrum	Dr. Amar Jesani	Chaired a panel discussion Women's Right to Health
Consultation on The Rights-Based Approach	Naukuchatal Uttaranchal	Dr. Amar Jesani	Participant
Meeting on 'Abortion in India: How Can Research Help Us Move	Goa, India	Dr. Amar Jesani	Chaired a session on the Legal Aspects.

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Selection Committee Meeting of the Fellowship for Leadership Development and Conference of MacArthur Foundation the Past and Present Fellows.	Goa	Dr. Amar Jesani	Participant
Training-of-Trainers on Ethical Issues in Biomedical Research by ICMR	New Delhi	Dr. Amar Jesani	Visiting Faculty
Workshop on Health Equity	ISB, Hyderabad	Dr. Amar Jesani	Issues in Health Equity in India
Short Course orgnized by the Sexuality and Rights Institute, New Delhi	Pune, India	Dr. Amar Jesani	Visiting Faculty : Took a session on Ethics
Training Workshop for Medical Officers on 'Role of Health Professionals in Responding to Domestic Violence	Mumbai	Dr. Amar Jesani	Visiting Faculty
Training Workshop on 'The Art and Practice of Leadership' at ISB, Hyderabad	Hyderabad	Dr. Amar Jesani	Visiting Faculty
Selection Committee Meeting for the Fellowship for Leadership Development of MacArthur Foundation	New Delhi	Dr. Amar Jesani	Participant
National Advisory Committee Meeting for the AIDS Vaccine Trials in India.	New Delhi	Dr. Amar Jesani	Participant
Meeting of the Ethics Consultation Group of the Abortion Assessment Project of India.	Mumbai	Dr. Amar Jesani	Participant

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Selection Committee for the Fellowship for Leadership Development of the MacArthur Foundation	New Delhi	Dr. Amar Jesani	Participant
National Conference on Women's sexual and Reproductive Rights: Working Group on Professional Ethics and Women's Rights by FOGSI	New Delhi	Dr. Amar Jesani	Participant
Ethics Committee Meeting for Project 'Processes and Factors Underlying Abortion Risk Behaviour : A Qualitative Investigation in Rural Tamilnadu by RUWSEC.	Chennai	Dr. R. Sukanya	Participant
ICRW Conference on Domestic Violence	Trivandrum	Dr. R. Sukanya	Participant
Seminar on 'Violence and Public Health: A Case study of Recent Violence in Gujarat'	Trivandrum	Dr. R. Sukanya	Speaker
Community Health and Environment Survey Skillshare(CHESS)	Trivandrum	Dr. R. Sukanya	Participant
Short Course on Gender, Health and Development by SAKHI, Trivandrum.	Trivandrum	Dr. R. Sukanya	Gender issues in health care services
Ford Small Grants Methodology Workshop	Kollam, Kerala	Dr. R. Sukanya	Grantee
Consultation Workshop to develop Short Course on Gender and Medical Education	Kollam, Kerala	Dr. R. Sukanya	Participant

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Consultation Workshop to Develop Short Course on 'Making Pregnancy Safer'	Kollam, Kerala	Dr. R. Sukanya	Participant
National Dissemination Workshop: 'Global agendas, Local realities: Implications of Health Sector Reforms on Women's Access to Reproductive Health Services in India'	Trivandrum	Dr. R. Sukanya	Provider Perceptions and Experiences of Reproductive Health Care in Kerala'
Medical Relief in Gujarat	Gujarat	Dr. R. Sukanya	Volunteer
National Conference on 'Economic reforms in Kerala Kerala 2003" jointly organized by Centre for Studies in Development Strategy and Department of Economics, University of Kerala	Trivandrum	Dr. D. Varatharajan	In Search of an Ideal Health Sector Reform Strategy: A Health Insurance Package for Kerala.
National Workshop on 'Global Agendas, Local Realities: Implications of Health Sector Reforms on Women's Access to Reproductive Health Services in India	New Delhi	Dr. D. Varatharajan	Decentralised Participatory Planning and People's Plan Campaign in Kerala.
Project Advisory Meeting/ Dissemination Seminar on Economic Reform and Health Sector in India, Centre for Multi-disciplinary Development Research.	Dharwad, Karnataka	Dr. D. Varatharajan	Participant
85 th Annual Conference of the Indian Economic Association	Trivandrum	Dr. D. Varatharajan	Financing Health : Lessons for Indian States from 18 Countries

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
85 th Annual Conference of the Indian Economic Association.	Trivandrum	Dr. D. Varatharajan	Human Development in Kerala: Future Prospects
Board of Studies Meeting at National Institute of Epidemiology (ICMR)	Chennai	Dr. D. Varatharajan	Participant
National Institute of Epidemiology (ICMR)	Chennai	Dr. D. Varatharajan	Taught Health Economics Module to MAE students
Workshop on Health Research to Policy by Alliance for Health Policy and Systems Research, WHO and Ministry of Health and Family Welfare, Govt. of India	Hyderabad,	Dr. D. Varatharajan	Participant
Workshop on National Health Accounts Organized by the Ministry of Health and Family Welfare, Govt. of India.	New Delhi	Dr. D. Varatharajan	Participant
Department of Demography University of Kerala	Trivandrum	Dr. D. Varatharajan	Human Development Debate
Department of Economics University of Kerala	Trivandrum	Dr. D. Varatharajan	Efficiency Issues in Kerala's Public Hospitals
All India Radio	Trivandrum	Dr. V. Mohanan Nair	Talk on 'Overweight and its health consequences'
Workshop on Workforce Management Issues in Health Care Delivery	Palakkad	Dr. V. Mohanan Nair	Participant

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Workshop on 'Ethics in Biomedical Research' organized by the ICMR	Delhi	Dr. V. Mohanan Nair	Participant
Workshop for developing SOPs for Institute Ethics Committees organized by the ICMR and Forum for Ethics Review Committees in Asia and Pacific (FERCAP)	Agra	Dr. V. Mohanan Nair	Participant
Seminar on World Diabetes Day organized by IMA	Trivandrum	Dr. V. Mohanan Nair	Diabetes : a Public Health Problem
1 st National Conference of Problem Solvers in Health	Trivandrum	Dr. V. Mohanan Nair	Participant
State Planning Board Brainstorming Session on 'Functioning of Local self governments'	Trivandrum	Dr. V. Mohanan Nair	Participant
Strategy Planning Workshop for 'Developing a Tribal Health Interventions' organized by the Government of Kerala	Trivandrum	Dr. V. Mohanan Nair	Participant
Meeting on 'Health Sector Reforms in Kerala' under the Health Vision Kerala – 2025 organized by the Director of Health Services	Trivandrum	Dr. V. Mohanan Nair	Participant
Task Force Meeting on 'Reproductive and Child Health Programme –2' Document Preparation and Modification of Urban RCH	Trivandrum	Dr. V. Mohanan Nair	Participant

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Subprojects for Trivandrum and Cochin Corporations organized by the Secretary to Govt., Health and Family Welfare Department			
ASA, Athiyanoor	Trivandrum	Dr. V. Mohanan Nair	Community Sensitization Campaign Against Remerging Infections
The Genomic Policy Executive Course organized jointly by the ICMR and University of Toronto Joint Centre for Bioethics, Canada	Kumarakom	Dr. V. Mohanan Nair	Participant
Medical Officers' Workshop	Ernakulam	Dr. V. Mohanan Nair	Resource Person
Panel discussion in the CHIRCON.GP, South Zone Conference of IMACGP	Chirayinkil	Dr. V. Mohanan Nair	Panelist
'Good Governance: Administrative Reforms Seminar' organized by the Director of Health Services	Trivandrum	Dr. V. Mohanan Nair	Resource Person
Workshop on Ethics in Biomedical Research in Achutha Menon Centre for Health Science Studies (ICMR sponsored)	Trivandrum	Dr. V. Mohanan Nair	Organizer
Dissemination seminar on National Family Health Survey-2 : Kerala findings	Trivandrum	Dr. V. Mohanan Nair	Expert Panel in the Technical Session of Fertility, Family Planning and Quality of care
Athiyanoor Sree Chitra Action (ASA) by Chief Secretary, Govt. of Kerala	Trivandrum	Dr. V. Mohanan Nair	Panelist to Discuss the Community Health and Development Initiative

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
National Dialogue on Mind, Body, Medicine' organized by Indian Society of Hospital Administrators	Mount Abu Rajasthan	Dr. P. Velayudhan Pillai	Participant
HOSPITRENDS, the International Conference on Trends in Health Care Facilities organized by Academy of Hospital Administration	Goa	Dr. S. K. Jawahar	Scope of Health Tourism in India
Seminar on 'Telemedicine' as a part of World Space Week Celebrations at VSSC	Trivandrum	Dr. S. K. Jawahar	Participant
Workshop on Infection Control at College of Nursing	Trivandrum	Dr. S. K. Jawahar	'Hospital Waste Management
National Seminar on Epidemiology of Diabetes Cardiovascular Diseases in India at the Madras Diabetes Research Foundation	Chennai	Dr. K. R. Thankappan	Trends in Cardiovascular Disease in India
Annual Spine Conference	Kanyakumari	Dr. Ravimohan Rao Dr. Dilip Panikar and Prof. Suresh Nair	Posterior interlaminar clamp fixation for mobile AAD's
Mid term NSI Conference	New Delhi	Prof. Suresh Nair	'Surgical management of syringomyelia associated with Chiari malformation' in the symposia on CV junction anomalies'
Mid term NSI Conference	New Delhi	Dr. Rajneesh Kachhara	'DACA aneurysms'

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
'3 rd international clinics of Neurological surgery' at GB PANT Hospital	New Delhi	Prof. R. N. Bhattacharya	'Anterior and posterior inferior cerebellar artery aneurysms' &
		Prof. N. Suresh Nair	'Neuroophthalmic manifestation of aneurysms and subarachnoid hemorrhage' respectively.
Annual conference of Pediatric Neurosurgery	Bangalore	Dr. B.R.M. Rao	'Pediatric epilepsy surgery' and was conferred the Best paper award.
1st Board Meeting of National Board of Superspeciality Neurosurgery at AIIMS	New Delhi	Prof. R.N. Bhattacharya	As a board member to formulate syllabus and other policy matters regarding DNB Neurosurgery training program.
51 st Annual Conference of Neurological Society of India	Cochin	Prof. R.N. Bhattacharya	Contemporary management of cerebral AVM's
51 st Annual Conference of Neurological Society of India	Cochin	Dr. Suresh Nair	Controversies in the pathogenesis and management of hind brain anomaly related syringohydromyelia.
51 st Annual Conference of Neurological Society of India	Cochin	Dr. M. Bhaskara Rao	Recent advances in epilepsy surgery
2 nd annual conference of Cerebro-vascular Society of India	Vaikom, Kerala	Prof. R. N. Bhattacharya	Proximal carotid aneurysms

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
2 nd annual conference of Cerebro-vascular Society of India	Vaikom, Kerala	Prof. Suresh Nair	'Neuro-ophthalmic manifestations of aneurysms and subarachnoid haemorrhage'
2 days conference organized on the occasion of 'Silver Jubilee of VHS'	Chennai	Prof. R. N. Bhattacharya	Chaired a session
2 days conference organized on the occasion of 'Silver Jubilee of VHS'	Chennai	Prof. Suresh Nair	'Current perspectives in hearing preservation in acoustic neurinoma surgery'.
Annual Conference of NSI, Kerala Chapter	Kottayam	Prof. R. N. Bhattacharya	President of the conference
		Dr. Suresh Nair	Coordinator of the CME.
3 rd Indo-Japan Neurosurgery Workshop and Symposium	Mumbai	Prof. R. N. Bhattacharya	Faculty
		Prof. Suresh Nair	Faculty
		Dr. B. J. Rajesh	Participant
Annual conference of Neurological Society of India	Cochin	Dr. V. V. Radhakrishnan	Chaired a scientific session on 'Neuro-oncology'
Annual conference of Indian Academy of Neurology	Lucknow	Dr. V. V. Radhakrishnan	Chaired a scientific session on 'Neuromuscular diseases'
Mid-Neurocon meeting of Neurological society of India	New Delhi	Dr. V. V. Radhakrishnan	Chaired a scientific session on 'Infectious diseases of Central Nervous System'
23rd Annual conference of the society of Indian Neuro Science Nurses	Cochin	Mrs. P. P. Saramma	Coordinated the Scientific Program and presented a paper entitled 'Infections of the Central Nervous System – Nurses' role in diagnostic investigations'.

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Annual conference of International Society for Heart Research - Indian Section	Chandigarh	Prof. C. C. Kartha	'Pathogenesis of aortic aneurysms:current concepts'.
National CME in Cardiac Pathology organized by Jayadeva Institute of Cardiology	Bangalore	Prof. C. C. Kartha	Faculty
Annual meeting of the Cardiological Society of India	Kochi	Prof. C. C. Kartha	Chairman for the clinico-pathological conference.
5 th Annual Conference of ISVIR & ISNR	Hyderabad	Dr. A.K. Gupta	Interventional Neuroradiology in Difficult Lesion
5 th Annual Conference of ISVIR & ISNR	Hyderabad	Dr. T. R. Kapilamoorthy	Results of PTA & Stenting in Infrarenal Occlusion of Abdominal Aorta and its Bifurcation
5 th Annual Conference of ISVIR & ISNR	Hyderabad	Dr. C. Kesavadas	MR imaging in mesial temporal sclerosis and focal cortical dysplasia Chordoid Meningioma - a rare meningioma variant
5 th Annual Conference of ISVIR & ISNR	Hyderabad	Dr. Bejoy Thomas	Renal Artery Angioplasty and Stenting
5 th Annual Conference of ISVIR & ISNR	Hyderabad	Dr. Ravi Varma	Balloon Assistance in interventional Neuroradiology
5 th Annual Conference of ISVIR & ISNR	Hyderabad	Dr. Sukalyan Purkayastha	Arteriovenous Fistulae of the neck Venous approach in intracranial intervention

Name of the Conference	Venue & Date	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
5 th Annual Conference of ISVIR & ISNR	Hyderabad	Dr. Narendra K. Bodhey	Embolisation of Uterine Artery in Per Vaginal Bleeding after Hysterectomy and Caesarian Section
Annual Conference of Neurological Society of India	Kochi	Dr. A. K. Gupta Dr. T. R. Kapilamoorthy Dr. C. Kesavadas Dr. Krishnamoorthy	Participants
National Laser Symposium	Trivandrum	Dr. A. K. Gupta Dr. R. S. Jayasree	Participants
Annual Conference of IRIA	Trivandrum	Dr. A.K. Gupta Dr. T. R. Kapilamoorthy Dr. C. Kesavadas Dr. Bejoy Thomas Mrs. Sheriffa Beevi Mrs. Rajeswari Amma	Participants
Second Annual Meet of Indian Society of Cerebrovascular Surgery at Indo American Hospital, Brain & Spine Centre	Vaikom, Kerala	Dr. A. K. Gupta	Status of Interventional Neuroradiology in India for Aneurysmal lesions
Neurointerventional Meet at Indraprastha Appollo Hospitals	New Delhi	Dr. A. K. Gupta	Complications in Neurointerventions
Annual conference of Indian College of Interventional Cardiology	Feb. 8-10 2003	Dr. A. K. Gupta	Subclavian artery PTA and stenting long-term result
CME programme by DGHS for Nurses	Jan 2002	Dr. T.R.Kapilamoorthy	Vertebroplasty in back pain
CME Programme at Medical College	Kottayam	Dr. T. R. Kapilamoorthy	Recent Advances in MRI

Name of the Conference	Venue & Date	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
South Zone CME & Workshop, by Indian Society of Vascular & Interventional Radiology	Calicut	Dr. T. R. Kapilamoorthy	Comprehensive Backache Care - Vertebroplasty and Kyphoplasty
Annual conference of Indian College of Interventional Cardiology	Cochin	Dr. T. R. Kapilamoorthy	Intervention in Aortoiliac Occlusion
Annual Conference IRIA (Kerala Chapter)	Cochin	Dr. Bejoy Thomas	Percutaneous Vertebroplasty
Annual Conference IRIA (Kerala Chapter)	Cochin	Dr. Krishnamoorthy	Imaging in CV Junction Anomalies
Workshop on Interventional Radiology at Gauhati Neurological Institute	Gauhati	Dr. A. K. Gupta	Faculty
Workshop on Interventional Radiology at Nizam's Institute of Medical Sciences	Hyderabad	Dr. A. K. Gupta	Faculty
Workshop on Interventional Radiology at Army Hospital (Research & Referral)	New Delhi	Dr. A. K. Gupta	Faculty
Indian Institute of Quality Management	Jaipur	Dr. G.S. Bhuvaneshwar	NABL Assessor Training Course
National GLP workshop	Chennai	Dr. G.S. Bhuvaneshwar	Participant
National Seminar on Ecofriendly Biodegradable Polymers	Cuttack	Dr. Jayabalan	Developments in Biodegradable Synthetic And Microbial Plastics
Micro Symposium on 'Biodegradable Polymers'	Chennai	Dr. Jayabalan	Developments in Ecofriendly Biodegradable Synthetic And Microbial Plastics

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
International Seminar on Frontiers of Polymer Science & Engineering (MACRO -2002) and 7 th National Conference of the Society for Polymer Science, India	Kharagpur	Dr. Jayabalan	Poly (Propylene Fumarate) Polymer As Biodegradable Material For Tissue Engineering
14 th AGM-MRSI held at BARC	Mumbai	Dr. Jayabalan	Development of High Flex Life Polyurethane for Cardiac Devices
Annual Meeting of the Indian Academy of Sciences	Chandigarh	Dr. A. Jayakrishnan	Participant
Annual Meeting of the Society for Biomaterials and Artificial Organs-India	Kolkata	Dr. A. Jayakrishnan	Polymeric Microspheres in Medicine and Surgery
Training course on 'Laboratory Quality System Management & Internal Audit' by NABL	Mysore	Dr. Maya Nandkumar	Participant
Biomaterials Science for the M.Tech.. Programme in the School of Medical Science and Technology	IIT Kharagpur	Dr. Mira Mohanty	Guest Professor
1 st Training programme on GLP Inspector's by the National GLP Compliance Monitoring Authority under Dept. of Science & Technology	Jaipur	Dr. P. V. Mohan	Participant
2 nd PSG Technology Symposium on Bio Sciences : 'Biotechnology in Healthcare' by the PSG College of Technology	Coimbaore	Dr. T.V. Kumari Mr. P. R. Anilkumar	Lecture on Tissue Engineering'

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
National Conference on Biomedical Materials.	Jadavpur, Bihar	Dr. Lissy K. Krishnan	Participant
Conference on Study of the Effect of drug coated stent for inhibition of cell proliferation using endothelial cells.			
Biological Significance of Proteolysis of alpha-granule proteins released from activated platelets. Winter Symposium on Cell Biology, Wellcome Research Centre	CMC, Vellore	Dr. Lissy K. Krishnan	Participant
Shear Stress Resistance of endothelial cells grown on Fibrin coated vascular conduits. Winter Symposium on Cell Biology, Wellcome Research Centre.	CMC, Vellore	Dr. Lissy K. Krishnan	Participant
National Conference of Society for Biomaterials & Artificial Organs, CGCRI	Kolkota	Mr. C.V. Muraleedharan	Heart valve design, testing and manufacture
National Conference on Biomedical Materials - 2002 at IIT, Khangpur, IIT Chennai and Meenakshi Dental College, Chennai	Kharagpur Chennai	Mr. D.S. Nagesh	Development of Oxygenators for clinical use
Inauguration of the Chennai Chapter of SBAOI as chief guest at IIT Chennai	Chennai	Dr. C.P. Sharma	Biomaterials and Medical Devices: Need of the Hour

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
Programme Advisory Committee meeting by DST on Water Management, Biodegradable/Biomedical Polymers Feb. 5, 2003	Kharagpur	Dr. C.P. Sharma	Participant
Symposium on Novel Polymeric Materials at the 14 th AGM of MRSI, Mumbai Chapter at BARC	Mumbai	Mr. Willi Paul	Stimuli sensitive tricalcium phosphate-insulin micromatrix as an antidiabetic pill
Seminars on 'The state of Animals Houses in India' by Govt: of India, Ministry of statistics and Programme implementation.	New Delhi	Dr. A.C.Fernandez	Participant
Seminar on Modern Trends in Biotechnology by Post Graduate Dept. of Zoology and Research Centre, Mahatma Gandhi College	Trivandrum	Dr. Annie John	'Biomaterials and Tissue Engineering'
Refresher Course organized by UGC-Academic Staff College, University of Kerala	Trivandrum	Dr. Annie John	Biomaterials - "Biological the evaluation of hydroxyapatite and bioactive glass system granules for hard tissue application" Tissue Engineering - "Engineering Options for Specialized Tissues"
Satellite Symposium on Extracellular Matrix in Health and Disease, organised by the Department of Biochemistry, University of Kerala	Trivandrum	Dr. Mira Mohanty	Participant

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
National Seminar on Science and Technology of Advanced Engineering Materials (SATAEM-2003)	Trivandrum	Mr. C.V. Muraleedharan	'Recent Developments in Biomaterials and Artificial Organs
Dept. of Polymer Science and Rubber Technology, Cochin University of Science and Technology	Kochi	Dr. P. Ramesh	Biomedical Applications of Polymers
IPR seminar organized by the Institution of Engineers- Kerala Chapter	Trivandrum	Mr. D. Ranjit	Participant
International Multi-disciplinary IPR seminar organised by Kerala University, Dept. of Law	Trivandrum	Mr. D. Ranjit	Participant
'Fusion-2003', an all India level Technical Exhibition, organized by Mahatma Gandhi University College of Engineering	Thodupuzha	Dr. Roy Joseph	'Biomaterial Concepts'
Symposium on New Perspectives, Risk Factors and Management of Cardiovascular Diseases, organized by SASAT	Trivandrum	Dr. C.P. Sharma	Chaired a session
National Seminar Science and Technology of Advanced Engineering Materials (STAEM 2003)	Trivandrum	Mr. S. Suresh Babu Mr. H. K. Varma	A Rapid Synthesis Method for Carbonate Apatite Bioceramic Material'
Midterm Conference of Neurological Society of India	New Delhi	Dr. Asha Kishore	Invited faculty. Spoke on 'Deep Brain Stimulation'
Annual Conference of Indian Psychiatry Society	Kochi	Dr. Asha Kishore	Invited faculty. Gave lecture on 'Movement Disorders in Psychiatry

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
51st Annual Conference of Neurological Society of India	Kochi	Dr. Asha Kishore	Presented Scientific Papers and chaired a session
Workshop on 'EMG guided Botox treatment in Spasticity	Bangalore	Dr. Asha Kishore	Participant

CONFERENCE ATTENDED BY STUDENTS

15 th Annual Kerala Science Congress	Trivandrum	Ms. Manju L.	'Marginal magnesium deficiency augments negative inotropic responses to cerium in rat papillary muscle.'
MACRO 2002, 7 th National Conference of the society for Polymer Science, India and International Seminar on Frontiers of Polymer Science and Engineering	Kharagpur	Ms. G. S. Sailaja	'Porous hydroxyl apatite Microspheres prepared Using natural latex as Binder'
90 th Session Indian Science Congress hydroxyapatite	Bangalore	Ms. G. S. Sailaja	'Natural rubber latex as binder for the processing of implant materials'
MACRO 2002 IIT Kharagpur	Kharagpur	Mr. K.Kaladhar	'Insulin drug delivery by sublingual route'
Satellite Symposium on Extracellular Matrix in Health and Disease, by Dept. of Biochemistry, University of Kerala	Trivandrum	Ms. Asha S. Mathew Ms. Bernadette K.Madathil Mr. P. R. Anilkumar	Participants
International Conference on Wound Healing 'WoundCon 2003' organized by the Indian Society of Wound Management	Chennai	Ms. Biji Balakrishnan	Participant

Name of the Conference	Venue	Name of the Speaker/ Participant	Title of the Paper/ Participant's status
International Inter-disciplinary Seminar on 'Intellectual Property Rights-Global and National Perspectives" organized jointly by the Department of Law, University of Kerala and South Asian Legal Consortium	Trivandrum	Dr. Nirmala R. James	Participant
National Conference on Biomedical Materials	Jadavpur University	Mr. C.Krishna Prasad	Study of the Effect of drug coated stent for inhibition of cell proliferation using endothelial cells.
Winter Symposium on Cell Biology, Wellcome Research Centre	CMC, Vellore	Ms. P. R. Sreerekha	Shear Stress Resistance of endothelial cells grown on Fibrin coated vascular conduits
23rd Annual Conference the Society of Indian Neuroscience Nurses	Kochi	Neuro Nursing students	Presented Papers, Posters and participated in Neuro Quiz

STANDING COMMITTEES

Academic Committee

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2. Dr. G. S. Bhuvaneshwar
Head, BMT Wing, SCTIMST
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3. Prof. B. Ekbal, Vice Chancellor
University of Kerala, Thiruvananthapuram
4. Prof. C. C. Kartha, Dean (Academic Affairs)
SCTIMST, Thiruvananthapuram
5. Dr. S. K. Mahajan
Ex-Head, Agriculture & Molecular Biology
Division, BARC, Mumbai - 400 085
6. Prof. J. M. Tharakan
SCTIMST, Thiruvananthapuram
7. Dr. A. Jayakrishnan
BMT Wing, SCTIMST, Poojappura
Thiruvananthapuram
8. Prof. Jayaprakash Muleyil
Christian Medical College, Vellore
3. Secretary to the Government of Kerala
Health & Family Welfare
Thiruvananthapuram
4. The Civil/Construction Engineer
ISRO, Vikram Sarabhai Space Centre
Thiruvananthapuram
5. Sri. P. Vijayakrishnan (Ex-Officio Convenor)
Financial Advisor & Chief Accounts Officer
SCTIMST, Thiruvananthapuram
6. A member to be co-opted by the Director
as and when necessary

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Secretary to the Govt. of India
Ministry of Science and Technology,
Technology Bhavan, New Delhi - 110 016
3. Shri. Arun Sharma
Joint Secretary to Govt. of India &
Financial Advisor,
Department of Science & Technology,
New Delhi - 110 016
4. Prof. B. Ekbal, Vice Chancellor,
University of Kerala, Thiruvananthapuram
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Head, BMT Wing, SCTIMST
Poojappura, Thiruvananthapuram

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2. Dr. G. S. Bhuvaneshwar
Head, BMT Wing, SCTIMST
Poojappura, Thiruvananthapuram
3. Dr. K. A. Dinshaw
Director, Tata Memorial Hospital
Parel, Mumbai - 400 012
4. A nominee of the Secretary
Department of Science & Technology
Govt. of India, New Delhi - 110 016
5. A Senior Professor of SCTIMST
Thiruvananthapuram to be nominated
by the Director of SCTIMST
6. An External Expert to be nominated by
the President of the Institute

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1. Dr. P. Velayudhan Pillai (Ex-officio)
Medical Superintendent,
Hospital Wing
SCTIMST, Thiruvananthapuram
2. Dr. G. S. Bhuvaneshwar
Head, BMT Wing, SCTIMST
Poojappura, Thiruvananthapuram
3. Shri. P. B. Sourabhan
Deputy Director (Admn)
SCTIMST, Thiruvananthapuram
4. Mrs. Vijayamma Harikrishnan
Nursing Superintendent
SCTIMST, Thiruvananthapuram

5. Dr. Arthur V. Lal
Scientist F, BMT Wing, SCTIMST
Poojappura, Thiruvananthapuram
6. Representative of Academic Wing of the
Institute nominated by the Director of the
Institute

Ethics Committee

1. Mr. Justice S. Sankarasubban (Chairman)
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2. Prof. G. Santhakumari
Former Prof. of Pharmacology & Director of
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R.G. 286, Thriveni, Ulloor
Thiruvananthapuram - 695 011
3. Prof. K.A. Kumar, Professor of Psychiatry
Medical College, Thiruvananthapuram
4. Head, Biomedical Technology Wing
5. An external expert on device technology
(to be identified and nominated by the
Director each time)
6. Director of the Institute

Technology Development Committee

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Head, BMT Wing, SCTIMST
Poojappura, Thiruvananthapuram
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Cardiovascular & Thoracic Surgeon
19, Nav Nirman Society
Grant Road Bridge
Low Parel (South), Mumbai - 400 022

4. Dr. S. N. Pal
Executive Director
Hindustan Latex Ltd.
Thiruvananthapuram
5. Prof. Chitra Sarkar
Dept. of Pathology
All India Institute of Medical Sciences
New Delhi - 110 029
6. Prof. Ramachandra Rao
Vice Chancellor
Banaras Hindu University
Varanasi - 221 005
7. Dr. C. P. Sharma
Scientist F, BMT Wing, SCTIMST
Poojappura,
Thiruvananthapuram
8. Shri. O. S. Neelakantan Nair
Engineer F, BMT Wing, SCTIMST
Poojappura,
Thiruvananthapuram

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New Delhi - 110 002
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Pune - 411 008
3. Shri. S. B. Krishnan,
Secretary- Technology Development Board
Dept. of Science & Technology
New Delhi - 110 016
4. Shri. C. Venugopal,
Head, Technology Transfer Division
V.S.S.C., I.S.R.O, Thiruvananthapuram
5. Head, BMT Wing (Ex-officio member)
6. FA & CAO of the Institute (Ex-officio)
7. Scientist-in-charge,
Technology Transfer Cell (Ex-officio)

DEPARTMENTS AND PERSONNEL

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Sundar Jayasingh, MA, MBA, DLL

Assistant Registrar

Library

S. Jayaprabha, BA, MLISc

Librarian-cum-Documentation Officer

(Librarian-in-charge)

Jayachandra Das, BSc, MLiSc

Librarian-cum-Documentation Officer

Nursing Education

P. P. Saramma, BSc, MN

Instructor in Nursing

Public Relations

T.V. Hemalatha, MA, MPhil, LLB, PGDJ

Public Relations Officer

Achutha Menon Centre for Health Science Studies

Dr. T.K.Sundari Ravindran, PhD

Honorary Professor

Dr. K.R. Thankappan, MD, MPH

Additional Professor

Dr. P. Sankara Sarma, PhD

Additional Professor

Dr. Mala Ramanathan, PhD, MA

Associate Professor

Dr. D. Varatharajan, PhD

Associate Professor

Dr. Amar Jesani, MBBS

Programme Coordinator (Adhoc)

Dr. V. Mohanan Nair, MBBS, MPH

Scientist C (Adhoc)

Dr. R. Sukanya, MBBS, MD

Scientist C (Adhoc)

Administration

Dr. K. Mohandas, MD

Director

V. Ambujakshan Nair, BCom, LLB

Secretary to the Director

P.B. Sourabhan, MA, LLB, PGDMM, DCA

Deputy Director (Administration)

P. Vijayakrishnan, BSc, FCA

Financial Advisor & Chief Accounts Officer

S. Sasikumar, BA, BGL, LLB, PGDIR, PGDIRPM, MA (PA)

Administrative Officer Gr I

R. Ramachandran, SAS

Internal Audit Officer (On deputation)

I.T. Edwin, BA

Administrative Officer Gr II

C. Gopinathan, BSc, LLB, SAS

Accounts Office Gr I

A.Santhakumari, MCom

Accounts Officer Gr I

C.R. Mohandas, BCom

Accounts Officer Gr II

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Purchase Officer Gr I

M. Sudhakara Sharma, BA
Stores & Purchase Officer Gr II

P. Gopalakrishnan Nair, BA
Stores & Purchase Officer Gr II

B. Joseph, BA
Security Officer

B. Radhakrishnan Nair, BA
Security Officer

S. Venkitachalam Iyer, BCom
Pool Officer

Construction Wing

C. Rajmohan, BE (Civil)

Constuction Engineer

G. Gopinatha Kurup

Junior Engineer (Civil)

BIOMEDICAL TECHNOLOGY WING

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Head

Artificial Organs

Dr. G.S. Bhuvaneshwar, M.S., Ph.D.

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Engineer F, Devices Testing Laboratory

Mr. D.S. Nagesh, M.Tech.

Engineer F, Modelling & Prototyping

Mr. V. Vinod Kumar, B.Tech.

Engineer B

Mrs. Kalyani Nair, B.Tech.

Engineer B

Mr. C.V. Muraleedharan, Dip. Mech. Engg.

Scientific Assistant

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Dr. P.R. Harikrishna Varma, M.Sc., Ph.D.

Scientist D

Dr. Manoj Komath, M.Sc., Ph.D.

Scientist C

Mr. R. Sreekumar, B.Sc.

Junior Scientific Officer

Mr. S. Vijayan, B.Sc.

Junior Scientific Officer

Biosurface Technology

Dr. Chandra P Sharma, M.Tech., M.S, D.Sc., MEBE.

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Calibration Cell

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Engineer F

Mrs. Leena Joseph, B.Tech.

Engineer B

Customer Service Cell

Mr. S. Balram, M.Tech.

Engineer E

Dental Products

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Scientist F

Dr. P.P. Lizymol, M.Sc., Ph.D.

Scientific Assistant

Engineering Services

Mr. O.S. Neelakantan Nair, B.Sc. Engg.

Engineer F

Mr. V. Ramesh Babu, B.E.

Engineer D

Mr. K.P.R. Bhas, Dip.Elect.Engg.

Asst.Engineer

Mr. E.B. Mohan Raj, Dip.Mech, Engg.

Foreman

Implant Biology

Dr. Mira Mohanty, M.D.

Scientist F, Histopathology laboratory

Dr. T.V. Anilkumar, M.VSc, Ph.D.

Scientist C

Dr. T.V. Kumary, M.Sc., Ph.D, Biochemistry

Scientist F, Tissue Culture laboratory

Dr. Annie John, M.Sc., Ph.D.

Scientist C,

Transmission Electron Microscopy

Instrumentation

Dr. Niranjana D. Khambete, M.Tech., Ph.D.
Engineer D

Microbiology

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Scientist D

Molecular Medicine

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Scientist E

Polymer Analysis

Dr. K. Sreenivasan, M.Sc., Ph.D.
Scientist F

Dr. Prabha D. Nair, M.Sc., Ph.D.
Scientist F

Mr. P.R. Hari, B.Sc, AIE.
Scientific Assistant

Mrs. C. Radhakumari, M.Sc.
Scientific Assistant

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Scientist D

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Scientific Assistant

Quality Cell

Mr. D.S. Nagesh, M.Tech.
Engineer F, Quality Manager

Mr. S. Balram, M.Tech.
Engineer E

Technical Co-ordination Cell

Mr. D. Ranjit B.E.
Engineer F

Technology Proving Facility

Mr. D.S. Nagesh, M.Tech.
Engineer F

Technology Transfer Cell

Mr. D. Ranjit B.E.
Engineer F

Thrombosis Research

Dr. Lissy K. Krishnan, M.Sc., Ph.D.
Scientist F

Toxicology

Dr. A.C. Fernandez, M.Sc., Ph.D.
Scientist E

Dr. P.V. Mohanan, M.Sc., Ph.D.
Scientist C

Vivarium

Dr. Arthur Vijayan Lal, B.VSc
Veterinary Scientist F

Dr. P.R. Umashankar, M.VSc.
Veterinary Scientist C

HOSPITAL WING

Dr. P. Velayudhan Pillai, MS, MCh
Medical Superintendent (upto 28.02.2003)
 Dr. K. Radhakrishnan, MD, DM
Medical Superintendent in charge (from 01.03.2003)
 Dr. S.K.Jawahar, MBBS
Asst. Administrative Medical Officer
 Smt.Vijayamma Harikrishnan, RN, RM, BSc (N)
Nursing Superintendent
 Smt.Sudhamaniamma, MSc (N), PGDHRM
Deputy Nursing Superintendent

Anaesthesiology

Dr. K. Mohandas, MD
Professor & Director of the Institute
 Dr. R.C. Rathod, MD
Professor & Head
 Dr. (Mrs) Rupa Srinivas, MD, Dip.NB
Additional Professor
 Dr. Thomas Koshy, MD
Associate Professor
 Dr. Srinivas V.Gandhinhaljkar, MD
Associate Professor
 Dr. Prasant Kumar Dash, MD
Associate Professor
 Dr. Raghunath Sreedhar Nalgirkar, MD
Associate Professor
 Dr. P.K. Neema, MD
Associate Professor
 Dr. S. Manikandan, MD
Assistant Professor
 Dr. P. K. Sinha, MD
Assistant Professor
 Dr. P. Gayathri, MD, FRCA
Assistant Professor

Dr. P. R. Suneel, MD, PDCC
Assistant Professor
 Dr. K. P. Unnikrishnan, MD
Assistant Professor
 Dr. Sameer P Mande, MD
Ad-hoc Consultant
 Ganapathy Potti. E.
Scientific Assistant

Biochemistry

Dr. K. Subramonia Iyer, PhD
Professor and Head
 Dr. P.S. Appukuttan, PhD
Additional Professor
 Dr. N. Jayakumari, PhD
Additional Professor
 Shanta A. George, MSc
Scientist E
 K. I. Annamma, BSc
Junior Scientific Officer
 B. Sasikumar, MSc
Junior Scientific Officer (Lab) -A

Biomedical Engineering

K.Vijayakumar, BSc, BSc (Engg.)
Engineer F and Head
 Koruthu P. Varughese, BSc(Engg.), PGDEDT, PGDCA
Engineer F
 G. Mohanlal, BSc (Engg.), MBA
Engineer F
 B. Madhusoodanan Pillai, BSc (Engg.), PGDCA, MBA
Scientist/Engineer D
 N. Sivanandan
Junior Engineer (Electrical)

Blood Transfusion Services

Dr. Jaisy Mathai, MBBS, DCP

Scientist F and Head

Dr. P.V. Sulochana, MBBS

Scientist F

Dr. S. Sathyabhama, MBBS

Scientist E

Cardiology

Dr. Jaganmohan A Tharakan, MD, DM

Professor & Head

Dr. Thomas Titus, MD, DM

Professor

Dr. V. Ajithkumar, MD, DM

Additional Professor

Dr. Anil Bhat, MD, DM

Additional Professor

Dr. S. Sivasankaran, MD, DM, DIP NB

Associate Professor

Dr. Bimal Francis, MD, DM

Associate Professor (resigned on 09.11.02)

Dr. K M. Krishnamoorthy, MD, DM

Assistant Professor

Dr. S. Harikrishnan, MD, DM

Assistant Professor

Dr. R. Padmakumar, MD, DM

Assistant Professor

Dr. Rakesh Gopal, MD, DM

Adhoc Consultant, Cardiology (upto 07.10.02)

Dr. Santhoshkumar Dora, MD, DM

Assistant Professor (from 26.03.02)

R.N. Vijayasanen, BSc

Junior Scientific Officer (Cathlab-B)

Cardiovascular & Thoracic surgery

Dr. K.S. Neelakandhan, MS, MCh, FAMS

Professor & Head

Dr. K. Jayakumar, MS, MCh

Professor (Adhoc)

Dr. R. Sankar Kumar, MS, MCh

Professor

Dr. K.G. Shyam Krishnan MS, MCh

Additional Professor

Dr. M. Unnikrishnan, MS, MCh

Additional Professor

Dr. S.R. Krishna Manohar, MS, MCh

Additional Professor

Dr. Apurba Kumar Sharma, MS, MCh

Assistant Professor

Dr. Praveen K. Varma, MS, MCh

Assistant Professor

Thomas Maliakal

Scientific Assistant

Cellular and Molecular Cardiology

Dr. C.C. Kartha, MD, FNASc, FASc

Professor & Head

Dr. Renuka Nair, PhD, MNAMS

Scientist F

Dr. K. Shivakumar, PhD

Scientist E

Computer Division

G. Geetha, MTech

Scientist F

Medical Records

P. Krishnamoorthia Pillai, MA

Senior Medical Records Officer & Head

N.G. Thampi MA, BMRSC

Medical Records Officer

P.J. Varghese

Assistant Medical Records Officer-C

Microbiology

Molly Antony, MSc, DMV

Scientist E

Dr. Muralidhar K. Katti, PhD

Associate Professor

K. Naseema, MSc, MLT

Scientific Assistant

Gracy Varghese, BSc, MLT

Scientific Assistant A

Neurology

Dr.K.Radhakrishnan, MD, DM, FAMS

Professor & Head

Dr. C.Sarada, MD, DM

Additional Professor

Dr. MD.Nair, MD, DM

Additional Professor

Dr. Sanjeev VThomas, MD, DM

Additional Professor (on leave)

Dr. Asha Kishore, MD, DM

Additional Professor

Dr. PA. Suresh, MD, DM

Additional Professor (on leave)

Dr. Abraham Kuruvilla, MD, DNB,DABN (CI/N Ph)

Assistant Professor

Dr. Joseph Cheriyan P,MD, DM,DNB,DABN

Assistant Professor

Dr. PS. Mathuranath, DM

Assistant Professor

Dr. PN. Sylaja, MD, DM

Adhoc consultant

Dr. N. Ahsan Moosa, MD,DM

Adhoc consultant (upto 26.11.02)

Neurosurgery

Dr. R N. Bhattacharya, MS, MCh

Professor & Head

Dr. S. Suresh Nair, MCh

Professor

Dr. Dilip Panikar, MS, MCh

Additional Professor

Dr. M. Bhaskara Rao, Dip NB

Additional Professor (upto 25.01.03)

Dr. Rajneesh Kachchara, MS, MCh

Associate Professor

Dr. Ravi Mohan Rao, MS, MCh, Dip NB

Associate Professor

Dr. Rajesh B. J., MS, MCh

Assistant Professor

Dr. R. Girish Menon, MCh, DipNB

Assistant Professor (upto 16.04.02)

Dr. Muthu Retnam S., MS, MCh

Assistant Professor (upto 28.03.03)

Dr. Parameswaran, MCh

Adhoc Consultant (upto 10.07.02)

Dr. Rajesh

Adhoc Consultant (10.08.02 to 25.03.03)

Pathology

Dr. V. V. Radhakrishnan, MD

Professor & Head

Dr. S. Sandhyamani, MD, FAMS

Additional Professor

Dr. Annamma Mathai, PhD

Junior Scientific Officer

Radiology

Dr. A. K. Gupta, MD

Professor & Head

Dr. R. Santhosh Joseph, DMRD, MD

Additional Professor

Dr. T.R. Kapilamoorthy, DMRD, MD

Associate Professor

Dr. C. Kesavadas, DMRD, MD

Associate Professor

Statement of Accounts 2002-2003

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Balance Sheet As at 31-03-2003

	Schedules	Current Year Rs. Ps.	Previous Year Rs. Ps.
CORPUS/CAPITAL FUND AND LIABILITIES			
CAPITAL FUND	1	416255343.39	387337240.32
RESERVES & SURPLUS	2	113818731.80	99707405.80
EARMARKED ENDOWMENT FUNDS	3	94294757.60	85691335.25
SECURED LOANS & BORROWINGS	4	11649397.58	5699609.76
CURRENT LIABILITIES & PROVISIONS	7	51728646.71	36381108.03
TOTAL		687746877.08	614816699.16

ASSETS

FIXED ASSETS	8	373643218.40		367046767.71	
INVESTMENTS FROM EARMARKED ENDOWMENT FUNDS	9	188101782.80		164828903.80	
CURRENT ASSETS, LOANS, ADVANCES ETC	11	126001875.88		82941027.65	
MISCELLANEOUS EXPENDITURE (TO THE EXTEND NOT WRITTEN OFF)			0.00		
TOTAL		687746877.08		614816699.16	

Sd/-
Financial Adviser &
Chief Accounts Officer

Sd/-
DIRECTOR
Sree Chitra Tirunal Institute for
Medical Sciences and Technology
Thiruvananthapuram

Income and Expenditure Account for the year ended 31-03-2003

	Schedules	Current Year Rs. Ps.	Previous Year Rs. Ps.
INCOME			
Income from Sales / Services	12	188129499.40	172662892.80
Grants Received from Govt of India(Non Plan)	13	94500000.00	105000000.00
Fees/Subscription	14	1609479.00	1230600.00
Income from Investments (Income on Invest from earmarked/endow. Funds transferred to Funds	15	5652796.00	9357096.00
Income from Royalty, Publication etc	16	1474556.80	94730.00
Interest Earned	17	2919304.57	2106244.27
Other Income	18	1874811.75	3194326.25
Total		296160447.52	293645889.32
EXPENDITURE			
Establishment Expenses	20	186756119.68	169035214.55
Other Administrative Expenses	21	220431253.77	182789472.54
Interest	23	386238.54	154882.00
Depreciation (Net Total at the year-end-corresponding to Schedule 8)		53326475.46	51860570.83
Total		460900087.45	403840139.92
Balance being Excess Expenditure over Income		164739639.93	110194250.60
Add: Transfer from Special Reserve Account		14729447.00	17340750.00
BALANCE BEING SURPLUS/(DEFICIT) CARRIED TO CORPUS/CAPITAL FUND		179469086.93	127535000.60

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 CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS 25

Sd/-
 Financial Adviser &
 Chief Accounts Officer

Sd/-
 DIRECTOR
 Sree Chitra Tirunal Institute for
 Medical Sciences and Technology
 Thiruvananthapuram

Schedules Forming Part of Balance Sheet as at 31-03-2003

	Current Year		Previous Year	
	Rs.	Ps.	Rs.	Ps.
SCHEDULE 1 - CORPUS/CAPITAL FUND:				
Balance as at the beginning of the year		387337240.32		391362303.92
Add: Contribution towards Corpus/Capital Fund (Plan Grants from Govt of India)	208000000.00			121000000.00
Add: Value of Equipments from Project Funds transferred to Assets	387190.00	208387190.00		2509937.00
Add/(Deduct): Balance of net income/(expenditure) transferred from the Income and Expenditure Account		-179469086.93		-127535000.60
		<u>416255343.39</u>		<u>387337240.32</u>
Less: Value of Assets Written off to date		0.00		
BALANCE AS AT THE YEAR-END		<u>416255343.39</u>		<u>387337240.32</u>
SCHEDULE 2 - RESERVES AND SURPLUS:				
1. Capital Reserve:				
As per last Account				
Addition during the year				
2. Revaluation Reserve:				
As per last Account				
Addition during the year				
Less: Deductions during the year				
3. Special Reserves:				
As per last Account	99707405.80		85760105.80	
Addition during the year	14111326.00		13947300.00	
Less: Deductions during the year	0	113818731.80		
				99707405.80
4. General Reserve:				
As per last Account				
Addition during the year				
Less: Deductions during the year				
TOTAL		<u>113818731.80</u>		<u>99707405.80</u>

Schedules Forming Part of Balance Sheet as at 31-03-2003

Fund-wise Break Up				
Name Of Grantee	Opening Balance	Grants	Additions To Fund Other Receipts	Total
SCHEDULE 3 - EARMARKED/ENDOWMENT FUNDS				
EMPLOYEES PENSION FUND	61326166.65		18490478.00	79816644.65
PATIENT WELFARE FUND	544129.00		71157.00	615286.00
PWF EXPENSES	57059.98		21713.05	78773.03
STAFF BENEVOLENT FUND	1073557.75		487440.00	1560997.75
PROJ-MISCELLANEOUS	35810.00	884406.00		920216.00
CSIR PROJECT-DR. P.S. APPUKUTTAN	13450.79			13450.79
DST GOVT. OF KERALA-DR. P.S. APPUKUTTAN	26335.53			26335.53
DST GOVT. OF KERALA-DR.K RADHAKRISHNAN	11438.00			11438.00
DST GOVT. OF KERALA- DR.J.SHANMUGHAM	7113.00			7113.00
PHYSIO-ANTHROPOMATIC STUDY-DR.GUPTA	24256.77	40000.00		64256.77
MPH PROGRAMME			1480.00	1480.00
INDIAN EPILEPSY ASSN.DR.K. RADHAKRISHNAN	4784.00			4784.00
PRJ/DST KERALA/DR.MURALEEDHARAN	4860.00			4860.00
PROJ. DR.ASHA VIJAYARAGHAVAN	4540226.70			4540226.70
PROJ/DST KERALA/DR.MURALEEDHARAN	67744.00			67744.00
THE KERALA REGISTRY OF PREGNANCY				0.00
IMPROVEMENT OF VOLUNTARY BLOOD DONAR	4988.90	42000.00		46988.90
COCONUT OIL AND INCIDENCE OF CAD IN	3971.30			3971.30
ANTIVIRAL AND ANTIFUNGAL STUDIES ON	5062.30			5062.30
GRANT/ROCKFELLER FOUNDATION,USA	983021.00			983021.00
CDS/GOVT. OF KERALA-DR P.A.SURESH				0.00
MODULATION OF MYOCARDIAL CONNTRACTIO	171462.70			171462.70
DST/KERALA/DR.S. SANDHYAMANI	43799.00			43799.00
DBT/BELHI/DR.V.V.RADHAKRISHNAN	128836.50			128836.50
M.D.PHARMA(DR.ASHA)	77602.00		1375401.50	1453003.50
PROJ.INDIAN EPILEPSY ASSTN.JAYACHANDRAN	13057.30	30000.00		43057.30
PROJ.PHC'S, DR.VARATHARAJAN	2575.80			2575.80
TRNG. PROG.DHO'S/IIM GUJARAT				0.00
PHSWOW MEETING/ROCKFELLER FOUNDATION	2140848.00			2140848.00
DHS-DR.K.R.THANKAPPAN	111291.00			111291.00
PROJ/GRANT/DHS/TVM/DR.MOHANAN NAIR/	244803.00	150700.00		395503.00
DST PROJ.DR.C.C.KARTHA	-10891.00	500000.00		489109.00
INDIAN EPILEPSY ASSOCIATION	6584.00	50000.00		56584.00
PROJECT GRANT/DR MALA RAMANATHAN	378933.50			378933.50
DR. K.R.THANKAPPAN/CDS PROJECT	5465.00	80000.00		85465.00
GRANT/WHO/DR VARATHARAJAN/AMC/PROJECT	148500.50			148500.50
GRANT/PROJECT/WHO/DR.T.K.SUNDARIRAV	82043.00	205500.00		287543.00
T V HEMALATHA/HEALTH AWARENESS PROGRAM	21745.00			21745.00
PROJECT/DEPT OF NEUROLOGY	25000.00	36000.00		61000.00
PROJ/DR.K.R. THANKAPPAN/AIIMS/DELHI	68508.00	387190.00		455698.00
PROJ/TRIAL OF ZOLMITRIPTAN/DR.ASHA				0.00
DOUBLE BLIND PLACEBO CONT. PARALLEL	130951.00	77719.00		208670.00

(Amount Rs)

Totals Utilisation	Capital Expenditure		Revenue Expenditure			Total	Total	Net Balance
	Fixed Assets	Others	Total	Salaries Wages	Rent	Other Adm Exp		
			0.00			9758825.00	9758825.00	70057819.65
			0.00			100.00	100.00	615186.00
			0.00			23426.00	23426.00	55347.03
			0.00			357533.00	357533.00	1203464.75
			0.00			397877.00	397877.00	522339.00
			0.00			0.00	0.00	13450.79
			0.00			0.00	0.00	26335.53
			0.00			0.00	0.00	11438.00
			0.00			0.00	0.00	7113.00
			0.00			39000.00	39000.00	25256.77
			0.00			0.00	0.00	1480.00
			0.00			841.00	841.00	3943.00
			0.00			265.00	265.00	4595.00
189650.00			189650.00	4000.00		490039.00	494039.00	3856537.70
			0.00			1161.00	1161.00	66583.00
			0.00			0.00	0.00	0.00
			0.00	12000.00		18894.00	30894.00	16094.90
			0.00			0.00	0.00	3971.30
			0.00			1342.00	1342.00	3720.30
			0.00			177281.00	177281.00	805740.00
			0.00			0.00	0.00	0.00
			0.00	51750.00		126844.00	178594.00	-7131.30
			0.00	8801.00		8801.00	8801.00	34998.00
64209.00			64209.00	10800.00		53483.00	64283.00	344.50
			0.00			0.00	0.00	1453003.50
			0.00	7780.00		10534.00	18314.00	24743.30
			0.00			2575.80	2575.80	0.00
			0.00			0.00	0.00	0.00
			0.00	180161.00		1909487.00	2089648.00	51200.00
			0.00	32733.00		78558.00	111291.00	0.00
			0.00			140332.00	140332.00	255171.00
65491.00			65491.00	144297.00		44432.00	188729.00	234889.00
2150.00			2150.00			6301.10	6301.10	48132.90
			0.00	132150.00		95867.50	228017.50	150916.00
			0.00	15000.00		29021.00	44021.00	41444.00
9487.00			9487.00	1950.00		125592.20	127542.20	11471.30
			0.00	162042.00		62523.00	224565.00	62978.00
			0.00			0.00	0.00	21745.00
			0.00	22000.00		7214.00	29214.00	31786.00
			0.00	270660.00		71458.00	342118.00	113580.00
			0.00			0.00	0.00	0.00
			0.00	19355.00		36524.00	55879.00	152791.00

Schedules Forming Part of Balance Sheet as at 31-03-2003

Fund-wise Break Up

Name Of Grantee	Opening Balance	Additions To Fund Grants	Other Receipts	Total
DETEC & TREAT OF CANCER BY LASER	2969628.00	754572.00		3724200.00
ADD.EXISTING GAP FIELD REPRO.&SEX	5041759.50			5041759.50
EURO REG. OF EPILEPSY & PREGNANCY	140997.00	165775.00		306772.00
TIDES FOUNDATION,DR.MALA	232406.00	888071.00		1120477.00
STRENGTHENING OF RESEARCH IN HEALTH	456400.00			456400.00
KERALA STATE AIDS CONTROL SOCIETY	1395354.00	1400000.00		2795354.00
WHO-MPH COURSE	189515.00	4474400.00		4663915.00
NEURONAL CONTROL-CARD.	614814.00			614814.00
RATAN TATA SMALL GRNT PRG-DR.MATHUR	200000.00			200000.00
RISK FACTORS FOR EPILEPSY-DR.RADHAKRISHNAN	30000.00	30000.00		60000.00
EFFECT OF BLOOD DONATION		110000.00		110000.00
AMC/MAC ARTHUR FOUNDATION/02-70546		4986318.00		4986318.00
IND.COUNCIL OF MEDICAL RESEARCH		415254.00		415254.00
IND.REVIEW OF MALARIA PROJ/DR.THANK		675000.00		675000.00
CLINICAL TRIAL/QUINTAILSPEC/DR.RADHAKRISHNAN		333733.00		333733.00
ANTIVIRAL PRINCIPLES/MOLLY ANTONY		116000.00		116000.00
PRIVATE HEALTH SECTOR PERF./		236325.00		236325.00
DEVELOP.SENTINEL HEALTH/DR.THANKAPPAN		200000.00		200000.00
VISIT OF HARWARD SCHOOL STUDENTS		329011.00		329011.00
EVAL.SUB-TYPES DEMENTIA/DR.MATHURA		104000.00		104000.00
DIFFUSION WEIGHTED IMAGING/DR.GUPT		388300.00		388300.00
WHO FELLOWSHIP/MPH STUDENT/2003 BA				0.00
PROJ/DR RADHAKRISHNAN NEUROLOGY	16190.50	47651.00		63841.50
PROJECTS CLOSED DURING THE YEAR	-218707.12		218707.12	0.00
DR ASHA KISHORE	-177299.00		177299.00	0.00
DST PROJECT/KERALA/P S APPUKUTTAN	7191.10		0.00	7191.10
DR.RAMAMKUTTY/GOVT OF KERALA	18961.30			18961.30
DST/DR SHIVAKUMAR	2.00			2.00
KERALA REGISTRY OF PREGNANCY/DR SANJEEV	83095.90		-83095.90	0.00
WILLIAM COOK/DR SANTHOSH JOSEPH	205254.00			205254.00
DEPT OF ATOMIC ENERGY/DR C.KARTHA	291614.50	36750.00	-33023.50	295341.00
MD PHARMA/DR.ASHA KISHORE	529580.50			529580.50
TRIAL OF ZOLMITRIPTAN/DR ASHA KISHORE	809714.00	90021.00		899735.00
CVDS/DR THANKAPPAN	50000.00			50000.00
CSI R GRANT	5239.74			5239.74
				0.00
				0.00
	85416800.89	18264696.00	20727556.27	124409053.16

(Amount Rs)

Totals Utilisation	Capital Expenditure		Revenue Expenditure			Total	Total	Net Balance
	Fixed Assets	Others	Total	Salaries Wages	Rent	Other Adm Exp		
2733822.00			2733822.00	159826.00	398521.00	558347.00	3292169.00	432031.00
			0.00		1620540.00	1620540.00	1620540.00	3421219.50
			0.00	17648.00		17648.00	17648.00	289124.00
			0.00	94083.00	950495.00	1044578.00	1044578.00	75899.00
			0.00		145840.00	145840.00	145840.00	310560.00
			0.00	94553.00	846956.00	941509.00	941509.00	1853845.00
			0.00	3765960.00	475283.00	4241243.00	4241243.00	422672.00
278147.00			278147.00	68721.00	234626.00	303347.00	581494.00	33320.00
			0.00	91684.00	82956.00	174640.00	174640.00	25360.00
			0.00	26796.00	7961.00	34757.00	34757.00	25243.00
			0.00	51774.00	26894.00	78668.00	78668.00	31332.00
86351.00			86351.00	270687.00	1017846.75	1288533.75	1374884.75	3611433.25
			0.00	64132.00	27424.00	91556.00	91556.00	323698.00
			0.00	84600.00	484198.00	568798.00	568798.00	106202.00
			0.00	67226.00	67552.00	134778.00	134778.00	198955.00
			0.00	22000.00	549.00	22549.00	22549.00	93451.00
			0.00		5032.00	5032.00	5032.00	231293.00
			0.00			0.00	0.00	200000.00
			0.00		68078.00	68078.00	68078.00	260933.00
			0.00			0.00	0.00	104000.00
			0.00		3200.00	3200.00	3200.00	385100.00
			0.00			0.00	0.00	0.00
			0.00	17000.00		17000.00	17000.00	46841.50
						0.00	0.00	0.00
						0.00	0.00	0.00
			0.00		7191.10	7191.10	7191.10	0.00
					18961.30	18961.30	18961.30	0.00
					2.00	2.00	2.00	0.00
			0.00			0.00	0.00	0.00
			0.00		205254.00	205254.00	205254.00	0.00
				16605.00	278736.00	295341.00	295341.00	0.00
					529580.50	529580.50	529580.50	0.00
0.00				53914.00	845821.00	899735.00	899735.00	0.00
					50000.00	50000.00	50000.00	0.00
					5239.74	5239.74	5239.74	0.00
							0.00	0.00
3429307.00	0.00		3429307.00	6042688.00	22472067.99	28514755.99	31944062.99	92464990.17

Schedules Forming Part of Balance Sheet as at 31-03-2003

Name of Grantee	Fund-Wise Break up			Total
	Opening Balance	Additions To Fund Grants	Other Receipts	
CSIR-GRANT-ASHA S MATHEW,PHD STUDENT	0.00	113266.00		113266.00
CSIR-GRANT-BERNADETTE K. MADATHIL,PHD	0.00	113266.00		113266.00
CSIR-GRANT-SAILAJA.G.S.SRF	0.00	107526.00		107526.00
LISI NO TRIAL TRIAL MERIND	20042.65			20042.65
NIRMALA RACHEL, CSIR		76659.00		76659.00
U.G.C. GRANT- BIJI BALAKRISHNAN	5151.50			5151.50
DST-H.K.VARMA	99210.00			99210.00
PRO-INDO FRENCH-NABL-BHUVANESWER	-2102039.16	500000.00		-1602039.16
MEMBRANE OXYNATOR	34978.34	99557.00		134535.34
DYNAMIC ORTHOPAEDIC PVT LTD, HYDROXY	113955.05			113955.05
PRO;SAHAJANAND VASCU;DR.AURTHUR	-61478.25	1078700.00		1017221.75
PROJ:D.S.T. DR.P.V. MOHANAN	-23243.10	250000.00		226756.90
PROJ:ATMRF:DR LISSY KRISHNAN	-45107.00	200000.00		154893.00
PROJECT:DYNAMIC ORTHOPAEDICS	12439.00			12439.00
PROJ: D.S.T. D.S.NAGESH	302416.70	500000.00	188.00	802604.70
IDENTIFICATION OF P.R.S. RACE.STED	3739.50		32578.00	36317.50
NMITLI, PROJECT C.S.I.R	35552.30	804000.00		839552.30
CHITOSAN BASED WAINED DRESSING	57319.00			57319.00
D.S.T. EXPERIMENTAL EVALUATION-	507943.75			507943.75
DST-FAB: CLINICALLY/SIG:SHAPE OF HEVA	133056.00	80000.00		213056.00
DST-LIZYMOL-DBSOMC FOR MEDICAL APPL	503371.05	125000.00		628371.05
STEC-BIOPOLYMERS & APPLICATIONS	104735.50			104735.50
AUROLAB,ARAVIND EYE HOSPITAL	67420.00			67420.00
TTK.HEALTHCARE.DEVELOPMENT OF VALV	49915.00			49915.00
INDO-GERMAN COMMITTEE MEETING-DST		95000.00		95000.00
HINDUSTAN LATEX.EVALU:BLOOD BAG	37140.00	160061.00	197201.00	
ALL INDIA COUNCIL FOR TECHNI:EDU:SH	0.00	903750.00		903750.00
DST.NIRANJAN		700000.00		700000.00
IFCPAR-DR.JAYAKRISHNAN		1013050.00		1013050.00
STED-KERALA,MANOJKPMATH,APATITE-CE		62500.00		62500.00
DST-LBFDPSBC-DR.SHARMA		240000.00	90.00	240090.00
DEV: HYDRO-CEPHALUS-HINDUSTAN LATEX	0.00	135641.00		135641.00
LIFE SCIENCE RESEARCH BOARD DR.MIRA	0.00	504500.00		504500.00
STED-DR.LIZZYMOL	0.00	10000.00		10000.00
SUSPENSE		21164.50		21164.50
DO	26012.00			26012.00
OLD PROJECTS(CLOSED DURING 02-03)	169152.03			169152.03
EXTERNAL SCHOLORSHIP RECEIVED	79293.50			79293.50
PROJECT/BMT	5108.75			5108.75
PROJECT/BMT	138450.25			138450.25
				0.00
Total	274534.36	7893640.50	32856.00	8201030.86

(Amount Rs)		TOTALS						
Current Year	Previous Year							
UTILISATION								
CAPITAL EXPENDITURE								
		Revenue		Expenditure				
			96600.00		96600.00	96600.00	16666.00	
			96600.00		96600.00	96600.00	16666.00	
			95851.00		95851.00	95851.00	11675.00	
					0.00	0.00	20042.65	
			67510.00		67510.00	67510.00	9149.00	
				4727.50	4727.50	4727.50	424.00	
					0.00	0.00	99210.00	
629611.00	0.00	629611.00	1074501.00	0.00	63712.50	1138213.50	1767824.50	-3369863.66
		0.00	88967.00		19682.50	108649.50	108649.50	25885.84
		0.00			67357.50	67357.50	67357.50	46597.55
		0.00	46455.00		344025.00	390480.00	390480.00	626741.75
7963.00		7963.00	66100.00		82042.50	148142.50	156105.50	70651.40
		0.00			38635.75	38635.75	38635.75	116257.25
		0.00			5283.00	5283.00	5283.00	7156.00
		0.00	176819.00		161163.50	337982.50	337982.50	464622.20
		0.00	4000.00		44161.00	48161.00	48161.00	-11843.50
19646.00		19646.00	225453.00		345792.40	571245.40	590891.40	248660.90
		0.00			30744.25	30744.25	30744.25	26574.75
20572.00		20572.00	27081.00		86094.00	113175.00	133747.00	374196.75
		0.00			48656.00	48656.00	48656.00	164400.00
435574.00		435574.00			31632.25	31632.25	467206.25	161164.80
		0.00	13483.00		85402.75	98885.75	98885.75	5849.75
		0.00			35746.00	35746.00	35746.00	31674.00
		0.00			349.00	349.00	349.00	49566.00
		0.00			98685.00	98685.00	98685.00	-3685.00
		0.00			201533.50	201533.50	201533.50	-4332.50
221751.00		221751.00	52355.00		336141.00	388496.00	610247.00	293503.00
		0.00			39552.00	39552.00	39552.00	660448.00
208543.00		208543.00	29227.00		28652.00	57879.00	266422.00	746628.00
		0.00	8461.00		9598.00	18059.00	18059.00	44441.00
		0.00	14245.00		260.00	14505.00	14505.00	225585.00
		0.00	8543.00		1707.00	10250.00	10250.00	125391.00
		0.00			6000.00	6000.00	6000.00	498500.00
		0.00				0.00	0.00	10000.00
		0.00				0.00	0.00	21164.50
		0.00	20240.00		5772.00	26012.00	26012.00	0.00
		0.00			169152.03	169152.03	169152.03	0.00
		0.00			79293.50	79293.50	79293.50	0.00
					5108.75	5108.75	5108.75	0.00
					138450.25	138450.25	138450.25	0.00
1543660.00	0.00	1543660.00	2212491.00	0.00	2615112.43	4827603.43	6371263.43	1829767.43

Schedules Forming Part of Balance Sheet as at 31-03-2003

		Current Year		Previous Year	
		Rs.	Ps.	Rs.	Ps.
SCHEDULE 4 - SECURED LOANS AND BORROWINGS					
1.	Central Government				
2.	State Government (Specify)				
3.	Financial Institutions				
	a) Term Loans				
	b) Interest accrued and due				
4.	Banks:				
	a) Term Loans-Interest accrued and due				
	b) Other Loans(specify)- Interest accrued and due(Against over draft facility)	11649397.58		5699609.7	
5.	Other Institutions and Agencies				
6.	Debentures and Bonds				
7.	Others(Specify)				
TOTAL		11649397.58		5699609.76	
SCHEDULE 7- CURRENT LIABILITIES AND PROVISIONS					
A. CURRENT LIABILITIES					
1.	Acceptances				
2.	Sundry Creditors:				
	a) For Goods	14899984.00		10816744.00	
	b) Others	3916456.00	18816440.00	703569.00	
3.	Advances Received		11823056.67	4507230.67	
4.	Interest accrued but not due on:				
	a) Secured Loans / borrowings				
	b) Unsecured Loans / borrowings				
5.	Statutory Liabilities:				
	a) Overdue				
	b) Others		2071400.89	4660239.79	
6.	Other current Liabilities		9772616.15	6672789.07	
TOTAL(A)		42483513.71		27360572.53	
B. PROVISIONS					
1.	For Taxation				
2.	Gratuity				
3.	Superannuation/Pension				
4.	Accumulated Leave Encashment				
5.	Trade Warranties/Claims				
6.	Others(Specify) Audit fee	20000.00			
	Sinking fund contribution to invest	9225133.00	9245133.00	9020535.50	
TOTAL(B)		9245133.00		9020535.50	
TOTAL(A+B)		51728646.71		36381108.03	

SCHEDULES TO ASSETS

Schedules Forming Part of Assets as at 31-03-2003

SCHEDULE 8 - FIXED ASSETS DESCRIPTION

	GROSS BLOCK			
	Cost/Valuation As at the beginning of the year	Additions during the Year	Deductions during the Year	Cost/Valua- tion of the Year-end
A. FIXED ASSETS:				
1. Land:				
A) Freehold	1585843.51			1585843.51
B) Leasehold				
2. Buildings:				
A) On Freehold Land	35597003.04	160106.22		35757109.26
B) On Leasehold Land				
C) Ownership Flats/Premises				
D) Superstructures On Land Not Belonging To The Entity	118023470.72	2325105.84		120348576.56
3. Plant Machinery & Equipment	549134076.84	49858057.10	0.00	598992133.94
4. Vehicles	2323229.74	36600.00	0.00	2359829.74
5. Furniture,Fixtures	20202830.60	861859.01	0.00	21064689.61
6. Office Equipment	867921.54	52616.00		920537.54
7. Computer/Peripherals		0.00		
8. Electric Installations	13090180.67	517254.00		13607434.67
9. Library Books	65164030.57	5957669.00	0.00	71121699.57
10. Tubewells & W.supply	174615.00	0.00		174615.00
11. Other Fixed Assets		0.00		
A) Oxygen Cylinders	203362.42	0.00		203362.42
B) Air Conditioners	17284183.91	110099.00	0.00	17394282.91
C) Telephone Installations	1853530.94	26560.00		1880090.94
D) Cold Room Installation	341700.00	0.00		341700.00
E) Water Coolers	62866.50	0.00		62866.50
F) Lift Installation	3301433.10	0.00		3301433.10
G) Kitchen Equipments	559520.22	0.00		559520.22
H) Canteen Equipments	99791.59	0.00		99791.59
I) Paintings	361757.63	17000.00		378757.63
K) Livestock	31848.00	0.00		31848.00
L) Gas Plant Installations	1086238.09	0.00		1086238.09
	831349434.63	59922926.17	0.00	891272360.80

DEPRECIATION		NET BLOCK			
As at the beginning of the year	during the year	OnDeductions during the year	Total up to the year-end	As at the Current year-end	As at the previous year-end
0.00	0	0	0	1585843.51	1585843.51
					35597003.04
51135067.16	5248530.93		56383598.09	99722087.73	66888403.56
330401207.95	40288638.90		370689846.85	228302287.09	218732868.89
2040634.34	63839.08		2104473.42	255356.32	282595.40
13151646.59	1186956.45		14338603.04	6726086.57	7051184.01
697609.43	33439.22		731048.65	189488.89	170312.11
9019927.64	688126.05		9708053.69	3899380.98	4070253.03
41652265.64	4420415.09		46072680.73	25049018.84	23511764.93
108759.04	9878.39		118637.43	55977.57	65855.96
183047.84	3047.19		186095.03	17267.39	20314.58
10323535.59	1060612.10		11384147.69	6010135.22	6960648.32
1363329.90	77514.16		1440844.06	439246.88	490201.04
331787.42	1486.89		333274.31	8425.69	9912.58
61940.11	138.96		62079.07	787.43	926.39
2396954.30	135671.82		2532626.12	768806.98	904478.80
420514.00	20850.93		441364.93	118155.29	139006.22
74790.38	3750.18		78540.56	21251.03	25001.21
227682.87	22661.21		250344.08	128413.55	134074.76
16794.34	2258.05		19052.39	12795.61	15053.68
695172.40	58659.85		753832.25	332405.84	391065.69
464302666.94	53326475.46	0.00	517629142.40	373643218.40	367046767.71

Schedules Forming Part of Balance Sheet as at 31-03-2003

		Current Year		Previous Year	
		Rs.	Ps.	Rs.	Ps.
SCHEDULE 9 - INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS					
1.	In Government Securities	20200000.00		15400000.00	
2.	Other approved Securities	5685391.00		5210062.00	
3.	Shares				
4.	Debentures and Bonds				
5.	Subsidiaries and Joint Ventures				
6.	Others (to be specified) Sinking Fund Investments	94673127.00		82049157.00	
	Technology Fund	19145604.80		17658248.80	
	Pension & staff funds	48397660.00	162216391.80	44511436.00	
TOTAL		188101782.80		164828903.80	

SCHEDULE 11 - CURRENT ASSETS, LOANS, ADVANCES ETC**A. CURRENT ASSETS**

1.	Inventories:				
a)	Stores and Spares	39274727.76		27245038.45	
b)	Loose Tools	1863977.00		2350406.20	
c)	Stock-in trade				
	Finished Goods				
	Work-in-progress				
	Medicine	9827857.01	50966561.77	6571316.99	
2.	Sundry Debtors:				
a)	Debts Outstanding for a period exceeding six months				
b)	Others		2490815	5736675.00	
3.	Cash balances in hand(including cheques/drafts and imprest)		375835.1	511268.44	
4.	Bank Balances:				
a)	With Scheduled Banks:				
	-On Current Account	46425.15		46425.15	
	-On Deposit Accounts(includess margin money)	2000000		10000000.00	
	-On Savings Accounts	26505023.21	28551448.36	9758115.42	
b)	With non-Scheduled Banks:				
	-On Current Account				
	-On Deposit Accounts				
	-On Savings Account				
5.	Post-Office-Savings Accounts				
TOTAL (A)		82384660.23		62219245.65	

Schedules Forming Part of Balance Sheet as at 31-03-2003

		Current Year		Previous Year	
		Rs.	Ps.	Rs.	Ps.
B.	LOANS, ADVANCES AND OTHER ASSETS				
1.	Loans:				
	a) Staff	15861868.12	15861868.12	13104334.07	
	b) Other Entities engaged in activities/objectives similar to that of the Entity				
	c) Other(specify)				
2.	Advances and other amounts recoverable in cash or in kind or for value to be received:				
	a) On Capital Account	6608083.00		3919159.00	
	b) Prepayments	2618139.53		3346888.93	
	c) Others	529125.00	9755347.53	351400.00	
3.	Income Accured:				
	a) On Investments from Earmarked/endowment Funds				
	b) On Investments-Others				
	c) On Loans and Advances				
	d) Others				
	(includes income due unrealised Rs)				
4.	Claims Receivable				
	From Govt of India on Plan Funds		18000000.00		0
	TOTAL(B)		43617215.65		20721782.00
	TOTAL(A+B)		126001875.88		82941027.65

Schedules Forming Part of Income & Expenditure for the Period/Year ended 31-03-2003

	Current Year		Previous Year	
	Rs.	Ps.	Rs.	Ps.

SCHEDULE 12 - INCOME FROM SALES/SERVICES

1.	Income from Sales			
	a) Sale of Finished Goods			
	b) Sale of Raw Material			
	c) Sale of Scraps			
2.	Income from Services			
	a) Labour and processing charges			
	b) Professional/Consultancy Services			
	c) Agency Commission and Brokerage			
	d) Maintenance Services			
	e) Others (Specify) From Hospital Services	184461759.65		172272576.80
	From Projects	2946803		0.00
	Testing & Facility charges received	720936.75		390316.00
	TOTAL	188129499.40		172662892.80

SCHEDULE 13 - GRANTS/SUBSIDIES

(Irrevocable Grants & Subsidies Received)

1.	Central Government	94500000.00		105000000.00
2.	State Government(s)			
3.	Government Agencies			
4.	Institution/Welfare Bodies			
5.	International Organisations			
6.	Others(Specify)			
	TOTAL	94500000.00		105000000.00

SCHEDULE 14 - FEES/SUBSCRIPTIONS

1.	Entrance Fees	535300.00		326990.00
2.	Annual Fees/ Subscriptions	875209.00		276000.00
3.	Seminar/Program Fees			
4.	Consultancy Fees			
5.	Others(Specify)	198970.00		127610.00
	Award received	500000.00		
	TOTAL	1609479.00		1230600.00

Schedules Forming Part of Income & Expenditure for the Period/Year ended 31-03-2003

	Investment from Earmarked Fund				Investment-Others			
	Current Year		Previous Year		Current Year		Previous Year	
	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
SCHEDULE 15 - INCOME FROM INVESTMENTS								
(Income on Invest. from Earmarked/Endowment Funds transferred to Funds)								
1) Interest								
a) On Govt. Securities								
b) Other Bonds/Debentures								
2) Dividends:								
a) On Shares								
b) On Mutual Fund Securities								
3) Rents					607909.00		656659.00	
4) Others(Specify) On Sinking Fund	4016954.00		7074230					
On Technology Fund	1027933.00		1626207					
TOTAL	5044887.00		8700437		607909.00		656659.00	
TRANSFERRED TO EARMARKED/ENDOWMENT FUNDS	5044887.00		8700437		0			

	Current Year		Previous Year	
	Rs.	Ps.	Rs.	Ps.
SCHEDULE 16 - INCOME FROM ROYALTY, PUBLICATION ETC				
1) Income from Royalty		1474556.80		94730
2) Income from Publications				
3) Others(Specify)				
TOTAL		1474556.80		94730

Schedules Forming Part of Income & Expenditure for the Period/Year ended 31-03-2003

	Current Year		Previous Year	
	Rs.	Ps.	Rs.	Ps.
SCHEDULE 17- INTEREST EARNED				
1) On Term Deposit				
a) With Scheduled Banks	1510754.37		1150890.82	
b) With non-scheduled banks				
c) With Institutions				
d) Others				
2) On Savings Account				
a) With Scheduled Banks	21173.00		18336.00	
b) With non-scheduled banks				
c) Post Office Savings Account				
d) Others				
3) On Loans	1387377.20		937017.45	
b) Others				
4) Interest on Debtors and other Receivables				
TOTAL	2919304.57		2106244.27	

SCHEDULE 18 - OTHER INCOME

1. Profit on Sale/disposal of Assets:				
a) Owned assets				
b) Assets acquired out of grants, or received free of cost				
2. Export Incentives realized				
3. Fees for Miscellaneous Services				
4. Miscellaneous Income (income from Projects)	856301.35		2213658.00	
Other Income	1018510.4		980668.25	
TOTAL	1874811.75		3194326.25	

SCHEDULE 20 - ESTABLISHMENT EXPENSES

a) Salaries and Wages	155101998.78		141610971.50	
b) Allowances and Bonus	1494095.00		1204972.00	
c) Contribution to Provident Fund				
d) Contribution to other fund(specify)				
e) Staff Welfare Expenses	5208556.90		4480702.25	
f) Expenses on Employee's Retirement and Terminal Benefits	11470083.00		9964838.00	
g) Others(Specify) PG Training & Accademic payments	13481386.00		11773730.80	
TOTAL	186756119.68		169035214.55	

Schedules Forming Part of Income & Expenditure for the Period/Year ended 31-03-2003

	Current Year		Previous Year	
	Rs.	Ps.	Rs.	Ps.
SCHEDULES 21 - OTHER ADMINISTRATIVE EXPENSES ETC				
a) Purchases	141763804.63		121257804.97	
b) Labour and processing expenses				
c) Cartage and Carriage Inwards	922953.85		685149.00	
d) Electricity and power	20766909.00		16277317.00	
e) Water charges	1736842.00		3268907.00	
f) Insurance	6505.00		3400.00	
g) Repairs and maintenance	37112847.65		25535233.51	
h) Excise duty				
i) Rent,Rates and Taxes	352046.00		337152.00	
j) Vehicles Running and Maintenance	397216.50		434178.50	
k) Postage,Telephone and Communication Charges	1416239.00		1504857.00	
l) Printing and Stationary	1836892.00		1748418.50	
m) Travelling and Conveyence Expenses	272121.00		387600.00	
n) Expenses on Seminar/Workshop	1693614.00		949574.00	
o) Subscription Expenses	111352.00		109494.00	
p) Expenses on Fees				
q) Auditors Renumeration	4950.00		0.00	
r) Hospitality Expenses				
s) Professional Charges				
t) Provision for Bad and Doubtful Debts/Advances				
u) Irrecoverable Balances Written-off				
v) Packing Charges				
w) Freight and Forwarding Expenses				
x) Distribution Expenses				
y) Advertisement and Publicity	1287005.00		793760.00	
z) Others(specify)	10749956.14		9496627.06	
TOTAL	220431253.77		182789472.54	

SCHEDULE 22 - EXPENDITURE ON GRANTS, SUBSIDIES ETC

- a) Grants given to Institutions/Organisations
- b) Subsidies given to Institutions/Organisations

TOTAL

SCHEDULE 23 - INTEREST

- a) On Fixed Loans
- b) On Other Loans(including Bank Charges)
- c) Others(specify)

TOTAL

386238.54	154882.00
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386238.54	154882.00
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Receipts & Payments for the Period ended 31-03-2003

RECEIPTS		Current Year	Previous Year
I	Opening Balances		
a)	Cash In Hand	511268.44	497154.15
b)	Bank Balances		
i)	In Current Account	46425.15	46425.15
ii)	In deposit Account		
iii)	Savings Account	9758115.42	3224887.36
II	Grant Received		
	From Government of India		
	Under Plan scheme	190000000.00	121000000.00
	Non-Plan scheme	94500000.00	105000000.00
III	Income on Investment from		
a)	Earmarked funds	18928958.05	21618620.00
b)	Own funds		
IV	Interest Received		
a)	On Bank deposits	2733100.37	1576061.82
b)	Loans Advances etc	528961.00	
V	Other Income		
	Income from Patient services	193550569.60	168765787.80
	Other receipts including Royalty	4939783.05	2500291.00
VI	Amount Borrowed		
	From State Bank of Travancore-OD facility	5949787.82	0.00
VII	Any other receipts		
	Grant received for Projects	31115213.26	36942301.00
	Refund of Deposits(LC Margin)	10000000.00	
	Other Deposit received	4863896.00	1096072.00
Total		567426078.16	462267600.28

PAYMENTS	Current Year	Previous Year
I Expenses		
a) Establishment expenses	196750323.75	178397555.95
b) Administrative Expenses		
For Purchases	182469330.08	119121960.72
Other expenses	48967066.67	55245792.53
II Payments made against funds for various Projects		
As Per schedule	24361603.36	23857825.70
III Investments & Deposits made		
a) Out of Earmarked funds	18223970.00	15245013.22
b) Out of own funds	2000000.00	
IV Expenditure on Fixed Assets & Capital work -in- progress		
a) Purchase of Fixed Assets	57663868.10	36083740.00
b) Capital work-in-progress		
V Refund of Loans		12718489.65
VI Finance Charges(Bank charges)	381017.54	
VII Other Payments		
To Funds/Deposit- refunds	9681615.20	11281413.50
VIII Closing Balance		
a) Cash in hand	375835.10	511268.44
b) Bank Balances		
I) In current Account	46425.15	46425.15
ii) In Deposit Account		
iii) Savings Account	26505023.21	9758115.42
Total	567426078.16	462267600.28

Schedules Forming Part of Accounts for the Period ended 31-03-2003

SCHEDULE - 24

1 ACCOUNTING CONVENTION

Financial Statements are prepared on the basis of historical cost convention unless otherwise stated and on the accrual method of accounting

2 INVENTORY VALUATION

Stores and spares including machinery spares are valued at cost

3 INVESTMENTS

Investment including long term investments are carried at cost.

5 FIXED ASSETS

Fixed assets are stated at cost of acquisition inclusive of inward freight, duties and taxes incidental and direct expenses related to acquisition.

6 DEPRECIATION

6.1 Depreciation is provided on reducing balance method at the rates specified by the Income tax Act 1961.

6.2 In respect of additions to/deductions from fixed assets, during the year depreciation is provided for full year.

9 GOVT GRANTS/SUBSIDIES

9.1 Govt Grant from Plan fund are treated as additions to Capital fund of Institute.

9.2 Grants in respect of specific fixed assets acquired are shown as deduction from the cost of the related asset.

9.3 Govt Grants/subsidies are accounted on Grant release order basis.

10 FOREIGN CURRENCY TRANSACTIONS

Transactions denominated in foreign currency are accounted at exchange rate prevailing at the date of transactions.

12 RETIREMENT BENEFITS

12.1 An amount equal to one month salary every year is transferred to Pension fund account to meet liability on account of Pension payments

12.2 An amount of Rs.4 lacks is transferred every year to above fund for meeting liabilities on account of Gratuity payments .

12.3 Leave encashment eligible at the time of retirement/reliving is accounted on actual payment basis.

13 PROVIDENT FUND

Liabilities and assets of Provident fund account were separated from Balance sheet of Institute and shown as separate statement.

14 SINKING FUND RESERVE

Five percent of receipts from patient are transferred to a Fund for meeting unexpected requirements for Fixed assets.

15 TECHNOLOGY DEVELOPMENT FUND

Receipts against technologies developed by Institute are transferred to the above fund for meeting additional expenses on Improvement of Technologies already developed. During the year Rs.3.86 lakh was spent from this fund for the purpose

SCHEDULE 25 - CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS**I CONTINGENT LIABILITIES**

- 1.1 Claims against the Institute not acknowledged
- | | |
|---|--|
| as debts | Rs. 15.86 crores (PY Rs.15.86 crores) |
| (Towards lease amount demanded by Govt of Kerala, for land given) | |
- 1.2 In respect of:
- | | |
|---|-----------------|
| Bank Guarantee given by Institute | |
| Letters of credit opened on behalf of Institute | Rs.249.58 lakhs |
- 1.3 Disputed demands on Income tax etc Nil
- 1.4 In respect of claims from parties for non-execution of orders Nil

2 CAPITAL COMMITMENTS

Estimated value of orders remaining to be executed on Capital Account	Rs.180 lakhs
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3 Lease obligation for rentals for Plant&Machinery	Nil
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4 CURRENT ASSETS, LOANS & ADVANCES

The aggregate amount shown in the Balance sheet for the Current assets, Loans and Advances , have the value which is realisable in the ordinary course of business.

5 TAXATION

Provision for Incometax not made since there is no taxable income for Institute under Income tax Act 1961, during the year

6 FOREIGN CURRENCY TRANSACTIONS:

- | | |
|-------------------------------------|----------------|
| 6.1 Value of Imports | |
| Capital Goods | Rs.284.05 lakh |
| Stores Spare & Consumables | Rs.304.87 lakh |
| 6.2 Expenditure in foreign currency | |
| Travel Expenses | US\$210/= |
| 6.3 Earnings: | |
| Value of Exports | Nil |
| 6.4 Remuneration to Auditors | |
| As auditors: | |
| For Taxation | Rs.4950/- |

7 Corresponding figures for previous years have been regrouped, wherever necessary.

8 Schedules 1 to 25 are annexed to and form integral part of the Balance sheet as at 31-03-2003, and Income & Expenditure Account for the year ended on that date.

Financial Adviser & Chief Accounts Officer
Director

Provident Fund Account for the year ended 31-03-2003

Amount Rs

	CURRENT YEAR	PREVIOUS YEAR
LIABILITIES		
MEMBERS BALANCE	116838381.00	106508153.00
BALANCE DUE TO MEMBERS NOT IN SERVICE		
Under EPF scheme	4357912.00	4133326.00
„ GPF „	670195.00	118738.00
PENSION FUND DUES	44847545.00	41144537.00
RESERVES & SURPLUS-INTEREST	739362.15	1155622.09
TOTAL	167453395.15	153060376.09
ASSETS		
INVESTMENT AT COST	155105103.00	138823666.00
DUES TO PF ACCOUNT		
FROM INSTITUTE	2013517.00	4242622.24
FROM PF COMMISSIONER	9090010.00	8339459.00
INTEREST ACCRUED NOT DUE	1125315.00	0.00
BALANCE WITH BANKS		
SBT -GPF A/C	47976.10	1585928.80
SBT-CPF A/C	71474.05	68700.05
TOTAL	167453395.15	153060376.09

Audit Report

Audit Report on the accounts of the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram for the year 2002-2003

Introduction

The Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram is governed by the provisions of The Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum Act 1980 (52 of 1980).

The Accounts of the Institute are audited by the Comptroller and Auditor General of India under Section 19(2) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971 read with section 18(2) of the "Sree Chitra Tirunal Institute for Medical Sciences and Technology Trivandrum Act, 1980".

The Institute is mainly financed by grant from the Government of India. During the year grant received was Rs.2845 lakh.

COMMENTS ON ACCOUNTS

Balance Sheet

1. Diversion of Plan Grant for Non-Plan Expenditure

The Plan Grant received from Government. of India to meet capital expenditure was Rs 1900 lakh.

REPLIES TO AUDIT COMMENTS

Expenditure for Salary & Allowances are met from Non-Plan Grant released to Institute. Due to revision of pay (by pay revision orders) the expenditure under salary has increased to Rs18.68 crore. while Non-

Out of this, capital expenditure of Rs 599.22 lakh only was incurred and Rs 507.97 lakh was used for meeting recurring expenditure of the Research and Academic programme. Hence plan grant of Rs 792.81 lakh was diverted for meeting expenditure under Non plan.

2. Provident Fund

The Institute maintains the Provident fund account of its employees. Prior to 1989, it was maintained by the Regional Provident Fund Commissioner, Thiruvananthapuram. The Provident Fund account showed an amount of Rs 90.90 lakh as receivable from the EPF Commissioner. However confirmation of the balance is yet to be obtained.

The Institute owed an amount of Rs 20.14 lakh to the PF

From this year onwards PF Accounts have been separated from Institute account and shown as separate statement as Annexure.

3. Accounting of Assets

The value of assets shown in the Balance Sheet after charging depreciation was Rs 3736.43 lakh. The Assets register was maintained only from 1998-99. It was reported by the Institute, in previous years, that a committee was formed for identifying and valuing obsolete fixed assets. But no assets had been written off or removed from the assets register on the recommendation of the said committee except asset worth Rs.10.40lakh, which was disposed off prior to 98-99. As such the entire value asset shown in the Balance sheet could not be verified individually.

Plan grant released is only Rs.9.45 crores. Institute had taken up with Department of Science & Technology for suitable revision in Non-Plan Grant amount.

Details of funds receivable from EPF commissioner are maintained separately and were shown to audit. Action had already been taken to obtain confirmation of balance from EPF commissioner.

The balance due to PF, represents mainly the recovery made from March03 salary which was subsequently transferred to fund during next year.(2003-04)

The obsolete items identified for disposal were auctioned and sold during 2003-04. Necessary adjustments will be made for items disposed off during next year.

4. Royalty received and investment there of

During the year, royalty received and accounted for was Rs14.75 lakh. As per the guide lines issued, this has to be invested in Technology development fund. The Investment made was to the extend of Rs.8.32 lakh. Hence deficit in investment was Rs.6.43lakhs.

Out of Rs.14.75lakhs received towards Royalty Rs.6.43 lakhs was received on 27th March2003, and this amount could be invested during 2003-04 only. Hence the reported deficit.

5. Excess Investment in Pension Fund

The liability to be discharged towards Pension Funds is Rs.700.57 lakh, where as investment made is to the extend of Rs.729.66 lakh. Excess investment thus made is Rs. 29.09 lakh.

The excess investment reported will be rectified during next year.

6. Non-accounting of EMD.

The Institute received a demand draft of Rs.137150- towards Earnest Money Deposit. This was not accounted for. EMD account and Bank balance account are understated to this extend.

Necessary instructions issued for depositing all EMD amounts received by Institute in to Institute accounts instead of returning the amount to Supplier directly on completion of purchase orders.

7. Excess expenditure on Projects

In respect of 5 sponsored projects excess expenditure to the extend of Rs.33.97 lakh was incurred by diverting Institute's funds. The Institute stated that the excess expenditure would be adjusted in 2003-04

Excess expenditure incurred with approval of Project Grantee. Necessary adjustments will be made during 2003-04

GENERAL

8. Revision of Accounts

(i) Bank Reconciliation

In the Bank Reconciliation statement cheques received for Rs.103800/- were shown/accounted for twice. When this was pointed out it was rectified. As a result of this Income from Hospital Services was reduced to

Necessary corrections made in the final statements as per instructions of audit.

the extent of Rs. one lakh and liability towards EMD was reduced by Rs.3800/-

(ii) Sale of Medicine

An amount of Rs.59107/ was earned on account of sale of medicine to outside patients. This was shown reduced from the cost of Medicines purchased. However on pointing out this was shown under sales as well as under purchases.

Sd/

Pr. Director of Audit (SD)

Place: New Delhi

Dated:

Final statements were revised as instructed by audit.

Sd/

Financial Adviser & Chief accounts Officer

Sd/

Director

Audit Certificate

I have examined the Receipt & Payments Accounts and Income & Expenditure Accounts for the year ended 31st March, 2003 and the Balance Sheet as on 31st March, 2003 of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram. I have obtained all the information and explanations that I have required and subject to the observations in the appended Audit Report, I certify, as a result of audit that in my opinion these Accounts and Balance Sheet are properly drawn up so as to exhibit a true and fair view of the state of affairs of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram, according to the best of Information and explanations given to me and as shown by the books of the organization.

New Delhi

Dated:

Sd/

Pr. Director of Audit
Scientific Departments

Sree Chitra Tirunal Medical Centre



Bio Medical Technology Wing



Maharani Setu Parvati Bai Surgical Centre



Achutha Menon Centre for Health Science Studies

